From Kelly W. Allred ~
Dedicated to my sons:
Nathan Kelly, Jesse Asa, Brady W, and Corby Spencer.
“Stand firm, be faithful and true!”

From Eugene M. Jercinovic ~
Dedicated to my wife, Betty Griffin, and children, Jason Jercinovic
and Jessica Jercinovic-Anaya

From Robert DeWitt Ivey ~
Dedicated to Vivian Porter Ivey

Front Cover: Organ Mountains, with *Eschscholtzia californica* subp. *mexicana*
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INTRODUCTION

THIS IS THE THIRD VOLUME IN THE FLORA NEOMEXICANA SERIES. Volume I presents a verified, annotated, and updated checklist of the names of vascular plants occurring in the state. Volume II introduces the meaning and etymology of each of these names. Volume III provides a means of identifying the vascular plants to which those names belong. Updated editions of Volumes I and II are published concurrently with this second edition of Volume III so that all three volumes agree as to the names and occurrence of the vascular plants of New Mexico.

Part 1 of FLORA NEOMEXICANA III (this book) treats the Spore Plants (Lycophytes & Monilophytes), Gymnosperms, and Monocotyledonous Plants of the Angiosperms. It also contains an outline of the classification of New Mexico vascular plants.

Part 2 of FLORA NEOMEXICANA III treats the Dicotyledonous Plants of the Angiosperms.

Volume I (Annotated Checklist) of the series gives brief accounts of the climate, geologic history, soils, ecoregions, vegetation types, and botanical history of New Mexico, as well as data on endemic, exotic, and noxious plants of the state, and a detailed statistical summary of the flora, so that information is not repeated here.

It is anticipated that a future Volume IV will comprise an illustrated treatment of the mosses of the state.

Volume III is really two books in one. Beginning in 1983, Robert DeWitt Ivey illustrated in masterful fashion the plants of New Mexico, his exceptional line drawings appearing in five editions of FLOWERING PLANTS OF NEW MEXICO (Ivey 1983-2008). We are pleased and gratified that DeWitt agreed to combine his outstanding illustrations with our text and commentary. It is hoped that the resulting collaboration exceeds in value each of its two components.

Nearly all the illustrations are by Robert DeWitt Ivey, and are taken from his last edition of FLOWERING PLANTS OF NEW MEXICO (Ivey 2008). A few additional illustrations are by Eugene Jercinovic, indicated by GJ. Approximately 1600 species are illustrated.
Illustrated Plant Parts and Terms

A. A Simple Flower
- stamen
- anther
- filament
- style
- ovary
- pistil
- petals
- collectively, all the petals are called the corolla
- receptacle
- peduncle

B. A Composite Head:
- if you suspect that your flower is a composite, break it into two halves to reveal disk or ray flowers
- involucre (not sepals)
- pistil
- stamens
- corolla
- a single ray flower
- pappus scales (calyx equivalent)
- inferior ovary
- a single disk flower

Some variations exist:
- petals missing
- sepals missing
- flowers with male or female parts missing are "imperfect"
- pistil missing

Types of Ovaries:
- simple ovaries
- compound ovaries

- ovules
- lobe
- inferior ovary
- superior ovary
- a space is a "cell"

- separate male & female flowers on same plant
- plant monoecious
- separate m. & f. plants
- plants dioecious

ROOTS AND STEMS
- storage root
- tap root
- fibrous root
- woody stem
- herbaceous stem
SIMPLE LEAVES AND LEAFLETS

parallel-veined  pinnate  palmate  net-veined  alternate  opposite  whorled

sessile  petioled  stipules  fused stipules or ocrea  clasping  entire (margin)

undulate  dentate  serrate  crenate  toothed  pinnately lobed  palmately divided  pinnatifid

rotate  cordate  oblong  ovate  obovate lanceolate  oblanceolate  spatulate  linear

attenuate  acute  obtuse  truncate  emarginate  rounded  cuneate  hastate  auriculate

COMPOUND LEAVES

even-pinnately compound  odd-pinnately compound  bipinnately compound  palmately compound  trifoliate
Family APIACEAE Parsley family

- 5 petals, 5 stamens, ovary inferior, styles 2
- calyx absent or of 5 small lobes
- ribbed, 2-parted fruits
- x.s. showing oil tubes
- typical umbels
- inflorescence is more recognizable than individual flowers
- compound umbel of sweet cicely
- stems hollow
- leaves compound or lobed

Family BRASSICACEAE Mustard family

- always in a 4 petals cross
- usually 6 stamens, 4 long, 2 short
- usually 4 upright sepals
- leaves alternate
- always a distinctive pod of 2 carpels
- a siliques
- 2 silicles
- beak
- septum
- dehiscent pod
- quad-rangular
- fruit compressed at rt. angles to septum
- compressed parallel to septum
- terete
- stipe
Family BORAGINACEAE  Borage family

- bristly plants with small flowers
- corolla and stamens
- Mertensia is rare
- typical types
- 2 carpels, each divided into 2 lobes
- leaves usually simple and entire
- scorpoid inflorescence
- fruit: 4 one-seeded nutlets
- barbed hair

Family CACTACEAE  Cactus family

- leaves reduced to spines, clustered in areoles, even on floral tube
- enveloping inferior ovary and subsequent fruit
- spineless pincushion
- radial spine
- organ pipe fruit
- central spine
- an areole
- tubercles coalesced into ribs
- unbarbed spines
- barbed spine
- example of grooved upper sides of tubercles

Family CARYOPHYLLACEAE  Pink family

- tiny to medium flowers; petals usually notched or fringed
- ovary is enclosed by sometimes united sepals
- flowers somewhat enlarged
- superior but elongate
- swollen node
- small to medium leaves, simple, often grasslike, sessile, opposite, arising from swollen nodes
Introduction
Family HYDROPHYLACEAE  Waterleaf family

- bristly plants with small flowers
- corolla with stamens arising from, or near base
- typical flowers
- ovary usually 1-celled

- 2-divided style
- seeds 2-many
- scorpionid
- fruit a capsule
- terminal cluster

Family LAMIACEAE  Mint family

- flowers small, mostly 2-lipped
- upper lip
- lower lip
- typical flowers
- a nearly regular type
- ovary 4-lobed
- in flower, later fruit is 4 one-seeded nutlets

- stamens 2 or 4
- corolla and stamens
- terminal head or spike
- calyx and pistil

- many are aromatic (minty)
- axillary clusters
- mostly leaves
- opposite sometimes whorled
- stems square 4-angled

Family LILIACEAE  Lily family

- flower parts radially symmetrical, or “regular”
- typically 3 sepals and 3 petals, all alike, separate or united;
- sometimes in unlike groups of 3

- stamens 6
- pistil 3-parted
- leaves slender, grass-like
Introduction

Family MALVACEAE  Mallow family

- always a flower shaped about like this, various sizes and colors
- 5 sepals
- 5 petals
- always a column of united stamens surround pistil stamens
- always a compound ovary with carpels like tangerine sections
- varying in details
- carpel
- reticulate wall

Types of hairs
- star-shaped
- simple
- peltate or shield-shaped
- stigmas
- linear
- truncate
- capitate

Family NYCTAGINACEAE  Four o'clock family

- petals absent; sepals united and petal-like: an involucre often holding one to several flowers
- calyx
- stamens, their bases united
- Ovary: actually superior, but appearing inferior
- Mirabilis
- Spiderling
- Abronia Sand-verbena
- single flower
- Allonia
- Trailing four-o'clock
- stems usually branched dichotomously; leaves, when opposite usually somewhat unequal in a pair

10
Family ONAGRACEAE  Evening primrose family

usually 4 petals, 4 sepals, 4-lobed stigma, ovary of 4 carpels, 8 stamens

flowers usually regular

Oenothera

inferior ovary

fruit (ovary)

simple leaves

sepals often hang downward and remain attached at their ends, in pairs

petals are sometimes displaced to sides, as in Gaura and fireweed

Gaura (slightly irregular)

Fireweed

exception to typical characters listed above: Circaea, the Enchanter's nightshade

2 petals each 2-lobed
2 sepals
2 stamens
1 or 2 carpels sl. 2-lobed stigma
ovary bristly with hooked hairs

Family PLANTAGINACEAE  Snapdragon family

mostly irregular flowers
5 united petals
2-lipped types

upper lip, 2 petals
lower lip, 3 petals

Penstemon

sterile stamen or staminode

anther sacs parallel divergent

leaves opposite, alt., entire or pinnatifid

regular type

Monkeyflower

typical fruit - usually 2-celled

flowers in racemes or spikes
POACEAE: Grass family

Our second largest family, after the Asteraceae
instead of sepals and petals, grasses have specialized scales

 Typically leaves and flower parts are 2-ranked

Grasses are divided into two major subfamilies:

Subfamily Festucoidae
One or more florets per spikelet, the lower ones fertile, infertile florets above, laterally compressed

Cross-sectional view of a festucoid grass

Subfamily Panicoidea
One perfect terminal floret, with a second infertile lemma below; dorsally compressed

Cross-sectional view of a panicoide grass

POLEMONIACEAE: Phlox family

5 partly united sepals; 5 partly united petals; 5 stamens, often unequal

Ipomopsis (Gilia)
Introduction

POLYGONACEAE Buckwheat family

8 stamens 5 sepals Achene (fruit) Polygonum

8 stamens 5 sepals Stipular sheath Polygonum

9 stamens 6 sepals Involucre Eriogonum

3-angled or winged achenes

Winged achene Rumex

RANUNCULACEAE Buttercup family

Many stamens Many pistils Shiny petals 5 petals, 5 sepals Buttercup type

No typical sepals, sepals are petalike Elkslip-anemone type

Larkspur Monkshood Columbine

Achene-type fruits Follicle-type fruits

Leaves typically alternate and without stipules

Family characteristics are inconsistent and difficult to define or recognize. These plants may perhaps best be learned as genera or species.
**ROSACEAE** Rose family

typically 5 petals, 5 sepals, 5 to many stamens, 1 to many simple pistils, ovary superior to inferior, a floral cup

**SOLANACEAE** Potato family

5 regular, united petals
5 partly united sepals
5 stamens, alternate with corolla lobes, their filaments partly grown to the corolla
ovary 2-celled or 3–5 celled, superior

1/4 actual size

fruit a berry or capsule
leaves various, alt., opp., simple, comp.

**VERBENACEAE** Verbena family

flowers small
stamens 4, in 2 pairs
slightly irregular corolla
corolla and stamens
ovary not lobed at flowering time

terete 4-angled
leaves opposite or whorled
fruit 4 one-seeded nutlets
Acknowledgments

No effort such as this arises on its own, but, rather, stands firmly on a foundation built by scores of others, who have willingly given their support and shared their expertise, advice, and enthusiasm.

First and foremost, we thank our wives, Lynda and Betty, for their unflagging sustenance, patience, encouragement, and cheer throughout our lives. They have contributed far more than they realize to this work. In addition, we give thanks for our children, Nathan, Jesse, Brady, and Corby; and Jason and Jessica. They, too, have been a blessing and source of excitement through the years.

Several botanists graciously provided, at no small investment in time and effort, treatments of particular groups of plants. We thank them for their excellent contributions: Patrick Alexander (Boechera, Erysimum, Heuchera, Mertensia, Thelypodium, key to Pteridaceae genera); Max H. Licher & Glenn R. Rink (Cyperaceae, Juncaceae); Max H. Licher, James McGrath, William R. Norris, & Glenn R. Rink (Carex); Timothy Lowrey (Asteraceae, Persicaria); John J. Schenk, Josh Brokaw, & Larry Hufford (Loasaceae); John C. Semple (Solidago); and Robert C. Sivinski (Allium, Boraginaceae, Ehrcteaceae, Ephedraceae, Heliotropiaceae, Hydrophyllaceae, Namaceae, key to Hieracium). Without exception, these friends of New Mexico botany were prompt, collegial, and scholarly.

Zachary Rogers generously provided hundreds of suggestions and corrections to the nomenclature and classification of our flora and to the typography of the manuscript; his contribution has been invaluable, and we thank him profusely.

Richard Felger called attention to numerous issues of nomenclature, distribution, and classification. His probing questions and suggestions were always welcome.

John T. Kartesz generously made available to us private distribution and reference data from his extremely useful Synthesis of the North American Flora, version 2.0.

Patrick Alexander kindly provided an online resource for generating the distribution maps, and spent many valuable hours tweaking it so those untrained in such things could use it.

Richard Worthington likewise provided plentiful comments, suggestions, identifications, range expansions, and called our attention to potential taxonomic problems that only a keen eye would notice.

In many cases, keys were adapted from the excellent work of others. They and their work are noted and acknowledged within the text.

Uniformly helpful curators and staff at herbaria with significant holdings of New Mexico plants aided enormously by providing access to specimens and checking identifications and locality information: Biology Herbarium (NMC) and Range Science Herbarium (NMCR) at New Mexico State University; Rocky Mountain Herbarium (RM); San Juan College Herbarium (SJNM); Dale A. Zimmerman Herbarium (SNM) at Western New Mexico University; and University of New Mexico Herbarium (UNM).

We also gratefully acknowledge online plant databases that have aided in wondrous fashion our search for specimens, localities, distributions, nomenclature, publications, and collectors: Biodiversity Heritage Library (biodiversitylibrary.org), the International Plant Names Index (ipni.org), SEINet Arizona-New Mexico Chapter (swbiodiversity.org), the Plants Database (plants.usda.gov), Southwest Biodiversity Consortium (swbiodiversity.org), and The Biota of North America Program (bonap.org).

Many others have made contributions great and small, and we gratefully recognize the help of each of the following: David Lee Anderson, Donovan Bailey, Mary Barkworth, George Cox, David Ferguson, Ron Hartman, Ken Heil, Tim Hogan, Chick Keller, Kim Kersh, Ben Legler, Ernie Nelson, Guy Nesom, Steve O’Kane, Roger Peterson, Mark Porter, Anton Reznicek, Al Schneider, Richard Spellenberg, Victor Steinmann, Phil Tonne, Gordon Tucker, Dieter Wilken, Michael Windham, Richard Worthington, Scott Zager, Peter Zika, and Dale A. Zimmerman.

Notwithstanding the superb assistance from each of the persons mentioned above, any errors remaining are ours alone, for which we humbly take credit. By now, we’re used to it.
IDENTIFICATION KEYS TO THE FLORA OF NEW MEXICO

Scope and Organization

As in Volume I of the Flora Neomexicana series, this work treats only the vascular plants of New Mexico. For convenience, the plants are arranged by broad taxonomic groups: Part 1 (this book) treats the Spore Plants (Lycophytes and Monilophytes, ferns and their allies), the Gymnosperms (conifers), and finally the Monocotyledonous Plants of the Angiosperms (flowering plants). Part 2 treats the true Dicotyledonous Plants and other non-monocots. We have attempted to include all taxa known to occur in the state, as documented in Volume I.

The initial keys (below) lead first to the cacti, then to two artificial groups of plants (aquatic and parasitic plants), and then to the major taxonomic groups (spore plants, gymnosperms, and angiosperms). Further keys to families are found within each of these taxonomic groups, followed by the families in alphabetical order. Headers at the top of each page will help inform the user as to the group and family found on that page.

The classification scheme herein corresponds to that presented concurrently in the 3rd edition of Volume I, and is adapted from the system presented in Judd et al. (2016), modified here to the use of New Mexico vascular plants, and integrating the many recent advances in phylogenetic classification with a more practical and simplified presentation necessary for identification purposes. Differences with Judd et al. (2016) in the classification of families and genera are noted in the text. An outline of the higher levels is presented below.

Outline of the Classification of New Mexico Vascular Plant Families

[adapted from Judd et al. 2016]

Spore Plants
- Lycophytes – Lycophyta Division
  - Isoetaeae
  - Lycopodiaceae
  - Selaginellaceae
- Monilophytes – Polypodiophyta Division
  - Aspleniaceae
  - Dennstaedtiaceae
  - Dryopteridaceae
  - Equisetaceae
  - Marsileaceae
  - Ophioglossaceae
  - Polypodiaceae
  - Pteridaceae
  - Salvinia

Seed Plants
- Gymnosperms – Pinophyta Division
  - Cupressaceae
  - Ephedraceae
  - Pinaceae
- Angiosperms – Magnoliophyta Division
  - Monocotyledonous Plants
    - Monotocyledonous Plants
    - All traditional monocot families
  - Dicotyledonous Plants
    - ANITA Grade
    - Nymphaeaceae
    - Magnoliid Complex
    - Aristolochiaceae
    - Saururaceae
    - Ceratophyllaceae
    - Eudicots
    - All other traditional dicot families

Statistical Summary of New Mexico Vascular Plants

Detailed statistical elaboration is available in Flora Neomexicana I.

<table>
<thead>
<tr>
<th>Group</th>
<th>Families</th>
<th>Genera</th>
<th>Species</th>
<th>Infraspecific Taxa</th>
<th>Total Taxa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lycophytes</td>
<td>3</td>
<td>4</td>
<td>15</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Monilophytes - Ferns</td>
<td>12</td>
<td>27</td>
<td>75</td>
<td>3</td>
<td>78</td>
</tr>
<tr>
<td>Gymnosperms</td>
<td>3</td>
<td>7</td>
<td>29</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Monocotyledonous Plants</td>
<td>26</td>
<td>206</td>
<td>766</td>
<td>62</td>
<td>828</td>
</tr>
<tr>
<td>Dicotyledonous Plants</td>
<td>115</td>
<td>830</td>
<td>2928</td>
<td>295</td>
<td>3228</td>
</tr>
<tr>
<td>Totals</td>
<td>159</td>
<td>1074</td>
<td>3813</td>
<td>362</td>
<td>4180</td>
</tr>
</tbody>
</table>

Conventions Used in the Keys and Family Treatments

- All keys are dichotomous and indented, with two contrasting leads. Keys to the groups, families, genera, and species begin with numbers (1, 2, 3, etc.). Keys to infraspecific taxa (subspecies, varieties, forms) begin with letters (a, b, c, etc.). After making a choice of one of the contrasting leads, the next pair of leads will be found immediately below that choice.

- Following the family heading, the number of genera, species, and total taxa (species, subspecies, varieties, and forms) for that family will be given in brackets (e.g., [37/67/69]).

- Names for documented plants that occur in the wild in New Mexico are in bold-italic, followed by the names of the botanical authors (not abbreviated).

- Names of plants not definitely known in the wild in New Mexico, but included in the key for clarification or because they will be likely found in the state, are in italics, but not bolded. These taxa are not included in the statistical totals.

- Common names are in ALL CAPS, and are provided for most genera and for occasional species where genuine common names are in use.

- Synonyms are in italics, not bolded, and placed within [brackets] following the botanical authorities or common name.

- Names of endemic taxa are preceded by a plus sign (+).

- Names of exotic taxa are preceded by an asterisk (*).

- Names of ×hybrid plants or hybrid populations that have been given formal taxonomic status are preceded by an ×.

- The names will be followed by short statements about habitat, distribution, and variation. The abbreviations M&H and W&S refer to the preceding works of W.C. Martin & C.R. Hutchins (A Flora of New Mexico), and E.O. Wooton & P.C. Standley (Flora of New Mexico), respectively.

- Plants that are illustrated are marked with §. The illustrations will be found a few pages subsequent to the symbol.

- The county distribution maps are based on actual occurrences based on specimens or observations.

- The term phase is used in a non-taxonomic, non-nomenclatural sense, to call attention to notable variation that does not meet the criteria for formal systematic recognition, but that is conspicuous and well-known, and might seem significant until placed within the context of the complete variation of the species. It is most similar to the rank of forma in the taxonomic hierarchy.

An explanation of the use of ex and in is appropriate. When a publishing author of a name ascribes the origin of the name to another person, that person may be cited after the epithet, followed by ex, followed by the name of the publishing author. For example, Humboldt & Bonpland coined the name Aristida divaricata for our poverty threeawn, but never validly published the name. Willdenow adopted that name for the same taxon, acknowledging Humboldt & Bonpland in his description. Hence, the full citation of authorities is Aristida divaricata Humboldt & Bonpland ex Willdenow. The name may be shortened to Aristida divaricata Willdenow, and still be correct. Note that it is the names before the ex that may be dropped, not the names after (this is counter-intuitive for English speakers).

If a plant name is validly published by one author within a larger work of another, then the term in may be used to explain the situation. For example, Englemann described the cactus Cereus pectinatus within Gray’s Plantae Fendleriinae. Since Gray had no involvement with the description of the name, the correct citation is Cereus pectinatus Engelmann in Gray, or more simply, Cereus pectinatus Engelmann.
Keys to the Groups and Families

1 Stems thick and succulent; leaves reduced to spines and barbs and grouped in definite clusters on the stem; plants cactus-like............(Part 2) CACTACEAE

1 Stems and/or leaves other than above; plants not cactus-like
2 Plants truly aquatic, at least most of the plant submerged or floating on the water....................................................GROUP I
2 Plants not truly aquatic, growing on dry land, or if growing in mud or shallow water then most of the plant extending up out of the water
3 Plants parasitic or epiphytic on stems, branches, or roots of other plants, generally without chlorophyll and not green, or if green then clearly growing on and attached to a host plant.................................................................GROUP II
3 Plants not obviously parasitic on other plants, but producing chlorophyll and greenish in color
4 Spore Plants: Lycophytes (quillworts, clubmosses, spikemosses) and Monilophytes (ferns): plants reproducing by spores, which are borne on the underside of the leaves, in the axils of the leaves, or in cones; seeds not produced; plants moss-like, fern-like, or horsetail-like.................................SPORE PLANTS, p. 21
4 Seed Plants: plants reproducing by seeds, which are borne in cones or in flowers; spores not produced; plants grasses, forbs, or woody plants of various habits
5 Conifers or Gymnosperms: leaves needle- or scale-like; plants evergreen trees or shrubs; seeds borne in woody or fleshy (berry-like) cones, never borne in true flowers..................................................GYMNOSPERMS, p. 39
5 Flowering Plants or Angiosperms: leaves various, generally not needle- or scale-like; plants often not evergreen; seeds borne in true flowers
6 Monocotyledonous Plants: Leaves simple, often sheathing the stem, usually parallel-veined and mostly alternate (rarely opposite or whorled), lacking stipules; flower parts in multiples of 3; vascular bundles scattered throughout the stem, lacking a cambium ring; root system adventitious and fibrous........................MONOCOTYLEDONOUS PLANTS, p. 49
6 True dicots (eudicots) and other non-monocots: Leaves simple or compound, generally not sheathing the stem, usually net veined, alternate, opposite, or whorled, with or without stipules; flower parts in multiples of 2 or 5 (rarely 3); vascular bundles usually joined in a cambium ring; root system various...DICOTYLEDONOUS PLANTS, go to Part 2

GROUP I: Plants Aquatic
1 Plants floating on the water or completely submerged, not rooted in the soil, the entire plant generally less than 6 cm long
2 Plant body not differentiated into stems and leaves .................................................(Monocots) ARACEAE
2 Plant body differentiated into stems and leaves .................................................(Spore Plants) SALVINIACEAE
1 Plants floating or rooted in the soil, the entire plant body generally much longer than 6 cm
3 Plants not differentiated into stems and leaves..........................................................various algae, not treated further here
3 Plants clearly differentiated into stems and leaves
4 Leaves all scale-like or narrowly linear, generally very thin (one or two cells thick) and entire, alternate, often densely overlapping; roots absent..........................................................various mosses, not treated further here
4 Leaves various, but in some or all ways different from above; roots generally present
5 Leaves compound or very deeply divided into several segments
6 Leaflets 3-4, palmately arranged
7 Leaflets 3, acutish at the tips (Menyanthes)...........................................(Part 2) MENYANTHACEAE
7 Leaflets 4, rounded at the tips, resembling 4-leaf clover (Marsilea) ............................(Spore Plants) MARDILLACEAE
6 Leaflets more numerous, pinnately arranged
8 Leaf segments lanceolate or wider, mostly ascend into the air (Rorippa) .................(Part 2) BRASSICACEAE
8 Leaf segments linear, at least on submersed leaves
9 Plants free-floating; roots absent or rarely produced
10 Leaves alternate with numerous small bladders borne on the leaf segments.......(Part 2) LENTIBULARIACEAE
10 Leaves mostly whorled, without bladders......................................................(Part 2) CETATOPHYLLACEAE
9 Plants rooted in the soil
11 Primary leaf divisions pinnate (Myriophyllum)...........................................(Part 2) HALORAGACEAE
11 Primary leaf divisions palmate (Ranunculus)...................................................(Part 2) RANUNCULACEAE
5 Leaves simple, the margins entire to shallowly lobed, toothed, or notched, but leaflets or segments not produced
12 Leaves peltate, sagittate, or deeply notched, but remaining simple
13 Leaves to 6 cm across/long, peltate, the petiole attached near the middle of the blade rather than at the margin or in the sinus (Hydrocotyle) .................................................................................(Part 2) APIACEAE
13 Leaves commonly more than 10 cm across/long, sagittate or deeply notched, the petiole attached in the sinus of the notch
14 Leaves pinnately veined, floating flat on the water or slightly submersed..........(Part 2) NYMPHAEACEAE
14 Leaves reticulate veined, generally ascend into the water.............................(Monocots) ALSIMATACEAE
12 Leaves not peltate, sagittate, or deeply notched
15 Leaves in whorls
16 Flowers numerous on the stem, whorled, sessile, and emergent in the axils of nearly all the upper (aerial) leaves; leaves branched pinnate-veined, thick and opaque (Hippuris) ......................................(Part 2) PLANTAGINACEAE
16 Flowers few, found only in a few of the leaf axils and mostly submersed, sessile (pistillate) or on long stalks (staminate); leaves single-veined, thin and nearly translucent...........(Monocots) NYMPHAEACEAE
15 Leaves not whorled, clearly either alternate, opposite, or basal
17 Leaves floating or emergent out of the water
18 Leaves opposite
19 Flowers showy, usually more than 5 mm long, often yellowish
20 Petals free from each other; ovary inferior; flowers actinomorphic; leaves mostly entire ...................
       ................................................................................................................................................. (Ludwigia) (Part 2) ONAGRACEAE
20 Petals united; ovary superior; flowers zygomorphic; leaves entire or toothed
21 Sepals free, a calyx tube not developed (Bacopa) .........................(Part 2) PLANTAGINACEAE
21 Sepals connate into a well-developed tube (Erythranthe) ......................(Part 2) PHRYMACEAE
19 Flowers not showy, often minute, less than 4 mm long, white or clear-colored
22 Stipules absent; blades linear to narrowly spatulate (Callitriche) ........ (Part 2) PLANTAGINACEAE
22 Stipules present; blades lanceolate to elliptic ...........................................(Part 2) ELATINACEAE
18 Leaves alternate or basal
23 Small annuals 3-10 cm tall; leaves all basal (Limosella).................(Part 2) SCROPHULARIAEAE
23 Perennial plants other than above
24 Leaves with pinnate venation (Polygonum)..............................................(Part 2) POLYGONACEAE
24 Leaves with parallel or reticulate venation
25 Plants usually a meter or more tall, the shoots and flowering stems stiffly erect; cattails,...........
       ................................................................................................................................................. (Monocots) TYPHACEAE
25 Plants less than a meter tall, the shoots and flowering stems often lax or limp
26 Mid-vein distinct and prominent
27 Flowers in axillary or terminal spikes, perfect ...... (Monocots) POTAMOGETONACEAE
27 Flowers in unisexual globose heads arranged laterally along a zig-zag rachis
       (Sparganium)......................................................................................................................... (Monocots) TYPHACEAE
17 Leaves all or mostly submersed under water
28 Leaves alternate or basal (occasionally opposite toward the tips of the stems)
29 Leaves all basal, the stems not elongate .................................................(Monocots) ALISMATACEAE
29 Leaves borne on elongate stems
30 Leaves extremely filiform, about 0.5 mm wide; mature fruits in umbels on long coiling peduncles......
       .................................................................................................................................................(Monocots) RUPPHACEAE
30 Leaves mostly wider than 2 mm; mature fruits in spikes, the peduncles stout and stiff..................
       ................................................................................................................................................. (Monocots) POTAMOGETONACEAE
28 Leaves opposite
31 Leaves prominently arranged in right-angle pairs one above the other (decussate); flowers on long thread-like stalks extending to the water’s surface (Elodea bifoliata).......(Monocots) HYDROCHARITACEAE
31 Leaves not prominently decussate; flowers completely contained in the leaf axis
32 Leaf blades abruptly broadened at the base to sheath the stems (Najas) .........................(Monocots) HYDROCHARITACEAE
32 Leaf blades of about equal width throughout, only weakly clasping the stem if at all
33 Fruits mostly 1-2 per node, globe-shaped, the style deciduous; leaves mostly less than 2 cm long
       (Callitriche) .......................................................................................................................... (Part 2) PLANTAGINACEAE
33 Fruits mostly 2-4 per node, crescent-shaped, with a persistent style; leaves 1-6 cm long
       (Zannichellia).................................................................................................................. (Monocots) POTAMOGETONACEAE
GROUP II: Plants Parasitic or Epiphytic on Host Plants
1 Plants tiny, no more than 5 mm tall or wide, the vegetative parts embedded within the host plant with only small reddish-brown flowers and a few scale-like leaves evident on the surface of the host; parasitic on Dalea ...........(Part 2) APODANTHACEAE
1 Plants larger and not as above
2 Stems vine-like, not stiffly erect but elongate and twining over the host plant (Cuscuta).............(Part 2) CONVOLVULACEAE
2 Stems not at all vine-like, mostly stiffly erect or woody, never twining
3 Plants stem parasites or epiphytes, growing on the aerial portions of a host plant, not growing in the soil
4 Plants growing in tight grayish balls about the size of a softball; leaves filiform, 3-15 cm long and about 2 mm wide; true epiphytes, growing on the stems of the host plant but not penetrating its tissues..............(Monocots) BROMELIACEAE
4 Plants in bushy yellowish or greenish growths much larger than above; leaves scale-like to broadly ovate, but not filiform as above; parasites, penetrating the tissues of the host plant (mistletoes) ..................................................(Part 2) VISCACEAE
3 Plants root parasites, growing in the soil and attached to the roots or decaying matter of a host plant
5 Flowers zygomorphic
6 Petals united into a tube; ovary superior .................................................................(Part 2) OROBANCHACEAE
6 Petals separate; ovary inferior.................................................................................(Monocots) ORCHIDACEAE
5 Flowers actinomorphic
7 Plants with chlorophyll, green, not obviously parasitic ...........................................(Part 2) COMANDRACEAE
7 Plants lacking chlorophyll, not green (Monotropoideae)..........................................(Part 2) ERICACEAE
### Spore Plants: Lycophytes and Monilophytes

Aspleniaceae

[quillworts, clubmosses, spikemosses, ferns, horsetails]


#### Key to the Families

1. Entire plant body floating in or on the surface of water, not rooted in the soil
   - **SALVINIACEAE**

1. Plants rooted in soil or rock crevices, though sometimes growing in the water or parts of the plants floating on the water's surface

2. Stems green, hollow and tubular, jointed, prominently ridged longitudinally; leaves brownish and scale-like, forming a circular sheath around the node
   - **EQUISETACEAE**

3. Plants moss- or grass-like; leaves scale-like or linear, less than 3 mm wide (Lycophytes)

4. Plants grass-like; leaves long and linear; spore-bearing structures embedded in the leaf bases at the base of the plant
   - **ISOETACEAE**

5. Leaves 1-5 mm long; fertile leaves 4-ranked, the cluster appearing square when viewed from above; spore-bearing sacks (sporangia) of two kinds, some with 4 large spores (female megaspores) and some with numerous smaller spores (male microspores)
   - **SELAGINELLACEAE**

6. Plants moss-like; leaves short and scale-like; spore-bearing structures in the leaf axils or at the branch tips

7. Plants with a single leaf borne on an erect, above-ground stem
   - **OPHIOGLOSSACEAE**

8. Clusters of sporangia borne along the margins of the leaves
   - **LYCOPODIACEAE**

9. Rhizomes and petiole bases covered with hairs only one cell wide; petioles strongly grooved (**Pteridium**)......
   - **PTERIDACEAE**

10. Sporangia grouped into distinct clusters (sori); indusia absent or present
    - **PTERIDACEAE**

11. Indusia absent
    - **PTERIDACEAE**

12. Blades only once pinnately lobed or divided, the primary lobes not lobed themselves....
    - **POLYPODIACEAE**

13. Sori elongate, straight or horseshoe-shaped
    - **ASPLENIACEAE**

14. Blades simple or once pinnate
    - **ASPLENIACEAE**

15. Indusia round or round-reniform, attached from within the sori
    - **DROOPIDACEAE**

16. Indusia hood-like (sometimes inconspicuous in mature leaves), basally attached under one side of the sori
    - **CYSTOPTERIDACEAE**

#### Aspleniaceae: Spleenwort Family

**[quillworts, clubmosses, spikemosses, ferns, horsetails]**

Plants terrestrial, epiphytic, or growing on rocks; stems (rhizomes) creeping to semi-erect, covered with clathrate scales; fronds simple and either undivided or lobed to 1-3-pinnate; vernation circinate; veins free or rarely anastomosing; sori elongate; indusium elongate and membranous when present. With 2 genera and more than 770 species nearly worldwide.

**Asplenium** [Greek spleen, spleen, the plants thought to be useful for treating spleen diseases] SPLEENWORT [5].

Terrestrial perennial plants; stems erect or short-creeping, bearing basally attached scales; leaves diverse, monomorphic or dimorphic, simple to pinnately compound; sori oblong to elongate, borne on veins, the indusium arising from one side of the sori.

**Species about 700; worldwide.**

1. Fronds simple, broadly ribbon- to grass-like
   - **A. septentrionale**

2. Fronds less than 3 mm wide, linear, frequently forking with 1-3 small narrow projections
   - **A. scolopendrium**

3. Apex of the blade gradually reduced to a whip-like rooting tip with a terminal bud
   - **A. palmeri**
Asplenium palmeri  [for Edward Palmer (1829-1911), prominent British botanist-ethnologist]. Stems short-creeping, unbranched, scales black with lighter margins; fronds monomorphic; blades once pinnate, pinnae appearing opposite, 4-9 mm long, 2-4 mm wide, oblong; rachis purplish black, lustrous, in some blades much prolonged and naked with a bud or rooting plantlet at the tip. ◆Shaded rocky slopes, crevices of cliffs; reported for New Mexico, but no valid specimens have been located.

Asplenium platyneuron  [Linnaeus] Britton, Stearns & Poggenburg  [broad-nerved]  [Acrostichum platyneuron Linnaeus] Stems short-creeping, unbranched, scales brown to black throughout; fronds dimorphic, the fertile taller, darker, and erect, the sterile shorter, lighter, and spreading or prostrate; blades once pinnate, pinnae 10-25 mm long, 3-6 mm wide, alternate, lustrous; often auriculate on one side of the base; rachis reddish or purplish brown, lustrous; sori elliptic to linear-oblong, nearer to the midvein than the margins. ◆Forest floor and among rocks, often on poor and sandy soil; northeast corner of the state. ♦Asplenium platyneuron also occurs in southern Africa. No other North American fern shares this distribution.

Asplenium resiliens  [Kunze]  [springing back, resilient]. Stems erect, unbranched, scales black throughout; fronds monomorphic; blades once pinnate, pinnae oblong, appearing opposite, sometimes imperfectly, 10-25(-30) mm long, 3-5 mm wide, 3-5 times longer than wide, base notably asymmetric, usually with an auricle pointing towards the frond tip; rachis black throughout, lustrous, glabrous. ●Terrestrial or in rock crevices, often on limestone, pine-oak forests; mostly southern.

Asplenium scolopendrium  [Linnaeus] [millipede-like, an allusion to the rows of sori]. Stems erect, unbranched, scales brown to black throughout; fronds monomorphic; petioles 1/8 to 1/3 length of the blade; blade glabrous, 8-35 cm long, 2-4 cm wide, base deeply cordate; margins entire; sori numerous, linear, ± perpendicular to rachis, usually restricted to the distal half of the blade. ◆On calcareous rocks in sinkholes, at cave entrances, always in deep shade. ●This rare (in New Mexico) fern was discovered in 2017 in a cave in Cibola County. Our material belongs to var. americanum  [Fernald] Kartesz & Gandhi  [of the Americas]  [Phyllitis scolopendrium (Linnaeus) Newman var. americanum Fernald]; other varieties do not naturally occur in North America.

Asplenium septentionale  [Linnaeus] Hoffman  [northern]  [Acrostichum septentionale Linnaeus] Stems erect, much branched to produce many-stemmed tufts bearing numerous fronds, scales dark reddish brown to black throughout; fronds monomorphic; blades 2-3 mm wide, grasslike, undivided or forked or with 1 or 2 narrow, flattened pinnae; rachis green glabrous; pinnae linear, flattened, ascending, sometimes forked; sori 2+, parallel to pinna margins. ●Cliff crevices, cracks of boulders; scattered locations, mostly northern.

Asplenium trichomanes  [Linnaeus] [with a hairy cup]. Stems short-creeping to erect, scales black throughout or with brown margins; fronds monomorphic; blades once pinnate, pinnae oblong broadly oval, appearing opposite (often alternate distally), 3-8 mm long, 2.5-4 mm wide, 1-2 times longer than wide, asymmetrically cuneate at the base; rachis reddish brown, lustrous, glabrous; sori noticeably longer than wide. ●Cliff crevices and ledges, talus slopes; scattered areas in mountains. ◆Our plants belong to subsp. trichomanes, the small-spored diploid cytotype. The tetraploid subsp. quadrivalens occurs in the northeastern United States.

ATHYRIACEAE LADY-FERN FAMILY [1/1/1]

Terrestrial or epiphytic perennial plants; stems creeping to ± erect, unbranched; blades simple to 3-pinnate-pinnatifid; veins usually ending before margins of ultimate segments; sori elongate, often J- or U-shaped; indusia shaped like sori. ●In New Mexico this family is represented only by the genus Athyrium, which was formerly included in a polyphyletic Dryopteridaceae; we follow Judd et al. (2016) in segregating the monophyletic groups corresponding herein to Athyriaceae, Cystopteridaceae, Dryopteridaceae, and Woodsiaceae. ◆With about 600 species in 5 genera; worldwide.

Athyrium filix-femina  [Linnaeus] Roth ex Mertens  [lady-fern]  [Polypodium filix-femina Linnaeus]. Petioles straw-colored distally; blades 2-pinnate to 2-pinnate-pinnatifid; pinnae sessile to short-stalked; pinnae pinnatifid; sori straight, hooked at distal end, not located near pinnule margins. ●Moist woods, meadows, stream banks in mountain areas. ◆This is a large, showy fern, variable, with several varieties in North America. Our plants belong to var. californicum  Butters  [of California], with petiole scales longer than 1 cm, blades twice as long as petioles, and linear-oblong to linear-lanceolate pinnales.

CYSTOPTERIDACEAE BLADDER-FERN FAMILY [2/5/5]

Terrestrial perennial plants; stems often long-creeping, scaly; leaves monomorphic, blades 2-3 pinnate-pinnatifid; veins extending to margins of ultimate segments; sori round; indusia hood-like and basally attached or absent. ●Our genera were formerly included in a polyphylectic Dryopteridaceae; we follow Judd et al. (2016) in segregating the monophyletic groups corresponding herein to Athyriaceae, Cystopteridaceae, Dryopteridaceae, and Woodsiaceae. ◆Cystopteridaceae is a nearly cosmopolitan family, but is more common in the Northern Hemisphere. It contains 3 genera and 36 species.

Cystopteris decumbens  [California]. Stems short-creeping to lignicolous; leaves monomorphic, serate-pinnatifid to entire; sori linear-oblong; indusia hood-like, basally attached; rhizomes naked. ●Damp woods, meadows, stream banks in mountain areas.
1 Indusia laterally attached............................................................................................................. Cystopteris
1 Indusia absent.......................................................................................................................... Gymnocarpium

**Cystopteris** [bladder fern] BLADDER-FERN [4].

Plants terrestrial or on rock; stems short-to long-creeping; petioles with 2 vascular bundles; blades 2-3-pinnate-pinnatifid; reduced distally to a pinnatifid apex; rachises and costae grooved adaxially; sori in one row between midrib and margin of pinnules; indusia hood-like, arching over sori towards the pinnule margin. ♦Species 25; worldwide.

1 Rachises densely covered with gland-tipped hairs; bulblets frequently borne along the rachis.................................................C. bulbifera
2 Rachises mostly without gland-tipped hairs; bulblets absent

2 Fronds 2- to 3-pinnate; stems usually long-creeping........................................................................... C. reevesiana
3 Rachises perpendicular to the rachis, not curving toward the apex, the margins crenulate or with rounded teeth ...C. tenuis

**Cystopteris bulbifera** (Linnaeus) Bernhardi [bulb-bearing]. [Polypodium bulbiferum Linnaeus] Petioles green or straw-colored; blades 2-pinnate to 2-pinnate-pinnatifid, widest at the base; rachises and costae with dense gland-tipped hairs, often with bulblets; pinnae perpendicular to rachis, margins serrate; indusia usually with gland-tipped hairs. ♦Forming streamer-like, hanging clumps on moist limestone cliffs and ledges; known only from Los Alamos County.

**Cystopteris fragilis** (Linnaeus) Bernhardi [fragile, easily broken] [Filigulis fragilis (Linnaeus) Gilib. Polypodium fragilis Linnaeus]. Petioles green to straw-colored, darker at the base; leaf blades 1-2-pinnate-pinnatifid, widest near middle; axes of pinnae lacking gland-tipped hairs; pinnae mostly perpendicular to rachis, margins serrate to sharply dentate; veins directed mostly into teeth. ♦Mostly on cliff faces in the northern mountains; easily confused with C. reevesiana which prefers boulders or soil over cliffs. ♦A number of specimens of C. fragilis were identified before C. reevesiana was described in 1981; some of these might well be C. reevesiana.

**Cystopteris reevesiana** Lellinger [for Timothy Reeves (1947–x), New Mexico botanist] [Cystopteris fragilis (Linnaeus) Bernhardi subsp. reevesiana Clute]. Petioles often uniformly dark purple at base, grading to straw-colored at junction with blade; leaf blades 2- to 3-pinnate, widest near middle; axes of pinnae with occasional gland-tipped hairs; pinnae mostly perpendicular to rachis, margins dentate to crenate; veins directed into teeth and notches. ♦Commonly in soil or in a thin soil layer of rocks; widespread in the state.

**Cystopteris tenuis** (Michaux) Desvaux [slender] [Cystopteris fragilis (Linnaeus) Bernhardi var. mackayi G. Lawson, Nephridium tenuis Michaux]. Petioles mostly green to straw-colored; leaf blades 1- to 2-pinnate-pinnatifid, widest near middle; axes of pinnae lacking gland-tipped hairs; pinnae usually at acute angle to rachis, curving toward blade apex, margins crenulate; veins directed into teeth and notches. ♦Shaded rock, cliff faces, and also the forest floor; barely entering New Mexico in the Four Corners region. ♦Another close relative of C. fragilis (with C. reevesiana) that has been segregated at the specific level.

**Gymnocarpium** [naked fruit] OAK-FERN [1].

Plants terrestrial; stems long-creeping; leaves monomorphic; petioles 1.5-3 times blade length with 2 vascular bundles; blade 2-3-pinnate-pinnatifid; proximal pinnae longest, usually inequilaterals with pinnules pointing toward the base longer than pinnules pointing towards the apex; rachises and costae adaxially grooved; sori in one row between midrib and margin; indusia absent. ♦Species 8; northern temperate regions, North America, Eurasia.

**Gymnocarpium dryopteris** (Linnaeus) Newman [resembling Dryopteris] [Dryopteris linnaeana C. Christensen, Polypodium dryopteris Linnaeus]. Leaf blade broadly deltate, abaxial surface and rachis glabrous or with sparse glandular hairs, adaxial surface glabrous; proximal pinnae facing the frond base with sessile first basal pinnules, these pinnules with the basal pinnule equaling or longer than the adjacent pinnule. ♦Cool, shady forests in montane areas; northern mountains. ♦This fern is very uncommon in both New Mexico and Arizona.

**DENNSTAEIDIACEAE** BRACKEN FAMILY [1/1/1]

Terrestrial perennial plants generally in forested habitats; stems short- to long-creeping; leaf blades monomorphic, 1- to 4-pinnate, rachises and costae often grooved adaxially; sori marginal; the true indusium cup-like (rarely absent), often obscured by a false indusium formed by revolute leaf margins. ♦Represented in New Mexico by one genus. The family contains about 10 genera and about 240 species distributed worldwide.

**Pteridium** [resembling Pteris] BRACKEN-FERN [1].

Stems long-creeping, bearing fine hairs; lacking scales; leaves broadly deltate; blades 2-4-pinnate, rachis and costae grooved adaxially; nectaries present at bases of proximal pinnae; segments of pinnae pinnately divided, hairy abaxially, margins entire; sori + continuous along margins of abaxial surface. ♦Species 1, worldwide.

**Pteridium aquilinum** (Linnaeus) Kuhn [eagle-like] [Pteris aquilina Linnaeus]. Fronds 0.5-1 m in length; petioles scattered on stems, grooved adaxially; blades sparsely to densely hairy abaxially; pinnae often opposite to subopposite; inner indusia, if present, hidden by reflexed margins of pinnules and maturing sporangia. ♦Mesic, montane forests; widespread. ♦Perhaps our most common fern, large and coarse, appearing early in the year and producing leaves all season, but wilting rapidly with the first frost. Used by indigenous people for food, but it is also poisonous. Our plants belong to var. pubescens Underwood [downy, hairy], having abaxial blade surfaces with abundant, lax and spreading hairs, and pinnules at nearly 90° to costae.
Spore Plants - Dryopteridaceae

**DROOPTERIDACEAE  SHIELD-FERN FAMILY**  [3/3/3]

Perennials homosporous, terrestrial or on rock; stems erect to creeping, covered with scales; leaves monomorphic or dimorphic; blades simple or once to multi-pinnately compound; sori usually round, sometimes elongate, borne on the veins or at vein tips, but usually not on the margin; indusia present or absent. The family formerly included several other genera in a polyphyletic arrangement; we follow Judd et al. (2016) in segregating the monophyletic groups corresponding herein to Athyraceae, Cystopteridaceae, Dryopteridaceae, and Woodsiaceae. Dryopteridaceae contains about 34 genera and about 1700 species.

**Dryopteris** [oak fern] MALE FERN [1].

1 Blades primarily once-pinnate, the pinnae pinnatifid lobed nearly throughout; indusia attached laterally at the sinus..............

1 Blades pinnate-pinnatifid to twice-pinnate, the pinnae pinnatifid-lobed nearly throughout; indusia attached laterally at the sinus..............

2 Pinnae 1-3 cm long; sori scattered in ± single row on both sides of midvein............................................................

2 Pinnae 2-9 cm long; sori in ± 2 longitudinal rows on both sides of midvein............................................................

**Phanerochlea** [with evident veins] VEINY-FERN [1].

Plants terrestrial and mesophytic; stems short-creeping to erect; petioles with 3 or more vascular bundles; blade 1-3-pinnate-pinnatifid, gradually reduced to a pinnatifid apex; rachis and costae adaxially grooved; sori in one row between pinnae midrib and margin, round; indusia plumply U-shaped, attached at a narrow sinus. Species about 250; mostly in the Northern temperate regions.

**Polystichum** [male fern] HORSETAIL [6].

2 Spores green, spherical

4 Sheaths dark-girdled at most of the nodes; teeth usually deciduous, articulation line visible ......................................

4 Sheaths green or obscurely girdled at the nodes; teeth deciduous or persistent, articulation line lacking

5 Cone apex rounded, aerial stems annual.................................................

5 Cone apex pointed or rounded, aerial stems perennial

**Equisetum** [horse tail] HORSETAIL [6].

1 Stems of two kinds, sterile and fertile, the sterile highly branched and bushy, the sterile unbranched .........................

1 Stems all alike, unbranched

2 Spores white, misshapen

3 Sheaths green; teeth prominent.................................................................

3 Sheaths dark-girdled; teeth usually deciduous..........................................
6 Sheath teeth usually persistent; cone apex sharply apiculate; stem ridges minutely grooved

**Equisetum arvense** Linnaeus [growing in cultivated fields]. Aerial stems dimorphic; vegetative stems green, branched, branches in regular whorls, ascending; fertile stems brown, unbranched, shorter than vegetative, ephemeral; cones terminal on fertile stems, cones rounded at the apex. Riverbanks, stream sides, marshes; widespread in mountain areas except for eastern plains and southern border counties. The bushy sterile stems are distinctive and easily gathered for scouring camping pots, and have been boiled in water to make a fungicide against mildew.

**Equisetum ×ferrissii** Clute [for Roxana Judkins (Sinichfield) Ferris (1895-1978), Colorado botanist]. Aerial stems not dimorphic, less than a year or sometimes overwintering, usually branched, ridges on stem flattened or ± convex; sheaths green, elongate, teeth 10-32, early deciduous, leaving a dark rim on sheath; articulation line lacking; cone apex rounded to apiculate; stem ridges flattened or ± convex.

**Equisetum hymale** Linnaeus [of the winter] Aerial stems not dimorphic, persisting more than a year, unbranched; sheaths dark-girdled when mature, brown to gray above the girdle, teeth usually deciduous, articulation line visible; cone apex pointed, cones maturing in summer; spores green, spherical. Riverbanks, lakeshores, woodlands; widespread.

Our plants belong to subsp. **affine** (Engelmann) Caldwell & R.L. Taylor [similar or related to] [Equisetum robustum A. Braun var. affine Engelmann]; subsp. **hymale** is found in Europe and Asia.

**Equisetum laevigatum** A. Braun [smooth or slippery] **Equisetum kansanum** Schaffner. Aerial stems not dimorphic, lasting less than a year or sometimes overwintering, usually unbranched, ridges on stem flattened or ± convex; sheaths green, elongate, teeth 10-32, early deciduous, leaving a dark rim on sheath; articulation line lacking; cone apex rounded to apiculate; cones with a pointed apex, maturing in early summer but spores not shed; spores white, misshapen. Riverbanks, lakeshores; known from Bandelier National Monument, Sandoval County. This is the sterile hybrid between **E. laevigatum** and **E. variegatum**.

**Equisetum variegatum** Schleicher ex F. Weber & D. Mohr [marked with different colors]. Aerial stems not dimorphic, persisting for more than a year, unbranched, stem ridges minutely grooved; sheaths green with a black apical band, teeth 3-14, persistent, erect, with prominent white margins; cones pointed at the apex, maturing in late summer or overwintering and shedding spores in spring; spores green, spherical. Wet woods, riverbanks, lakeshores; known only along the San Juan River in San Juan County.

**Phlegmariurus**

- **Phlegmariurus ferrissii** [for Michael Ferris (1895-1978), Colorado botanist]. Aerial stems not dimorphic, lasting less than a year or sometimes overwintering, usually unbranched, ridges on stem flattened or ± convex; sheaths green, elongate, teeth 10-32, early deciduous, leaving a dark rim on sheath; articulation line lacking; cone apex rounded to apiculate; stem ridges flattened or ± convex.

**Lycopodiaceae**

**Quillwort Family** [1/1/1]

Plants aquatic to ephemeral, terrestrial, perennial, heterosporous; stems erect, corn-like, having secondary growth; leaves simple, linear, quill-like, with four longitudinal air chambers; sporangia ovoid, solitary, embedded in leaf bases; ligule present on the inner surface of the leaf above the sporangium; sporangia partly to entirely covered by a membranous flap (velum); the megaspores, necessary for distinguishing the various species, appear as tiny, salt-like granules.

This family contains a single genus **Isoetes**, with about 192 species, with features of the family.

**Isoëtes** [for Johann Peter Huperz (1771-1816), German physician and fern horticulturalist]

- **Isoëtes hymale** Clute [for Roxana Judkins (Stinchfield) Ferris (1895-1978), California botanist]. Aerial stems not dimorphic, lasting less than a year or sometimes overwintering, usually unbranched, ridges on stem flattened or ± convex; sheaths green, elongate, teeth 10-32, early deciduous, leaving a dark rim on sheath; articulation line lacking; cone apex rounded to apiculate; stem ridges flattened or ± convex.

**Lycopodiaceae**

**Club-Moss Family** [2/3/3]

Terrestrial, perennial, homosporous plants usually 5-20 cm tall with dichotomously branching stems; leaves (microphylls) simple, less than 2 cm long, with a single vein, often densely covering the stem, alternate or opposite; sporangia ± kidney-shaped to globose, solitary in the leaf axils or clustered into strobili. This cosmopolitan family contains about 3 genera and 1000 species.

1 Horizontal stems present, creeping, the aerial branches not bunched but arising singly; spores borne in cones. **Lycopodium**

1 Horizontal stems absent, the aerial branches bunched together; spores borne in axes of unmodified leaves, not in cones. **Huperzia**

**Huperzia** [for Johann Peter Huperz (1771-1816), German physician and fern horticulturalist]

- **Huperzia lucidula** (Michaux) Trevisan [somewhat clear or shining]. **Lycopodium lucidulum** Michaux. Shoots erect, indeterminate, becoming long-decumbent, with the trailing senescent portion becoming brown, not rooting; juvenile growth erect; leaves spreading to reflexed, lustrous, lanceolate to narrowly obovate, margins papillate, with 1-8 irregular teeth, stomata on abaxial surface only; gemmiferous branchlets in one pseudo-whorl at end of each year's annual growth; spores 0.23-0.29 μm.
- **Mountains, foothills; known only from a single collection from a piñon-juniper woodland in Santa Fe County.** **Huperzia** species freely interbred; the resulting hybrid entities reproduce by gemmae.
Spore Plants - Marsileaceae

**Lycopodium** [a wolf’s foot] CLUBMOSS [2].

Plants trailing on the ground; horizontal stems on substrate surface or subterranean, long-creeping, with scattered upright shoots; shoots unbranched or with 1-4 lateral branches; leaves linear to linear-lanceolate; leaves on horizontal stems appressed, membranous; leaves on branches in 6-8 ranks; gemmiferous branchlets and gemmae absent; sporangia segregated in strobili; strobili single and sessile or multiple and pedunculate, peduncles leafy; sporophylls much reduced; sporangia reniform in axils of sporophylls. ●Species about 65; temperate and subarctic regions.

- **Marsilea** [for Luigi Fernando, Count of Marsigli (Latinized as Marsilia)] WATERCLOVER [1].

Roots arising at nodes, sometimes on internodes; leaves emergent or floating, with 4 similar leaflets attached at the apex of a long petiole; leaflets horizon-tally elliptic, rounded at the base, broadly rounded at the apex, bearing fine, short hairs or glabrate; sporocarps borne on short stalks or at near bases of petioles, attached laterally to stalk apex, the tip of stalk often protruding as a bump or tooth, sometimes two; sporocarps often hairy. ●Species about 45.

- **Marsilea vestita** Hooker & Greville [cloth, as with hairs] WATERCLOVER [2].

A small club. Horizontal stems on substrate surface, sparsely rooting; upright shoots clustered, dominant main shoot with 3-6 branches mainly in lower half; lateral branches like upright shoots, terete, ascending to erect, annual constrictions abrupt; leaves spreading to ascending, linear, up to 8 mm long, margins entire, apex tapering to a long, narrow, hair-like tip; strobili 2-3, on a branched terminal peduncle; sporophylls abruptly reduced to a hair-like tip. ●Moist fields and forests, bogs, north central mountains; Sandoval County; uncommon.

- **Marsilea minuta** Fournier, not Linnaeus; **Marsilea mucronata** A. Braun; **Marsilea clavata** A. Braun are perhaps present in ponds in Hidalgo County; it may be distinguished as follows:
  - A stalk of sporocarp recurved or prostrate, 3-11 mm long; sporocarps subterranean, the distal tooth up to 0.4 mm long. **M. ancylopa**
  - A stalk of sporocarp erect, 0.5-25 mm long; sporocarps above-ground, the distal tooth 0.4-1.2 mm long. **M. vestita**

**MARSILEACEAE PEPPERWORT FAMILY [1/1/1]**

Aquatic or amphibious, perennial, heterosporous plants with creeping stems rooted in mud; leaves resemble blades of grass (*Pilularia*) or four-leaved clover at the end of a long petiole (*Marsilea*); sporangia enclosed in a hard sporocarp formed from a specialized leaf; both megasporangia and microsporangia within the same sporocarp. ●The family contains 3 genera and about 50-80 species, nearly worldwide in tropical and subtropical areas; represented in New Mexico only by the genus Marsilea.

**Marsilea** [1/1/1]

- **Marsilea fournieri** Hooker & Greville; **Marsilea minuta** Fournier, not Linnaeus; **Marsilea mucronata** A. Braun; **Marsilea clavata** A. Braun are perhaps present in ponds in Hidalgo County; it may be distinguished as follows:
  - A stalk of sporocarp recurved or prostrate, 3-11 mm long; sporocarps subterranean, the distal tooth up to 0.4 mm long. **M. ancylopa**
  - A stalk of sporocarp erect, 0.5-25 mm long; sporocarps above-ground, the distal tooth 0.4-1.2 mm long. **M. vestita**

**OPHIOGLOSSACEAE ADDER’S TONGUE FAMILY [4/13/13]**

Terrestrial, homosporous, perennial plants from tubers or rhizomes; leaves 1 per plant (rarely more), simple or much divided, not circinate in *Ophioglossum*, but circinate in *Botrychium, Botrypus*, and *Sceptridium*; leaf divided dichotomously into 2 axes joined at their bases, one a photosynthetic sterile blade (trophophore), the other fertile, bearing sporangia (sporophore), the blade simple to ± pinnately compound or many times pinnately compound; sporangia not clustered into sori, exposed on branches of the sporophore or embedded in a spike-like sporophore. ●Genera 5, with 70-90 species, worldwide, especially temperate and tropical regions.

- **Ophioglossum**
  - 1 Trophophore simple, entire; veins reticulate; sporophore with sporangia clearly sunken in axis.......................... **Ophioglossum**
  - 1 Trophophore compound (rarely simple and entire in *Botrychium simplicissimum*); veins forked; sporangia not sunken in axis, exposed as sessile to short-stalked clusters
    - 2 Trophophore more than twice divided, usually less than 4.5 cm wide, mostly ternate to pinnate (rarely simple)........ **Botrychium**
    - 2 Trophophore ternate, 3- to 4-times divided (less in very small plants), generally more than 6 cm wide
      - 3 Leaf persistent and evergreen for one year; trophophore and sporophore joined ± at ground level; trophophore stalked; pinnal thick and leathery .......................................................... **Sceptridium**
      - 3 Leaf withering away in the fall, not persistent nor evergreen; trophophore and sporophore joined well above ground level; trophophore sessile; pinnal thin and delicate .......................................................... **Botrypus**

**Botrychium** [a small bunch of gramine] MOONWORT [10].

- Stems subterranean, erect, forming a caudex; leaves 1 (rarely 2) per stem; leaf bud glabrous; trophophore ascending to perpendicular to stem, sessile or stalked; blade linear, oblong, or deltate, simple to 2-pinnae; pinnae ascending to spreading, fan-shaped to lanceolate to linear, margins entire to dentate or lacerate; sporophores usually 1 per leaf, 1-3 pinnae, long-stalked, borne at ground level or high on a stalk shared with the sporophore. ●All species of *Botrychium* in New Mexico are little-collected and poorly known. Species 45-60; nearly worldwide.
Spore Plants - Ophioglossaceae

1 Trophophore blade width (at the base) greater than or approximately equal to the blade length

2 Sporophore present and conspicuous

3 Pinnae apices cuneate to narrowly acute, acute, forming an angle of ± 45-60°, sharply pointed; pinnae thin and delicate

4 Trophophore sessile or short-stalked, joined to the sporophore well above the ground at the top of the common stalk

5 Pinnae thin and delicate; plants lustrous when fresh; sporophore pinnately branched; sporophore stalk length longer than the total trophophore length

6 Lobes of basal pinnae elongate and pointed; all but the uppermost pinnae acutely lobed; plants never glaucous

7 Pinnae pairs above the basal pair absent or mostly simple and fan-shaped, sometimes palmately lobed

1 Trophophore blade longer than wide

8 Basal pinnae entire or palmately dissected (trophophore undivided in small B. simplicium), broadly to narrowly fan-shaped, wedge-shaped, or linear in outline, clearly broadest at the outer margin

9 Trophophore and sporophore joined near ground level; sporophore stalk at maturity usually much longer than the total trophophore length, stalk lax, often areuate; plants of wet areas

10 Spans of basal pinnae less than 120° (often less than 100°)

11 Trophophore stalk approximately ½ or less the length of the trophophore; trophophore sessile or with stalk shorter than the average of the distances between the first (basal) and second, and second and third, lowermost pinnae pairs

12 Plants green to yellow-green when fresh; pinnae entire to symmetrically 3 or 5 (odd) lobed, middle lobes often larger; stalks of lower pinnae appearing narrow, stalk widths approximately ⅓ the pinnae widths; lower sporophore branches stalked, sporangia not obscuring the sporophore rachis

13 Plants palid (pale) or whitish blue-green when fresh; pinnae entire to crenate to asymmetrically cleft into two principle lobes, upper lobe larger and more developed, stalks of lower pinnae not appearing narrow, stalk widths approximately ½ or more the pinnae widths; lower sporophore branches usually not stalked, sporangia partially obscuring the sporophore rachis

[Key and drawings adapted and redrawn from Farrar & Popovich 2010, 2012]
10 Spans of basal pinnae greater than 120° (often greater than 150°)
13 Fresh plants deep green, dull to somewhat lustrous; pinnae symmetrically fan-shaped with abrupt differentiation between outer and side margins; sporophore stalk at maturity (spore release or later) equal to or longer than the length of the trophophore; basal sporophore branches generally ascending and not twisted ............................................... B. neolunaria

13 Fresh plants green to yellow-green, lustrous; pinnae ± round without abrupt differentiation between outer and side margins, basal pinnae often asymmetrical with lower half of the outer margin extended outward and downward; sporophore stalk at maturity less than the length of the trophophore; basal sporophore branches ± spreading and twisted so that sporangia point outward or downward........................................... B. tunux

8 Basal pinnae pinnately dissected to (rarely) entire, ovate to elliptic in outline, broadest at the base or middle
14 Lobes of basal pinnae divergent (like spread fingers); upper pinnae and lobes of lower pinnae narrowly elliptic-elongate with mostly acute apices (less than 90°)

15 Trophophore broadly triangular or pentangular in outline, ± as long as broad; lustrous dark green when fresh; sporophore ternately branched; sporangia bright yellow before spore release ........................................ B. lanceolatum
15 Trophophore ovate to narrowly triangular in outline, longer than broad; somewhat lustrous to dull green when fresh; sporophore usually pinnately branched; sporangia dull yellow before spore release ........................................ B. echo
14 Lobes of basal pinnae parallel to convergent (not spreading); upper pinnae and lobes of lower pinnae ovate with mostly obtuse apices (more than 90°)

16 Fresh trophophore lustrous green; all but the uppermost pinnae dissected or lobed on both the upper and lower margins; sporophore pinnately divided; common stalk, if not entirely green, uniformly maroon toward the base............... B. pinnatum
16 Fresh trophophore weakly to distinctly glaucous blue-green, not lustrous; pinnae above the basal pair often entire or shallowly dissected (often only on the lower margin); sporophore stalk at maturity (spore release or later) equal to or longer than the length of the trophophore; basal sporophore branches ± spreading and twisted so that sporangia point outward or downward; sporangia ± twisted so that sporangia point outward or downward...........................................

Botrychium campestrum W.H. Wagner & Farrar [of fields or plains]. Plants 6-18(-21) cm tall; trophophore sessile to short-stalked, raised on a common stalk 3-8(-10) long; blade oblong to linear-oblong, once pinnate with 3-6 pairs of pinnae; pinnae usually ascending, mostly remote, linear to wedge-shaped, apex often lobed; sporophore generally once pinnate, 1-2 times the length of the trophophore, with a single major axis. ●Meadows, fen, seeps, gravelly roadsides; known only from McKinley County. ●Our plants belong to var. lineare (W.H. Wagner) D.R. Farrar [narrow and line-like] B. lineare W.H. Wagner, characterized by its narrow pinnae with parallel margins, separated by 2-5 times the width of the pinnae.

Botrychium echo W.H. Wagner [resembling other species]. Plants 3-15 cm tall; trophophore sessile to short-stalked, raised on a common stalk 2-10 long; blade broad oblong or ovate to narrowly triangular, once pinnate with up to 5 pairs of pinnae; pinnae narrowly attached to the rachis, remote to approximate, lanceolate to oblanceolate, lobed or cleft to subentire; lower pinnae often have a small lower lobe like a mitten thumb; sporangia 1-2 pinnate, 1-2 times length of trophophore. ●High elevations mostly in the northern mountains, disturbed gravelly flats, meadows, clear-cut areas.

Botrychium "furculatum." [small forked]. Plants mostly less than 15 cm tall; trophophore stalk 2-8 mm long, raised on a common stalk 3-6 cm long; blade oblong, up to 4 cm long, folded lengthwise when alive, once pinnate with up to 5 pinnae pairs, pinnae small, ascending, approximate, fan-shaped to spatulate, strongly asymmetric, tending toward 2 lobes, margins often irregularly toothed or scalloped; trophophore and sporophore stalks meeting in a wishbone-like "V"; sporophore 1-2-pinnate, 1.5-4 times length of trophophore. ●Subalpine meadows and forest openings in the northern mountains. ●This is a newly discovered allotetraploid, the name awaiting publication; we use the manuscript name that was used by Dauphin et al. (2017) and Farrar & Popovich (2010, 2012). ●Note: no publication of the name Botrychium furculatum is intended herein; it is used only for reference.

Botrychium hesperium (Maxon & R.T. Clausen) W.H. Wagner & Lellinger [western] B. matricariifolium (Döll) W.D. J. Koch subsp. hesperium Maxon & R.T. Clausen. Plants up to 20 cm tall; trophophore mostly short-stalked, raised on a common stalk 3-13 cm long; blade short-stalked, oblong to subdeltate, up to 6 cm long, 1(2)-pinnate, gray-green and dull when alive; pinnae to 6 pairs crowded to commonly overlapping, ovate to lanceolate with rounded apices, reaped to lobed; basal pinnae often enlarged, lobed to pinnatifid; sporophore 3-10 cm tall, mostly with one or more long basal branches. ●Grassy slopes, old roads, other moist ground at high elevation in the northern mountains.
Botrychium lanceolatum (S.G. Gmelin) Angström [spear-shaped] [Osmunda lanceolata S.G. Gmelin]. Plants 5-35 cm tall; trophophore sessile or nearly so, raised on a common stalk 3-25 cm long; blade deltate, 1-2-pinnate, up to 7 cm long; pinnae up to 5 pairs, ascending, crowded, linear to broadly lanceolate, lobed to pinnatifid; lobes of basal pinnae elongated and pointed; all but the uppermost pinnae acutely lobed; sporophore usually ternately branched, stalk length shorter than to nearly equal to total trophophore length. ●High elevations in the northern mountains. ♦Plants of this species in the southeastern United States belong to subspecies lancifolium. This subspecies occurs in two phenotypes:

a. Common stalk maroon (at least at the base) or maroon-striped; basal pinnae asymmetric with the innermost lower lobes closely longer than opposing upper lobes, midribs usually upwardly curved...the Red phenotype

b. Common stalk completely green; basal pinnae ± symmetrically lobed, midribs usually straight...the Green phenotype

Botrychium minganense Victorin [from the Mingan Islands of Quebec] [Botrychium lunaria (Linnaeus) var. minganense (Victorin) Dole]. Plants 5-20 cm tall; trophophore stalked 0-2 cm, raised on a common stalk 3-11 cm long; blade lanceolate to oblong, once pinnate, up to 10 cm long; pinnae up to 10 pairs, horizontal to slightly spreading, approximate to remote, nearly circular, fan-shaped or ovate, margins nearly entire, shallowly crenate, sometimes pinnately lobed or divided; sporophore 1-pinnate (2-pinnate in robust plants), 1.5-2.5 times length of trophophore. ●Disturbed ground at high elevations, often along old logging roads, near clear cuts, mostly in the northern mountains, but also in Lincoln County.

Botrychium neolunaria Stensvold & Farrar [similar to Botrychium lunaria] [Botrychium lunaria of most North American reports]. Plants 5-25 cm tall; trophophore stalked 0-3 cm, raised on a common stalk 2-7 cm long; blade narrowly oblong to narrowly ovate, once pinnate; pinnae 3-8 pairs, remote to somewhat overlapping, usually sessile, fan-shaped to lunate, usually symmetrical, outer margins entire to undulate, sometimes shallowly cleft; sporophore 1-2-pinnate, 2-17 cm long (stalk 1-8 cm long), branches strongly ascending. ●Poorly to moderately well-drained open areas dominated by perennial, herbaceous vegetation; mostly northern mountains, but also from Lincoln County. ♦Specimens of Botrychium lunaria (Linnaeus) Swartz in the continental United States actually belong to this newly defined species (Stensvold & Farrar 2017).

Botrychium pinnatum H. St. John [like a feather]. Plants 3-12 cm tall; trophophore sessile to short-stalked (large plants), raised on a common stalk 3-7 cm long; blade oblong or somewhat narrowed at the tip, once pinnate (twice pinnate on larger plants); pinnae 7-11 pairs, sessile and decurrent on rachis, ovate to elliptical, entire or often with rounded pinnate lobing; sporophore erect, narrow, with ascending branches, 1-3-pinnate, 2 times length of trophophore. ●High elevation disturbed grassy slopes, old logging roads, woods; mostly northern mountains.

Botrychium simplex E. Hitchcock [simple, undivided]. Plants 3-15 cm tall; trophophore stalk 0-3 cm, arising at ground level or on a common stalk to 3 cm long; blade linear to oblong to ovate-oblong or triangular, simple to 2(3)-pinnate, up to 7 cm long; pinnae if present, up to 7 pairs, approximate to overlapping, cuneate to fan-shaped, asymmetric, divided or undivided; basal pair commonly much larger and more complex; sporophore mainly once pinnate, 1-8 times length of trophophore. ●Dry fields, marshes, moist to dry meadows, roadside ditches; northern mountains. ♦Our plants belong to var. simplex, with the trophophore and sporophore joined near ground level and the trophophore simple or with undivided basal pinnae. This variety is often found in riparian-influenced areas or saturated substrates.

Botrychium tunux Stensvold & Farrar [a Native Alaskan warrior]. Plants 6-12 cm tall; trophophore stalk 0-1 cm long, raised on a common stalk 0-3 cm long; blade narrowly oblong to ovate, once pinnate, up to 7 cm long; pinnae 4-6 pairs, separate to slightly overlapping; basal pinnae asymmetric with expanded basal portions; middle and upper pinnae rounded; sporophore stalk shorter than or equal to total trophophore length, branching portion of sporophore about equal to stalk length, 1-2-pinnate, branches ascending to spreading, lowermost twisted and pointing downward and outward. ●Very high elevations near tree line, loose scree slopes; known only from Taos County.

Botrypus [grape-foot, alluding to the tuber-like gametophytes] RATTLENSNAKE-HERB [1].

Plants more than 12 cm tall; leaf bud densely hairy; leaf absent in winter; sporophore and trophophore joined, arising from middle to distal portion of common stalk; trophophore sessile, blade deltate to ternately triangular, generally 3-4-pinnate, thin, herbaceous; first pinnule on basal pinnae usually borne on the side of the pinna facing the blade apex (acropetally); sporophore long-stalked, 1-3-pinnate, commonly absent in young plants ♦2-3 species, worldwide.

Botrypus virginianus (Linnaeus) Michaux [from Virginia] [Botrychium virginianum (Linnaeus) Swartz, Osmunda virginiana Linnaeus]. Plants 12-80 cm tall, the common stalk 7-40 cm long; trophophore blade up to 25 cm long, 30 cm wide; pinnae up to 12 pairs, approximate to overlapping, herbaceous; pinnae lanceolate, with a midrib, deeply lobed, lobes narrow, serrate, apex pointed; sporophore 2-pinnate, 0.5-2 times length of trophophore. ●Moist shady forests in the northern mountains; known only from Los Alamos County. ♦This is the largest and most conspicuous of the grape ferns (Botrychium and Botrypus), easily told by the large, highly divided, thin-textured, and lacy-cut leaves.

Ophioglossum [snake-tongue] ADDER'S TONGUE [1].

Leaves 1-2(-3), glabrous, erect to prostrate, common stalk absent to nearly as long as the trophophore; trophophore sessile or stalked; blade lanceolate or ovate to elliptic, simple, entire; venation profusely reticulate; sporophore simple, stalked, erect, borne at the base of the trophophore; sporangia in 2 rows, deeply sunken in the simple, linear or oblong sporophore tip. ♦25-30 species, nearly worldwide.


Ophioglossum engelmannii Prantl [for George Engelmann (1809-1884), distinguished German-born botanist of St. Louis]. Plants 5-25 cm tall; common stalk 0-10 cm long; trophophore sessile to very short-stalked; blade ovate to narrowly elliptic, up to 10 cm long, 4 cm wide, commonly folded when alive; veins complex-reticulate with primary and secondary areoles; sporophore long-stalked, up to 2.5 times length of trophophore. ●Clayey depressions among limestone ridges. ●The broadly ovate, succulent leaf mimics the hood of the adder, the sporophore appearing as the tongue. ●Once collected in Doña Ana County; no specimens known currently.
Spore Plants - Polypodiaceae

Sceptridium [a staff or sceptre] GRAPE-FERN [1].

Plants more than 12 cm tall; leaf bud densely hairy; leaf evergreen for one year; sporophore and trophophore joined, arising from near ground level on a short common stalk; trophophore long-stalked, blade deltate to ternately triangular, generally 2-3-pinnate, herbaceous or leathery; first pinnule on basal pinnae usually borne on the side of the pinna facing the blade base (basiscopically); sporophore long-stalked, 1-3-pinnate, commonly absent or represented by a hairy rudiment. 15-20 species, worldwide.

Sceptridium multifidum (S.G. Gmelin) M. Nashida ex Tagawa [with many lobes or divisions]. [Botrychium multifidum (S.G. Gmelin) Trevisan, Botrychium multifidum (S.G. Gmelin) Trevisan subsp. coadse (Underwood) Clausen]. Plants 12-30 cm tall; common stalk 2-4 cm long; trophophore stalk 2-15 cm long, less than half to slightly longer than rachis; blade up to 25 cm long, 35 cm wide; pinnae up to 10 pairs, approximate to remote, thick and leathery; pinnaules obtusely ovate, subentire to crenulate or lobed, lobes and apex rounded; sporophore long stalked, 2-3-pinnate, 5-15 cm long. Marsch streamside meadows, moist forests in the northern mountains.

POLYPODIACEAE POLYPODY FAMILY [1/2/2]

Plants perennial, homosporous, terrestrial, on rock or epiphytic; stems long- to short-creeping, bearing scales; leaves monomorphic or dimorphic; blades simple to pinnatifid or pinnate; sori borne on veins, round to oblong, paraphyses present or absent; sporangia on a short stalk; indusium absent. The family contains 50-80 genera and about 1500 species; widespread in tropical and with a few temperate representatives. The status of this family is far from settled. In New Mexico the family is represented by one genus.

Polypodium [many-footed] POLYPODY [2].

Plants on rock, sometimes terrestrial; stems usually branched, sometimes with a waxy, whitish coating; leaves monomorphic, pinnatifid (sometimes 1-pinnate at the base); sori usually confined to distal region of leaf, circular to oval when immature, borne at tips of single veins, in 1-3 rows on either side of midrib. Species 100-125; worldwide, 2 in New Mexico.


[Key to genera by Patrick J. Alexander]

1 Blades whitisht- or yellowish-farinose on the lower surface
   2 Leaves palmatifid or pinnate-pinnatifid; smallest divisions of the leaf sessile, generally not distinctly separate
   3 Sporangia only along the leaf margin, which is reflexed to form a false indusium,..........................Notholaena
   4 Sporangia scattered along veins, leaf margin not forming a false indusium........................................Pentagramma

2 Leaves twice-pinnate or more compound; leaflets stalked, clearly distinct.................................Argyrochosma

1 Blades glabrous, pubescent, or scaly on the lower surface, but not whitish- or yellowish-farinose
   4 Sporangia scattered along veins, leaf margin not forming a false indusium
   5 Leaves once-pinnate to pinnate-pinnatifid, linear..................................................................................Astrolepis
   5 Leaves pinnatifid, pentagonal or deltate in outline .................................................................Bommeria

4 Sporangia only along the leaf margin, which is reflexed to form a false indusium
   6 Rachis green or yellowish; fertile and vegetative leaves strongly dimorphic; alpine or subalpine habitats...........Cryptogramma
   6 Rachis brownish to black; fertile and vegetative leaves not or only slightly dimorphic; various habitats but rarely alpine or subalpine
   7 Rachis pubescent or scaly
   8 Surfaces of the leaflets pubescent or scaly or, if glabrous, then the leaflets toothed to pinnatifid....................Myriopteris
   8 Surfaces of the leaflets glabrous (rarely with a few scattered hairs on the central vein); leaflets not toothed or pinnatifid......Pellaea

7 Rachis glabrous
   9 Leaflets toothed or shallowly lobed........................................................................................................Adiantum
   9 Leaflets entire
   10 Stem scales bicolored......................................................................................................................Pellaea

[30]
Adiantum [unwettable] MAIDEN-HAIR FERN [1].

Plants terrestrial or on rock; stems suberect or short-to-long creeping, bearing scales; leaves monomorphic to somewhat dimorphic; petioles dark in color, grooved adaxially; blades 1-4-pinnate; ultimate segments round, fan-shaped, rhombic, or oblong; soror borne submarginally on abaxial surface on lobes which fold back forming a flap over the abaxial surface with the soror on the underside.

- Nearly worldwide with 150-200 species.
- Adiantum capillus-veneris Linnaeus [the hair of Venus]. Stems short-creeping, scales concolorous, golden to medium brown; blades 2-pinnate or more divided; rachises glabrous; ultimate leaflets fan-shaped, rhombic, to nearly round, margins toothed to lobed, dark color of stalks extending into base of ultimate segments. 
- Often found hanging on wet rocks, ledges, and canyon walls; scattered locations, mostly southern.

Adiantum | [silver powder] CLIFFBRAKE [4].

- Plants usually on rock; stems compact, usually unbranched, scales concolorous, narrowly lanceolate; leaves monomorphic; petiole brown or black, mostly glabrous; blades 2-6-pinnate, abaxially glabrous or covered by whitish farina, adaxially glabrous or sparsely glandular; rachises glabrous; ultimate segments less than 4 mm wide, margins plane or recurved forming false indusia.
- About 20 species, in the Americas.

- Adiantum microphylla Linnaeus. Stems short-creeping, scales concolorous, golden to medium brown; blades 2-pinnate or more divided; rachises glabrous; ultimate leaflets fan-shaped, rhombic, to nearly round, margins toothed to lobed, dark color of stalks extending into base of ultimate segments. 
- Often found hanging on wet rocks, ledges, and canyon walls; scattered locations, mostly southern.

Adiantum fendleri (Maxon) Windham [for Charles Augustus Fendler (1813-1883), German-born botanical collector] [Notolaena fendleri Kunze, Pellaea fendleri (Kunze) Prantl].

- Stem scales brown; petioles dark brown; blades pinnate proximally, abaxially covered by whitish farina; pinnae costae distinctly flexuous, branches arising from angles; ultimate segments not jointed, stalk color continuing into segment base.
- Rocky slopes and cliffs, usually on granite or basalt; scattered mountain locations.

**Argyrochosma incana (C.Presl) Windham [ash-colored]** [Notolaena incana C. Presl]

- Stem scales brown; petioles black; blades 3-4-pinnate; blades abaxially covered by dense, white farina; pinnae costae straight or nearly so, branches not arising from angles; ultimate segments jointed at the base, stalk color stopping abruptly at bases; segment margins plane, not concealing sporangia.
- Volcanic ledges and canyon walls; southwestern. 
- A. incana is a mostly Mexican species.

**Argyrochosma leprosula (Poir.) Windham**

- Stems brown; petioles reddish brown to black; blades 3-5-pinnate proximally; abaxially covered by dense white farina; pinnae costae straight to slightly flexuous, branches not arising from angles; ultimate segments not jointed at base, stalk color continuing into segment bases, segment margins recurved, often concealing sporangia.
- There are two subspecies.
  - a Leaf blades broadly deltoid-ovate, 4- to 5-pinnate; proximal pinnae at least ⅓ as long as blades....subsp. leprosula [Notolaena leprosula]
  - a Leaf blades broadly deltoid-ovate, 4- to 5-pinnate; proximal pinnae at least ⅓ as long as blades....subsp. leprosula [Notolaena leprosula]

**Argyrochosma pulchella subsp. leprosula (Maxon) Windham**

- Stem scales brown; petioles brown; blade 3- to 4-pinnate proximally, glabrous; pinnae costae straight to slightly flexuous, branches rarely arising from angles; ultimate segments jointed at base, stalk color stopping suddenly at segment bases, segment margins recurved to revolute, often concealing sporangia.
- Rocky limestone hillsides and cliffs in the southeastern region.

Astrolepis [star-like] CLOAKFERN [4].

- Plants usually on rock; stems compact to short-creeping, sparingly branched; scales tan to chestnut brown, concolorous or weakly bicolored; leaves monomorphic; petioles chestnut brown or straw-colored, with scales; blades 1-pinnate, leathery, abaxially covered with ciliate scales, adaxially with sparse to dense stellate or ciliate scales; pinnae stalked or subsessile, usually more than ⅔ a Leaf blades broadly deltoid-ovate, 4- to 5-pinnate; proximal pinnae at least ⅓ as long as blades....subsp. leprosula (Maxon) Morton.
- Rocky slopes and cliffs, usually on calcareous or volcanic substrates; southwestern.

- Astrolepis microphylla (Mettenius ex Kuhn) Windham [small-leaved] [Pellaea microphylla Mettenius ex Kuhn. Pellaea pulchella subsp. leprosula W.S.]
- Stem scales brown; petioles brown; blade 3- to 4-pinnate proximally, abaxially covered by dense, white farina; pinnae costae straight or nearly so, branches not arising from angles; ultimate segments jointed at the base, stalk color stopping abruptly at bases; segment margins plane, not concealing sporangia.
- There are two subspecies.
  - a Leaf blades broadly deltoid-ovate, 4- to 5-pinnate; proximal pinnae at least ⅓ as long as blades....subsp. microphylla [Notolaena microphylla].
  - a Leaf blades broadly deltoid-ovate, 4- to 5-pinnate; proximal pinnae at least ⅓ as long as blades....subsp. microphylla [Notolaena microphylla].

**Astrolepis incana** (Maxon) Windham [on the border]

- Stem scales brown; petioles reddish brown to black; blades 3-5-pinnate proximally; abaxially covered by dense white farina; pinnae costae straight to slightly flexuous, branches not arising from angles; ultimate segments not jointed at base, stalk color continuing into segment bases, segment margins recurved, often concealing sporangia.
- There are two subspecies.
  - a Leaf blades broadly deltoid-ovate, 4- to 5-pinnate; proximal pinnae at least ⅓ as long as blades....subsp. leprosula (Maxon) Morton.
  - a Leaf blades broadly deltoid-ovate, 4- to 5-pinnate; proximal pinnae at least ⅓ as long as blades....subsp. incana (Maxon) Windham.

**Astrolepis microphylla** (Mettenius ex Kuhn) Windham [small-leaved] [Pellaea microphylla Mettenius ex Kuhn. Pellaea pulchella subsp. microphylla W.S.]

- Stem scales brown; petioles brown; blade 3- to 4-pinnate proximally, abaxially covered by dense, white farina; pinnae costae straight or nearly so, branches not arising from angles; ultimate segments jointed at the base, stalk color stopping abruptly at bases; segment margins plane, not concealing sporangia.
- There are two subspecies.
  - a Leaf blades broadly deltoid-ovate, 4- to 5-pinnate; proximal pinnae at least ⅓ as long as blades....subsp. microphylla (Mettenius ex Kuhn) Windham.
  - a Leaf blades broadly deltoid-ovate, 4- to 5-pinnate; proximal pinnae at least ⅓ as long as blades....subsp. microphylla (Mettenius ex Kuhn) Windham.

**Astrolepis pulchella** subsp. microphylla (Maxon) Windham [ash-colored].

- Stem scales brown; petioles brown; blade 3- to 4-pinnate proximally, abaxially covered by dense, white farina; pinnae costae straight or nearly so, branches not arising from angles; ultimate segments jointed at the base, stalk color stopping abruptly at bases; segment margins plane, not concealing sporangia.
- There are two subspecies.
  - a Leaf blades broadly deltoid-ovate, 4- to 5-pinnate; proximal pinnae at least ⅓ as long as blades....subsp. microphylla (Mettenius ex Kuhn) Windham.
  - a Leaf blades broadly deltoid-ovate, 4- to 5-pinnate; proximal pinnae at least ⅓ as long as blades....subsp. microphylla (Mettenius ex Kuhn) Windham.
Spore Plants - Pteridaceae

sympatric subspecies in New Mexico:

- **Astrolepis integrerrima** (Hooker) D.M. Benham & Windham [entire] [Notholaena sinuata (Lagasca) Kaulfuss var. integrerrima Hooker]. Stems compact; blades 1-pinnate to pinnate-pinnatifid; pinnae oblong to ovate, largest usually 7-15 mm long, entire or asymmetrically lobed, lobes 2-7, broadly rounded; abaxial scales concealing surface, ciliate with coarse marginal projections; adaxial scales abundant, stellate to coarsely ciliate, attached at base, mostly 5-7 cells wide. ● Rocky hillsides and cliffs, usually on limestone or other calcareous substrates; widespread, but more commonly southern.

**Astrolepis sinuata** (Lagasca ex Schwartz) D.M. Benham [wavy margined]. Stems compact to short-creeping; blade pinnate-pinnatifid; pinnae ovate to deltate, largest 7-15 mm long, usually symmetrically but shallowly lobed; abaxial scales concealing surface, ciliate with coarse marginal projections; adaxial scales sparse, mostly persistent, elongate, usually stellate, body 2-4 cells wide. ● On calcareous and non-calcereous cliffs, and rocky slopes; southern third of the state. ● This species is derived from at least three other southwestern ferns, and is somewhat intermediate between *A. sinuata* and *A. integrerrima*.

**Bommeria** [for Joseph Edouard Bommer (1829-1895), French botanist] BOMMERIA [1].

Plants terrestrial; stems prostrate, long-creeping; leaves monomorphic, scattered; blade pentagonal, divided into 3 segments, deeply pinnate-pinnatifid; abaxially with scales, coiled hairs, and straight hairs; margins not recurved to form false indusia. ● Five species; North America to Central America.

- **Bommeria hispida** (Mettenius ex Kuhn) Underwood [shaggy, rough] [Gymnopteris hispida (Mettenius) Underwood, Gymnogramma hispida Kuhn]. Petioles generally rounded (sometimes distally grooved); blade about as long as wide, ultimate segments rounded at apex. ● Shady rocky ledges and rock crevices in the southern foothills and dry mountains. ● This may be confused with *Notholaena standleyi* and *Pentagramma triangularis*, which have dense farina covering the lower surface of the leaves. This is the only species of the genus occurring north of Mexico.

**Cheilanthes**... to **Myriopteris**

**Cryptogramma** [hidden line, an allusion to the hidden sori] ROCKBRACE [1].

Plants on rock; stems decumbent to erect, or creeping; leaves dimorphic, sterile leaves shorter than fertile leaves; petioles dark at the base, green to pale brownish distally, grooved adaxially; blades 2-4-pinnate, abaxially glabrous, adaxially glabrous or sparsely pubescent; segments of sterile leaves elliptic, or ovate to fan-shaped, usually less than 4 mm wide, margins flat; fertile segments lanceolate to linear, usually less than 2 mm wide, margins reflexed to form false indusia. ● Species 8-11; North & South America, Eurasia.

- **M. scabra**

**Myriopteris** [with many wings] LIPFERN, [12].

Plants on rock or terrestrial; stems compact to long-creeping, with concolorous or bicolored scales; petioles reddish brown to black, Scaly and/or pubescent to almost glabrous; rachises terete, somewhat flattened, or grooved, with indument like petioles; blades 2-4-pinnate, adaxial surfaces glabrous or pubescent, abaxial surfaces scaly and/or pubescent to almost glabrous; ultimate segments round to oblong-ovate or spatulate, veins obscure, margins usually recurved forming a false indusium; sporangia in sexual species with 64 spores. ● The North American members of *Cheilanthes* have been removed to a monophyletic *Myriopteris*, following Grusz & Windham (2013). Species 47, North America to Central America.

- **M. tomentosa**

1 Midveins with multiserial scales on the lower leaf, sometimes intermixed with hairs; vernation not circinate, the expanding leaves hooked but not coiled at the tips
2 Rachises grooved on one side; ultimate segments spatulate; sori discontinuous, confined to the lobes ...........................................

- **M. pringlei**

4 Midvein scales linear, inconspicuous, the largest less than 0.5 mm wide ........................................... **M. tomentosa**

5 Midvein scales lanceolate to ovate, conspicuous, the largest 0.4-1.5 mm wide
5 Margins of midvein scales entire to erose or denticate, not ciliate
6 Ultimate segments glabrous on the upper surface; stems long-creeping; stem scales mostly uniformly colored ................................................................. **M. fenderi**
7 Ultimate segments pubescent on the upper surface; stems compact; stem scales mostly bicolored with a dark central portion and a lighter margin
8 Segments appearing densely tomentose on the upper surface, which usually permute the lower surface in addition to the midvein scales, which do not conceal the segment................................................................. **M. rufa**
9 Segments nearly glabrous below except for the midvein scales that usually conceal the segment **M. windhamii**
5 Margins of midvein scales ciliate, especially near the base
8 Segments appearing densely tomentose on the upper surface, the midvein scales with fine curly cilia forming an entangled mass ................................................................. **M. lindheimeri**
9 Segments appearing glabrous above; midvein scales often ciliate only in the basal ½; stem scales usually brown, uniformly colored................................................................. **M. wootonii**
9 Segments appearing sparsely pubescent above; midvein scales usually ciliate the entire length; stem scales dark brown, often bicolored................................................................. **M. yavapensis**
1 Midveins lacking multiseriesate scales, but pubescent or glabrous; or midvein absent; vernation circinate or not, the expanding leaves tightly coiled at the tip in most species
10 Rachises and segments essentially glabrous; petioles grooved for most their length ................................................................. **M. aurea**
10 Rachises and often the segments pubescent or glandular; petioles never grooved below the middle
11 Rachises and both kinds of leaf, long divergent hairs and tortuous appressed hairs; segments nearly glabrous below ......... **M. alabamensis**

11 Rachis hairs all the same; segments conspicuously pubescent:
12 Ultimate segments elongate, not beadlike, the largest 1-7 mm long; blades pinnate-pinnatifid throughout ................................. **M. aurea**
12 Ultimate segments round to slightly oblong, beadlike, the largest 1-3 mm long; blades 3-pinnate at the base................................................................. **M. gracilis**

**Myriopteris alabamensis** (Buckley) Grusz & Windham  
[from Alabama]  
[Cheilanthes alabamensis (Buckley) Kunze, Pteris alabamensis Buckley].  Vernation noncircinate; petioles dark brown, rounded, often grooved below the middle; blades pinate-pinnatifid; rachises round adaxially, lacking scales, densely pubescent; pinnae jointed at the base, costae absent; ultimate segments not beadlike, elongate, largest 1-7 mm long, abaxially densely tomentose, margins recurved forming weakly defined false indusia.  ●Cliffs and ledges, rarely on limestone; southern border areas.

**Myriopteris fenderi** (Hooker) E. Fournier  
[for Augustus Fenderl (1813-1883), German-born botanical collector]  
[Cheilanthes fenderi Hooker].  Stems compact; scales mostly uniform; vernation ciliate; petioles dark brown to black, rounded, lacking scales but pubescent; blades 3-pinnate at base; pinnae not jointed; costae mostly green adaxially, without scales; ultimate segments not beadlike, sparsely hisulate to glabrescent above and below.  ●Limestone ledges in the southern mountains; uncommon.

**Myriopteris gracilis** Fée  
[graceful, slender]  
[Cheilanthes féei T. Moore].  Stems compact to short-creeping; scales brown, some with dark central stripe; vernation ciliate; petioles dark brown to black, rounded, lacking scales but pubescent; blades 3-pinnate at base; pinnae not jointed; costae mostly round adaxially, lacking scales below; ultimate segments round, beadlike, 1-3 mm, densely villous below, sparsely hisulate to glabrescent above.  ●Cliffs and ledges, usually on limestone or sandstone; widespread.  ●The small fronds and tiny beadlike segments of this fern are distinctive.

**Myriopteris lindheimeri** (Hooker) J. Smith  
[for Ferdinand Jakob Lindheimer (1801-1879), German-Texan botanist]  
[Cheilanthes lindheimeri Hooker].  Stems long-creeping; ciliate; petioles dark brown, rounded; blades 4-pinnate at base; rachises with linear-lanceolate scales, also sparsely pubescent, not grooved; pinnae not jointed, appearing densely tomentose above, costae mostly green, abaxially with conspicuous lanceolate scales 0.4-1.5 mm wide, marginally long-ciliate, cilia fine, curved, tangled; ultimate segments beaklike less than 1 mm long, surfaces mostly glabrous, obscured by tangled cilia.  ●Cliffs and ledges on a variety of substrates; southwestern.  ●Confused with **Myriopteris wootonii** and **M. yavapensis**.

**Myriopteris pringlei** (Davenport) Grusz & Windham  
[for Cyrus Guernsey Pringle (1838-1911), American botanical collector]  
[Cheilanthes pringlei Davenport].  Stems long-creeping; 1-3 mm in diameter; vernation noncircinate; petioles dark brown, grooved distally; blade 3-pinnate-pinnatifid at the base; rachises grooved, with scattered lanceolate scales, not pubescent; pinnae not jointed; costae mainly green, not pubescent, abaxially with conspicuous lanceolate scales not concealing ultimate segments, margins not ciliate; ultimate segments not beadlike, spatulate, adaxially glabrous.  ●Rocky slopes and ledges, usually on igneous substrates.  ●Often reported for New Mexico, but this is a strictly Sonoran Desert fern; perhaps to be found in the bootheel region, if at all.

**Myriopteris rufa** Fée  
[rusty, reddish brown]  
[Cheilanthes eatoni Baker].  Stems compact, 4-8 mm in diameter; scales with dark central stripe, pale margins; vernation noncircinate; petioles dark brown, rounded; blades 3-4-pinnate at base; rachises rounded, not grooved, pubescent and with scattered linear-lanceolate scales, scales not ciliate; pinnae not jointed, appearing tomentose to glabrescent above, costae mostly green below, with linear to lanceolate scales less than 1 mm wide, not concealing ultimate segments; ultimate segments beaklike, densely tomentose below, pubescent to
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glabrescent above. Rocky plams and bluffs in the southeastern region, usually on limestone; not common.

**Myriopteris scabra** (C. Christensen) Grusz & Windham [rrough] *Cheilanthes horridula* Mason, *Cheilanthes scabra* C. Christensen. Stems short-creeping, 4-7 mm in diameter; vernation noncircinate; petioles dark brown to black, rounded; blades pinate-pinnatifid to 2-pinnate at the base; rachises rounded with scattered linear-lanceolate scales, sparsely hirsute abaxially, axially with tortuous appressed hairs; pinnae not jointed; costae mostly green, with somewhat inconspicuous lanceolate scales, margins not ciliate; ultimate segments narrowly elliptic, not beaded, largest 3-5 mm, both surfaces scabrous with usually pubulose hairs. Rocky plams and bluffs in the southeastern region, usually on limestone; not common.

**Myriopteris tomentosa** (Link) Fée vonmence [Cheilanthes tomentosa Link]. Stems compact, 4-8 mm in diameter, scales mostly bicolored; vernation noncircinate; petioles dark brown, rounded; blades usually 4-pinnate at base; rachises rounded, pubescent, with scattered inconspicuous linear scales; pinnae not jointed; costae mostly green, abaxial scales inconspicuous, linear, less than 0.5 mm wide, usually entire, not concealing ultimate segments; ultimate segments ovate-lanceolate, not beaded, largest 1-2 mm, abaxially densely tomentose, axially pubescent with fine hairs. Rocky slopes and ledges on a variety of substrates, including limestone and granite, in the southern third of the state.

**Myriopteris windhamii** Grusz [for Michael D. Windham (1958-8), American botanist] *Cheilanthes vilosa* Davenport ex Mason, *Cheilanthes myriophylla* Desvail. Stems compact, 4-8 mm in diameter, scales bicolored with dark central stripe and pale margins; vernation noncircinate; petioles dark brown, rounded; blades 3-4-pinnate at base; rachises rounded, not pubescent, with scattered filiform to lanceolate scales; pinnae lanceolate to lanceolate-scales; appearing villous adaxially; costae mostly green, abaxially with conspicuous lanceolate to ovate scales, often concealing ultimate segments, not ciliate; ultimate segments beadlike, the largest 1-2 mm, abaxially nearly glabrous, axially villous with coarse hairs. On limestone cliffs and ledges in the southern third of the state.

**Myriopteris wootonii** (Maxon) Grusz & Windham [for Elmer Ottis Wooton (1865-1945), premier New Mexico botanist] *Cheilanthes wootonii* Maxon. Stems long-creeping, 1-3 mm in diameter, scales mostly uniformly brown; vernation incircinate; petioles dark brown, round; blades 3-4-pinnate at base; rachises rounded, pubescent, with scattered linear-lanceolate scales; pinnae not jointed, appearing appressed adaxially; costae mostly green, abaxially with conspicuous lanceolate-ovate, often concealing ultimate segments, ciliate, usually in the basal ½; ultimate segments beadlike, largest 1-3 mm abaxially nearly glabrous, adaxially glabrous. Widespread on usually igneous cliffs and ledges.

**Myriopteris yavapensis** (T. Reeves ex Windham) Grusz & Windham [from Yavapai County or region, Arizona] *Cheilanthes yavapensis* T. Reeves ex Windham. Stems long-creeping, 1-3 mm in diameter, scales mostly uniformly brown; vernation incircinate; petioles brown, grooved; blades 2-pinnate-pinnatifid at base; rachises grooved, not scaly or pubescent; pinnae not jointed; costae mostly green, without scales abaxially; ultimate segments oblong to linear, not beaded, glabrous on both surfaces. Rocky slopes, cliffs, and ledges of igneous origin; southwestern. Easily confused with *Myriopteris wootonii*, from which it was recently segregated.

**Notholaena** [false cloak] CLOAKFERN [2].

Plants usually on rock; stems short-creeping to compact, with subulate to lanceolate scales; leaves monomorphic; blades pinate-pinnatifid to 4-pinnate, abaxially with yellowish or whitish farina; ultimate segment margins recurved to form false indusia. Widespread on usually igneous cliffs and ledges.

**Notholaena grayi** Davenport [for Asa Gray (1810-1898), prominent American botanist of the 19th century] *Cheilanthes grayi* (Davenport) Domatsu. Stems scales concolorous to weakly bicolored; petioles equal to or shorter than blades, rounded, glabrous-farinose, with scattered hairs and scales; blades 2-pinnate-pinnatifid, 3-6 times longer than wide, with conspicuous whitish farina below along with lanceolate, entire scales scattered along rachises and costae, distinctly glabrous above. Rocky slopes and cliffs in the arid southwestern mountains. Only subsp. grayi with 16 spores per sporangium occurs east of Arizona.

**Notholaena standleyi** Mason [for Paul Carpenter Standley (1884-1963), North American botanist and scholar of the New Mexico flora] *Notholaena hookeri* D.C. Eaton. Stems scales strongly bicolored, with dark centers and brown, well defined margins; petioles equal to or longer than blades, glabrous except for a few scales at base; blades pentagonal, deeply pinnatifid but not fully pinnate above base, 1-2 times longer than wide, with conspicuous whitish farina below along with lanceolate, entire scales scattered along rachises and costae, distinctly glandular above. Rocky slopes and cliffs in the arid southwestern mountains. Only subsp. grayi with 16 spores per sporangium occurs east of Arizona.

**Pellaea** [dusky or dark-colored] CLIFFBRAKE [5].

Plants usually on rock; stems compact to long-creeping, with linear-subsulate to lanceolate scales; leaves monomorphic to dimorphic; blades 1-4-pinnate proximally, often leathery, glabrous above, below glabrous, pubescent, or with scales; ultimate segments usually stalked, more than 4 mm wide, margins reflexed forming false indusia. About 40 species, mostly in the Western Hemisphere.


1 Pelioles and rachises straw-colored, tan, or gray, rarely shiny......................................................... 1. Pellaea intermedia
1 Petioles and rachises dark brown to black, usually shiny
2 Stem (rhizome) scales bicolored, with a dark central region (like a midrib) and a lighter marginal region
   3 Pinnae with 3-9 ultimate segments ................................................................. P. wrightiana
   3 Pinnae with 9-25 ultimate segments ............................................................... P. truncata
2 Stem (rhizome) scales uniformly colored
   4 Leaf segments glabrous or nearly so on the lower surface; rachis nearly glabrous ........................................ P. glabella
   4 Leaf segments sparsely pubescent on the lower surface on the midvein; rachis with short curly hairs, at least on one side ............................. P. atropurpurea

Pellaea atropurpurea (Linnaeus) Link [dark purple] [Pinnia atropurpurea Linnaeus]. Stem scales uniformly reddish brown or tan, linear-subulate; leaves somewhat dimorphic, sterile, shorter and less divided than fertile leaves; petioles dark, lustrous, rounded; blades 2-pinnate at base; rachises reddish purple, rounded, densely pubescent adaxially with short, curly, appressed hairs; ultimate segments leathery, sparsely villous near costae; costae often longer than ultimate segments; sporangia long-stalked. ● Widespread in the state, often on calcareous cliffs, ledges, and rocky places.

Pellaea glabella Mettenius ex Kuhn [somewhat glabrous] [Pellia axkudorfiana Butters]. Stem scales reddish brown, linear-subulate; leaves monomorphic; petioles brown, lustrous, rounded; blades 1-2-pinnate at base; rachises brown, rounded, nearly glabrous; proximal pinnae with 3-7 lobes or ultimate segments; ultimate segments essentially glabrous; sporangia long-stalked containing 32 spores. ● Limestone cliffs and ledges. ● Our material is subsp. simplex (Butters) A. Löve & D. Löve [undivided, single] [Pellia glabella Mettenius ex Kuhn var. simplex Butters], with ultimate segments essentially glabrous and with sporangia containing 32 spores. It occurs from northern Arizona through Utah and eastern Colorado to Wyoming and South Dakota as well as in the far northwest and British Columbia; in New Mexico it is known from one specimen in Grant County.

Pellaea intermedia Mettenius ex Kuhn [intermediate in some feature]. Stems slender, creeping, scales mostly bicolored with black center and brown margins; leaves monomorphic; petioles straw-colored, tan or gray, not lustrous; blades usually 2-pinnate at base; rachises tan, rounded, pubescent; pinnae perpendicular to rachises; ultimate segments ovate to elliptic, leathery, margins recurved on fertile segments. ● Southern third of the state on rocky slopes and ledges. ● The light colored petioles and rachises and the ovate to elliptic ultimate segments of this fern are distinctive.

Pellaea truncata Goodding [chopped off square, as in a sawed trunk] [Pellia longimucronata Hooker var. longimucronata (Hooker) Davympor]. Stem scales linear-subulate, bicolored with black, thick centers and thin brown margins; leaves mildly dimorphic, sterile shorter and less divided than fertile leaves; petioles dark brown, lustrous, flattened or somewhat grooved; blades 2-pinnate at base; rachises brown, glabrous, shallowly grooved; pinnae with 9-25 ultimate segments; costae much longer than fertile ultimate segments; ultimate segments leathery, glabrous, apices mucronate. ● Widespread on cliffs and rocky slopes, but rarely on limestone.

Pellaea wrightiana Hooker [for Charles Wright (1811-1885), outstanding American botanical collector] [Pellia terrifolia (Cavanilles) Link var. wrightiana (Hooker) Tryon]. Stem scales linear-subulate, bicolored with black thick centers and thin brown margins; leaves monomorphic; petioles dark brown, lustrous, flattened or somewhat grooved; blades 2-pinnate at base; rachises brown, glabrous, shallowly grooved; pinnae with 3-9 ultimate segments; costae shorter than ultimate segments; ultimate segments leathery, glabrous, apices mucronate. ● Nearly throughout the state on arid cliffs and rock ledges.

Pentagramma [five lines, for the pentagonal leaf blades] GOLDFERN [1].

Plants terrestrial or on rock; stems short-creeping, scales narrowly lanceolate, bicolored with a black, hard, central stripe and tan margins; leaves monomorphic; blades triangular-pentagonal, 1-2-pinnate-pinnatifid at base, farinose below, glabrous or glandular above; margins of ultimate segments not recurved to form false indusia. ● Species 2; North America and Mexico.


Pentagramma maxonii (Weatherby) Schuettpelz & Windham [for William Ralph Maxon (1877-1948), U.S. fern specialist] [Gymnogramma triangularis Kaulfuss, Pentagramma triangularis (Kaulfuss) Yatskievitch, Windham & Wollenweber, Pityrogramma triangularis (Kaulfuss) Maxon var. maxonii Weatherby, Pityrogramma triangularis (Kaulfuss) Maxon]. Petioles reddish to dark brown, glabrous or white-farinose at base; blades herbaceous, densely white-farinose below, with scattered yellow, capitate glands above; sporangia scattered along veins. ● Pine-oak woodlands in the foothills. ● Pentagramma maxonii resembles Notholaena standleyi and Bommeria hispida; Notholaena standleyi has strictly marginal sori and false indusia; Bommeria hispida is never farinose abaxially.

SALVINIACEAE FLOATING-FERN FAMILY [2/3/3]

Small, heterosporous aquatic, free-floating plants; Stems slender, branching, glabrous or hairy; roots either long and pendent or absent; leaves either monomorphic and bilobed with the upper lobe aerial and green and the lower colorless and floating, or dimorphic in whorls of three with two floating and one submerged; sori or sporocarps either attached to the lowe lobes of bilobed leaves, or to the submerged leaves, each sporocarp bearing either a megaspor in each megasporangium or numerous microspores in each microsporangium. ● The family contains 2 genera and about 20 species; nearly worldwide.

We follow current circumscription in including Azollaceae in the Salviniacaeare.


1 Roots simple, unbranched; leaves uniform, alternate, with each leaf papillate and divided into an upper aerial lobe and a lower submerged lobe ................................................................. Azolla

1 Roots simple; leaves dimorphic in whorls of three with two lateral and floating, and the third submerged and dissected into filiform, hairy segments ....................................................................................... Salvinia
Spore Plants - Selaginellaceae

Azolla [alluding to death] MOSQUITO-FERN [2].
Small, feather-like, plants; stems horizontal, usually not green, with hanging, unbranched roots; leaves sessile, alternate, each leaf bilobed, upper lobe green or red with narrow paler margins, lower lobe colorless; sporangia in nut-like unisexual sporocarps; microsporocarps globose, containing numerous microsporangia; megasporocarps globose, containing one megasporangium producing one megaspore. ● Species about 6. Plants in this genus have a symbiosis with the nitrogen-fixing cyanobacterium, Anabaena azollae, which is present in cavities in the upper leaf lobes.

1 Leaves of the aerial stems arranged in 4 distinct ranks; axillary leaves present at branching points

Azolla filiculoides Lamark [resembling a small fern]. Tiny aquatic ferns forming dense mats on still water; leaves green to yellowish green or dark reddish; largest hairs on upper leaf lobes near stem 2(-3) celled; megaspore surface pitted and sparsely covered with a few long filaments. ● Still or barely moving water, sometimes on mud; scattered riparian areas, mostly southwestern.

Azolla mexicana Schlechtendal & Chamisso ex Kunze [from or pertaining to Mexico]. Minute aquatic ferns capable of forming dense mats across still water (supposedly smothering mosquito larvae); leaves green to blue-green, often red in full sun or when under stress; largest hairs on upper leaf lobes strict unicellular; megaspore surface warty with raised angular bumps, each with a tangle of filaments. ● Still or barely moving water, sometimes on mud; scattered riparian areas, mostly southwestern.

Salvinia [for Antonio Maria Salvini (1653-1722), Italian poet and scholar] WATER-SPANGLES [1].
Stems with many hairs; submerged leaves give rise to chain-like clusters of sporocarps, both megasporocarps (few, proximal) and microsporocarps (numerous distal) attached to the same leaf; megasporocarps with 10-40 sporangia, each producing only one mature megaspore; microsporocarps with 100 or more microsporangia. ● About 10 species, 7 from North America to South America, 3 from Eurasia and Africa.

*Salvinia minima Baker [smallest]. Floating leaves elliptic to suborbicular, obtuse or notched at tip, upper surface with numerous conical papillae, the apex of each with 4 spreading hairs, free at their tips; sporocarps sessile. ● Known only from a single collection from a pond on the campus of New Mexico State University; definitely adventive there.

Selaginella densa Rydberg [compact]. Plants terrestrial or on rock; stems creeping or decumbent, never erect, mat-forming; upper-side leaves smaller than underside ones; underside leaf bases oblique, long decurrent; upper-side leaf bases oblique, slightly decurrent; leaf apexes abruptly long-bristled, bristles 1-2 mm long, conspicuously puberulent; leaf margins long-ciliate; spores with margins ciliate the entire length, apices usually long-bristled. ● Dry rocky slopes, rock crevices, gravelly or sandy or clay soils, often at high altitudes in the mountains. ● Distinguished with difficulty from S. scopulorum, which may be conspecific.


SELAGINELLACEAE SPIKE-MOSS FAMILY [1/11/12]
Plants perennial, heterosporous, terrestrial, on rock, sometimes epiphytic, usually less than 5 cm tall; leaves (microphylls) less than 1 cm long, with a single vein, monomorphic or dimorphic; sporangia borne in the axils of overlapping sporophylls clustered to form strobili; strobili 4-angled (rarely cylindric), sometimes flattened; sporophylls usually monomorphic, slightly or highly differentiated from sterile leaves. ● The family contains 1 genus and about 750 species worldwide.

Stems leafy, regularly or irregularly forked or branched; modified leafless shoots producing roots usually present; if leaves monomorphic, then linear to narrowly lanceolate and spirally arranged; if leaves dimorphic, then round to lanceolate and arranged in 4 full sun or when under stress; largest hairs on upper leaf lobes near stem 2(-3) celled; megaspore surface pitted and sparsely covered with a few long filaments. ● Still or barely moving water, sometimes on mud; scattered riparian areas, mostly southwestern.

1 Leaves of the aerial stems arranged in 4 distinct ranks; axillary leaves present at branching points

2 Leaves without a bristle-tip, the margins with a wide transparent portion .......................................................... S. lepidophylla
2 Leaves with a bristle-tip 1/3 to ½ the length of the leaf, the margins with a narrow transparent portion ........................................... S. pilifera

1 Leaves of the aerial stems not in distinct ranks; axillary leaves absent at branching points

3 Stems prostrate, the two sides (under- and upper-) differentiated; leaves at least slightly dimorphic

4 Upper-side leaves 2-3 mm long; underside leaves decurrent .......................................................... S. peruvian a
4 Upper-side leaves 3-4 mm long; underside leaves abruptly adnate or slightly decurrent ...................................... S. wrightii

3 Stems pendent, erect, ascending, or rarely prostrate, radially symmetric or the two sides only slightly differentiated

5 Aerial stems erect or ascending; bud-like arrested branches usually present on rhizome

6 Base of leaf decurrent .......................................................... S. weatherbiana
6 Base of leaf abruptly adnate

7 Leaf bristle 0.6-2 mm long; all cilia of the leaf long and spreading outward .................................................. S. rupincola
7 Leaf bristle 0.3-0.5 mm long; cilia at the apex of the leaf short and ascending, those at the base long and spreading ...........

.......................................................... S. × neomexicana

5 Aerial stems creeping or decumbent, never erect; bud-like arrested branches absent

8 Leaves of main stem adnate to the stem and distinct from the stem in color, the bases usually rounded .......... S. mutica
8 Leaves of main stem decurrent and not distinct from the stem in color, the bases cuneate or oblique

9 Main stems radially symmetric, the leaves equal in size .......................................................... S. underwoodii
9 Main stems with the two sides slightly differentiated, the leaves unequal in size

10 Leaf bristle 1-2 mm long, conspicuously puberulent; leaf margins usually long-ciliate (the cilia nearly microscopic, however) .......................................................... S. densa
10 Leaf bristle 0.5-1 mm long, hardly puberulent; leaf margins short-ciliate .......................................................... S. scopulorum

Selaginella densa Rydberg [compact]. Plants terrestrial or on rock; stems creeping or decumbent, never erect, mat-forming; upper-side leaves smaller than underside ones; underside leaf bases oblique, long decurrent; upper-side leaf bases oblique, slightly decurrent; leaf picces abruptly long-bristled, bristles 1-2 mm long, conspicuously puberulent; leaf margins long-ciliate; sporophylls with margins ciliate the entire length, apices usually long-bristled. ● Dry rocky slopes, rock crevices, gravelly or sandy or clay soils, often at high altitudes in the mountains. ● Distinguished with difficulty from S. scopulorum, which may be conspecific.
Selaginella lepidophylla (Hooker & Greville) Spring [scaly-leaved] RESURRECTION PLANT [Lycopodium lepidophillum Hooker & Greville]. Plants terrestrial or on rock; stems flat when moist, curled up when dry, axillary leaves present at branching points; leaves thick, stiff, in 4 ranks, 2 median, 2 lateral; lateral leaves somewhat longer and wider than median, lateral leaves rounded at the apex, median leaves abruptly acuminate; all leaves with a wide transparent margin. ●Dry rocky soil and limestone talus in the southern mountains. ○Known from a single collection in Sierra County.

Selaginella mutica D.C. Eaton ex Underwood [cut-off]. Plants terrestrial or on rock; stems radially symmetric, forming loose mats; leaves monomorphic, main stem leaves distinct from stem in color; leaves tightly appressed to stems, lanceolate to linear-lanceolate, margins ciliate to denticulate, bases usually rounded. ●New Mexico has two varieties:

1. Varieties of Selaginella mutica:
   a. Margins of sporophylls long-ciliate, seldom denticulate, the cilia spreading; apex of leaves with or without a bristle; leaf margins long-ciliate…var. mutica ●Widespread throughout the state on limestone, sandstone, or igneous rock.
   b. Margins of sporophylls very short-ciliate to denticulate, the cilia and teeth ascending; apex of leaves with a bristle; leaf margins short-ciliate to denticulate…var. limitanea Weatherby [on the border]. ○Sheltered igneous cliffs and rock faces; known from Doña Ana, Luna, and Taos counties.

Selaginella neomexicana Maxon [of New Mexico]. Plants on rock, forming clumps; stems radially symmetric, subterranean and aerial, often with bud-like, arrested branches; aerial branches erect to ascending; aerial stem leaves linear-lanceolate, appressed, bases abruptly adnate to stems, margins with long, spreading cilia proximally and short, ascending cilia distally; leaf apices with a short bristle 0.3-0.5 mm long. ●Infrequent on canyon rock in Doña Ana County. ○This is a presumed hybrid, with misshapen microsporangia and lacking megasporangia.

Selaginella peruviana (Milde) Hieronymus [from Peru] [Selaginella rupincola (Linnaeus)Spring forma peruviana Mildes, Lycopodium rupincola Linnaeus]. Plants terrestrial or on rock; stems prostrate, forming loose mats, upper-sides and underside different; leaf apices with a bristle 0.3-0.8 mm long, leaves linear-lanceolate; underside leaves decurrent, longer than upper-side; upper-side leaves less than 3 mm long, bases abruptly adnate to stems. ●Igneous and sandstone cliffs and ledges; mostly central and eastern portions of the state.

Selaginella pilifera A. Braun [hairy] RESURRECTION PLANT [Selaginella pringlei Baket, Selaginella pilifera A. Braun var. pringlei (Baker) Morton]. Plants terrestrial or on rock, forming rosettes; stems prostrate, flat when moist, nearly flat when dry, axillary leaves present at branching points; leaves thick, leathery, in 4 ranks, 2 median, 2 lateral, with narrow transparent margins and an apical bristle 1/3 to ½ the leaf length; median leaves peltate with rounded to truncate bases; lateral leaves with cordate bases with 2 ciliate lobes. ●Dry rocky soil, cliff faces, and limestone talus; known from Eddy County.

Selaginella rupincola Underwood [rock-dwelling] [Selaginella rupincola (Linnaeus)Spring var. rupincola (Underwood) Clute]. Plants terrestrial or on rock; stems subterranean and aerial, radially symmetric, bud-like arrested branches often present; aerial stems with linear-lanceolate leaves with bases abruptly adnate to the stems; leaves ascending, appressed, margins with long spreading cilia and tipped with a bristle 0.6-2 mm long. ●Exposed ledges, cliffs, and gravelly ground mostly in the southern regions near the border.

Selaginella scalposcolumarum [of the Rocky Mountains] [Selaginella densa Rydberg var. scapulorum (Maxon) R. Tryon]. Plants terrestrial or on rock, forming mats; stems decumbent or creeping; upper side leaves somewhat smaller than underside; underside leaf bases oblique, decurrent; upper-side leaf bases oblique, slightly decurrent to adnate; leaf apices abruptly bristled, bristles 0.5-1 mm long, slightly puberulent to entire; leaf margins usually short-ciliate; sporophylls with margins short-ciliate to denticulate proximally, lacking cilia apically, apices short-bristled. ●Rock crevices, rocky slopes, meadows, often at high altitudes; widespread in mountain areas. ○This species has been treated as a variety of S. densa.

Selaginella underwoodii Hieronymus [for Lucien Marcus Underwood (1853-1907), American fern specialist] [Selaginella fendleri Hieronymus (non Baker)]. Plants on rock; stems short-to-long creeping or pendent, radially symmetric; main stem indeterminate; leaves monomorphic, linear to linear-lanceolate, bases cuneate and decurrent; margins short-ciliate or denticulate to entire; apices slightly attenuate, short- to long-bristled; sporophylls lanceolate to ovate-lanceolate, base glabrous with very prominent auricles. ●Throughout the state on a variety of cliffs, outcrops, and ledges.

Selaginella weberthyiana R. Tryon [for Charles Alfred Weatherby (1875-1949), American fern specialist]. Plants on rock; stems rhizomatous and aerial, radially symmetric; rhizomatous stems with bud-like arrested branches; aerial stems erect or ascending; leaves on rhizomatous stems scale-like, loosely appressed, often incurved; aerial stem leaves narrowly lanceolate, tightly appressed, bases cuneate and decurrent, apices bristle-tipped. ●Uncommon on granitic rock outcrops ledges, and cliffs in the northern forested mountains.

Selaginella wildi Hieronymus [for Charles Wright (1811-1885), outstanding American botanical collector]. Plants on rock; stems prostrate, branches with upturned tips, upper-sides and underside different; upper-side leaves linear-lanceolate, 3.3-3.9 mm long, bases abruptly adnate to stems; underside leaves narrowly linear-lanceolate, 3.5-4.5 mm long, bases abruptly adnate (sometimes slightly decurrent); all leaf apices yellowish bristle-tipped. ●On limestone cliffs; known only from Eddy County.

WOODSIACEAE CLIFF-FERN FAMILY [1/5/5]

Plants terrestrial or on rock; stems compact to creeping, ascending to erect; leaves monomorphic; petioles shorter than blades, with 2 vascular bundles; blades 1-2-pinnate-pinnatifid; pinnae sessile, bases nearly equilateral, margins entire to dentate, sometimes with translucent projections; veins ending before reaching margins of ultimate segments; sori, round, in one row between midrib and margin along veins; indusia basal, dissected into filamentous or scale-like segments. This family contains a single genus, which was formerly included in a polyphyletic Dryopteridaceae; we follow Judd et al. (2016) in segregating the monophyletic groups corresponding herein to Athyriaceae, Cystopteridaceae, Dryopteridaceae, and Woodsiaceae.
**Spore Plants - Woodsiaceae**

*Woodsia* [for Joseph Woods (1776-1864), English architect, botanist] WOODSIA [5].

With the features of the family.

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1. Indusia composed of relatively broad segments, these multiserate for most of their length, but often branched or divided distally
   - **2 Veins tips enlarged and visible as whitish lines showing through on the upper surface; petiole light brown or straw-colored**
     (sometimes darker at the very base)................................. **W. cochisensis**
   - **2 Vein tips not enlarged; petiole reddish brown to dark purple** ................................................................. .......................... **W. plummerae**

1. Indusia composed of narrow, usually filamentous segments, these uniserate for most of their length
   - **3 Pinnule margins (viewed from below) smooth to somewhat ragged but usually lacking translucent projections or filaments; lower portions of petioles reddish brown or dark purple**
     - **4 Pinnae with flattened, multicellular hairs along the midrib** ........................................................................ **W. scopulina**
     - **4 Pinnae lacking flattened, multicellular hairs along the midrib** ..................................................................... **W. oregana**
     - **3 Pinnule margins (viewed from below) with translucent projections or filaments on the teeth; lower portions of petioles light brown or straw-colored**
     - **5 Translucent projections on pinnule margins mostly 1- or 2-celled, occasionally filamentous; largest pinnae divided into 3-7 pairs of closely spaced pinnules** ................................................................. **W. neomexicana**
     - **5 Translucent projections on pinnule margins mostly multicellular, often prolonged to form twisted filaments; largest pinnae with 7-18 pairs of discrete, widely spaced pinnules** ........................................................................................................... **W. phillipsii**

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**Woodsia cochisensis** Windham [from Cochise County, Arizona]. Petioles light brown or straw-colored throughout when mature; blades pinnate-pinnatifid or 2-pinnate, sparsely to moderately glandular; largest pinnae with 4-9 pairs of pinnules; pinnule margins usually thickened, lustrous, lacking cilia but sparsely glandular with occasional 1-2-celled translucent projections; vein tips enlarged and visible as whitish lines showing through on the upper surface; indusia of relatively broad segments but usually divided distally. Moist, shaded ledges and protected sites near seeps and springs; central and southwestern mountains.

**Woodsia neomexicana** Windham [of New Mexico]. Petioles light brown or straw-colored; blades pinnate-pinnatifid or 2-pinnate, subglabrous or sparsely glandular; largest pinnae with 3-7 pairs of pinnules; pinnule margins not lustrous nor thickened, lacking cilia but sparsely glandular, with 1-2-celled projections; vein tips sometimes enlarged and visible on the upper surface; indusia of narrow filamentous segments. Cliffs, crevices of rocks, ledges often on igneous substrates; mountain forests throughout the state. This and *W. phillipsii* replace *W. mexicana* in New Mexico.

**Woodsia oregana** D.C. Eaton [from or pertaining to Oregon] [Woodsia cathcartiana B.L. Robinson]. Petioles reddish brown to dark purple proximally; blades pinnate-pinnatifid or 2-pinnate, sparsely to moderately glandular, largest pinnae with 3-9 pairs of pinnules; pinnule margins not lustrous nor thickened, lacking cilia, with occasional glands, rarely with 1-2-celled projections; indusia of narrow, filamentous segments. Cliffs and rocky slopes on various substrates; widely distributed in mountain areas except for the far southeast. Our plants belong to the tetraploid subsp. *cathcartiana* (B.L. Robinson) Windham [for Ellen Weir Cathcart (1836-1916), bryologist] [Woodsia cathcartiana B.L. Robinson]; the diploid subsp. *oregana* occurs in the Pacific Northwest of the United States and western Canada, differing in spore size and the microstructure of pinnule margin cells.

**Woodsia phillipsii** Windham [for Walter Sargeant Phillips (1905-1975), fern botanist of Arizona]. Petioles light brown or straw-colored; blades usually 2-pinnate, sparsely to moderately glandular; pinnae much longer than wide with 7-18 pairs of pinnules; pinnule margins often lustrous adaxially with occasional glands, appearing ciliate due to presence of translucent projections that are often prolonged; vein tips usually enlarged and visible adaxially; indusia of narrow filamentous segments. Cliffs and rocky slopes in the southern mountains, also Cibola, San Miguel and Harding counties.

**Woodsia plummerae** Lemmon [for Sara Allen Plummer Lemmon (1836-1923), California botanist-artist] [Woodsia patula E. Fournier var. glandulosa (Eaton & Faxon) Taylor]. Petioles reddish brown to dark purple; blades usually 2-pinnate, densely glandular, often viscid; largest pinnae with 5-11 pairs of pinnules, both sides glandular, lacking scales and non-glandular hairs; pinnule margins non-lustrous, lacking cilia but with occasional translucent projections; indusia of relatively broad segments divided distally. Cliffs, ledges, and rocky slopes in the mountains throughout the state, often on loose granite.

**Woodsia scopulina** D.C. Eaton [of cliffs, crags, and rocky places] [Woodsia obtusa (Sprague) Torrey var. lyallii Hooker, Woodsia oregana D.C. Eaton var. lyallii (Hooker) Bolvin]. Petioles reddish brown to dark purple proximally, brittle; blades 2-pinnate proximally, moderately glandular; largest pinnae with 5-14 pairs of pinnules; pinnule surfaces with flattened, multicellular hairs along midribs, pinnule margins lacking translucent projections; indusia of filamentous segments. Cliffs and rocky slopes. This fern has been reported for New Mexico, but no specimens are known.
GYMNOSPERMS

Evergreen, monoecious or dioecious shrubs or trees; branchlets not in flattened sprays; leaves opposite in 4 ranks or whorled in 3 internodes ................................................................................................................. EPHEDRACEAE

1 Shrubs with green photosynthetic stems; leaves reduced to small brownish papery scales and separated by very long (2-10 cm) internodes.................................................................................................................

1 Large shrubs or trees without green photosynthetic stems; leaves needle-like, or if scale-like then green and membranous and overlapping on very short (less than 0.5 cm) internodes
2 Cones woody when mature; foliage leaves needle-like, borne singly or in fascicles, falling from the twigs in age........ PINACEAE
2 Cones woody or berry-like when mature; foliage leaves scale-like or needle-like (one species), borne singly, remaining on the twigs and usually the entire twig falling from the plant in age.................................................. CUPRESSACEAE

CUPRESSACEAE CYPRESS FAMILY [2/8/8]

Evergreen trees and shrubs, monoecious and dioecious, highly branched; bark exfoliating in fibers or plates; buds lacking scales; leaves needle-, scale- or awl-shaped, often covering the branches, opposite or whorled, shed with the shoots; male cones small and inconspicuous; female cones with the ovule scales fused, woody or fleshy when mature. ♦ This is the most widespread of all gymnosperm families, being found on all continents except Antarctica. Taxodium distichum (Linnaeus) L.C. Richard var. mexicanum Gordon was reported for the state by St. Hilaire (2001), based on nursery seed, but no trees are known in the wild.

1 Branchlets arranged in conspicuously flattened sprays, these vertical to horizontal; plants known only in cultivation
2 Branchlets typically in vertical sprays; cones fleshy, the scales strongly curved, greenish or yellowish at maturity ............. Platycladus
2 Branchlets typically in horizontal, or at least not vertical, sprays; cones not fleshy, more woody, brown at maturity............. Thuja
1 Branchlets not arranged in flattened sprays; plants wild or cultivated
3 Seed cones usually fleshy and somewhat berry-like, occasionally dry and mealy but not woody, the scales not opening and the seeds not released; plants monoecious or dioecious................................................................. Juniperus
3 Seed cones becoming woody at maturity, the scales opening and releasing the seeds; plants monoecious
4 Plants known only in cultivation; growth form narrowly columnar, the canopy rarely as much as 2 m in diameter...... Cupressus
4 Plants known in cultivation or in the wild; growth form open and spreading, the canopy 3-many m in diameter...... Hesperocyparis

Cupressus [ancient Greek name] CYPRESS [8].

Monoecious trees and large shrubs, the bark fibrous or platey, the twigs round or 4-angled, spreading or in flattened sprays; leaves scale-like, green to glaucous, usually with a central gland; seed cones globose to oblong, composed of 3-6 opposite pairs of thick woody scales, with 5-20 winged seeds per scale. ♦ About 14 species of sub tropical to temperate regions of the Northern Hemisphere. See Hesperocyparis for our native species formerly included in Cupressus.


* Cupressus sempervirens Linnaeus [evergreen] ITALIAN CYPRESS. Evergreen tree to 30 m tall, tall and narrow, the crown no more than 2 m in dia; cones globose, glossy, brown to gray, woody when mature, 2-3 cm long, found in the upper reaches of the tree; seed flattened, minute. ♦ A very popular ornamental tree in residential areas; not known in the wild in New Mexico; native to Eurasia. ♦ This is the tree featured in Van Gogh’s The Starry Night.

Hesperocyparis [western cypress] CYPRESS [1].

Evergreen trees or shrubs; leaves opposite, 4-ranked, the adult leaves scale-like, appressed to divergent, rhomboidal; seed cones persisting closed for many years or until opened by fire, 1-4 cm diam, the scales persistent, thick and woody. ♦ The genus Hesperocyparis accommodates all the New World species of Cupressus. Hesperocyparis glabra (Sudworth) Bartel (Cupressus glabra Sudworth), with the trunk bark cherry-red, flaking in thin plates, fresh herbage pleasant-smelling, pine-like or citrus-like, and native to Arizona, is sometimes found as an ornamental, but is not known in the wild in New Mexico.


Hesperocyparis arizonica (Greene) Bartel [of Arizona] ARIZONA CYPRESS [Callitropsis arizonica (Greene) D.P. Little, Cupressus arizonica Greene, Neocupressus arizonica (Greene) de laubenfels]. Tree to 23 m tall; trunk bark smooth at first, sometimes becoming rough and fibrous, not flaking into thin strips; fresh herbage malodorous, stinky or skunky; leaves scale-like, about 2 mm long, usually glaucous-green, the adaxial resin gland not conspicuous; seed cones globose, 2-3 cm dia, dark reddish brown, with 6-8 scales; seeds 4-5 mm long. ♦ Uncommon in piñon-juniper woodlands and canyon bottoms in the southwestern mountains, at mid-elevations. ♦ Few populations are known in the wild in New Mexico: one, of perhaps hundreds of trees in the Cooke’s Range (Luna County), are definitely a native population; another, of two trees in the San Andres Mountains (Doña Ana County), was most likely a deliberate human introduction of the past 60 years or so; and, a third, of numerous saplings and young trees thriving at Fort Bayard (Grant County) from ornamental trees planted there. We find both this species and the related Hesperocyparis glabra (Sudworth) Bartel (with smooth bark) in cultivation as ornamental trees.

Juniperus [classical Latin name] JUNIPER [7].

Evergreen, monoecious or dioecious shrubs or trees; branchlets not in flattened sprays; leaves opposite in 4 ranks or whorled in 3 ranks; adult leaves scale-like to needle-like, with an abaxial gland; seed cones terminal (auxiliary in J. communis) maturing in 1-2 years, globose, berry-like, remaining closed, usually glaucous, the scales persistent, fleshy or fibrous or obscurely woody. ♦ Cultivars of many species are used in ornamental landscaping, and some of these are keyed below the regular key. Juniperus ashei Buchholz and J.
coahuilensis (Martinez) Gaussen ex R.P. Adams have been reported for the state by various workers, but all supposed specimens have been determined as either J. monosperma or J. arizonica (pers. comm. R.P. Adams 2015, 2016).


1 Mature leaves needle-like, 6-12 mm long, spreading; cones axillary ................................................................. J. communis

1 Mature leaves scale-like, triangular, less than 5 mm long, appressed; cones terminal

2 Margins of leaves entire (at 20x); bark exfoliating in rectangular plates .................................................................. J. scopulorum

2 Margins of leaves denticulate (at 20x); bark exfoliating in rectangular plates or in thin strips

3 Seed cones with 3-6 seeds; bark exfoliating in rectangular plates or in thin strips

4 Glands on leaves inconspicuous because they are embedded in leaf; seed cones somewhat dry and mealy at maturity; plants monoecious ................................................................................................................................. J. osteosperma

4 Glands on leaves conspicuous; seed cones usually somewhat fleshy at maturity; plants dioecious (rarely monoecious)

5 Seed cones reddish blue to brownish under the glaucous bloom; fewer than 1/5 of whip-leaf glands with evident white exudate

6 Seed cones rose to pinkish, with a glaucous coating; inner surface of leaves glaucous ....................................... J. monosperma

6 Seed cones copper to copper-red under the glaucous bloom (if present); 1/4 or more of whip-leaf glands with evident white exudate

6 Seed cones rose to pinkish, with a glaucous coating; inner surface of leaves glaucous ....................................... J. arizonica

6 Seed cones copper to copper-red, without a glaucous coating; inner surface of leaves not glaucous ................. J. pinchoii

● Several juniper species are commonly cultivated throughout the state. The following may help in identification:

a Plants trees or tree-like

b Scale leaves obtuse; needle-like leaves in whorls of three; cones 6 mm or more in diameter ................................................................................................................................. J. chinensis Linnaeus "torulosa" HOLLYWOOD TWISTED JUNIPER,

b Scale leaves acute; needle-like leaves mostly opposite (in 3s or vigorous twigs); cones less than 6 mm in diameter

c Bark of main trunk and larger branches exfoliating in flattened plates; branchlets usually drooping; berries bitter ................................................................................................................................. J. scopulorum Sargent ROCKY MOUNTAIN JUNIPER. Uncommon in cultivation.

c Bark of main trunk and larger branches exfoliating in thread-like and stringy strips; branchlets usually not drooping; berries sweet ......................................................................................................................... J. virginiana (Linnaeus) Antoine EASTERN RED CEDAR.

d Plants shrubby, not tree-like (numerous cultivars here, difficult to identify, many of them belong to J. chinensis)

d Crushed leaves with a strong disagreeable odor ......................................................................................................................... J. sabina Linnaeus SAVIN JUNIPER.

d Crushed leaves not malodorous

e Plants usually taller then 25 cm, the stems semi-procumbent to erect and widely branched .......................................................... J. chinensis Linnaeus CHINESE JUNIPER. This species is notoriously variable, and many of the taller forms will fall here.

e Plants very low, rarely more than 20 cm tall, the stems procumbent

f foliage bluish........................................................................................................................................................................ J. horizontalis Moench CREEPING JUNIPER,

f foliage greenish........................................................................................................................................................................ J. chinensis Linnaeus var. procumbens Endlicher CHINESE JUNIPER.

Juniperus arizonica (R.P. Adams) R.P. Adams [of Arizona] ARIZONA JUNIPER [Juniperus coahuilensis (Martinez) Gaussen ex R.P. Adams var. arizonica R.P. Adams, Juniperus erythrocarpa of western NM locales]. Dioecious shrubs or trees to 8 m tall, sprouting after burning or cutting; trunk bark exfoliating in long fibrous strips, not in plates; leaves 3-ranked; whip-leaves 4-6 mm long, the margins denticulate, the glands about ½ the sheath length; scale-leaves 1-3 mm long; seed cones maturing in 1 year, globose, 6-7 mm dia, rose to pinkish, with a glaucous coating, with 1 or rarely 2 seeds.

● Grassland-woodland ecotones and conifer woodlands of foothills, bajadas, and plains; mostly southwestern region, with a few outliers eastward. This is the common juniper of the dry southwestern low mountain slopes of New Mexico and Arizona, formerly passing as J. monosperma, which occurs generally more northward than on the upper elevations of the foothills. It was formerly classified as a variety of J. coahuilensis, which is not known from New Mexico (Adams 2016), but occurs in west Texas and Mexico and has whip-leaf glands about ½ as long as the sheath.

Juniperus communis Linnaeus [common] COMMON JUNIPER. Dioecious low shrubs with prostrate to ascending stems and branches, to 3 m tall (more when rarely tree-like); bark fibrous, exfoliating in thin strips; leaves green to silvery; the adaxial surface with a glaucous stomatal band about as wide as the green marginal band, the abaxial glands very elongate; seed cones maturing in 2 years, globose, 6-9 mm dia; seeds 4-5 mm dia. Mixed conifer or subalpine forests at high elevations. Our plants belong to var. depressa Pursh [pressed down]. Seed cones are used to flavor gin.


Dioecious trees to 10-20 m or more tall, single-stemmed; bark brown, exfoliating in rectangular plates; leaves green or appearing silvery, the abaxial gland ovate to elliptical and conspicuous, the margins denticulate; whip-leaves 3-6 mm long; scale-leaves 1-2 mm long; seed cones maturing in 2 years, globose, 8-15 mm dia, reddish brown, glaucous, the seeds 6-9 mm. Mostly in the western mountains; rather common with piñon, other junipers, oaks, and ponderosa pine. Our plants belong to var. deppeana; 4 other varieties in Mexico. Easily recognized by the distinctive platy bark, but not to be confused with Juniperus scopulorum, which has similar bark, at least on the branches.

Juniperus monosperma (Engelmann) Sargent [one-seeded] ONE-SEED JUNIPER [Juniperus gymnocarpa (Lemmon) Cory, Juniperus maritimus Spach (Engelmann) Cory, Juniperus occidentalis Hooker var. monosperma Engelmann, Sabina monosperma (Engelmann) Rydberg]. Dioecious shrubs or trees to 10 m or more tall; bark gray to brown, exfoliating in thin strips; leaves green, the margins denticulate, the abaxial glands elongate, fewer than 1/5 of the glands on whip-leaves with exudate; whip-leaves 4-6 long; scale-leaves 1-3 mm long; seed cones maturing in 1 year, globose, 6-8 mm dia, reddish blue to brownish blue under the glaucous bloom, with (1) 3 seed; seeds 4-5 mm long.

● Widespread and common on plains, foothills, dry mountain slopes, and mesas, merging into grasslands at lower elevations and forests at upper elevations; generally at higher elevations or more mesic sites than J. arizonica when in the same area. One of the most common junipers in the state, much

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used for fenceposts and fuel. Because of the recent clarification of *Juniperus arizonica* and *J. coahuilensis*, distributional data from literature and online databases can be problematic in terms of specific localities of this species. *Juniperus monosperma* seems to be absent from the southwest corner of the state, being replaced there by *J. arizonica*; although both species are reported for the same southwestern counties, *J. monosperma* tends to occur north of I-10 and *J. arizonica* south of that interstate.

*Juniperus osteosperma* (Torrey) Little [bony seeded] **UTAH JUNIPER** *Juniperus utahensis* (Engelmann) Lemmon, *Juniperus megalocarpa* Sudworth, *Juniperus tetragona* Schlechtendal var. *osteosperma* Torrey, *Sabina osteosperma* (Torrey) Antoine. Monoecious shrubs or trees to 7 m or more tall; bark gray to brown, exfoliating in thin strips; leaves light yellow-green, the margins denticulate, the abaxial glands inconspicuous and embedded in the leaf, exudate absent; whip-leaves 3-5 mm long; scale-leaves 1-2 mm long; seed cones maturing in 1-2 years, globose, (6)8-12 mm dia, bluish brown to tan beneath the glaucous bloom, with 1(2) seeds 4-5 mm long. Dry slopes, hills, low foothills on the western side of the state; overlapping with *J. monosperma*. Plants are monoecious with rather large mealy cones mostly 8-12 mm dia and a single seed.

*Juniperus pinchotii* Sudworth [for Gifford Pinchot (1865-1946), first Chief of the U.S. Forest Service] **REDBERRY JUNIPER** *Juniperus erythrocarpa* Cory, *Juniperus monosperma* (Engelmann) Sargent var. *pinchotii* (Sudworth) Van Melle. Dioecious shrubs to 6 m tall, multi-stemmed, the crown often flattened; bark ashy gray to brown, exfoliating in long strips, sometimes in plates on the branches; leaves yellow-green, the margins denticulate, many of the abaxial glands with a white exudate; whip-leaves 4-6 mm long; scale-leaves 1-2 mm long; seed cones maturing in 1 year, globose, 6-8(10) mm dia, copper to copper-red, without a glaucous bloom. Most entirely in the southeastern portion of the state, with a few outliers in eastern Otero County and southern Quay County. Plants from Grant and Luna counties identified as this belong to *J. arizonica* (but there is a valid *J. pinchotii* just across the border in extreme southeast Arizona (pers. comm. R.P. Adams 2016).

*Juniperus scopulorum* Sargent [of the Rocky Mountains] **ROCKY MOUNTAIN JUNIPER** *Sabina scopulorum* (Sargent) Rydberg. Dioecious trees with a single trunk (rarely multistemmed), to 20 m tall; bark brown, the larger branches and often the trunk exfoliating in thin rectangular plates; leaves light to dark green, often glaucous, the margins entire, the abaxial glands conspicuous but exudate absent; whip-leaves 3-6 mm long; scale-leaves 1-3 mm long; seed cones maturing in 2 years, generally globose, 6-9 mm dia, dark blue-black beneath the glaucous bloom when mature, tan when immature, with mostly 2 seeds 4-5 mm long. Widely scattered throughout the mountains and higher foothills. Drooping foliage and rectangular plates of bark are characteristic. Plants are uncommon in cultivation.

*Platycladus* [flat-branched] **ARBORVITAE** [0].

*Platycladus orientalis* (Linnaeus) Franco [eastern] **ORIENTAL ARBORVITAE** *Thuja orientalis* Linnaeus. Monoecious evergreen trees to 20 m tall; bark flaking in long strips; branchlets arranged in flattened vertical sprays; leaves decussate, 4-ranked, scale-like, 1-3 mm long, dimorphic, the lateral leaves overlapping the facial ones and boat-shaped, the facial leaves rhomboidal with glandular groove at center; seed cones terminal, red-brown when ripe, ovoid, remaining somewhat fleshy, the cone scale decussate. A commonly cultivated ornamental, not known in the wild.

*Thuja* [ancient Greek name] **ARBORVITAE** [0].

*Thuja occidentalis* Linnaeus [western] **AMERICAN ARBORVITAE**. Monoecious evergreen trees to 25 tall; bark flaking in long strips; branchlets arranged in flattened sprays, these horizontal or various orientations but not vertical; leaves scale-like, 1-4 mm long; seed cones ovoid, 9-14 mm long, becoming woody. A commonly cultivated ornamental, not known in the wild.
Gymnosperms - Ephedraceae

Shrubs (ours) or vines; dioecious (very rarely monoeocious); solitary or spreading in rhizomatous patches; stems jointed, many, terete, green and longitudinally ridged when young; leaves opposite or whorled at the nodes, scale-like, ephemeral and not photosynthetic; pollen cones 1-10 in whorls at the nodes, composed of 2-8 sets of membranous bracts that usually subtend a sporangiophore bearing 2-15 sessile or stalked pollen-producing microsporangia; seed cones 1-10 in whorls at the nodes, composed of 2-10 sets of opposite or whorled overlapping bracts that are papery, membranous or fleshy; seeds 1-3 per seed cone, yellow to dark brown, smooth to variously roughened. Ephedraceae has only one genus, Ephedra, with more than 40 species scattered throughout the arid regions of the globe.

Ephedra [ancient Greek name] EPHEDRA, MORMON TEA [6].

Characteristics of the family. Several species have been used as a beverage or medicinally to treat respiratory ailments, syphilis, or as a stimulant.

1 Leaf scales whorled, 3 at a node; ovulate cone bracts in whorls of 3, papery
2 Leaves 5-15 mm long; twigs ending in sharp points................................................................. E. trifurca
2 Leaves 2-5 mm long; twigs blunt-tipped.................................................................................... E. torreyana

1 Leaf scales mostly opposite, 2 at a node; ovulate cone bracts opposite, papery, membranous or fleshy
3 Plants strongly rhizomatous, forming low, clonal patches in rather deep sands
4 Twigs viscid; mature ovulate cone bracts membranous................................................................ E. cutleri
4 Twigs not viscid; mature ovulate cones berrylke, bracts fleshy................................................................ E. coryi
3 Plants not rhizomatous; woody shrubs in various habitats, but usually not deep sand
5 Seeds 1 (rarely 2) per cone ........................................................................................................ E. aspera
5 Seeds 2 (rarely 1) per cone ........................................................................................................ E. viridis

Ephedra apera Engelmann [tough] [Ephedra nevadensis S. Watson var. aspera (Engelmann) L. Benson]. Solitary shrubs with gray woody stems, 5-15 dm tall; twigs pale to dark green, becoming yellowish with age, not viscid; terminal bud obtuse; leaves opposite (rarely in whorls of 3), 1-3(5) mm long, connate to half or more their length, not, or slightly, thickened at the base; pollen cones sessile or rarely on short peduncles; staminate bracts opposite, yellow or red-brown; seed cones sessile or on short peduncles; ovulate bracts opposite, membranous with brown thickened center and base; seeds usually 1 (rarely 2) per cone, ovate-acute, 5-8 mm long, smooth to slightly scabrous. Dry ridges and rocky slopes in Chihuahuan Desert scrub. Sterile plants in the south-central part of the state are (inconsistently) distinguished from E. viridis by shorter, less thickened leaf scales. Ephedra antisyphilitica Berlandier in adjacent Texas also has single-seeded ovulate cones, but its inner cone bracts are red and fleshy.

Ephedra coryi E.L. Reed [for Victor Louis Cory (1880-1964), Texas botanist]. Rhizomatous shrubs, 1-5 dm tall, forming patches of slender green stems from red-brown rhizomes; twigs blue-green, becoming yellow-green with age, not viscid; terminal bud conic; leaves opposite (rarely in whorls of 3), connate 1-2 mm, tips acute and 1-2 mm or subulate and up to 10 mm, bases becoming thickened and dark; pollen cones on 2-10 mm peduncles or sessile; staminate bracts opposite, yellow or reddish; seed cones on naked peduncles 5-25 mm long; ovulate bracts opposite, initially membranous, then becoming fleshy; mature ovulate cones berrylke, pale yellow or orange; seeds 2 per cone, elliptic, 5-8 mm long, usually smooth. Sandy soil, usually with shinnery oak scrub in some southeastern counties. The report of this species in the San Andres Mountains (Steven son 1993) is a misidentification of E. viridis. A recently discovered, and thus far undetermined, species of rhizomatous, fleshy-coned Ephedra in Sandoval County will key to this species, but differs by shorter and not thickened leaf scales, scarlet ovulate cones, and roughened seeds.

Ephedra cutleri Peebles [for Hugh Carson Cutler (1912-1998), ethnobotanist and student of Ephedra] [Ephedra coryi E.L. Reed var. viscida Cutler, Ephedra viridis Coville var. viscida (Cutler) L. Benson]. Rhizomatous shrubs, 2-10 dm tall, forming patches of slender green stems from brown or red-brown rhizomes; twigs yellow-green or blue-green, viscid; terminal bud conic; leaves opposite, 2-5 mm, connate 1-3 mm, tips acute or subulate, bases becoming thickened and dark; pollen cones on short scaly peduncles or sessile; staminate bracts opposite, yellow; seed cones on 5-25 mm long peduncles from a basal

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pair of bracts; ovulate bracts opposite membranous with a yellow center and base; seeds 2 per cone, ovate, 5-8 mm long, smooth.

- Sandy soil with sagebrush scrub and juniper savanna in some northwestern counties.

**Ephedra torreyana** Torrey ex S. Watson [for John Torrey (1796-1873), distinguished American botanist]. Solitary shrubs with gray woody lower stems, 3-10 dm tall; twigs blue-green, glaucous; terminal bud conic; leaves in whorls of 3, 2-5 mm long, connate to half or more of their length, becoming tattered, gray; pollen cones sessile; staminate bracts whorled, pale yellow or pale red; seed cones sessile; ovulate bracts whorled, papyry with a yellow-orange or brownish center and base; seeds 1-3 per cone, lanceolate-acuminate, 5-8 mm long, brown or yellowish, papillate or transversely laminar.

- Widespread throughout New Mexico from piñon-juniper woodland down to desert scrub. A rare hybrid of this species with *E. trifurca* from Sierra County has been named *Ephedra ×intermixta* Cutter.

**Ephedra trifurca** Torrey ex S. Watson [3-forked]. Solitary shrubs with gray woody stems, 0.5-3 m tall; twigs green or yellow-green; terminal buds spiny-like; leaves in whorls of 3, 5-15 mm long, initially connate to half or more of their length, quickly becoming tattered, not basally thickened; pollen cones on short, scaly peduncles; staminate bracts whorled, yellowish or reddish brown; seed cones on short, scaly peduncles or sessile; ovulate bracts whorled, papery-translucent with a brownish center and base; seeds usually 1, rarely 2 or 3 per cone, lanceolate-acuminate, 8-15 mm long, pale brown, smooth. "Rocky and sandy places in Chihuahuan Desert scrub. A rare hybrid with *E. torreyana* from Sierra County has been named *Ephedra ×intermixta* Cutter, and distinguished by its spiny terminal buds, shorter leaves and scabrous seeds. §

**Ephedra viridis** Coville [green]. Solitary shrubs with gray woody stems, 5-15 dm tall; twigs bright green or yellow-green, not viscid; terminal bud obtuse; leaves opposite, 2-5 mm long, connate to half or more of their length, becoming swollen and dark at the base; pollen cones sessile; staminate bracts opposite, pale yellow or reddish; seed cones sessile or on scaly peduncles; ovulate bracts opposite, membranous with yellowish center and base; seeds usually 2 (rarely 1) per cone, ovate, 5-8 mm long, smooth. "Sedimentary outcrops and rocky slopes in piñon-juniper woodland or sagebrush scrub. "Sterile plants in the south-central part of the state are (inconsistently) distinguished from *E. asper* by bright yellow-green twigs and longer leaf scales with dark thickened bases.

**PINACEAE PINE FAMILY** [4/15/16]

Small to large usually evergreen monoeous trees with whorled branches, the buds enclosed in bud scales; leaves needle-like, single, spirally attached to the branch or in sheathed clusters of 2-5; pollen cones small and papery, shed annually; seed cones woody with persistent scales or fleshy and deciduous (*Abies*), with two ovules on each scale, taking 1-2 years to develop. "With about 11 genera and 235 species, worldwide. This is an extremely important family, both ecologically and economically, covering vast expanses of forested land and producing much of the world’s softwood timber and wood products.

1 Leaves in clusters of 2-5, surrounded by a basal sheath (which may be early deciduous).................................................................**Pinus**

- Leaves borne singly, not in clusters

2 Leaves ± square in cross-section; twigs roughed by peg-like projections that persist after the leaves fall ........................................**Picea**

- Leaves flattened, not squarish; twigs lacking peg-like projections

3 Leaves sessile, leaving a circular leaf-scar; seed cones erect, the scales falling from the persistent main axis, the subtending bracts not 3-toothed .................................................................**Abies**

- Leaves petiolate from a short stalk that lies flat against the twig, leaving an elliptic leaf-scar; seed cones drooping, the entire cone falling when mature, the subtending bracts conspicuously 3-toothed .................................................................**Pseudotsuga**

**Abies** [the classical Latin name] **FIR** [2].

Monoeocious evergreen trees; branches whorled; leaf scars circular to elliptic; leaves needle-like, single, sessile, flattened, often appearing 1-ranked, with 2 stomatal bands abaxially; pollen cones borne on current year’s growth, ephemeral; seed cones borne on year-old growth, erect, generally on the upper branches, the axis persistent and the scales falling away with the seeds; seeds 2 per scale, winged. "With 47 species, mostly Northern Hemisphere. Erect cones with deciduous scales are diagnostic.


**Abies arizonica** Merriam [of Arizona] **CORR-BARK FIR** [**Abies bifolia** A. Murray bis var. *arizonica* (Merriam) O’Kane & K.D. Heil. *Abies lasiocarpa* (Hooker) Nuttall var. *arizonica* (Merriam) Lemmon]. Streeple-shaped trees to 50 m tall, forming krummholz growth in harsh timberline environments; bark gray, smooth, thick and corky, with resin blisters; branchlets pubescent; leaves glaucous, 10-30 mm long, 1-2 mm wide, flat, upper surface grooved, J-shaped at the base and curved upward; seed cones 5-12 cm long, 2-4 cm wide, resinous; scales about 2.5 cm long and 15 mm wide; seeds 5-7 mm long, the wing ½ again longer. "Forested mountains throughout the state, generally above 8,000 ft, but descending down to 7,200 ft, commonly with *Picea engelmannii*. "The taxonomy of cork-bark fir is controversial, being recognized as a variety of *A. lasiocarpa*, of *A. bifolia*, or being submerged in *A. lasiocarpa* without formal placement. New Mexico plants fall within a single taxon, and we treat it as a geographically separated species, pending further clarifying studies. §

**Abies concolor** (Gordon & Glendinning) Lindley ex Hildebrand [of the same color] [**Picea concolor** Gordon & Glendinning]. **WHITE FIR**. Steele-pine- to cylindric-shaped tree to 60 m tall; bark gray, thin, usually corky, developing deep longitudinal furrows; branchlets glabrous to sometimes pubescent; leaves glaucous, 2-6 cm long, 2-3 mm wide, attached to the twig by a round mouth-like stalk, rounded apically, flat, the upper surface sometimes grooved; seed cones 7-12 cm long, 3.45 cm wide, olive-green and turning dark; scales 2.5-3 cm long and slightly wider; seeds 8-12 mm long, the wing twice as long. "Forested mountains throughout the state, generally below 9,000 ft, but ascending up to 9,800 ft, often with *Pinus* species. "Our plants belong to var. *concolor*. §
Gymnosperms - Pinaceae

Picea [pitch] SPRUCE [2].

Evergreen monococious trees, single-stemmed; branches mostly whorled; bark thin and scaly; twigs with persistent peg-like leaf bases; leaves needle-like, 4-angled, stiff, often sharp-pointed, persisting many years; pollen cones borne on current year’s growth, ephemeral; seed cones hanging from upper branches, usually falling when mature; scales flexible, the bracts not visible; seeds winged.

Stiff angular needles arranged all around the twigs and abundant soft cones with rounded scales help to recognize this genus.

Our species are all members of mountain forests and upland woodlands.

Picea engelmannii Parry ex Engelm. for Georg Engelmann (1809–1884), distinguished German-born physician and botanist of St. Louis. ENGELMANN’S SPRUCE, Trees to 60 m tall, narrowly columnar; bark scaly, gray to reddish brown; twigs usually finely hairy; leaves 1.5-3 cm long, 4-angled, stiff, sharp, blue-green; seed cones 3-7 cm long, ellipsoid to cylindric; scales diamond-shaped, the apex rounded, ½ longer than wide; seeds 2-3 mm long with a wing 10-12 mm long. Dominant with cork-bark fir in the high elevation forests of our mountains, generally above 8,000 ft. Our plants belong to var. engelmannii; var. mexicana (Martínez) R.J. Taylor & T.F. Patterson occurs in Mexico. The squarish needles have a skunk-like odor when crushed.

Picea pungens Engelmann [sharp pointed] BLUE SPRUCE [Picea paryana Sargant]. Trees to 50 m tall, broadly columnar to ovoid; bark scaly, gray to brown; twigs stout, glabrous; leaves 1.5-6 cm long, 4-angled, stiff, sharp-tipped, dark green to blue-green; seed cones 6-11 cm long, ellipsoid to cylindric; scales elliptic to diamond-shaped, widest below the middle, about ½ longer than wide; seeds 3 mm long with a wing 6-9 mm long. At mid- to high elevations in the mountains, usually with white fir, generally above 8,200 ft. The sharply pointed, stiff needles have a resinous odor when crushed. Ornamental trees are usually bluer than those found in the wild.

Pinus [classical Latin name] PINE [9].

Evergreen trees and shrubs, with short shoots bearing fascicles of needle-like leaves, the fascicles sheathed basally; leaves in clusters of 1-6 per fascicle; pollen cones in dense spike-like cluster at the ends of branchlets; seed cones maturing in 2(3) years, sessile or stalked, dropping whole, the scales persistent; seeds winged or wingless. About 100 species in cool temperate and mountain tropical areas of the world. Our species are all members of mountain forests and upland woodlands. Pinus strobusformis Engelmann (as construed herein) is not found in New Mexico; it is represented by our widespread occurrence; it is easily identified by its long needles (15-30 cm) in threes, persistent leaf sheathes 2-4 cm long, and massive cones 20-40 cm long, which can weigh as much as 11 pounds (capable of piercing a tent roof or severely damaging a skull).

Pinus, section Monophylla. Trees to 60 m tall, narrowly columnar; bark scaly, reddish brown; twigs usually finely hairy; leaves 1.5-3 cm long, 4-angled, stiff, sharp, blue-green; seed cones 6-11 cm long, ellipsoid to cylindric; scales diamond-shaped, the apex rounded, about ½ longer than wide; seeds 2-3 mm long with a wing 10-12 mm long. Dominant with cork-bark fir in the high elevation forests of our mountains, generally above 8,000 ft. Our plants belong to var. engelmannii; var. mexicana (Martínez) R.J. Taylor & T.F. Patterson occurs in Mexico. The squarish needles have a skunk-like odor when crushed.

Pinus tree.

1 Leaves mostly 1-3 in a cluster
2 Leaves mostly 1-2 per cluster, 2-4 cm long............................................. P. edulis
3 Leaves mostly 2-3 per cluster, 3-40 cm long
4 Leaves mostly 6-12 cm long; plants monoecious........................................... P. leiophylla
Gymnosperms - Pinaceae

4 Leaves mostly 3-6 cm long; plants nearly dioecious...........................................................................................................P. cembroides

3 Leaf sheath persistent

5 Leaves mostly 10-22 cm long; sheaths 1-2 cm long ........................................................................................................P. ponderosa

6 Leaves mostly 25-45 cm long; sheath 2-3 cm long ........................................................................................................P. engelmannii

1 Leaves mostly 5 (occasionally 4) in a cluster

6 Leaves mostly 10-22 cm long

7 Leaves mostly 3-8 cm long

7 Leaves lacking resin droplets, straight or nearly so; leaf sheaths early deciduous, absent on older clusters; cones scales lacking any kind of prickle or bristle

White stomatal lines visible only on the inner (adaxial) surfaces of the needles; needles 4-10 cm long, serrulate on the distal margins; cones 15-25 cm long, sometimes shorter ......................................................................................P. flexilis

8 White stomatal lines visible on both inner and outer surfaces of the needles; cones 3-7 cm long, entire; cones 7-15 cm long ........................................................................................................................................P. aristata

Several pines are commonly used in landscaping. The following key might help in the identification of some of them:

a Leaves in fascicles of 2
b Needles 6-10 cm long...*P. halepensis Miller ALEPPO PINE
c Needles 20-30 cm long...*P. rubra B. Sargent CHIEF PINE

a Leaves in fascicles of 3
c Needles 1 mm or less thick, green or dark green
d Needles 6-10 cm long...*P. halepensis Miller ALEPPO PINE
e Needles 10-15 cm long...*P. brutia Tenore subsp. eldricae (Medwedew) Silba AFGHAN PINE
f Needles about 1-1.5 mm thick, yellowish green

g Bark gray to blackish; crown irregular, pointed; needles 6-10 (12) cm long...*P. shansi F. Parl. JAPANESE BLACK PINE

Pinus aristata Engelm ann (un neced) BRISTLECONE PINE. Trees to 15 m tall, the crown often quite irregular; bark gray to red-brown, with shallow fissures; branches contorted; needles 5 per fascicle, upcurved, 3-4 cm long, bearing white resin drops, a narrow groove on the abaxial surface; seed cones ovoid, 6-11 cm long, sessile, falling soon after maturity, each scale bearing a brittle prickle 4-10 mm long; seeds 5-6 mm long, with a wing 10-13 mm long. Exposed sites and thin, rocky soils at high elevations in the northern forests. Distinguishing features are 5 short, closely packed needles in a bottlebrush arrangement, with tiny white resin droplets. Closely related to P. aristata

Pinus cembroides Zuccarini [resembling Pinus cembra] MEXICAN PIÑON PINE. Shrubs or small trees to 15 m tall, the trunk to 30 cm dbh, much branched, with a rounded crown; bark reddish brown, shallowly furrowed with scaly ridges; needles mostly 3 per fascicle, 2-6 cm long, stiff, curved, the sheath 5-7 mm long, recurving and early-deciduous; seed cones ovoid, 1.5-3.5 cm long, resinous; seeds 12-15 mm long, wingless. Pinon-juniper-oak woodlands in the boosheel region. This is the main edible nut pine of Mexico. In New Mexico, no other pine has such short needles in threes. Of our two varieties, it may be equally accurate to treat var. bicolor at the specific level (as Pinus discolor) (Montes et al. 2016). §

a Needles bicolored, one surface with white lines, the other surface green... var. bicolor Little [Pinus discolor Bailey & Hawksworth, Pinus johannis M.-F. Robert]. Some authors prefer to recognize this at the specific rank, as Pinus discolor.

b Needles of one color on both surfaces, or very nearly so... var. cembroides

Pinus edulis Engelm ann (edible) PIÑON PINE. Shrubs or small trees to 21 m tall, the trunk to 60 cm dbh, the crown rounded; bark reddish brown, shallowly furrowed between scaly ridges; needles mostly 1-2 per fascicle, 2-4 cm long, curved-blue; seed cones ovoid to globose, 3.5-5.5 cm long, pale, resinous, sessile to short-stalked, the sheath 5-7 mm long, recurving and early-deciduous; seeds 10-15 mm long, wingless. Common on plains, hills, and mesas surrounding our mountain ranges. This is the main two-needle (sometimes one) píon of the four-corner states, and very common below the ponderosa zone with various junipers. We have two varieties:

a Leaves mostly 2 per fascicle... var. edulis [Pinus cembroides Zuccarini var. edulis (Engelmann) Voss]. Widespread almost throughout the state, on short rocky soils of foothills, mesas, canyon walls, and mountain slopes. §

b Leaves mostly 1 per fascicle... var. fallax Little [deceptive] [Pinus californiarum D.K. Bailey subsp. fallax (Little) D.K. Bailey, Pinus ×fallax Businsky (nom. illeg.), Pinus monophylla Torrey & Fremont subsp. fallax (Little) D.K. Bailey]. A few populations are known from the southwestern region of the state. Montes et al. (2019) suggest that species status is appropriate for this taxon; the name Pinus ×fallax Businsky applies to this taxon but is a later homonym (not Pinus fallax Saporta), and no other names at specific rank are yet available. We maintain it at varietal rank, in alignment with similar variation in Pinus cembroides.

Pinus engelmannii Carrier [for Georg Engelmann (1809-1884), distinguished German-born physician and botanist of St. Louis] APACHE PINE [Pinus apachecae Lemmon, Pinus latifolia Sargents, Pinus macrophylla Engelmann]. Trees to 35 m tall, the trunk to 60 cm dbh; bark dark brown, deeply furrowed into narrow scaly plates; twigs about 2 cm thick; needles 3 per fascicle, 25-45 cm long, the sheath persistent and 2-3 cm long; seed cones ovoid, 11-14 cm long, solitary, very short-stalked, the scales with an out-curved claw; seeds 8-9 mm long, the wings 20 mm long. Barely entering New Mexico in the boosheel region. This is one of three pines that are essentially Mexican in distribution, the others being Chihuahua pine and Mexican píon. The twigs are thick and stout (about as wide as your thumb), and easily seen against the sky, bearing very long needles. ¥
Gymnosperms - Pinaceae

**Pinus flexilis** James [curved, plant] LIMBER PINE [Pinus flexilis (James) Rydberg]. Tree 12-26 m tall, the trunk 60-150 cm or more dbh, straight or contorted; bark light gray, nearly smooth to furrowed; needles 5 per fascicle, 3-7 cm long, the margins entire, with whitish stomatal lines visible on both inner and outer surfaces of the needles, the sheath 1-2 cm long, early deciduous; seed cones 7-15 cm long, 5-7 cm wide (when open), falling soon after maturity; seeds 7-10 mm long, wingless or nearly so. [-Summits, ridge tops, rocky foothills, often at edges of forest or at timberline, typically scattered with other conifers, in the Sangre de Cristo Mountains. For relationships to *P. reflexa* and *P. strobus*, see comments under *P. reflexa*.]

**Pinus leophylla** Schide & Deppe ex Schlechtendal & Chamisso [with smooth leaves]. Tree to 26 m tall, the trunk to 1 m db, often forked above; bark reddish brown, narrowly furrowed with narrow rectangular scaly ridges; needles 2-3 per fascicle, 6-12 cm long, the sheath to 1.5 cm long and early deciduous; seed cones broadly ovoid, 3.5-5.5 cm long, on a stalk to 1.5 cm long, remaining on the tree for several years; seeds 2 mm long, the wing to 10 mm long. [-Mid-elevation forests in the far southwestern region. Our plants belong to var. *chihuahuana* (Engelmann) Shaw [of Chihuahua]. CHIHUAHUA PINE [Pinus chihuahuana Engelmann]. The numerous cones are relatively long-stalked and remain on the tree for several years, and the bark is very thick; the typical variety occurs in Mexico.]

**Pinus ponderosa** Douglas ex P. Lawson & C. Lawson [heavy, ponderous]. Trees to 30 m tall; trunk to 2 m dbh; bark reddish to yellow brown, deeply furrowed and cross-checkered into rectangular scaly plates; twigs stout, to 2 cm thick; needles mostly 2-3 per fascicle, 9-22 cm long, 1-2 mm thick; seed cones mostly symmetric, 5-10 cm long, 5-8 cm wide; scale umbo narrowing to a thick-based out-curving prickle or spur; seed body 3-4 mm, the wing 10-21 mm long. [-Mid-elevations in all the mountains, often with *Pseudotsuga menziesii* and *Quercus gambelii*, sometimes in large, expansive parklands (see Ponderosa Pine Forests in discussion of New Mexico Vegetation Types). *P. ponderosa* is extremely variable across its wide range in the western United States from South Dakota to the Pacific, the variation giving rise to up to 5 subspecies or species (Callaham 2013; Willyard et al. 2017). Plants of the continental interior have most commonly been recognized as the *scopulorum* entity, or var. scopulorum, on northern Mexico, and, as *P. ponderosa scopulorum* var. latifolia, on the Rocky Mountain cordilleran. Plants of its southern distribution in Arizona and New Mexico were initially named *Pinus brachyptera* by Engelmann in 1880 (based on a specimen collected by Wislizenus in 1846 near Las Vegas, New Mexico), and this taxon has been resurrected recently by Callaham (2013), who amassed a ponderous quantity of ecological, morphological, and statistical data in support of its recognition; his circumscription is supported and elevated to species rank by Willyard et al. (2017). Most of New Mexico populations correspond to this southwestern form (*brachyptera*), with a zone of intergradation into the northern form (*scopulorum*) in the northern mountains. Given the wide and overlapping variability in all features, we regard subspecies rank to be the least disruptive disposition (though Willyard et al. 2017 make a reasonable case for specific rank).]

- Needles mostly 2 per fascicle, 9-14 cm long...subsp. *scopulorum* (Engelmann) E. Murray [of the rocks or rocky places] ROCKY MOUNTAINS PONDEROSA PINE [Pinus ponderosa Lawson var. scopulorum Engelmann, Pinus ponderosa Douglas ex Lawson & C. Lawson subsp. scopulorum (Engelmann) W.A. Weber, Pinus scopulorum (Engelmann) Lemmon]. Scattered plants and perhaps populations in the northern mountains. *Even though one may find individual plants with characteristics aligning somewhat with subsp. *scopulorum*, Callaham (2013) and Conkle & Critchfield (1988) both assert that northern New Mexico is a transition zone between more typical *brachyptera* to the south and *scopulorum* to the north.]

- Needles mostly 3 per fascicle, 11-22 cm long...subsp. *brachyptera* (Engelmann) Silba [short winged] SOUTHWESTERN PONDEROSA PINE [Pinus brachyptera Engelmann, Pinus ponderosa Douglas ex Lawson & C. Lawson subsp. brachyptera (Engelmann) Callaham, Pinus ponderosa var. brachyptera (Engelmann) Lemmon]. In all the mountains of the state. *Populations in the far northern mountains will show transitional features into var. *scopulorum*, which is more typical in Colorado and northward.*

**Pinus reflexa** (Engelmann) Engelmann [reflexed] SOUTHWESTERN WHITE PINE [Pinus ayacahuite var. reflexa (Engelmann) Voss, Pinus flexilis James var. reflexa Engelmann, Pinus strobusfornis of NM reports]. Tree to 34 m tall, usually with a single straight trunk to 1.5 m db; bark gray, becoming darker and broken into furrowed plates; needles 4-10 cm long, with whitish stomatal lines visible only on the inner (adaxial) surfaces, the margins serrulate in the distal half, the sheath 1-2 cm long, early deciduous; seed cones 15-25 cm long, 6-9 cm wide (open), falling soon after maturity; seeds 8-12 mm long, winged nearly to the tip. -Canyon sides, rocky ridges, typically mixed with other conifers, in all New Mexico mountains. -Southwestern white pine is the central component of an expansive band of *Pinus* variation, extending from southern Canada, southward along the Rocky Mountain cordilleran through New Mexico, along the Sierra Madre Occidental of Mexico, and south to Guatemala (Bisbee 2014; Frankis 2008). Relatively unambiguous species are *P. flexilis* in the north, from southern Canada to southern Colorado, and *P. strobusfornis* in the south, from southern Durango to northern Chihuahua. Just about all of New Mexico constitutes a nearly contiguous zone of intergradation and introgression between these two species, with morphological features merging into *P. flexilis* toward the north, and into *P. strobusfornis* toward the south. We concur with Bisbee (2014), Farjon & Stiles (1997), and Frankis (2008) in recognizing these intermediate populations as *P. reflexa*. Plants belonging to *P. flexilis* and *P. reflexa* (though not unequivocally so) may be found in the Sangre de Cristo Mountains; nearly all other populations in New Mexico will be referred to *P. reflexa*; no plants of *P. strobusfornis* Engelmann (as constituted herein, in the strict sense) are to be found in New Mexico.

**Pseudotsuga (false Doug) [1]**

- Tall evergreen trees; bark thick and furrowed; needles flattened, short-stalked, with 2 whitish stomatal bands on the abaxial surface; seed cones borne at the tips of year-old twigs, the scales interlaced with exerted 3-pronged bracts, the seeds falling when mature and the cones falling soon after. A genus of about 7 species in Asia and North America, extremely important for lumber and wood products.


**Pseudotsuga menziesii** (Mirbel) Franco [for Archibald Menzies (1754-1842), Scottish botanist] DOUGLAS-FIR. Tree to 35 m tall, the trunk single and to 1 m db; bark reddish brown to blackish, becoming deeply furrowed; needles 15-30 mm long, 1-1.5 mm wide, flattened, spirally arranged along the twigs, with a short narrowed stalk; seed cones long-ovoid, 4-10 cm long, with 3-pronged and usually reflexed bracts exserted between the scales, falling entire from the tree; seeds 5-6 mm long, the wing 6-8 mm long. *Very common at intermediate elevations in our forests, invading openings in the canopy.* -Our plants belong to var. *glauca* (Beissner) Franco [blue-green] *Pseudotsuga macronota* (Rafinesque) Sudworth, *Pinus taxifolia* (Lamarck) Britton var. *glauca* (Beissner) Sudworth, *Pseudotsuga taxifolia* (Lambert) Britton, *Tsuga douglasii* Carrière var. *glauca* Beissner; var. *menziesii* is a taller coastal tree of greater mass, with appressed cones on the branches. The oldest known living var. *glauca* (about 740 years old) occurs in New Mexico, on the El Malpais National Monument (Bleakly 1997).
Gymnosperms - Pinaceae

Pinus flexilis

April
Pelancillo Mts.

Pinus leiophylla var. chihuahuana

Pinus ponderosa subsp. scopulorum

Pseudotsuga menziesii
ANGIOSPERMS: MONOCOTYLEDONOUS PLANTS

Key to Families

1 Plants parasitic or epiphytic on stems, branches, or roots of other plants, generally without chlorophyll and not green, or if green then clearly growing on and attached to a host plant
2 Plants stem parasites or epiphytes, growing on the aerial portions of a host plant, not growing in the soil.................. BROMELIACEAE
2 Plants root parasites, growing in the soil and attached to the roots or decaying matter of a host plant.......................... ORCHIDACEAE
1 Plants not obviously parasitic on other plants, but producing chlorophyll and greenish in color
3 Plants shrubby, sometimes with well-developed perennial stems 15 cm or more wide; leaves usually longer than 30 cm, leathery, often spiny, borne in rosettes at the tips of branches or all basal
4 Leaves with spiny margins
5 Leaves narrow and ribbon-like, 0.6-1 m long or more and 2-4 cm wide, with numerous stout hooked prickles all along the margins; ovary superior (Dasyliion) ......................................................................................................................... RUSCACEAE
5 Leaves shorter and wider, often thick and semi-succulent, with more widely spaced spines or hooks; ovary inferior (Agave) ... ................................................................................................................................. AGAVACEAE
4 Leaves without spiny margins (but may be filiferous with long threads)
6 Leaves entire to filiferous, with a terminal spine; flowers bisexual, more than 1.4 cm long; seeds several to many in each chamber of the ovary .......................................................... AGAVACEAE
6 Leaves serrate to serrulate, lacking a terminal spine; flowers usually unisexual, less than 1 cm long; seeds 2 or 3 in each chamber of the ovary (Nolina) .......................................................... RUSCACEAE
3 Plants aquatic, if perennial stems developed (some giant reed grasses) then the stems much less than 15 cm wide; leaves other than above
7 Plants aquatic, at least most of the plant submerged or floating on the water
8 Plants floating on the water, not rooted in the soil, the plant body less than 2 cm long, disc-shaped, not differentiated into stems and leaves .......................................................... ARACEAE
8 Plants floating or rooted in the soil, the entire plant body generally much longer than 6 cm, differentiated into stems and leaves
9 Leaves sagittate .......................................................................................................................... ALISMATACEAE
9 Leaves not sagittate
10 Leaves in whorls, very thin and nearly translucent, forming a sheath around the stem ........... HYDROCHARITACEAE
10 Leaves not whorled and not as above
11 Leaves floating or emergent out of the water
12 Emergent leaves linear, cattail-like, lacking a petiole, passing from the sheathing portion directly into the blade portion, both about the same shape, the blade portion 50 cm or more long ................................................. TYPHACEAE
12 Emergent leaves either not linear and cattail-like, or if so, then the blade portion much less than 50 cm long, usually petiolate, with a distinct difference in shape between the sheathing portion and the blade portion
13 Mid-vein not at all evident ................................................................................................. PONTEDERIACEAE
13 Mid-vein distinct and prominent .................................................................................. POTAMOGETONACEAE
11 Leaves all or mostly submerged under water
14 Leaves alternate or basal (occasionally opposite toward the tips of the stems)
15 Leaves all basal, the stems not elongate ........................................................................ ALISMATACEAE
15 Leaves borne on elongate stems
16 Leaves extremely filiform, about 0.5 mm wide; mature fruits in umbels on long coiling peduncles........ RUPPIACEAE
16 Leaves mostly wider than 2 mm; mature fruits in spikes, the peduncles stout and stiff ...................... POTAMOGETONACEAE
14 Leaves opposite
17 Flowers on long thread-like stalks extending to the water’s surface (Elodea) ........ HYDROCHARITACEAE
17 Flowers remaining in the leaf axils, at most very shortly stalked
18 Leaves prominently toothed to shallowly incised, with prickles on the abaxial midveins (Najas marina) .......... HYDROCHARITACEAE
18 Leaves entire or minutely serrulate (use magnification), lacking prickles on the abaxial midveins
19 Leaves 1-3 cm long (Najas guadalupensis) ................................................................ HYDROCHARITACEAE
19 Leaves 3-4 cm long (Zannichellia) .................................................................................. POTAMOGETONACEAE
7 Plants not truly aquatic, growing on mud, or if growing in mud or shallow water then most of the plant extending up out of the water
20 Periath chaffy, scale-like, or of bristles, never petal-like in color or texture, or periathan absent
21 Flower parts concealed in the axils of chaffy bracts (spikes and spikelets); periathan absent or represented by bristles or minute scales; grasses and sedges
22 Leaves 2-ranked; sheath margins usually overlapping (fused in some); stems round or compressed in cross-section, but never 3-angled; flower and fruit subtended by two bracts (lemma and palea); anthers attached to their filaments at the middle of the anther ................................................................. POACEAE
22 Leaves 3-ranked; sheath margins fused together; stems 3-angled; flower and fruit subtended by a single bract (in Carex the flower completely enclosed in a sack-like perigynium and this subtended by a single bract); anthers attached to their filaments at the end of the anther ............................................................. CYPERACEAE
21 Flower parts not concealed in the axils of chaffy bracts; periathan various, present or absent
23 Inflorescence an elongate spike
24 Plants a meter or more tall; spike differentiated into a large, lower portion of pistillate flowers, and a smaller, upper portion of staminate flowers..........................................................TYPHACEAE
24 Plants less than a meter tall; spike uniform of perfect flowers..................................................JUNCAGINACEAE
23 Inflorescence of racemes, loose clusters, or globose heads
25 Flowers in globose heads, the lower heads pistillate, the upper heads stamine (Sparganium) ......TYPHACEAE
25 Flowers in various clusters, but not in unisexual heads............................................................JUNCACEAE
21 Perianth with some or all the parts petal-like in color or texture
26 Ovary subterranean, the flower arising from ground level; plants acaulescent (Leucocirrimum) .......AGAVACEAE
26 Ovary above ground; plants caulescent, at least with a flowering scape
27 Ovary wholly inferior
28 Flowers zygomorphic; stamens 1 or 2, the pollen grains clumped together in a pollen mass.............PHILODACTYLLACEAE
28 Flowers actinomorphic; stamens 3 or 6, the pollen grains readily dispersed individually
29 Leaves cauline, 2-ranked and often equitant; stamens 3 .......................................................IRIDACEAE
29 Leaves mostly basal, not 2-ranked nor equitant; stamens 6
30 Perianth segments pilose on the abaxial surface; foliage grass-like, herbaceous, usually pubescent .......
..........................................................................................................................HYPOXIDACEAE
30 Perianth segments glabrous; foliage not grass-like, fleshy-thickened, glabrous or nearly so...........
..........................................................................................................................AMARYLLIDACEAE
27 Ovary superior or mostly so
31 Carpels numerous (more than 6), separate and distinct in separate pistils; stamens 6-numerous (in pairs opposite each petal when 6)..................................................ALISMATACEAE
31 Carpels 3 or 6, united into a single pistil; stamens 3-6, never in pairs
32 Petals and sepals clearly differentiated from each other
33 Petals less than 2 cm long, all purplish or two bluish and one white..........................COMMELINACEAE
33 Petals more than 2 cm long, white or rose colored (Calochortus).................................LILIACEAE
32 Petals and sepals similar in size, texture, and color, not clearly differentiated
34 Flowers mostly solitary or 2-3(4) together, borne at the stem tips or in the leaf axils
35 Plants diffusely branched in flower (but not when very young); leaves scale-like, subtending filiform branches (cladophylls) that resemble leaves (Asparagus) ..............ASPARAGACEAE
35 Plants and leaves not as above
36 Leaves all basal or absent, none borne on the flowering stems
37 Leaves 1-2, elliptic, mottled with purple; flowers bright yellow, nodding (Erythronium) .........LILIACEAE
37 Leaves 1 to several, linear, not mottled; flowers whitish to bluish, erect....................................THEMIDACEAE
36 Leaves borne on the flowering stems
38 Flowers borne in the axils of the leaves
39 Perianth segments united to near the tips (Polygonatum)............RUSCACEAE
39 Perianth segments separate to near the base (Streptopus).............LILIACEAE
38 Flowers borne at the stem tips
40 Leaves linear-filiform; flowers white or purple-brown.....................LILIACEAE
40 Leaves broader; flowers whitish or orange-red
41 Leaves whorled at the upper nodes, alternate below, lanceolate; flowers orange-red (Lilium)..........................LILIACEAE
41 Leaves alternate throughout, lanceolate to ovate; flowers whitish or yellowish
42 Stems simple, unbranched; tepals neither swollen nor slightly inflated above the base; flowers erect to spreading (Maianthemum) ..........RUSCACEAE
42 Stems branched below; tepals weakly gibbous above the base; flowers nodding (Proisarum)..........................................................LILIACEAE
34 Flowers usually several to numerous in umbels, well-developed racemes, or panicules
43 Flowers in umbels or umbel-like clusters
44 Perianth segments separate nearly to the base...............................ALLIACEAE
44 Perianth segments united to about the middle ..................................THEMIDACEAE
43 Flowers in racemes or panicules
45 Leaves 3-30 cm wide, tending toward broadly elliptic, obviously disposed along the stem, with 5-9 or more leaves on the flowering shoot well above the base
46 Plants 1-2 m tall; leaves 15-30 cm long, the larger 10-20 cm wide; flowers borne in large panicles often more than 20 cm long (Veratrum) .............MELANTHIACEAE
46 Plants up to 1 m tall; leaves 5-20 cm long, 3-10 cm wide; flowers borne in panicles or racemes 3-10 cm long (Maianthemum) ..................................RUSCACEAE
45 Leaves 1-2 cm wide, tending toward linear or narrowly lanceolate, mostly basal or nearly so, with only 1-3 leaves on the flowering shoot slightly above the base
47 Flowers sessile or nearly so and borne in rather dense clusters, pedicels and branches absent or scarcely evident
48 Flowers blue-purple; perianth segments united into an urn-shaped tube (Muscari) .................................HYACINTHACEAE
48 Flowers greenish to yellowish; perianth segments separate (Schoenocaulon)..........................................................MELANTHIACEAE

47 Flowers borne on well-developed and evident pedicels or branches
49 Tepals yellow to orange with deep veins, 7-8 cm long; leaves 70-100 cm long in mature plants; escaped ornamentals..........................HEMEROCALLIDACEAE
49 Tepals yellowish to whitish, less than 2 cm long; leaves less than 50 cm long; native or exotic plants
50 Pedicels jointed with a circular band about mid-length; exotic noxious weed rare in the southern desert region..................ASPHODELACEAE
50 Pedicels not jointed, lacking a circular band; native plants, generally not of the Chihuahuan Desert region
51 Flowers whitish; perianth segments each with a gland at the base; styles distinct..................................................MELANTHIACEAE
51 Flowers yellowish; perianth segments lacking a gland at the base; styles united (Echeandia)..........................................................AGAVACEAE

AGAVACEAE AGAVE FAMILY [4/18/21]

Robust herbs or shrubs, with at least short rhizomes; leaves alternate or basal, usually in dense rosettes, simple, usually stiff and semi-succulent, persistent, entire to spinose-serrate, the shrubby members usually with a spine at the tip; stipules lacking; inflorescences paniculate, some poorly developed and racemose; flowers actinomorphic to slightly zygomorphic, perfect; perianth of 6 petaloid tepals, distinct or connate at the base; stamens 6; pistil single, superior or inferior, of 3 united carpels; fruit a capsule, sometimes berry-like, the seeds flat, blackish. ●Widely distributed in warm-temperate regions of the Western Hemisphere, with about 25 genera. The classification of the family is contentious; we follow Judd et al. (2016) in expanding the Agavaceae to include the herbaceous Anthericaceae (not entirely satisfactory), removing the ‘woody’ Nolina and Dasyliurion to the Ruscaceae (q.v.), and maintaining the group as distinct from the Asparagaceae. Some current workers (see Angiosperm Phylogeny Website online) prefer an expanded (and unwieldy and almost meaningless, in our opinion) Asparagaceae to include several taxa treated as families herein.


1 Plants shrubby, leaves usually longer than 30 cm, leathery, often spiny, borne in rosettes at the tips of branches or all basal

2 Leaves mostly serrate to serrulate, some entire, lacking a terminal spine; flowers usually unisexual, less than 1 cm long; seeds 2 or 3 in each chamber of the ovary (Dasyliurion, Nolina)..............see RUSCACEAE

2 Leaves entire to filiferous, with a terminal spine; flowers bisexual, more than 1.4 cm long; seeds several to many in each chamber of the ovary

3 Leaves with spiny margins; ovary inferior.................................................................Agave

3 Leaves without spiny margins (but may be filiferous with long threads); ovary inferior or superior

4 Ovary inferior; leaves 1-2 cm wide and 25-50 cm long; trunk absent, the leaves all basal (A. schottii).................................Agave

4 Ovary superior; leaves and trunk various

5 Flowers reddish or yellowish, present during much of the growing season, in raceme-like inflorescences; leaves generally 0.5-1 cm wide, deeply furrowed or channeled; known only in cultivation..........................Hesperaloe

5 Flowers white or cream-colored, usually present only during the flowering season, in panicles or raceme-like inflorescences; leaves mostly 1-5 cm wide, flat to channeled; common in the wild and in cultivation..........................Yucca

1 Plants herbaceous; leaves other than above

6 Perianth white; ovary subteranea, the flower arising from ground level; plants acaulescent .................................................Leucocrinum

6 Perianth yellow to yellow-orange; ovary above ground; plants acaulescent, at least with a flowering scape..........................Echeandia

Agave [noble] AGAVE [5].

Perennial shrubs and trees, acaulescent or caulescent, often rhizomatous; leaves succulent, in evergreen rosettes, often thick and fleshy, the margins entire to spinose-toothed; inflorescences paniculate terminal at the end of elongated scapes arising from rosettes, much exceeding the leaves, spicate, racemose, to paniculate, blooming after 8-20 or more years of vegetative growth and the rosette then dying; flowers showy, erect or recurved, mostly yellowish, funnelform to tubular, the tepals connate basally, the stamens exerted; ovary inferior, succulent and thick-walled, mostly fleshy in fruit. ●Agave provides both sisal hemp and tequila, and is commonly seen as an ornamental (Agave americana Linnaeus, century plant) in the southwest.


[Key adapted from Reveal & Hodgson 2002]

1 Inflorescence spicate or sub-spicate

2 Leaf margins entire or filiferous, sometimes with inconspicuous teeth near the base; Hidalgo County .........................A. schottii

2 Leaf margins conspicuously armed with spine-toothed; Doña Ana County and eastward.............................A. lecheguilla

1 Inflorescence paniculate

3 Plants freely suckering, forming colonies of several rosettes; leaves narrowly lanceolate to broadly ovate......................A. parryi

3 Plants rarely suckering, the rosettes single; leaves linear-lanceolate to lanceolate

4 Leaves 18-30 cm long; flowers 6-45 per cluster; flowering summer to early fall; Doña Ana County and eastward....A. gracilipes

4 Leaves 35-92 cm long; flowers 8-16 per cluster; flowering late spring to summer; Luna County and westward........A. palmeri
Monocotyledonous Plants - Agavaceae

**Agave gracilis** Trelease [slender-stalked]. Rosettes usually solitary, 70-80 cm diam; leaves ascending, 18-30 cm long, 4-7 cm wide, lanceolate to broadly lanceolate, the margins not filiferous, armed, the apical spine 2-5 cm long; scapes 3-5 m tall; inflorescences paniculate; flowers 6-45 per cluster, 4-6 cm long, yellow to yellowish green; capsules 2.5-4.5 cm long. ● Barely entering the state in the grasslands and desert scrub north of the Texas border; map implies. §

**Agave lechuguilla** Torrey [little lettuce, from the Spanish] LECHUGILLA. Rosettes clustered, 50-60 cm diam; leaves ascending to erect, 30-50 cm long, 2-5 cm wide, the margins not filiferous, strongly armed with spine teeth, the apical spine 1-5 cm long; scape 2-3.5 m tall; inflorescences spicate; flowers 2-3 per cluster, 2-5 cm long, yellow; capsules oblong, 2-3 cm long. ● Rocky hills and slopes in the south-central and southeastern regions, rarely entering the state. ● Plants are toxic to livestock. The apical spines can be pernicious to unwary passers-by, earning the name SHIN-DAGGERS. §

**Agave palmeri** Engelmann [for Edward Palmer (1829-1911), British botanist, who made vast collections of plants in the Americas]. Rosettes mostly solitary, 70-130 cm diam; leaves ascending to spreading, 35-90 cm long, 4-20 cm wide, lanceolate, the margins not filiferous, armed, the apical spine 3-6 cm long; scapes 3-6 m tall; inflorescences broadly paniculate; flowers 8-16 per cluster, 4-7 cm long, cream-colored to pale yellow or light green; capsules oblong, 3-6 cm long. ● Oak woodlands on limestone in the booted region. §

**Agave parryi** Engelmann [for Charles Christopher Parry (1823-1890), English-American botanist]. Rosettes solitary or clustered, 40-80 cm diam; leaves ascending to erect, 10-65 cm long, 4-20 cm wide, broadly ovate, the margins not filiferous, usually strongly armed, the apical spine 1-4 cm long; scapes 2-6 m tall; inflorescences broadly paniculate; flowers 25-50 per cluster, 4-8 cm long, yellow to yellowish green; capsules ovoid to obvoid, 2-5 cm long. ● There are two varieties, both in New Mexico:
- a Rosettes flat-topped; scape 2-4.5 m tall; perianth tube 12-18 mm long; capsules 2.5-3.5 cm long...var. neomexicana (Wooton & Standley) B. Ullrich [from New Mexico].
- a Rosettes globe; scape 4-6 m tall; perianth tube 6-12 mm long; capsules 3.5-5 cm long...var. parryi [for Charles Christopher Parry (1823-1890), botanist-
surgeon who accompanied the surveys of the mid-1800s].§

**Agave schottii** Engelmann [for Arthur Carl Victor Schott (1814-1875), German naturalist on the U.S.—Mexico Boundary Survey of 1851] [Agave geminiflora (Tagl.) Ker-Gawler var. sonorae Torrey]. Rosettes solitary or densely clustered, 60-120 cm diam; leaves mostly erect, widest near the base, 10-40 cm long, 1-3 cm wide, the margins filiferous, entire, the apical spine 1-2 cm long; scapes 1.5-4 m tall; inflorescences spicate to racemose; flowers 1-3 per cluster, 3-5 cm long, yellow; capsules obovoid, 1-2 cm long. ● Rocky hills and ledges in the booted region. ● Our plants belong to var. schottii, with leaves to 1.2 cm wide, apical spine to 1.2 cm long, spicate inflorescences, and flowers to 4.2 cm long. §

**Hesperaloe** [western aloe] [0]. Perennial, agave- or yucca-like plants, short- to long-rhizomatous; leaves in expansive basal rosettes, linear, thick, the margins filiferous, not toothed, with a frayed or stout apical spine; inflorescences weakly paniculate to racemose; flowers bisexual, showy, the perianth 6-merous, narrowly tubular (ours) to broadly campanulate, the tepals alike and petaloid; ovary superior; fruit an ovoid capsule. ● With 5 species, southern U.S., Mexico. We have a single species:

*Hesperaloe parviflora* (Torrey) Coulter [small-flowered] RED/YELLOW YUCCA [Yucca parviflora Torrey]. Leaves dark green, 50-100 cm or more long, 0.5-1(2) cm wide, the margins with slender threads; panicles 1-2.5 m long; flowers reddish to salmon-colored, or yellow in one cultivar, 2.5-3.5 cm long; capsules 2.5-3 cm long. ● Not known in the wild in the state, but commonly used as a landscape ornamental.

**Echeandia** [for Pedro Gregorio Echeandía (1746-1817), Spanish botanist] CRAG-LILY [1].

Perennial herbs, from corms with enlarged storage roots; leaves grass-like, basal and cauline, sheathing, the bases surrounded by fibrous leaf bases from previous years; inflorescences racemose or paniculate; tepals distinct, strongly reflexed to spreading, 3-veined; anthers connate into a cone or distinct (ours); ovary superior, with a single style; fruits capsule-like, with black seeds. ● About 80 species of the New World. Formerly placed in the Anthericaceae, which is merged within the Agavaceae herein.


**Echeandia flavescens** (J.A. & J.H. Schultes) Cruden [yellowish]. [Anthericum torreyi] Baker, Anthericum torreyi Baker var. neomexicanum Poelzing. Basal leaves 3-15 in number, linear 8-40 cm long, to 1 cm wide, the margins minutely toothed, ciliate; cauline leaves 0-3 in number, about 5 mm wide; flowering scape bracteate; inflorescences 20-70 cm long; tepals 8-15 mm long, the inner (lower) about twice the width of the outer (upper); capsules 7-16 mm long, 3-6 mm wide. ● Desert plains, woodlands, openings in pine forests; widely distributed but nowhere abundant, often hiding among grasses on the forest floor. §

**Leucocrinum** [white lily] STAR-LILY [1].

Perennial, aculeatous, glabrous herbs, from deeply buried fleshy roots; leaves few, basal, sheathed together basally, the blades linear; inflorescences umbel-like, sessile, at ground level; flowers showy; tepals 6, connate below the middle and forming a perianth tube; stamens inserted near apex of perianth tube; ovary below ground, inferior, 3-locular; fruit capsular, 3-angled, the seeds black. ● This is a monotypic species of the western United States. Formerly placed in the Anthericaceae, which is merged within the Agavaceae herein.


**Leucocrinum montanum** Nuttall ex Gray [of mountains]. Plants 5-10 cm tall; leaves spreading outward, lax, 10-20 cm long, 2-8 mm wide, the sheaths 3-8 cm long; perianth tubes 5-8 cm long; tepals 2-3 cm long; anthers 4-6 mm long; capsules 5-8 mm long, the seeds 3-4 mm long. ● Prairies, foothills, bluffs, and sagebrush plains in the far northern counties. ● After flowering in the spring or early summer, the entire above-ground portions of the plants wither and blow away, leaving scarcely a trace of their presence; how the plants are dispersed is unknown, but some suggest ants...
transport the seeds from the below-ground capsule.

**Yucca** [Carn name for another plant] YUCCA [11].

Perennial shrubs or trees, often branching extensively; leaves in basal or terminal rosettes, evergreen, leathery and often thick and succulent, rigid, the blades linear to lanceolate, the bases expanded, the margins entire or denticulate, the apices mostly spinose or at least sharp pointed; inflorescences racemose to paniculate; flowers showy, the tepals petaloid and similar, whitish or cream-colored, distinct or connate basally, the stamens included but evident; ovary superior; fruits a capsule, fleshy and indehiscent or semi-woody and dehiscent, the seeds black and flattened. ♦ Yucca, without specific designation, is the state flower of New Mexico. There is considerable hybridization and intergradation among several species, and some individual plants may be very difficult to identify; this is also true of most immature (pre-flowering) plants and especially herbarium specimens. Sivinski’s overview (2008) is especially helpful in understanding some of the difficult species. The distributions are conservative, and populations might be found outside the mapped ranges. Three genera of the moth family Prodoxidae participate in a mutualistic pollination system with Yucca.


The following table may help sort through the more meaningful features:

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[Key partially adapted from Sivinski, 2008]

1. Mature plants tree-like with well-developed stems 1-5 m long
2. Leaves not or only rarely filiferous, 3-6 cm wide
   3. Plants mostly solitary; leaves somewhat flexible.................................................. Y. madresis
   4. Plants mostly forming colonies; leaves stiff and rigid........................................ X Y. schottii
3. Leaves strongly filiferous, 0.5-8 cm wide
4. Leaves thin and flexible, 0.5-2 cm wide; fruits dehiscent, semi-woody, erect.............. Y. elata
5. Leaves thick, stout, rigid, 2-8 cm wide; fruits indehiscent, fleshy, pendulous
6. Mature plants shorter than 2 m (not including panicles); distribution in the bootheel (var. brevifolia)............................................ Y. baccata
7. Mature plants taller than 2.5 m (not including panicles); distribution rarely in the bootheel
8. Tepals connate basally; ovary 3-8 cm long; most of the panicle exceeding the leaves; leaf arrangement very orderly and symmetric, the leaves tending to be narrower and symmetric...................................................... Y. faxoniana
9. Tepals distinct; ovary 1-3 cm long; most of the panicle within the leaves; leaf arrangement unkempt and asymmetric, the leaves tending to be narrower and asymmetric...................................................... Y. treculiana
10. Leaves plano-convex, 1-4 cm wide; capsules constricted near the middle
11. Leaves 1.2-2 cm wide; lowermost flowers of raceme arising at least 10 cm or more above the leaves; styles yellowish or pale green; distribution east of Rocky Mountains in the northeastern counties.................................................. Y. neomexicana
12. Leaves 2-4 cm long; lowermost flowers of raceme arising within or at the leaf tips; styles green; distribution west of Rocky Mountains in the Four Corners region................................................................. Y. harrimaniae
13. Leaves plano-convex, 0.3-1.2 cm wide; capsules constricted or not
14. Lowest flowers of the racemes arising well beyond the leaves; capsules deeply constricted near the middle................................................ Y. angustissima
15. Lowest flowers of the racemes arising just beyond the leaves; capsules usually not constricted
16. Peduncles long, lifting the lower panicle branches well-above the leaves; mostly west of Pecos River............................................. Y. elata
17. Peduncles short, holding the lower panicle branches below or just above the leaf tips; eastern plains............................................. Y. campestris
18. Peduncles 10-20 cm long; style slender or swollen
19. Peduncles 20-50 cm long; style slender or swollen
20. Leaves 5-8 mm wide; styles slender, white or pale yellow-green; capsule 2-2.5 cm wide (var. intermedia)..................................................... Y. baileyi
21. Leaves 8-12 mm wide; styles swollen, dark green; capsules 3-5 cm wide.............................. Y. glauca

**Yucca angustissima** Engelmann. ex Trel. [very narrow]. Plants solitary or colonies, mostly acaulescent, 1-2 m tall; leaves greenish, not glaucous, 25-45 cm long, 0.5-0.8 cm wide, flexible, plano-convex, the margins filiferous; inflorescences racemose, arising well beyond the leaves, 80-100 cm long, the peduncles 30-50 cm long; flowers 4.5-5.5 cm long, the tepals distinct, pale green with rose tinges, the styles mostly white to pale greenish; fruits semi-woody,
Monocotyledonous Plants - Agavaceae

erect, 3.5-6 cm long, 2-3 cm wide, deeply constricted near the middle. ● Questionably present on arid foothills south of Mt. Taylor. ● We confine the name *Y. angustissima* to plants that are acaulescent and narrow-leaved, with the racemes elevated well above the leaves and the capsules strongly constricted; relatively few plants near Grants (Cibola Co.) approach this circumscription, and the case can be made that these plants are not *Y. angustissima* at all, but rather hybrids between *Y. baileyi intermedia* × *Y. elata*. It has been reported in the far western Four Corners region of New Mexico, but the narrow-leaved, racemose plants of the western counties align more accurately with *Y. baileyi*.

**Yucca bacatua** Torrey  [berry-like] BANANA YUCCA. Plants forming colonies, acaulescent or short-caulescent, shorter than 2.5 m; leaves bluish green, concave-convex, 30-100 cm long, 2-6 cm wide, rigid, the margins moderately to strongly filiferous; inflorescences paniculate, within or exceeding the leaves, 60-80 cm long, the peduncles to 80 cm long; flowers 5-15 cm long, the tepals connate basally for 7-12 mm, cream-colored, sometimes with purple tinges, the styles white; fruits fleshy, indehiscent, 8-23 cm long, 4-8 cm wide. ● We have two varieties:

- a Plants acaulescent or caulescent; stems 1-6, aerial or subterranean, shorter than 30 cm tall; leaf margins coarsely filiferous...var. *bacatua* ● Widespread nearly throughout the state. §
- a Plants caulescent; stems 1-24 in number, aerial, often branched, some reaching 200 cm tall; leaf margins finely filiferous...var.*brevifolia* L.D. Benson & R.A. Darrow  [short-leaved].

Our plants belong to var. *bacatua*.

**Yucca baileyi** Wooton & Standley  [for Vernon Orlando Bailey (1864-1942), naturalist for the USDA Bureau of Biological Survey] MOUNTAIN YUCCA. Plants acaulescent, solitary or basally forming colonies, to 1.5 m tall; leaves yellowish-green, 30-50 cm long; the panicles arising within or somewhat above the leaves; flowers 5-7 cm long, cream-colored or greenish, the tepals distinct, the styles slender-terete, white to pale yellowish green; fruits semi-woody, dehiscent, 5-6 cm long, about 2.5 cm wide, only occasionally constricted. ● We have two weak varieties:

- a Inflorescences 25-80 cm long; peduncle shorter than 20 cm...var. *baileyi* [Yucca baileyi Wooton & Standley var. *navaojos* (Webber) Webber, Yucca navaojos Webber, Yucca standleyi McKelvey]. ● Woodlands and grasslands, foothills of the northwest mountains and plains. ● Plants of the Four Corners region growing in compact colonies with many erect stems have been called *Y. navaojos* (see synonyms).

- a Inflorescences 70-130 cm long (sometimes shorter); peduncle 10-50 cm long...var. *intermedia* (McKelvey) Reveal  [Yucca intermedia McKelvey]. ● Woodlands and grasslands of the western mountain and north-central plains and foothills; endemic to New Mexico.

**Yucca campestris** McKelvey  [of fields]  [Yucca intermedia McKelvey var. *ramosa* McKelvey]. Plants acaulescent, forming open colonies, to 2 m tall; leaves pale to yellowish-green, flat to plano-convex, somewhat flexible to rigid, 25-65 cm long, 2-4 cm wide, only occasionally constricted. ● Infl orescences arise within or just above the leaves, 45-100 cm or more long; the peduncles 1-2 m long; flowers 3.5-5 cm long, pale greenish-white, the tepals distinct, the styles bright green; fruits semi-woody, dehiscent 4-6 cm long, 2-4 cm wide, 2.5 cm long; flowers greenish-white to white, about 5 cm long, the tepals distinct, 2.5 cm wide. ● Widespread throughout the deserts, grasslands, and foothills in the southeastern half of the state. ● Our plants belong to var. *elata*. This species is generally quite distinctive, but young plants without inflorescences can be easily confused with other narrow-leaved yuccas. §

**Yucca faxoniana** Sargent  [for Charles Edward Faxon (1846-1918), assistant director of the Arnold Arboretum]  [Yucca angustifolia Pursh var. *elata* Engelmann]. Plants solitary, tree-like, to about 5 m tall (not including inflorescence); stems single, sometimes branched above; leaves yellow-green, 40-100 cm or more long, 3-8 cm wide, rigid, the margins strongly filiferous; inflorescences paniculate, partially within or mostly exceeding the leaves, 0.5-2 m long, the peduncles 30-60 cm long; flowers 4-12 cm long, the tepals connate basally for 1-3 mm, whitish, the styles white; fruits fleshy, indehiscent, 4-14 cm long, 2-4 cm wide. ● Barely entering the state along the southern border with Texas, and known from very few specimens. ● Similar to *Yucca treculiana*, which is much more common and differs most conspicuously in the key features. Commonly used as an ornamental.

**Yucca glauca** Nuttall  [Yucca angustifolia Pursh, Yucca glauca Nuttall var. *gurneyi* McKelvey]. Plants acaulescent, commonly forming small colonies, acaulescent or rarely acaulescent, commonly with a few branches, 2-5 m tall; leaves yellow-green, 25-100 cm long, 5-15 mm wide, flexible, the margins strongly filiferous; inflorescences paniculate, sometimes racemose distally or in weakly developed plants, arising well beyond the leaves, 70-150 cm long; flowers 3-6 cm long, creamy white, the tepals distinct, the styles white to pale green; fruits semi-woody, dehiscent, 5-8 cm long, 2-4 cm wide. ● Widespread throughout the deserts, grasslands, and foothills in the southeastern half of the state. ● Our plants belong to var. *elata*. This species is generally quite distinctive, but young plants without inflorescences can be easily confused with other narrow-leaved yuccas.

**Yucca intermedia** Wooton & Standley var. *ramosa* McKelvey]. Plants acaulescent, commonly forming small colonies, acaulescent or rarely acaulescent, commonly with a few branches, 2-5 m tall; leaves pale green, 30-60 cm long, 0.8-1.2 cm wide, somewhat rigid; the margins filiferous; inflorescences racemose, arising within or just beyond the leaves, 50-100 cm long, the peduncles 20-30 cm long; flowers greenish-white to white, about 5 cm long, the tepals distinct, the styles swollen, dark green; fruits semi-woody, dehiscent, 5-9 cm long, 3-5 cm wide, not constricted. ● Grasslands and plains in the northeastern quarter of the state. ● We apply the name *Y. glauca* herein in a more restrictive sense than other workers, to refer to acaulescent, narrow-leaved plants with race mose inflorescences arising within or nearly at the leaf tips, and with swollen green styles; plants similar to this but with mostly paniculate inflorescences, formerly placed here or within *Y. intermedia*, are referred to *Y. harrimaniae*. §

**Yucca harrimaniae** Trelase  [for Mary Williamson Averell Harriman (1851-1932), patron of natural history endeavors]. Plants acaulescent, solitary or forming colonies, to 1.5 m tall; leaves pale green, 30-50 cm long, 2-4 cm wide, rigid, the margins filiferous; inflorescences racemose, sometimes short-paniculate proximally, 35-70 cm long, the peduncles 10-20 cm long, the lower flowers within or just above the leaves; flowers 4-5 cm long, yellow or greenish-yellow, the tepals distinct with purple tinges, the styles pale to bright green; fruits semi-woody, dehiscent, 3-5 cm long, 2-3 cm wide, deeply constricted near the middle. ● Sometimes reported for the state, but authentic specimens are unknown; to be looked for on desert slopes and foothills in the Four Corners region. ● *Yucca harrimaniae* is characterized by being acaulescent, the leaves concave-convex, thick, and rigid, the racemes arising within or at the leaf tips, the styles green, and the capsules deeply constricted. Plants reported as *Y. harrimaniae* for northernwestern New Mexico belong mostly to *Y. baileyi*, and individual specimens of *Y. baileyi* × *Y. bacata*. ● Infrequent in pine-oak woodlands in the bootheal region. ● Many of the plants corresponding to this name were formerly called *Y. schottii*; we follow Lenz & Hanson (2000, 2001) in using the name *Y. schottii*.
for supposedly hybrid derivatives involving *Yucca baccata* × *Y. elata* × *Y. madrensis*, all of which can be found in the bootheel. We restrict the name *Y. madrensis* Gentry for non-colonizing caulescent plants 2-3 m tall, with somewhat flexible leaves and non-filiferous margins and the panicle arising within the leaves. §

*Yucca neomexicana* Wooton & Standley [from New Mexico] NEW MEXICO YUCCA [*Yucca harrimaniae* Trelease var. *neomexicana* (Wooton & Standley) Reveall]. Plants acaulescent, single or forming open colonies, to 1.5 m tall; leaves green-glaucous, 15-45 cm long, (0.7)-1-2 cm wide, concave-convex, somewhat flexible, the margins filiferous; inflorescences racemose, rarely short-paniculate proximally, arising at or up to 20 cm beyond the leaves, 40-70 cm long; flowers white to greenish-white with purplish tinges, 3-5 cm long, the tepals distinct, the styles pale green to white; fruits semi-woody, dehiscent, 3-4 cm long, 2-3 cm wide, deeply constricted near the middle. ● Rocky slopes and ledges in grasslands and woodlands of the northeastern region. ● Once thought to be endemic to New Mexico, but now reported from Colorado and Oklahoma as well.

×*Yucca schottii* Engelmann pro sp. [for Arthur Carl Victor Schott (1814-1875), German naturalist]. Plants mostly forming colonies, short-caulescent, 1-2 m tall; leaf blades stiff and rigid, green to glaucous, 40-80 cm long, 3-6 cm wide, the margins mostly entire and not filiferous. ● We follow Lenz & Hanson (2000, 2001) in applying this name to supposedly hybrid derivatives involving *Yucca baccata* × *Y. elata* × *Y. madrensis*, all of which can be found in the bootheel.

*Yucca treculiana* Carrière [for Auguste Adolphe Lucien Trécul (1818-1896), French botanist-anatomist]. TORREY’S YUCCA (*Yucca baccata* Torrey var. *macrocarpa* Torrey, *Yucca macrocarpa* (Torrey) Engelmann, *Yucca torreyi* Shafer, *Yucca torreyi* Shafer form *parviflora* McKelvey). Plants single or forming colonies, mostly 3-7 m tall, the stems single or occasionally branched; leaves yellowish to bluish green concave-convex, rigid, 35-130 cm long, 2-7 cm wide, the margins filiferous with coarse fibers; inflorescences paniculate, partially exceeding to mostly within the leaves, 50-150 cm long, the peduncles (in ours) 10-20 cm long; flowers 3-8 cm long, the tepals distinct, cream-colored, the styles white; fruits fleshy, indehiscent, 5-18 cm long, 2-5 cm wide. ● Dry hillsides, bajadas, and brush land across the southern desert region. ● Our plants belong to the *torreyi* form, scarcely differing from the *treculiana* form of southwest Texas to the Gulf. The specific epithet was originally spelled *treculeana*, but that is an orthographic error capable of correction to *treculiana*, in accordance with the rules of epithet formation (see International Code of Nomenclature for algae, fungi, and plants, Articles 60.12 and Recommendation 60C). §
ALISMATACEAE  WATER PLANTAIN FAMILY

Glabrous, aquatic herbs from rhizomes; leaves alternate and basal, simple, linear to sagittate, the petiole distinct with a flattened, sheathing base, the venation reticulate; stipules absent; inflorescence an erect scapose raceme or panicle; flowers actinomorphic, perfect or unisexual (monoecious); sepals 3, green and commonly persistent; petals 3; short-lived; stamens 3, 6, or many; pistils 3-many, superior, of individual carpels, the style single; fruit an achene.


1 Ovaries and fruits arranged in a single whorl on the receptacle; stamens 6 ................................................................. Alisma

2 Leaf blades with translucent markings evident as distinct lines; flowers bisexual; fruits plump .............................................. Echinodorus

3 Leaf blades lacking translucent markings; at least the proximal flowers unisexual; fruits compressed ............................... Sagittaria

Alisma  [ancient Greek name] WATER -PLANTAIN  [3].

Perennial herbs, submersed to emergent, glabrous, rhizomes often present; roots not septate; leaves sessile to petiolate, the blade lacking transverse markings, linear to ovate, the margins entire; inflorescence a panicle of whorls of flowers, erect and emergent, rarely submersed; flowers bisexual, on a flattened receptacle; petals pink to white; stamens 6; pistils 15-20.  A small genus of perhaps 9 species, nearly world-wide.


1 Leaves linear, less than 2.5 cm wide; achenes about as wide as long, distinctly bisulcate on the back; pedicels stout; petioles 4-6 mm wide ...................................................................................... A. gramineum

2 Achenes 2 mm long or less, the dorsal groove shallow or with a somewhat depressed slight thickening in the trough; fruiting heads 3.5 mm or less in diameter ............................................................ A. subcordatum

2 Achenes more than 2 mm long, the dorsal groove deep; fruiting heads more than 3.5 mm in diameter ................................ A. triviale
**Alisma gramineum** K.C. Gimelin [grass-like] [Alisma geyerii Torrey, Alisma gramineum K.C. Gimelin var. geyeri (Torrey) Samuelsson]. Perennial herbs, 1-30 cm tall/long; leaves submersed or floating or emergent, the submersed leaves sessile and ribbon-like, the floating leaves linear and to 1 m long, the emergent leaves petiolate and lanceolate to 25 cm long; panicles to 50 cm long, less than 1 cm wide; flowers white to greenish; fruiting heads 3-6 mm diam; achenes 2-3 mm long. ● Shallow water of ponds and ditches. Known from only a few collections.

**Alisma subcordatum** Rafinesque [nearly heart-shaped]. Perennial herbs to 60 cm tall/long; leaves emergent, rarely floating, petiolate; blade ovate to elliptic, to 15 cm long and 10 cm wide; panicles to 100 cm long; flowers chasmogamous; sepals 1-3 mm long; petals 1-3 mm long; fruiting heads 2-4 mm diam; achenes 1-2 mm long. ● Shallow water of ponds and ditches.

**Alisma triviale** Pursh [commonplace] [Alisma brevispic Greene, Alisma plantago-aquatica sensu W&S, Alisma plantago-aquatica Linnaeus var. americanum Schultes & Schultes f]. Perennial herbs to 1 m tall/long; leaves emergent, petiolate, the blade lanceolate to broadly elliptic or ovate, to 35 cm long, 3-12 cm wide; panicles to 1 m long; flowers chasmogamous; sepals 1-3 mm long; petals 3-6 mm long; fruiting heads 4-7 mm diam; achenes 2-3 mm long. ● Shallow water of ponds and ditches. ■ This is the most common of the three species, as its name suggests. §

**Echinodorus** [spiny like a hedgehog] BURR-HEAD [1]. Annual or perennial aquatic herbs, the plants emergent or with floating leaves (rarely submersed), glabrous to stellate-hairy, with or without rhizomes, but lacking stolons, corms, and tubers, the roots not sepaated; leaves sessile to petiolate, the blades with or without transverse markings; inflorescence a raceme or panicle, of 1-several whorls, emergent; flowers bisexual, 3-merous, the petals white, the stamens several-hundreds, the pistils several-hundreds, forming a dense head; fruit an achene. A small New World aquatic genus of about 25 species.


**Echinodorus berteroi** Sprengel Fassett [for Carlo Giuseppi Bertero (1789-1831), Italian botanist] [Alisma berteroi Sprengel, Echinodorus rostratus (Nuttall) Engelmann]. Annual to perennial herbs, to about 70 cm tall (the erect leaves), with rhizomes; leaves mostly emergent, the petioles to 36 cm long, the blades broadly lanceolate to ovate, 3-16 cm long, as wide or wider, the bases truncate to cordate; racemes paniculate, 2-40 cm long, as wide or wider, of several whorls; flowers 6-11 mm wide; sepals spreading to recurved, 9-13-veined; stamens 9-15; pistils 45-200; achenes 1-3 mm long, 3-5-ribbed, beaked. ● Wet ditches, streams, and shallow ponds, reported from Roosevelt County. ● The elongated beaks of the fruits give mature flower heads a bristly appearance.

**Sagittaria** [arrow-shaped] ARROWHEAD [5]. Perennial aquatic herbs, emergent, floating-leaved, or submersed, mostly glabrous, often with rhizomes, stolons, and tubers, corms absent, the root system; leaves petiolate to sessile, the blades with transverse markings; inflorescence a raceme or panicle of 1-several whorls, bracteate at the nodes, emergent or floating; flowers unisexual, 3-merous, the staminate distal, the pistillate proximal, the petals absent, the roots septate; leaves sessile to petiolate, the blades with transverse markings; inflorescence a raceme or panicle, of 1-several whorls; bracts connate at least ¼ their total length; stamens 7-30; the pistils to a thousand or more, spirally arranged; fruit an achene, often winged. A small, mostly New World aquatic genus of about 30 species. With the exception of *Sagittaria cuneata*, our species are poorly collected or very infrequent in the state. *Sagittaria graminea* Michaux has been reported from Collin County, but the specimen in question belongs to *S. demersa*.


1 All leaves linear to oblong, not cordate, hastate, or sagittate ................................................................. S. demersa

1 At least some leaf blades cordate, hastate, or sagittate

2 Sepals of pistillate/fruiting heads spreading to recurved, not enclosing the head........................................... S. montevidensis

2 Sepals of pistillate/fruiting heads spreading to recurved, enclosing the head

3 Bracts distinct or connate much less than ⅛ their total length ............................................................... S. brevirostra

3 Bracts connate at least ⅛ their total length

4 Beak of the achene projecting horizontally, 1-2 mm long ........................................................................... S. latifolia

4 Beak of the achene erect or recurved, to 0.6 mm long

5 Emergent plants with recurved petals and linear to sagittate blades; basal lobes equal to or shorter than the remainder of the blade; submersed leaves lanceolate, phyllodial; floating blades cordate to sagittate. ......................................................... S. cuneata

5 Emergent plants with ascending to erect petals and sagittate blades; basal lobes longer than the remainder of the blade; submersed and floating leaves absent. ................................................................. S. longiloba

**Sagittaria brevirostra** Mackenzie & Bush [short-beaked] [Sagittaria engelmanniana J.G. Smith subsp. brevirostra (Mackenzie & Bush) Bogin]. Perennial herbs to 70 cm tall, lacking rhizomes, stolons and corms present; leaves emergent, the petiole to 35 cm long; blades sagittate, 5-20 cm long, 2-8 cm wide, the basal lobes equal to or less than the remainder of the blade; inflorescence of 5-12 whorls, the bracts distinct or connate less than ⅛ their total length and 1-4 cm long; flowers to 3.5 cm diam; sepals reflexed to spreading, not enclosing the flower; fruiting heads 1-3 cm diam; achenes with a lateral beak 0.5-1.7 mm long. ● Shallow water of ponds, lakes, and marshy ground; not known from New Mexico, but to be found in the northeast region.

**Sagittaria cuneata** Sheldon [wedge-shaped] [Sagittaria arifolia Nuttall]. Perennial herbs to 100 cm tall, lacking rhizomes and stolons, corms present; leaves submersed, floating, and emergent; submersed leaves phyllodial, 5-40 cm long; floating leaves petiolate, the blades mostly cordate to sagittate, 7-9 cm long, 3-4 cm wide; emergent leaves with petals recurved, 3-45 cm long, the blades linear to sagittate, 3-15 cm long, 2-10 cm wide, the basal lobes shorter than the remainder of the blade; inflorescences of 2-10 whorls, the bracts connate more than ⅛ their total length, 7-40 mm long, the fruiting pedicles ascending; flowers to 2.5 cm diam; sepals recurved, not enclosing the flower; fruiting heads 1-1.5 cm diam; achenes with erect lateral beaks less than 0.5 mm long. ● Muddy shores and river banks, ditches, pastures. § This is the most common *Sagittaria* in the state, and can be highly variable.

**Sagittaria demersa** J.G. Small [submerged] [Sagittaria graminea of NM reports]. Annual herbs to 60 cm tall, lacking rhizomes, stolons and corms present; leaves submersed, phyllodial (lacking a blade), 12-50 cm long, to 1 cm wide; inflorescences of 2-7 whorls, floating or emergent, the bracts connate more than ⅛ their total length, 1-2 mm long; fruiting pedicles spreading to reflexed; flowers 2-5 cm diam; sepals spreading in the stamine flowers, erect to spreading in pistillate flowers and often enclosing the flower head; fruiting heads less than 1 cm diam; achenes with a lateral erect beak about 1 mm long. ● Margins of lakes and ponds in the northern plains and foothills; known from few collections, otherwise known only from central Mexico.
**Sagittaria latifolia** Willdenow [broad-leaved]. Perennial herbs to 45 cm tall, lacking rhizomes, with stolons and corms; leaves emergent, the petioles 6-50 cm long, the blades sagittate, 2-30 cm long, to 17 cm wide, the basal lobes equal to or less than the remainder of the blade; inflorescences mostly racemose, of 3-9 whorls, the bracts connate more than ¼ their total length, 3-8 mm long; flowers to 4 cm diam; sepals recurved to spreading, not enclosing the flower; fruiting heads 1-2 cm diam; achenes with a lateral horizontal beak 1-2 mm long. ●Margins of lakes and ponds.

**Sagittaria longiloba** Engelmann ex J.G. Smith [with long lobes] [Sagittaria greggii J.G. Smith]. Perennial herbs to 100 cm tall, lacking rhizomes, stolons and corms present; leaves emergent, the petioles 25-60 cm long, the blades sagittate, 11-26 cm long, 1-15 cm wide, the basal lobes longer than the remainder of the blade; inflorescences mostly racemose, of 5-17 whorls, the bracts connate more than ¼ their total length, 7-15 mm long, the fruiting pedicels spreading; flowers to 3 cm diam; sepals recurved to spreading, not enclosing the flower; fruiting heads 1-1.5 cm diam; achenes with an erect lateral beak to 0.6 mm long. ●Margins of lakes and ponds, presumably on the eastern plains. ●Reported by various workers, and present in Texas just east of the state line, but specimens from New Mexico are unknown.

**Sagittaria montevidensis** Chamisso & Schlectendal [of Montevideo, Uruguay]. Annual to perennial herbs, to 1 m tall, with rhizomes and corms, stolons absent; leaves submersed and emergent; submersed leaves sessile, the blades linear; emergent leaves petiolate, the petioles 20-50 cm long, the blades hastate to sagittate, 3-18 cm long, 1-20 cm wide; inflorescence of 1-15 whorls, floating or emergent, the bracts distinct, 4-30 mm long; flowers 2-5 cm diam; sepals spreading in the staminate flowers, erect and enclosing the flower in pistillate flowers; fruiting heads 1-2 cm diam; achenes with a lateral horizontal beak 0.4-1 mm long. ●Mud flats of lakes and streams. ●Our plants belong to subsp. calycina (Engelmann) Bogin [calyx-like] [Sagittaria calycina Engelmann, Lophotocarpus calycinus (Engelmann) J.G. Smith]; the typical subspecies is native to South America.
**Amaryllidaceae** *Onion Family* [2/13/14]

Perennial herbs from bulbs, with or without an onion-like odor; leaves simple, alternate, basal, mostly closed-sheathing, parallel-veined; flowers bisexual, actinomorphic, terminal on a scape in an umbellate inflorescence (actually a contracted elicotid cyme), subtended by a few membranous spathe-like bracts; individual flowers not associated with bracts; perianth of 6 petaloid tepals, sometimes with a corona; stamens mostly 6, distinct to connate; pistil single, superior, of 3 carpels, the style single; fruit a capsule. *A* family of about 13 genera, widely distributed in temperate to tropical regions of the world, and includes important seasoning plants, such as onion, garlic, leek, and chives (all in the genus *Allium*). *Allium* and relatives were traditionally placed in a large and polyphyletic Liliaceae, and are currently sometimes combined with the Amaryllidaceae, but the smaller families of the Asparagales (such as Amaryllidaceae), as applied herein, remain monophyletic (Judd et al. 2016).

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**1 Plants smelling of onion; tepals white, pink, reddish, to pale lavender.** Allium

**1 Plants not smelling of onion; tepals white, cream-colored, to pale yellow.** Nothoscordum

**Allium** [the classical Latin name for garlic] *Onion* [12].

Contributed by Robert C. Sivinski

Perennial, with an onion or garlic-like odor from crushed leaves; scapose from bulbs that annually clone by lateral division, or terminate short/thick or long/slimer rhizomes; leaves linear, flat or concave-convex (channeled); inflorescence a terminal, involucrate umbel; involucral bracts dry and membranous, one to several nerved; tepals 6, distinct, all petaloid; stamens 6, ovary 3-lobed, sometimes crest on each carpel. All species are edible without worry of misidentifying the genus. If the crushed leaves smell like onion or garlic and the plant has an umbellate inflorescence, it is an *Allium* and the bulbs can be eaten. The species of *Allium* are often misidentified. Digging up a bulb is necessary to view the bulb coat and look for rhizomes. *Allium brevistylum* S. Watson has been reported in the state from misidentified Sierra Blanca specimens of *Allium gooddingii* M. Ownbey.

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**1 Umbel erect; perianth segments acute or acuminate; stamens shorter than the perianth segments.**

**2 Bracts of the involucre mostly 1-nerved; spring or summer blooming.**

**3 Ovary and capsule conspicuously crested with 3 pairs of short, flat projections; leaves usually 2 per scape; western and central New Mexico.** Allium przewalskii A. var. przewalskii

**3 Ovary and capsule crestless; leaves usually 3 per scape; eastern New Mexico.** Allium przewalskii A. var. przewalskii

**4 Perianth spreading; epidermal cells of inner bulb coats (under outer periculum) intricately contorted; portions of outer bulb coat fused into irregular, solid pieces except along the ragged top and bottom edges of the bulb; spring blooming.** Allium drummondii

**4 Perianth urceolate; epidermal cells of the innermost bulb coats rectangular and vertically elongate; entire outer bulb coat a reticulate fabric of coarse fibers with open interstices; spring or summer blooming.** Allium textile

**5 Leaves usually 2 per scape; spring blooming.** Allium perfoliatum

**5 Leaves usually 3 or more per scape; summer blooming.** Allium georyi

**1 Outer bulb coat with fibers (or with a few thin, parallel fibers in *A. gooddingii*), never densely fibrous reticulate; with or without rhizomes.**

**6 Bulbs attached to stout, dark, iris-like rhizomes; leaves flat, strap-shaped, 5-10 mm wide.** Allium geyeri

**6 Bulbs with or without rhizomes, if rhizomes present, then slender and pale; leaves linear-channeled or broadly U-shaped in cross section, usually less than 5 mm wide (occasionally flat and more than 5 mm wide in *A. cernuum*).

**7 Umbel nodding from a decurved bend in the scape below the involucral bracts; tepals obtuse; stamens exserted from corolla.** Allium textile

**7 Umbel erect; perianth segments acute or acuminate; stamens shorter than the perianth segments.**

**8 Inner whorl of perianth segments long-acuminate with recurved tips, the margins minutely serrulate-dentate; outer segments similar, but conspicuously broader and usually entire; outer bulb coat cells relatively square with thick walls (waffle-like).** Allium drueckei

**8 Inner and outer whorls of perianth segments entire and not conspicuously wider or narrower; other characters never combined as above.**

**9 Ovary and capsule crested.**

**10 Scape usually less than 10 cm tall; perianth 8-14 mm long; rhizomes absent; outer bulb coats dark brown, the cells elongating vertically.** Allium bigelowii

**10 Scape taller (10-30 cm); perianth segments 6-10 mm long; slender rhizomes often present at base of bulb; outer bulb coats grayish, the cells elongating horizontally.** Allium bisceptrum

**9 Ovary and capsule not crested.**

**11 Bulb subspherical, often (not always) proliferating from the base by slender, scaled rhizomes; corolla campanulate-spreading; tepals white (often drying pinkish) with a dark red-purple midrib on the outer surface; anthers pink-purple (drying brown).** Allium rhizomatum

**11 Bulb ovoid, without rhizomes; corolla spreading-rotate; tepals white to pale pink (drying pink), outer midrib absent or vague; anthers yellow.** Allium kunthii

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*Allium acuminatum* Hooker [a long tapering point]. Bulb nearly spherical, 0.8-1.5 × 0.9-1.5 cm, without rhizomes; outer bulb coat membranous, without fibers, brownish or grayish, cells relatively square with thick walls; leaves 2-3 per bulb, subterete or channeled, 1-3 mm wide, mostly withered by anthesis, scape to 8-25 cm tall; involucral bracts 3-7 nerved; umbel 10-30 flowered; perianth narrowly campanulate; tepals reddish purple with a slightly darker midrib, lanceolate with acuminate recurving tips, inner tepals smaller than outer, margins finely denticate; ovary crested with...
Monocotyledons - Alliaceae

3 processes. ●Rocky, north-facing slopes in arid southwestern hills and woodlands in northwestern canyons near the Colorado border; flowering spring or early summer. ●The purple flowers with recurved tepal tips cannot be confused with any other early flowering onion.

**Allium bigelowii** S. Watson [for John Milton Bigelow (1804-1878), physician-botanist on early western surveys]. Bulb globose, 1-1.5 × 1-2.5 cm, without rhizomes; outer bulb coat membranous, without fibers, dark brown, cells vertically elongate-rectangular; leaves 2 per bulb, channelled, 2-4 mm wide, usually coiling – especially at the tips; scape 5-12 cm tall; involucral bracts 2-4 several; umbel hemispheric, loose to ± compact, 10-25-flowered; perianth campanulate; tepals lanceolate, 10-14 mm long, red to bright pink on the midrubs and tips of the inner tepals, otherwise white; ovary crested with 6 prominent, flat processes. ●Desert scrub up to juniper savanna in the hills of the southwestern region; flowering in the spring. ●Arguably our most beautiful wild onion with rather large umbels of pink and white flowers on short scopes.

**Allium cernuum** for homes at higher elevations. Its pink nodding flowers with exserted yellow stamens cannot be mistaken for any other species.

**Allium deserticola** S. Watson [two species – the carpel crests] [Allium deserticola S. Watson var. palmeri (S. Watson) Cronquist, Allium palmeri S. Watson]. Bulb ovoid, 1-1.8 × 0.7-1.5 cm with filiform rhizomes from the base; outer bulb coat membranous, without fibers, brown or gray; leaves channelled and horizontally elongating; leaves 2-4 per bulb, channelled, 2-8 mm wide, channelled or flattened; scape 10-30 cm tall; involucral bracts 3-4 several; umbel globose, 10-30-flowered; pedicels loosely spreading; becoming deflexed with age and in fruit; perianth campanulate-spreading; tepals lanceolate, 7-10 mm long, pink or lavender; ovary crested with 6 prominent, flat processes. ●Open forests, meadows and aspen groves in the mountains of the western region; flowering in early summer. ●Uncommon and rarely observed in the state.

**Allium cernuum** Roth [nodding] NODDING ONION [Allium cernuum Roth var. neomexicanum (Rydberg) MacBride, Allium neomexicanum Rydberg, Allium recurvatum Rydberg]. Bulbs clustered, eliptic-elongate, 2-5 × 0.8-1.5 cm; outer bulb coat membranous, without fibers, brownish or grayish; inner bulb coats and upper bulb sheaths sometimes reddish; leaves persistent, green in early fruit, 3-4 per bulb, channelled or flattened, 3-8 mm wide; scape to 30 cm tall, abruptly recurved at the apex just below the umbel; involucral bracts 2-3 several; umbel cernuous, loose, 8-30-flowered, hemispheric; pedicels usually recurving in flower and becoming more erect in fruit; perianth campanulate; tepals 4-6 mm long, ± obtuse and incurved at the apex, pink or rarely white, midribs indistinct; stamens and style exserted; ovary crested with 6 prominent, flat processes. ●Mountain meadows and rocky benches in woodlands and forests on all mountain ranges throughout the state; flowering in the summer. ●Our most common montane onion and an excellent garden addition for higher elevations. Its pink nodding flowers with exserted yellow stamens cannot be mistaken for any other species. §

**Allium drummondii** Regel [for Thomas Drummond (1790-1831) Scottish botanical explorer, 1865] [Allium helleri Small, Allium nuttalii S. Watson]. Bulb ovoid, 1-2 × 0.6-1.8 cm, without rhizomes; outer bulb coat coarsely fibrous, light reddish-brown, some areas fused into solid pieces that often have no openings between fibers except at the ragged edges around the top and bottom of the bulb; inner bulb coat cells intricately contorted; leaves 2-3 per bulb, channelled, 1-3 mm wide; scape 10-25 cm tall; involucral bracts 1-2 several; umbel hemispheric, 10-20-flowered; perianth campanulate-spreading to rotate; tepals lanceolate, 6-9 mm long, white or rarely pink, with a darker purplish outer midrib; ovary without crests. ●Woodlands on limestone hills down to desert scrub and shortgrass prairie in the eastern one-third of the state; flowering in the spring. ●The unique outer bulb coat is similar to coconut husk, while the fibrous bulb coats of other species are more like coarse fabric. §

**Allium geyeri** S. Watson [for Charles A. Geyer (1809-1853) German botanist and plant hunter]. Bulb ovoid or more elongate, 1-2.5 × 0.8-2 cm, without rhizomes; outer bulb coat coarsely fibrous, gray or brown, reticulate, cells rather coarse-meshed; Leaves usually 3 or more per bulb, channelled, rarely flat, 1-3 mm wide; scape 10-35 cm tall; involucral bracts usually 1-nerved; umbel 10-25-flowered, tightly packed with short pedicles to subcapitate; perianth urceolate; tepals lanceolate-glabrescent, 4-8 mm long, white or pink without prominent midribs; ovary without crests. ●Easily distinguished from our other species with fibrous bulb coats by its summer blooming and montane habitats. There are two variants isolated by habitat and reproduction.

A Umbel wholly floriferous; flowers fertile…var. **geyeri** [Allium funiculorum A. Nelson]. ●Widespread on rocky slopes from woodlands up to subalpine meadows in all mountain ranges. §

A Most umbel flowers replaced by bulblets; any remaining flowers are sterile…var. **tenerum** M.E. Jones [tender] [Allium rubrum Osterhout, Allium sabulicola Regel]. ●Most common in wet mountain meadows, eastern slopes, and streams sides. ●Usually taller and more robust than the fertile variety.

**Allium gooddingii** M. Ownbey [for Leslie Newton Goodding (1873-1946), western botanist and collector]. Bulbs clustered on thick, iris-like rhizome; outer bulb coat brown, membranous or thinly striate fibrous, not coarsely fibrous-reticulate, leaves persistent in flower and early fruit, 3-6 per bulb, flat, 5-10 mm wide; scape 25-45 cm tall; involucral bracts 2-5-nerved; umbel erect, loose, 8-23-flowered; perianth campanulate; tepals lanceolate-elliptic, 8-10 mm long, magenta; without a distinct midrib; ovary without crests. ●Stream sides, damp forest understory and rarely in subalpine meadows in the Mogollon, Sierra Blanca and Chuska mountains; flowering in the summer. ●This rare onion is listed as endangered by the State of New Mexico. Distinguished by its high elevation habitats, broad leaves and magenta flowers.

**Allium kunthii** G. Don. [for Carl Sigismund Kunth (1788-1850), German botanist with an interest in New World plants] [Allium scapatum Bentham]. Bulb ovoid or elliptic, 1.5-4 × 1-2.1-5 cm, without rhizomes, often nearly horizontal in the soil; outer bulb coat membranous, without fibers, brownish or grayish; leaves persistent, green at anthesis, 2-5 per bulb, flat or channelled, 2-3 mm wide; scape 15-30 cm tall; involucral bracts 2-5 several; umbel erect, conic to subcapitate, 3-4-5 or 5-20-flowered; pedicels 8-16 mm; perianth stellate-spreading to rotate; tepals elliptic-lanceolate, 3-8 mm long, white or pale pink, midribs absent or vague; anthers yellow; ovary without crests. ●Desert scrub up to pine-oak woodland on limestone soils in the ridges and mountains of the southern region; flowering in the late summer. ●Rare in the southwestern region where it is often confused with **Allium rhizomatum**.

**Allium macropetalum** Rydberg [large-petalost]. LARGE-FLOWER ONION [Allium deserticola (M.E. Jones) Wooton & Standley]. Bulb ovoid, 1.5-2.5 × 1-2 cm; outer bulb coats brown, reticulate, coarse-meshed, fibrous; leaves 2-3 per bulb, channelled, 2-3 mm wide; scape 5-20 cm tall; involucral bracts 2-3 several; umbel erect; loose to ± compact, 8-20-flowered; perianth campanulate to nearly urceolate with outward spreading tepal tips; tepals lanceolate, 8-12 mm long, white to pink with purplish midribs; ovary crested with 6 prominent, flat processes. ●Desert scrub up to juniper savanna and sagebrush in the central and western regions; flowering in the spring. ●Our most common and abundant spring-blooming onion on arid hills and grasslands in the western two-thirds of the state. Its range does not overlap with **Allium drummondii** or **Allium perdulce**, which are often misidentified as this species. §

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**Allium per dulce** Fraser  ([thoroughly sweet]). Bulb ovoid, 1.2-2.5 × 1.2-2.8 cm; outer bulb coats thick, dark brown, reticulate, coarse-meshed, fibrous; leaves 2 per bulb, channelled, 2-3 mm wide; scape 5-18 cm tall; involucral bracts 2- several nerved; umbel erect, loose to ± compact, 5-20-flowered; perianth urceolate with outward spreading tepal tips; tepals lanceolate, 6-10 mm long, white to pink with dark purple midribs; ovary without crests. ● Desert scrub and shortgrass prairie up to juniper savanna in the eastern region; flowering in the spring. ● We have only var. **per dulce.**

**Allium rhizomatum** Wooton & Standley  [with rhizomes]  [Allium glandulosum of NM reports]. Bulb globose, 1.2-1.22 cm, often with a slender, scaly rhizome up to 4 cm long; outer bulb coat membranous, without fibers, brownish or grayish; leaves persistent, green at anthesis, 2-4 per bulb, flat, 2-4 mm wide; scape 5-20 cm tall; involucral bracts 2-3 nerved; umbel globose to hemispheric, loose, 5-15-flowered; pedicels 10-40 mm; perianth spreading to campanulate; tepals lanceolate, acute to acuminate, 6-9 mm long, white with purple outer midribs; anthers pink or purple; ovary without crests. ● Oak woodland, pinyon-juniper woodland or open pine forest in the southwestern region, usually on igneous soils; flowering in late summer. ● Some populations (e.g. Animas and Peloncillo mountains) lack rhizomes when flowering. In these cases it is distinguished from *Allium kunthii* by its (usually) longer, thicker pedicles, more campanulate corolla with dark purplish outer midribs on the tepals, and purplish anthers.

**Allium textile** A. Nelson & Macbride  [woven]  [Allium reticulatum Fraser]. Bulb ovoid, 1.2-2.5 × 1-2 cm; outer bulb coats gray or brown, reticulate, fine-meshed, fibrous; leaves 2-3 per bulb, channelled, 2-3 mm wide; scape 5-20 cm tall; involucral bracts 1-nerved; umbel erect, loose to ± compact, 15-30-flowered; perianth urceolate with outward spreading tepal tips; tepals lanceolate, 5-7 mm long, white or rarely pink, with reddish midribs; ovary ± conspicuously crested 6 small, flat processes. ● Woodland, juniper savanna and sagebrush in the northern region; flowering in the spring. ● Uncommon and similar to *Allium macropetalum* from which it differs by its less prominent ovary crests and involucre bracts with a single nerve.

**Nothoscordum** [false garlic] CROW-POISON [1].

Perennial, scapose herbs, from bulbs, not smelling like onion or garlic; leaves basal, present at anthesis, sheathing, filiform to linear; inflorescences umbel-like, subtended by a 2 bracts; flowers stiffly funnel-form, creamy white to pale yellow; tepals 6, similar, petaloid, slightly connate to nearly distinct, the midveins darkened; fruit a capsule. ● A small genus of about 19 species, native to the Western Hemisphere. Plants have been reported as mildly toxic when eaten in large amounts, or not toxic at all; the wise will abstain. They are similar in appearance to our native species of onion (*Allium*), but lack a garlic or onion smell and sometimes have pale yellowish flowers.

**Nothoscordum bivalve** (Linnaeus) Britton  [2-valved]  [Nothoscordum texanum M.E. Jones, Ornithogalum bivalve Linnaeus]. Plants 15-60 cm tall; bulbs globose, about 1 cm diam; scapes mostly solitary; leaves few, linear, the sheaths surrounding the neck of the bulb, to 30 cm long, 1-4 mm wide; umbels 3-8-flowered, 1-3 cm diam, the subtending bracts persistent and 1-2 cm long; flowers not fragrant; tepals whitish to cream to pale yellow, 8-14 mm long, the midveins reddish or purplish, the apices acute to acuminate; anthers yellow; capsules subglobose, 6-8 mm diam. ● Moist ditch banks, fields, roadsides, plains in the southern region; not common. §

**AMARYLLIDACEAE  AMARYLLIS FAMILY** [1/22]

Perennial herbs from bulbs, without an onion-like odor; leaves simple, alternate, basal (ours) or cauline, mostly closed-sheathing, parallel-veined, entire; stipules lacking; flowers bisexual, actinomorphic, terminal on a scape in an umbel-like inflorescence (actually a contracted helicoidal cyme), subtended by a few membranous spathe-like bracts; individual flowers each associated with a filiform bract; perianth of 6 petaloid tepals, sometimes with a corona; stamens mostly 6, sometimes united; pistil single, inferior, of 3 carpels, the style single; fruit a capsule (ours) or rarely a berry, the seeds sometimes winged. ● Worldwide in distribution, this family of about 60 genera includes several notable ornamentals (*Amaryllis, Crinum, and Narcissus*). The family is sometimes expanded to include Alliaceae, but the segregate families of the Asparagales (such as Alliaceae), as applied herein, remain monophyletic.


Scapose perennial herbs from bulbs; leaves with overlapping sheath bases, the blades linear, scape hollow; inflorescence mostly 1-flowered, with a spathé; perianth funneliform to salverform; tepals connate basally into a tube, subequal; fruit a capsule, subglobose. ● A New World genus of about 70 species.

**Zephyranthes candida** (Linley) Herbert  [white] PERUVIAN SWAMP LILY  [(Amaryllis candida Lindley). Leaf blades glossy deep green, to 3 mm wide; scape 2-4 cm long; flowered erect, subtrolate, 3-4.5 cm long, white; perianth tube green, 1-4 mm long, less than ½ the perianth length; stigma capitulate. ● Wet ground of ditches and canals; recently found in Doña Ana County; native to South America.

**Zephyranthes longifolia** Hemsley  [long-leaved]  [(Atamasco longifolia) (Hemsley) Cockerell, Habranthus longifolius (Hemsley)] Flagg, Smith & Meeyer]. Leaf blades dull green, about 1 mm wide; spathes 2-3 cm long; flowers erect to slightly inclined, funnel-form, 2-3 cm long, yellow; perianth tube green, 2-6 mm long, no more than ¼ the perianth length; stigma 3-fid. ● Sandy or gravelly soils of plains and flats in the southeastern half of the state. ● A report of *Zephyranthes chlorosolen* (Herbert) D. Dietrich belongs here; that species is not yet known from New Mexico. §
Monocotyledonous Plants - Amaryllidaceae

Allium cernuum

April 16
Hondo Valley

July 16
Sandia Mts.

Allium geyeri

July 17
Santa Fe
Ski Basin

Allium drummondii

May 18
Bloomfield

Arid hills and plains

May 18
Los Medanos Sike
Carlsbad

Allium
macro-petalum

Nothoscordum bivalve

Odorless

Zephyranthes longifolia

Pink to white

Mountain meadows

Arid hills and plains

Mountain meadows
**ARACEAE ARUM and DUCKWEED FAMILY**

[Lehmann]

**[Description applies to subfamily Lemnoideae; we have no other Araceae in New Mexico]** Floating or submerged aquatic perennial herbs, the stem flattened and thallos- or leaf-like and termed a frond, with or without roots; flowers mostly bisexual, 1 per frond, borne in a pouch, lacking a perianth; stamens 3; pistil single, superior, of a single carpel; fruit a utricle With 119 genera, 6450 species. Based on numerous phylogenetic and molecular studies (see Judd et al., 2016), the former Lehmannaceae is recognized as subfamily Lemnoideae of the Araceae; the spathes typical of Araceae are highly reduced and modified or absent in this subfamily. Our plants are among the smallest and most reduced of the flowering plants, and interpretation of the morphology can be difficult and controversial.


1 Each body segment (thallus) with several roots hanging down into the water ................................................................. **Lemna**

1 Each body segment (thallus) with 0-1 roots hanging down into the water ................................................................. **Lemna**

**Lemna** [marsh or pond] DUCKWEED [9].

Roots 1 per frond; fronds floating or submersed, solitary or in groups or chains, flat or gibbous, entire or minutely toothed, with 2 reproductive pouches, with 1-7 pellucidating veins; turions generally absent, sometimes present in **L. turionifera**. A small genus of 13 species, found throughout the world. Several species are used as model organisms in community ecology, toxicology, and biology, and as a source of biofuels. Large growths can sometimes invade and congest waterways. We have in New Mexico all of the species that occur in North America, in quiet waters of ponds and lakes, and slow-moving streams, ditches, and the like. The specific epithets **minuta**, **minuta**, **obscura**, and **perpusilla** are anamorphic attempts to the diminutive size of these plants.


[Key adapted from Landolt 2000]

1 Thallus submersed (except when flowering or fruiting), the margins denticulate at the ends ................................................................. **L. trisulca**

1 Thallus floating, the margins entire

2 Thallus with a single vein

3 Vein prominent, longer than the extension of air spaces, or running through at least ¼ the distance between node and apex, .............. **L. valdiviana**

3 Vein sometimes indistinct, shorter than the extension of air spaces, not longer than 2/3 the distance between node and apex

2 Thallus with 3-5 veins

4 Root sheath winged at the base; root tip mostly sharp pointed; roots to 3 cm long; thallus lacking red color or spots, mostly with a single papilla near the apex on the upper surface

5 Root sheath wing 2-3 times longer than wide; seeds remaining within the fruit wall after ripening, with 35-70 indistinct ribs ................................................................. **L. gibba**

5 Root sheath wing 1-2.5 times longer than wide; seeds falling from the fruit wall after ripening, with 8-26 distinct ribs ................................................................. **L. aquinoctialis**

4 Root sheath not winged; root tip mostly rounded; roots often longer than 3 cm; thallus often with reddish tinge or spots, or without papilla

6 Largest air spaces more than 0.3 mm long; if red-colored on lower surface, then coloration beginning from the margin; ovary with 2-7 ovules ................................................................. **L. gibba**

6 Largest air spaces 0.3 mm or less long; if red-colored, then coloration beginning from the attachment point of root; ovary with a single ovule

7 Thallus not reddish below (or at least much less than above); greatest distance between the lateral veins near or above the middle ................................................................. **L. minor**

7 Thallus often reddish below, and more so than above; greatest distance between the lateral veins near or below the middle

8 Thallus flat, with distinctly gibbous papillae on the midline of the upper surface ................................................................. **L. turionifera**

8 Thallus often gibbous, with distinctly papillae above node and near the apex on the upper surface, but not between the node and the apex ................................................................. **L. obscura**

**Lemna aquinoctialis** Welwitsch [from the quater] **Lemna perpusilla** Torrey var. trineris Austin. Roots to 3 cm long; fronds floating, few, coherent in groups, ovate-lanceolate, flat, 1-6 mm long, entire, with 3 veins, green above and below, not reddish; turions absent. **Meso-** to eutrophic quiet water, wet meadows and marshes, rivers, creeks; northern and western mountains. This has been either subsumed within or recognized as a variety of **Lemna perpusilla**; the specific epithets **obscura** and **perpusilla** are anamorphic attempts at the diminutive size of these plants.

**Lemna gibba** Linnaeus [swollen]. Roots to 15 cm long; fronds floating, 1-5, coherent in groups, obovate, often gibbous, 1-8 mm long, entire, with mostly 4-5 veins, sometimes red below or with red spots above; turions generally absent. **Meso-** to eutrophic quiet water, streams, stock tanks; western mountains, foothills, and plains.

**Lemna minor** Linnaeus [smaller]. Roots to 15 cm long; fronds floating, 1-5 or more, coherent in groups, ovate, scarcely gibbous, flat, 1-8 mm long, entire, with 3 veins, rarely reddish below, sometimes reddish above; turions absent. **Meso-** to eutrophic quiet water, ponds, wetlands, ponds, creeks, ditches, marshy ground, scattered sites in the mountains.

**Lemna minima** Kunth [minute] **Lemna minima** Philippi. Roots to 15 cm long; fronds floating, 1-5, coherent in groups, obovate, flat to gibbous, 1-4 mm long, entire, with 3 veins, often reddish below, sometimes with red spots above; turions absent. **Meso-** to eutrophic quiet water, lakes, wetlands, ponds, creeks, ditches, marshy ground, scattered sites in the mountains.
**Monocotyledonous Plants - Asparagaceae**

**Asparagus**

- **Asparagus officinalis** [Linnaeus]. Erect herbs, 1-2 m or more tall, the aerial stems annual, highly branched or singly; perianth of 6 petaloid tepals in 2 whorls; stamens 6, borne on the tepals; pistil single, superior, of 3 carpels, the style single; fruit a spherical, fleshy berry, with 1-6 seeds.

**Asphodelus**

- **Asphodelus fistulosus** [Linnaeus]. Annual to short-lived perennial herbs, 20-70 cm tall; leaves 5-35 cm long, the margins denticulate distally, mostly with 3 veins; flowers rare. This is a very large genus of up to 300 species (depending upon the circumscription), and the source of our widely cultivated and eaten asparagus; other species are Mesotrophic quiet waters rich in calcium. This is the only species with commonly submersed fronds (except when flowering or fruiting).

**Lemna**

- **Lemna trisulca** (Linnaeus) Schleiden [many roots] [Lemna trisulca Linnaeus]. Roots to 2-3 mm diam. Fronds floating, 1-4, coherent in groups, obovate-obovate, flat, 1-4 mm long, entire, with 3 veins, reddish above and below; turions absent. ●Meso- to eutrophic quiet water, small ponds. ●The reports for Cibola and Grant counties are from Correll & Correll (1972).

- **Lemna perpusilla** Torrey [tiny]. Roots to 3.5 cm long; fronds floating, 1-4, coherent in groups, ovate-obovate, flat, 1-4 mm long, entire, with 3 veins, green above and below, not reddish; turions absent. ●Meso- to eutrophic quiet water, known only from San Juan County.

- **Lemna trisulca** Linnaeus [3-grooved]. Roots to 3 cm long; fronds submersed except when flowering or fruiting, 3-50, coherent in groups or chains, narrowly ovate, flat, 3-15 mm long, the bases suddenly narrowed to a green stalk 2-20 mm long, the margins denticulate distally, mostly with 3 veins; flowers rare. ●Mesotrophic quiet waters rich in calcium. This is the only species with commonly submersed fronds (except when flowering or fruiting).

**Sporodela** [evident threads] DUCKMEAT [1].

- **Sporodela polyrhiza** (Linnaeus) Schleiden [many roots] [Sporodela polyrhiza Linnaeus]. Roots 7-21, to 3 cm long; fronds floating, 2-10 mm long, sometimes with a red spot in the center above, with 7-16 or more veins; rootless turions sometimes present, brownish, 1-2 mm diam; flowers rare. ●Quiet waters of ponds and lakes; known only from a few collections.

**ASPARAGACEAE** **ASPARAGUS FAMILY** [1/1/1]

Parennial shrubs and herbs from fleshy tuberous rhizomes; leaves alternate, spiral, reduced to scale-like and papery, generally with a spiny spur at the base; stipules lacking; flowers bisexual, actinomorphic, in racemes or umbels or singly; perianth of 6 petaloid tepals in 2 whorls; stamens 6, borne on the tepals; pistil single, superior, of 3 carpels, the style single; fruit a spherical, fleshy berry, with 1-6 seeds. ●Members of this family were traditionally placed in a large and polyphyletic Liliaceae.

**Spirodela**

- **Spirodela polyrhiza** (Linnaeus) Schleiden [many roots] [Lemna polyrhiza Linnaeus]. Roots to 1.5 cm long; fronds floating or rarely submersed, 1-2, coherent in groups, ovate to lanceolate, flat, 1-5 mm long, entire, with 1 vein, green above and below; turions absent. ●Mesotrophic quiet waters, creeks, ponds, ditches, mostly western mountains, but expected elsewhere.

**Lemna**

- **Lemna trisulca** (Linnaeus) Schleiden [many roots] [Lemna trisulca Linnaeus]. Roots to 1-5 cm long; fronds to 2-10 mm long, sometimes with a red spot in the center above, with 7-16 or more veins; rootless turions sometimes present, brownish, 1-2 mm diam; flowers rare. ●Quiet waters of ponds and lakes; known only from a few collections.

**ASPHODELACEAE** **ASPHODEL FAMILY** [1/1/1]

Parennial herbs (ours) or rarely pachycaulous trees, with succulent roots; leaves simple, alternate, often in rosettes, parallel-veined, often succulent; flowers bisexual, actinomorphic, in racemes or panicles; perianth of 6 tepals in 2 whorls; stamens 6; pistil single, superior, of 3 carpels, the style single; fruit a capsule or (rarely) a berry; seeds with a fleshy covering. ●The members of this family were traditionally placed in a large and polyphyletic Liliaceae; Asphodelaceae is sometimes broadened to include the Hemerocallidaceae.

**Asphodelus** [the flower of Hades and the dead] ONIONWEED [1].

Annual to perennial herbs, from swollen rhizomes; leaves basal, the blades linear, entire, flat or terete, sheathing; inflorescences scapose, the scape hollow, paniculate to racemose, many-flowered, with persistent bracts; flowers small but showy, borne on an articulated pedicel; tepals 6, each with a single prominent midvein, distinctly to scarcely connate basally; filaments expanded at the base; capsules globose, hard, with 3 or 6 black seeds.

- **Asphodelus fistulosus** (Linnaeus) Schleiden [many roots] [Asphodelus fistulosus Linnaeus]. Roots to 1.5 cm long; fronds to 2-10 mm long, sometimes with a red spot in the center above, with 7-16 or more veins; rootless turions sometimes present, brownish, 1-2 mm diam; flowers rare. ●Quiet waters of ponds and lakes; known only from a few collections.

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Monocotyledonous Plants - Commelinaceae

**BROMELIACEAE** **PINEAPPLE FAMILY** [1/1]

Mostly epiphytic herbs, with short stems, with hairs modified as water-absorbing scales; leaves alternate, commonly in dense, stiff rosettes, entire or serrate, with sheathing bases, sometimes grass-like (ours); flowers actinomorphic or zygomorphic, perfect, often with brightly colored bracts; sepals 3, green; petals 3, often brightly colored; stamens 6; pistil single, superior or inferior, of 3 united carpels, the style single; fruit a berry, capsule, or multiple. ♦ About 60 genera and over 1000 species, mostly tropical to warm-temperate regions. Pineapple (*Ananas comosus*) is a member of this family; many genera provide household ornaments.

**Tillandsia** [for Elias Tillands (1640-1693), Swedish botanist] SPANISH MOSS.

Epiphytic, perennial herbs, acaulescent or with long stems; leaves evergreen, 2- to many-ranked, the bases sheathing, the blades linear to triangular or ligulate, the margins entire; inflorescences 1-many-flowered, the floral bracts conspicuous; petals distinct; fruit a capsule, the seeds with a plumel appendage. ♦ Despite being called SPANISH MOSS, the species of this genus are neither Spanish in origin nor a true moss.

**COMMELINACEAE** **DAYFLOWER FAMILY** [2/5]

Mostly perennial herbs, commonly semi-succulent with swollen nodes; leaves alternate or basal, simple, entire, closed-tubular at the base, lacking a ligule, with parallel veins; flowers actinomorphic or zygomorphic, bisexual; often borne in a spathe, lacking nectar; sepals 3, green or sometimes petaloid; petals 3, distinct, usually blue, violet, or white; stamens 6, some may be staminodes; pistil single, superior, of 3 united carpels, the style single; fruit a capsule. ♦ About 40 genera and 600-700 species worldwide. Flowers are ephemeral, lasting a day at most, often much less.

**Commelina** [for Johan (1629-1692) and his cousin Caspar (1667-1731) Commelin, Dutch botanists] DAYFLOWER [2].

Annual to perennial herbs; leaves spirally arranged or 2-ranked, the bases sheathing; inflorescences terminal, of 1-2 cymes, enclosed in subtending spathes, the spathes often filled with a mucilaginous liquid; flowers zygomorphic; sepals 3, distinct or the lower 2 connate, unequal; petals 3, distinct, the lower one often a different color than the other 2 and smaller, usually bluish or white or various other colors; stamens 3, fertile and 3 staminodes, the filaments glabrous. ♦ About 170 species, nearly worldwide, mainly tropical.

**Commelina dianthifolia Delile** [with leaves like Dianthus] **Commelina dianthifolia Delile var. filiformis** M.E. Jones, *Commelina dianthifolia Delile var. longispatha* (Torrey) G. Brashier, *Commelina linearis Bentham var. longispatha* (Torrey). Perennial herbs, unbranched or only sparsely so, with tuberous roots, the stems erect to ascending; blades linear to linear-lanceolate, 4-15 cm long, to 1 cm wide; distal cyme usually 1-flowered; spathes falcate or not, 2-8 cm long, the margins distinct and not ciliate, the apices gradually to abruptly acuminate; petals dark blue, the lower petal somewhat smaller. ♦ Widespread on rocky ground, nearly throughout the state, except for the eastern part of the counties. ♦ Plants with spathes abruptly narrowed into a long attenuate tip have been referred to var. *longispatha* (Torrey) Brashier, but there is considerable intergradation with the typical forms (Faden 2000).

**Commelina erecta** *Linnaeus* [upright] **[Commelina angustifolia Michaux, Commelina crispa Wooton, Comelina erecta Linnaeus var. argentea (Michaux) Fernald, Comelina erecta Linnaeus var. crispa (Wooton) Palmer & Steyermark, Comelina erecta Linnaeus var. decamiana Fernald].** Perennial herbs, with fleshy tufted roots, the stems erect to ascending (rarely decumbent and rooting at the nodes); leaf sheath auriculate at the summit; blades linear to lanceolate, 5-15 cm long, to 4 cm wide; distal cyme absent; spathes falcate or not, 1-4 cm long, the margins conuate basally, glabrous except for the ciliate connate portion, the apices acute to acuminate; lower petal minute and white, the upper 2 petals bluish and much larger. ♦ Numerous habitats, such as sand hills, plains, rocky slopes, ledges and outcrops, road sides, in much of the state. ♦ Plants with blades 3-15 mm wide and spathes 1-2 cm long have been called var. *angustifolia* (Michaux) Fernald; many of our plants seem to fit this, but many do not.

**Tradescantia** [for John Tradescant (1567-1638) and son, John Tradescant (1608-1662), gardeners to King Charles I] SPIDERWORT [3].

Perennial herbs; leaves spirally arranged or 2-ranked, the bases sheathing; inflorescence of umbel-like cymes subtended by leaf-like bracts, not enclosed in the bracts; flowers actinomorphic; sepals distinct; petals distinct, equal, white, pink, blue, violet; stamens 6, all fertile, the filaments glabrous or bearded (ours). ♦ About 75 species native to the New World. Grown in many parts of the world as ornamentals, hot-house plants, and indoor flowers. The common name, SPIDERWORT, comes from the cobwebby hairs attached to the filaments of many species.


**T. Wrightii**

1 Sepals glabrous
2 Petals rose to magenta or purple; leaf blades 4-10 cm long, 2-5 mm wide.......................................................... **T. Wrightii**
2 Petals bright blue; leaf blades 5-62 cm long, 4-9 mm wide (var. *scopulum*) .......................................................................................................................... **T. occidentalis**

1 Sepals pubescent, the hairs glandular or not
3 Pedicels 0.8-1 cm long; sepals 4-6 mm long; petals 9-12 mm long ................................................................. T. pinetorum

3 Pedicels 0.8-3 cm long; sepals 4-11 mm long; petals 11-16 mm long (var. occidentalis) ........................................ T. occidentalis

Tradescantia occidentalis (Britton) Smyth [western] [Tradescantia virginica Linnaeus var. occidentalis Britton]. Erect or ascending herbs, the stems to 90 cm long/tall; blades linear-lanceolate, 5-50 cm long, to 3 cm wide, glaucous, glabrous; sepals 4-11 mm long; petals blue, rose, magenta, broadly ovate, 6-16 mm long, not clawed; filaments bearded. ♦ We have two varieties:

a Sepals glabrous...var. scopulorum (Rose) Anderson & Woodson [of the Rocky Mountains] [Tradescantia scopulorum Rose]. ● Moist canyons and stream banks in the southern regions.

b Sepals pubescent, the hairs glandular or not...var. occidentalis. ● Throughout New Mexico in plains, prairies, foothills, woods, forests openings, and disturbed ground. §

Tradescantia pinetorum Greene [in pine woods] [Tradescantia tuberosa Greene]. Erect to ascending herbs, the stems sparsely branched 8-39 cm long/tall; blades linear-lanceolate, 1-10 cm long, to 1 cm wide, glaucous, glabrous; sepals frequently reddish, 4-6 mm long; petals bright blue to rose and purple, about 10 mm long, not clawed; filaments bearded. ● Moist canyons and stream banks. §

Tradescantia wrightii Rose & Bush [for Charles Wright (1811-1885), outstanding American botanical collector]. Erect to ascending herbs, the stems unbranched, 5-18 cm long/tall; blades linear-lanceolate, 4-10 cm long, to 0.5 cm wide, glaucous, glabrous; sepals 5-6 mm long, mostly glabrous; petals rose to magenta or purple, broadly ovate, not clawed, about 10 mm long; filaments bearded. ● Moist canyons in the western and southern mountains and foothills.
Grass-like herbs, cespitose or rhizomatous, with fibrous roots; culms usually triangular, occasionally round, polygonal, or rarely compressed in cross section, usually solid, occasionally hollow or separte, not jointed; leaves simple, basal, or cauline and alternate, usually 3-ranked; blades linear, parallel-veined, entire, or leaves reduced to bladeless sheaths; sheaths fused. Inflorescence composed of 1-many spikelets, these arranged in spikes, panicles, umbels, or racemes, in varying orders of complexity, sometimes compressed into a compact head; usually subtended by a leaf-like or scale-like bract; spikelets composed of 1-many florets, usually spirally arranged, occasionally 2-ranked along the axis of the spikelet (reduced to a single floret in Carex and some Kobresia); flowers small and inconspicuous, bisexual (unisexual in Carex & Kobresia), each usually subtended by a single scale, with perianth lacking or reduced to bristles and/or scales; ovary superior (in two genera, the pistillate flower/achene is partially (Kobresia) or completely (Carex) enclosed in a sac-like bract called a perigynium); stamens usually 3, exerted at anthesis; anthers basifixed; stigma 1, either 2 or 3-branched; fruit an achene, either biconev or trigonous, corresponding to the number of style branches. About 100 genera and 5000 species worldwide. Usually associated with wetlands, but some species adapted to alpine or dryland habitats.

Cyperaceae Sedge Family

Contributed by Max H. Licher and Glenn R. Rink

Grass-like herbs, cespitose or rhizomatous, with fibrous roots; culms usually triangular, occasionally round, polygonal, or rarely compressed in cross section, usually solid, occasionally hollow or separte, not jointed; leaves simple, basal, or cauline and alternate, usually 3-ranked; blades linear, parallel-veined, entire, or leaves reduced to bladeless sheaths; sheaths fused. Inflorescence composed of 1-many spikelets, these arranged in spikes, panicles, umbels, or racemes, in varying orders of complexity, sometimes compressed into a compact head; usually subtended by a leaf-like or scale-like bract; spikelets composed of 1-many florets, usually spirally arranged, occasionally 2-ranked along the axis of the spikelet (reduced to a single floret in Carex and some Kobresia); flowers small and inconspicuous, bisexual (unisexual in Carex & Kobresia), each usually subtended by a single scale, with perianth lacking or reduced to bristles and/or scales; ovary superior (in two genera, the pistillate flower/achene is partially (Kobresia) or completely (Carex) enclosed in a sac-like bract called a perigynium); stamens usually 3, exerted at anthesis; anthers basifixed; stigma 1, either 2 or 3-branched; fruit an achene, either biconev or trigonous, corresponding to the number of style branches. About 100 genera and 5000 species worldwide. Usually associated with wetlands, but some species adapted to alpine or dryland habitats.

Monocotyledonous Plants - Cyperaceae

Cyperaceae Sedge Family [13/154/156]

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Cyperus clade. Taxon 59(6):1883-1890.

Cyperaceae

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Monocotyledonous Plants - Cyperaceae

1-5, surpassing the inflorescence, spreading or erect, leaflike; spikelets ovoid to lanceoloid, composed of 25 or more florets spirally arranged along the rachilla; flowers bisexual, subtended by a scale; perianth of 3-6 bristles, stamens 3; ovary superior, style 2-3 stigma branches, base persistent; fruit an achene, biconvex to trigonous. About 15 species worldwide, 5 listed in the Flora of North America. *Bolboschoenus fluviatilis* (Torrey) Sojak was reported for the state by M&H, but no specimens are known; it is unlikely that this taxon occurs in New Mexico.


*Bolboschoenus maritimus* (Linnaeus) Palla [of the sea or sea’s edge] ALKALI BULBUSH [Scirpus maritimus Linnaeus]. Plants perennial, single to few-stemmed and colonial from stout rhizomes; culms 50-150 cm long, (13)-8 mm wide; with prominent corn-like tuberous bases; leaves basal and cauleine, with blades 2-12 mm wide; inflorescences composed of (1)-20 sessile spikelets in a terminal cluster, or with up to half of the spikelets on 1-4 rays; inflorescence bracts 1-4, surpassing the inflorescences, leaflike; spikelets ovoid to lanceoloid, 7-40 mm long, (4)-10 mm wide; floral scales brown to stramineous, 5-8 mm long, membranous, with acute apex, bifid 0.5-1 mm deep with slender awn, the awn 1-3 mm long; stigmas 2 or rarely 3; anthers 2-4 mm long; achenes glossy brown, obovoid, usually biconvex, 2.3-4.1 mm long, the beak 0.1-0.4 mm long.

Watercourses and marshes, ponds and lakeshores, often brackish or alkaline; 3000-8700 ft; widely distributed throughout NM. Our plants belong to subsp. *paludosus* (A. Nelson) T. Koyama [of marshy places]. *Scirpus brittonianus* Piper, *Scirpus campestris* Britton, *Scirpus maritimus* Linnaeus var. *paludosus* (A. Nelson) Koyama, *Scirpus paludosus* A. Nelson. Similar species: *Bolboschoenus fluviatilis* differs in having the majority of flowers with 3 stigmas, the achenes obviously trigonous, stouter and more persistent perianth bristles, and with more of the spikelets on rays than in the main terminal cluster. Occasionally one can find an inflorescence of *Bolboschoenus maritimus* with the latter character, but the styles will still be predominantly 2-parted. *Bolboschoenus fluviatilis* was previously reported from New Mexico, but is not presently vouchers from the state. §

*Bulbostylis* [a bulbous style] HAIRSEDGE [3].

Plants grass-like, annual or less frequently perennial; cespitose with fine fibrous roots only; culms wiry, terete to angulate, ribbed; leaves basal; blades linear to filiform, involute, with scabrous-ciliate margins; sheaths glabrous and usually fimbriate-ciliolate apically, ligules absent; inflorescence terminal on slender culms, composed of a single to many spikelets arranged in simple to compound anhela (cymose corynbs); inflorescence bracts (1)2-8, spreading to erect, leaflike to scale-like; spikelets ovoid to lanceoloid, with 6-50 florets spirally (or rarely sub-distichously) arranged along the rachilla; flowers bisexual, in the axil of a scale; perianth absent; stamens 1-3; ovary superior, style with 3 stigma branches in our species, the style base persistent as a small articulated tubercle on the top of the achene; fruit an achene, trigonous or 3-lobed, 3-ribbed. About 100 species worldwide, 8 listed in the Flora of North America.


1 Spikelets usually more than 1 per culm (often 1 in depauperate individuals); culms 10-30 cm tall; leaves ⅓ to ⅔ of total culm length; basal spikelets only present..............................................................B. *capillaris*

1 Spikelets per culm; culms up to (15) cm tall; leaves ⅔ to slightly exceeding culms; basal spikelets usually present
2 Anthers 2; culms to 15 cm tall; leaves ⅔ to exceeding culms; involucral bracts 1 or 0; achenes of the basal spikelets larger (1.5 mm long) than those on scapes (1 mm long); basal spikelets dissimilar to those on culms..........................................................B. *funckii*

2 Anthers 3; culms to 7 cm tall; leaves exceeding culms; involucral bracts 2; achenes of the basal spikelets the same size as those on culms (1 mm long); basal spikelets similar to those on culms..............................................................B. *saffieri*

*Bulbostylis capillaris* (Linnaeus) Kunth ex C.B. Clarke [hair-like] [Scirpus capillaris Linnaeus, *Stenophyllum capillaris* (Linnaeus) Abildgaard]. Plants annual, densely cespitose; culms to 30 cm tall, ridged; leaves with blades ⅛ - ⅓ the length of the culm, ca. 0.5 mm wide; involute; inflorescence terminal (occasionally basal also); composed of 1-3(7) spikelets in a subcapitate cluster to an open cyme; inflorescence bracts 1-2, filiform, the proximal shorter to longer than the inflorescence; spikelets 3.5 mm long, ovoid to lanceoloid; floral scales 1.5-2 mm long, red-brown with a green or tan midrib, the apex acute; stigmas 3, 0.5-0.7 mm long; achenes trigonous-obovoid, 1 mm long. Sandy or gravelly clearings, rocky slopes, roadsides, semi-riparian desert scrub, and shallow pools in pinyon-juniper woodland; 5000-7600 ft; occasional in the southwestern United States. Similar Species: When depauperate plants of *Bulbostylis capillaris* have most or all inflorescences with a single spikelet only, or when plants have basal spikelets, they have been confused with *B. funckii* and *B. saffieri*. However, both of these diminutive annuals have leaf blades at least half as long as the culms, while those of *B. capillaris* are generally much shorter. In addition, the basal spikelets of *B. funckii* look more like individual exposed achenes when mature, and the spikelets of *B. saffieri* lack the reddish-brown coloration and are distally more acuminate in profile than the ovate ones of *B. capillaris*. *Bulbostylis juncoidea*, found in southeastern Arizona and Mexico, looks similar in spikelet coloration, but most inflorescences form definite anhela with more than 3 spikelets, and it has harder, perennial, sometimes slightly bulbous bases. *Bulbostylis juncoidea* was previously reported for New Mexico, but no specimens are known.

*Bulbostylis funckii* (Steudel) C.B. Clarke [for Nicholas Funck (1816-1896), plant collector] [Isolepis funckii Steudel, *Stenophyllum funckii* (Steudel) Britton]. Plants annual, densely cespitose; culms 5-10 cm tall, ridged; leaves with blades ⅛ the length of to slightly exceeding the culm, 0.5 mm wide, flat or involute; inflorescence terminal and basal; terminal inflorescence mostly sterile and composed of a single spikelet with 0-1 bract, the bract when present appearing as an extension of the culm; basal inflorescence composed of individual fertile florets developing in the sheath axils at the culm base; terminal spikelet 5-7 mm long, lanceoloid, with acuminate apex; floral scales 2-2.5 mm long, reddish brown with a green or tan midrib, prominently excurrent as a mucro; stigmas 3, 0.5 mm long; achenes broadly trigonous-obovoid, 1 mm long in terminal spikelets, 1.5 mm long in basal spikelets. Sandy clearings, road banks, fields, disturbed areas; 7500 ft; known from one collection in Catron County. Similar species: see discussion under *Bulbostylis capillaris*.
**Carex** [Boeckeler] C. B. Clarke

[for Johann Wilhelm Schaffner (1830-1882), German pharmacist-botanist]

*Scirpus schaffneri* Boeckeler. Plants annual, cespitose, diminutive; culms 5-7 cm tall, ridged; leaves with blades exceeding the culms, 0.5 mm wide, filiform, flat to involute; inflorescence terminal and/or sub-terminal on very short culms, composed of a single spikelet; inflorescence bracts 2, the proximal leaflike and exceeding the spikelet; basal spikelets similar to the terminal ones; spikelets 5 mm long; ovoid; floral scales 2.2-2.5 mm long, pale brown with a greenish or yellowish midrib, excurrent as a spreading or recurved mucro; stigmas 3, stamens 3, anthers less than 0.5 mm long; achenes trigonous or nearly so, are often darker, reddish brown.

**Carex** [Boeckeler] C. B. Clarke

Plants grass-like, perennial, mostly monococious, but some species dioecious, densely cespitose from short rhizomes to colonial from long-growing rhizomes; culms mostly trigonous, occasionally subtended, phlophoric (bearing leaves to the base), or aphylophoric (lower leaves bladeless and reduced to sheaths only); leaves three-ranked, blades simple, linear, flat to V- or M-shaped in cross section, less commonly filiform or revolute, ligule present and attached to blade, sheaths usually closed, the fronts often hyaline and rippling or shedding in age; inflorescences simple or compound, composed of one or more sessile or pedunculate spikes; spikes entirely staminate, entirely pistillate, or androgynous (with both staminate and pistillate flowers with the staminate flowers above the pistillate ones), gynoecandrous (with both staminate and pistillate flowers with the pistillate flowers above the staminate ones), or more rarely with staminate and pistillate flowers intermixed in no obvious pattern; each spike subtended by a bract or not, the bracts leaf-like or broader, planoconvex in flowers with 2 stigmas, trigonous in flowers with 3 stigmas.

**Similar species:** see discussion under *Bulbostylis capitillaris*. The spikelets of *Bulbostylis schaffneri* are always pale colored, while those of *B. capillaris* and *B. funckii* are often darker, reddish brown.

**Bulbostylis schaffneri** (Boeckeler) C. B. Clarke

Plants annual, cespitose, diminutive; culms 5-7 cm tall, ridged; leaves with blades exceeding the culms, 0.5 mm wide, filiform, flat to involute; inflorescence terminal and/or sub-terminal on very short culms, composed of a single spikelet; inflorescence bracts 2, the proximal leaflike and exceeding the spikelet; basal spikelets similar to the terminal ones; spikelets 5 mm long; ovoid; floral scales 2-2.5 mm long, pale brown with a greenish or yellowish midrib, excurrent as a spreading or recurved mucro; stigmas 3, stamens 3, anthers less than 0.5 mm long; achenes trigonous-obovoid, 1 mm long. Sandy or gravelly clearings, in pine or oak woodlands; 5100-8400 ft; infrequent in the southwestern counties.

**Similar species:** see discussion under *Bulbostylis capitillaris*. The spikelets of *Bulbostylis schaffneri* are always pale colored, while those of *B. capillaris* and *B. funckii* are often darker, reddish brown.
KEY A: Single spike per culm
1 Plants cespitose, growing in dense to loose clumps
2 Perigynia apices rounded to slightly retuse, without beaks; plants soft, lax, of wet/moist habitats within high elevation (8500-10,500 ft) conifer forests, loosely cespitose from short rhizomes ................................................................. C. leptalea
2 Perigynia apices contracted, beaked; plants more stiffly upright, habitat and elevation various, densely tufted, rhizomes lacking or inconspicuous
3 Perigynia with stipitate base, glabrous, ellipsoid to narrowly ovoid or lanceolate; spike with staminate portion shorter than pistillate portion; pistillate scales ovate to lanceolate, dark brown with narrow hyaline margins; plants of dry to moist alpine habitats................................................................. C. micropoda
3 Perigynia lacking stipitate base, glabrous to finely pubescent, ovoid to obovoid; spike with staminate portion longer than pistillate portion (rarely equal); perigynia scales mostly broadly ovate, or broadly obovate to sub-orniculate, light tan to greenish, yellowish or reddish brown, with broad hyaline margins; plants of dry habitats in pinyon-juniper woodland, mountain meadows, grasslands, or alpine
4 Leaf blades folded or channeled, wider blades 0.8-1.5(2.8) mm wide near base, culms sometimes scabrous below the inflorescence; plants of mountain meadows, dry slopes and grasslands, not alpine habitats................................. C. oreocharis
4 Leaf blades involute-cylindric, filiform, wider blades 0.2-0.8 mm wide near base, culms mostly smooth below the inflorescence; plants of pinyon-juniper woodland or alpine habitats
5 Perigynia glabrous or sparsely short hirsute/ciliate only on the upper portion near the base of the beak; plants of alpine rock fields and meadows above timberline, 10,500-12,800 ft ................................................................. C. elynoides
5 Perigynia usually short pubescent all over, at least on the distal portion; plants of desert scrub and open areas within pinyon-juniper woodland, 5900-8200 ft ................................................................. C. filifolia
1 Plants rhizomatous, with single stems to small clusters of stems arising from obvious rhizomes
6 Spikes with pistillate and staminate sections separated by a section of bare rachis, pistillate portion of 1-2(3) separated perigynia; perigynia (4.4)9.4-4.8(8.4) mm long, obovoid, rounded at top with a minute beak or beakless; culms to 50 cm tall, plants of dry woodlands and forests, open slopes and meadows ................. C. geyeri
6 Spikes with pistillate and staminate sections contiguous, pistillate portion usually with more than 3 adjacent perigynia; perigynia to 4.7 mm long (appearing longer in C. microglochin due to exserted rachilla), widest usually at the middle or below, beaked; culms up to 25 cm tall, plants of wet or dry habitats
7 Plants of wet habitats, leaf blades 0.2-1 mm wide
8 Perigynia lance-subulate, 3.4-4.7 mm long, more than 4 times as long as wide, strongly deflexed at maturity, the rachilla present, exserted from orifice up to 2.2 mm (appearing like an extension of the beak); stigmas 3 ................. C. microglochin
8 Perigynia ovoid, oblong, or plumply elliptic, 2.6-3.4 mm long, less than 3 times as long as wide, spreading to slightly deflexed at maturity, rachilla absent; stigmas 2 ................................................................. C. gynocrates
7 Plants of drier habitats; leaf blades 0.5-3(3.8) mm wide
9 Perigynia uniformly deep red-brown to dark brown, shiny; sheath fronts with red-purple dots; leaf blades 0.5-1.6(2) mm wide, tips generally straight or curved, not curling; rhizomes often reddish-purple; plants of montane grasslands, open forests, ponderosa pine savannas and rocky ridges up to 10,500 ft ................................................................. C. obtusata
9 Perigynia cream or pale green with darker tip, dull; sheath fronts without red-purple dots; leaf blades 1.4-3(3.8) mm wide, tips often curling; rhizomes brown; plants of alpine summits, dry meadows and rocky ridges at or above 11,500 ft ........................................................................................................................... C. rupestris

KEY B: Multiple spikes per culm, perigynia pubescent or muricate-warty
1 Inflorescence a dense head of indistinguishable similar androgynous spikes; plants single-stemmed to occurring in small clumps connected by long rhizomes; dry habitats ................................................................. C. duriuscula (in part)
1 Inflorescence elongate with spikes of different types, terminal spike staminate and lateral spikes mostly pistillate, or if all spikes similar and androgynous, then separated along the rachis and easily distinguishable; plants cespitose or colonial rhizomatous; varying habitats (note that some of these species have both cauline and basal inflorescences, the latter having a simpler, compact structure).
2 Pistillate spikes 1-7 cm long, with 40 or more perigynia; plants colonial from long rhizomes; wetland habitats, usually pond, lake margins, along streams, wet meadows or seasonally flooded wetlands
3 Perigynia occasionally with a few bristles along the nerves, otherwise glabrous; base of leaf blades and summit of leaf sheaths usually pubescent; perigynia 6-8.2(9) mm long, beak bidentate with spreading teeth 1.6-2.2(3.6) mm long ................................................................. C. atherodes (in part)
3 Perigynia densely pubescent over entire surface; base of leaf blades and summit of leaf sheaths glabrous; perigynia 2.5-3.8(5.2) mm long, beak bidentate with straight teeth 0.4-0.6 mm................................. C. pellita
2 Pistillate (androgy nous in C. muriculata) spikes 1.2 cm or less long (to 2.2 cm long in C. muriculata), with less than 20 perigynia; plants loosely to densely cespitose; dry to mesic woodland, forest, or prairie habitats
4 Surface of perigynia muricate warty; lateral spikes 2-5, androgynous or sometimes appearing pistillate due to cryptic male flowers......................................................................................... C. muriculata (in part)
4 Surface of the perigynia more or less pubescent (proximally glabrous in C. planotachys); lateral spikes 1-3(4), pistillate
5 Plants with cauline inflorescences only, usually with both staminate and pistillate spikes
6 Culms to 50 cm tall, longer to much longer than the leaves; perigynia prominently 10-25 nerved at least to mid-body; proximal inflorescence bract as long or longer than the inflorescence, less frequently shorter; staminate scales pale green throughout, sometimes with a darker green midstripe; southwestern mountains only ........................................ C. leucodonta
6 Culms to 35 cm tall, shorter to longer than the leaves; perigynia nerveless except for two strong marginal nerves; proximal inflorescence bract usually shorter than the inflorescence, rarely a bit longer; staminate scales with brown body and pale or green midstripe; found primarily in the northern half of the state (hybrids w/ basal inflorescences are occasional) ................. C. heliophila
5 Plants with both basal and caulin inflorescences, occasionally basal only, the caulin inflorescences with staminate and pistillate spikes, the basal spikes on short peduncles, usually all pistillate.

7 Perigynia with many prominent nerves, hispidulous distally, glabrous proximally, or nearly glabrous throughout; beak slightly bent or straight; of various distributions.

8 Old leaves persisting as coarse fibers, tan to brown, usually without any red or orange color; caulin pistillate spike bract usually shorter than the inflorescence; pistillate scales shorter than to as long as the perigynia; staminate spikes often thick with many strongly overlapping scales. ................................................................. C. geophila

8 Old leaf bases only slightly fibrous, with some red or orange coloring; caulin pistillate spike bract shorter to longer than the inflorescence; pistillate scales usually shorter than perigynia; staminate spikes usually slender, with fewer, less overlapping scales, with more of the scale length exposed.

9 Perigynia 2.3-3.4(4.2) mm long; beaks 0.5-1(1.5) mm long; plants loosely cespitose, often lax; alpine rock fields and tundra at or above above timberline. ................................................................. C. brevipes

9 Perigynia 3-4.9 mm long; beaks 0.7-2 mm long; plants densely cespitose, strict or lax; pinyon-juniper woodland to ponderosa pine or mixed conifer forests at or below timberline (rarely above in C. rossii).

10 Cauline pistillate spikes 3-6(15) flowered; proximal inflorescence bract wide, flat, longer to much longer than the inflorescence; culms 7-25(40) cm tall; staminate spikes (6)13-16.5 mm long, the scales pale to slightly tinged with brown or red (not deep purple) .............. C. ultra

10 Cauline pistillate spikes 1-4 flowered; proximal inflorescence bract narrow, folded or involute, shorter to slightly longer than the inflorescence; culms 3-15 cm tall; staminate spikes 4.8-13 mm long, the scales usually darker, with purple-black tinge

11 Cauline inflorescence with 2-4 pistillate spikes, each with (1)2-3 perigynia, the perigynia thus appearing in clusters along the axis of the inflorescence; stamineate spike 7.5-13 mm long, on a peduncle of variable length, often with a pistillate flower close to its base; leaves flat, lax ................................................................. C. “aff. rossii”

11 Cauline inflorescence with 1-2(3) pistillate spikes, each with (1)2 perigynia, the perigynia thus often appearing separated along the axis of the inflorescence; stamineate spike 4.8-8.3(11.5) mm long, usually on a long peduncle equal to or much longer than spike, rarely with a pistillate flower at its base; leaves often folded or involute, stiffer than the above ................................................................. C. pitophila

KEY C: Multiple spikes per culm, stigmas 3, perigynia glabrous, terminal spike staminate (rarely androgynous), mostly wetland plants (Note: Only C. capillaris, C. geyeri, C. hystericina, & C. utriculata) are known from more than a few locations in the state.

1 Mature pistillate spikes uniformly dark; perigynia and scales at least partially suffused with dark purple or blackish coloration; plants rare in NM, known from Rio Arriba and Taos counties.

2 Stigmas 2 (some flowers occasionally with 3); perigynia 2 times as long or wide, often shiny, ovate to ovate-lanceolate or broadly elliptic in profile, inflated (often flattened in pressing), the beaks smooth; plants colonial rhizomatous ...................... C. saxatilis

2 Stigmas 3; perigynia 2.5-3 times long as wide, not shiny, narrowly elliptic to lanceolate, not inflated, the beaks ciliate-setose (at least at the base of the beak); plants cespitose to short-rhizomatous ................................................................. C. luzulina

1 Mature pistillate spikes green to brown or straw colored but not uniformly dark; either perigynia and scales both pale OR dark scales contrasting with pale colored perigynia OR pale scales contrasting with darker perigynia; plants of varying frequency and distribution in NM.

3 Plants with robust pistillate spikes; longer pistillate spikes 2-13 cm long, each with more than 50 perigynia, the perigynia densely packed on the spike; perigynia moderately to strongly inflated (though often flattened/collapsed in pressing or flat to slightly inflated in C. ultra), the achenes not infructifying; plants often robust; wetland habitats.

4 Perigynia beaks 0.2-0.6 mm long, bodies with red-brown spotting or blotching, flattened to only slightly inflated; leaf blades usually glaucous, thick, coriaceous, with harsh scabrous margins; plants densely cespitose; Hidalgo County ................................. C. ultra

4 Perigynia beaks 0.7-4.2 mm long, bodies without red-brown spotting or blotching (though with dark brownish coloration in some species), usually inflated; leaf blades pale to dark green but not glaucous, thin to thick but not coriaceous and without harsh scabrous margins; plants cespitose to rhizomatous; various locations in NM.

5 Pistillate scales with a long scabrous awn, the awn longer than 1 mm, often equaling or longer than the body, distinct from the body of the scale.

6 Base of leaf blades and summit of leaf sheaths usually pubescent; perigynium beak bidentate with teeth 1.6-2.2(3.6) mm long; plants rhizomatous, producing large colonies ................................................................. C. atherodes (in part)

6 Base of leaf blades and summit of leaf sheaths glabrous; perigynium beak bidentate with teeth (0.2)0.3-1 mm long; plants rhizomatous or cespitose

7 Perigynium body obconic, widest near the top, abruptly contracted to the beak; proximal pistillate spike ascending to spreading; sheath fronts papery-membranous, easily torn, not ladder-fibrillose; plants rhizomatous; extreme southern NM ................................................................. C. aureolensis

7 Perigynium body lanceoloid to ovoid to ellipsoid, widest at or near the middle, gradually tapering into the beak; proximal pistillate spike often pendent; sheath fronts not papery membranous, becoming ladder-fibrillose; plants densely cespitose; widespread in NM ................................................................. C. hystericina

5 Pistillate scales without an awn, or with midrib extended as short, smooth awn less than 1 mm long, shorter than the length of the body.

8 Perigynia bodies broadly obvoid to subspherical, 3-7 nerved, beaks 0.7-1.1 mm long; widest leaf blades 8-20 mm wide; Grant and Sierra counties ................................................................. C. amplifolia

8 Perigynia bodies lanceoloid, ovoid, or ellipsoid, 6-12 nerved, beaks 0.8-2 mm long; widest leaf blades 4.5-10 mm wide; widespread (C. utriculata) or rare in NM (C. vesticaria)
Monocotyledonous Plants - Cyperaceae

9 Ligule of lowest leaf blade no more than 1.5 times as long as wide, with rounded or emarginate apex; culms often thick, clothed in old leaf bases; sheaths thick and spongy based, often with crosswalls between the veins, appearing like brickwork, the sheaths surrounding the thickest culms rarely reddish, the sheaths surrounding narrower culms occasionally reddish; widest leaf blades up to 10 mm wide; plants colonial from long rhizomes; perigynia strongly spreading at maturity; common and widespread.................................................................C. utriculata

9 Ligule of lowest leaf blade at least twice as long as wide, with acute apex; culms often thin, not clothed in old leaf bases; sheaths thin, not spongy based, with few or no crosswalls between the veins, not appearing like brickwork, the sheaths often reddish; widest leaf blades up to 6(8) mm wide; plants loosely cespitose from short rhizomes; perigynia ascending to spreading at maturity; rare in NM, Cibola and Rio Arriba counties....................................................C. vesicaria

3 Plants with delicate pistillate spikes; longer pistillate spikes less than 3 cm long (rarely longer in C. luzulina, C. microdonta, and C. sprengelii), each with fewer than 50 perigynia, the perigynia loosely packed on the spike (or if densely packed, then the spike less than 2 cm long); perigynia not or barely inflated, the achenes more nearly filling the perigynia; plants robust or not; varying habitats

10 Proximal pistillate spikes pendent on long flexuous peduncles

11 Perigynium body abruptly contracted to a long conspicuous beak, the beak 1.9-2.8 mm long, subequal to or slightly longer than the body; sheath bases disintegrating into a persistent tuft of vertical “horsehair” fibers; plants up to 90 cm tall; leaf blades up to 40 cm long.........................C. sprengelii

11 Perigynium body gradually or abruptly tapered into a shorter beak, the beak 0.1-1.1 mm long, less than half the length of the body, or absent; sheath bases not disintegrating into a persistent tuft of fibers; plants 5-40(70) cm tall; leaf blades usually less than 10 cm long

12 Perigynium surface smooth, beak 0.3-1.1 mm long; inflorescence bract with sheath 4 mm long or longer; roots without a covering of fine hairs; plants cespitose .........................C. capillaris

12 Perigynium surface papillate, beak (0.6)0.9-1.9(2) mm long; perigynium body abruptly contracted to a long conspicuous beak, the beak 1.9-2.8 mm long, subequal to or slightly longer than the mature perigynia and giving the pistillate spike a ‘shaggier’ appearance, deciduous; plants rhizomatous but sometimes growing in clumps; phyllopodic, culms usually with dead leaf remains at base.................................................................C. magellanica

13 Perigynia 2.4 mm long or longer (1.8-3 mm in C. luzulina, C. microdonta, C. sprengelii); inflorescence with terminal staminate spike(s) surpassing all lateral pistillate spikes; inflorescence bract with blade; leaf blades 1 mm or more wide; distribution various

14 Inflorescence with only 1-2 individual sessile perigynia; perigynia obovoid, (4.4)4.9-6.4(8.4) mm long, beakless, with a narrow, spongy base; plants rhizomatous, of dry montane forest, woodland, and meadow habitats.................................C. geyeri

14 Inflorescence with more than 3 perigynia, on multiple spikes (sometimes a single basal spike in several species); perigynia of various shapes, without narrow spongy base, 4.5 mm long or less, with beak (except in C. conoidea), plant growth form and habitat various, but not both as above

15 Perigynia 1.5-2.2 mm long; inflorescence with the terminal staminate spike surpassed by one or more perigynia, each with fewer than 50 perigynia, the perigynia loosely packed on the spike (or if densely packed, then the spike less than 2 cm long); perigynia not or barely inflated, the achenes more nearly filling the perigynia; plants robust or not; varying habitats

16 Perigynium beak short, abruptly bent, 0.6 mm long or less, glabrous; culms with leaf blades more evenly distributed along the culm.................................................................C. planostachys

17 Proximal pistillate spike arising from the lower third of the culm; plants rhizomatous .....................C. microdonta

17 Proximal pistillate spike arising in the upper half (usually upper third) of the culm (separate basal inflorescences can be present in Carex planostachys); plants cespitose

18 Proximal inflorescence bract greatly exceeding the inflorescence, erect to widely divergent; pistillate spikes oblong to ovoid to globose, the perigynia very densely packed; the terminal group of spikes tightly clustered and sessile to subsessile to short pedunculate.................................................................C. viridula

18 Proximal inflorescence bract shorter than to slightly exceeding the inflorescence, usually erect to ascending; pistillate spikes cylindric to cylindric-oblaneooid, the perigynia more loosely packed than in C. viridula; the terminal spikes not tightly clustered, or if clustered, then usually more loosely so and short pedunculate

19 Plants of dry habitats in southern NM, basal inflorescences often present; culms up to 15 cm tall........

19 Plants of wet to mesic habitats, in northern NM, culms usually 15 cm or more tall

20 Perigynium beak evident, straight, 0.5-1.5 mm long, ciliate-serrulate (at least at the base of the beak); culms with leaf blades crowded near the base, fewer above on the culm.................C. luzulina

20 Perigynium beak short, abruptly bent, 0.6 mm long or less, glabrous; culms with leaf blades more evenly distributed along the culm.................................................................C. planostachys

KEY D: Multiple spikes per culm, stigmas 3(2), perigynia glabrous, terminal spike gynandrous

1 All spikes sessile in a compact head and closely overlapping one another (occasionally the basal spike slightly remote and subsessile)

2 Perigynia ovate to suborbicular, 1.3-2.5(2.8) times longer than wide, contracted abruptly to beak 0.2-0.5(0.6) mm long; spikes often not readily distinguishable.................................................................C. nova

2 Perigynia narrowly elliptic to narrowly ovate, 2.8-3.9 times longer than wide, tapering to a beak (0.3)0.5-0.8(0.9) mm long; spikes easily distinguishable ..................................................................................C. nelsonii
Monocotyledonous Plants - Cyperaceae

1 Lower spikes pedunculate, some shortly so; inflorescence usually moderately elongate, always with one to several lower spikes remote from the terminal cluster
3 Pistillate scale apices typically with awns 0.5-2(3.5) mm long; lateral spikes sessile to short pedunculate; plants rhizomatous; lower leaf sheath fronts-light-colored becoming ladder-fibrillose with age; rare in NM .............................................. C. buxbaumii
3 Pistillate scale apices acute to acuminate, without awns; lateral spikes short to long-pedunculate; plants loosely to densely cespitose; lower leaf sheaths not becoming ladder-fibrillose with age; rare in common in NM
4 Lowest spike gynandroecious (though often with only a few staminate flowers at the base), on a peduncle longer than the upper spikes; spikes generally longer and cylindrical or narrowly ellipsoid, often more than 3 times as long as wide ............ C. bella
4 Lowest spike wholly pistillate (rarely gynandroecious in Carex chalciolepis), short pedunculate; spikes oblong, ovoid or ellipsoid in shape, generally less than 2.5 times as long as wide
5 Perigynia 1.9-2.7 mm long, usually bright green or tan, contrasting with the dark scales; pistillate scales shorter than the perigynia; plants of seeps, moist meadows, streambanks or forests ......................................................... C. stevenii
5 Perigynia 2.8-4.8 mm long, usually partially suffused with darker color, not contrasting strongly with the dark scales; pistillate scales usually as long or longer than the perigynia; plants of rocky alpine or subalpine habitats
6 Pistillate scales lanceolate to ovate-lanceolate, exceeding the perigynia in the upper half of the spike, giving the inflorescence a 'shaggy' appearance; achene filling approximately half of the perigynium; inflorescence often nodding in maturity ................................................................. C. chalciolepis
6 Pistillate scales broadly ovate, about equaling the perigynia in length, not giving the inflorescence a 'shaggy' appearance; achene filling most of the perigynium; inflorescence usually remaining erect.............................. C. albonigra

KEY E: Multiple spikes per culm, stigmas 2(3), perigynia glabrous, terminal spike staminate (androgyrous) or gynandroecious
1 Plants relatively slight; culms thin and flexuous, generally less than 40 cm tall; perigynia nearly beakless; lateral pistillate spikes up to 2.8 cm long; leaf blades less than 3.5 mm wide; rhizomes 0.7-1(1.8) mm thick; stigmas usually 2, but sometimes with a few flowers (up to 20%) with 3 stigmas; perigynia sometimes golden yellow to orange .............................................. C. aurea
1 Plants more robust or coarse; culms thick and upright, ranging from 7-120 cm tall; perigynia beaks 0.1-1.1 mm long; lateral pistillate spikes 0.5-8 cm long; leaf blades 1-10(12) mm wide; rhizomes 1-6 mm thick; stigmas 2 (occasionally 3 in C. saxatilis); perigynia never golden yellow to orange
2 Plants cespitose or culms densely clustered in clumps
3 Basal sheaths red brown, often shiny, ladder-fibrillose; uncommon in southwestern NM; 4500-8500 ft ............... C. senta (in part)
3 Basal sheaths not red brown, not shiny, not becoming ladder-fibrillose; northern and western NM (C. kelloggii) or nearly statewide except southwestern NM (C. emoryi); 3400-12,500 ft.
4 Plants cespitose; terminal staminate spike usually one; perigynia abruptly and narrowly stipitate; ligule never shorter than wide; free portion of ligules 0.5-2 mm long; spikes dark; 7000-12,500 ft ......................................................... C. kelloggii
4 Plants rhizomatous; terminal staminate spikes 2 or more; base of perigynia attenuate to broadly stipitate; ligule usually shorter than wide, free portion of ligules up to 0.5 mm long; spikes pale; 3400-8800 ft ......................................................... C. emoryi
2 Plants with culms occurring singly or a few together connected by rhizomes
5 Perigynia 0.2-0.3-1.1 mm long; perigynia inflated, suborbicular in cross-section (often flattened in pressed specimens); pistillate scales dark brown to reddish black, often with a white hyaline apex; mostly 2-styled with biconvex achenes, occasionally 3-styled with trigonous achenes; rare in NM; over 10,000 ft ......................................................... C. saxatilis
5 Perigynia beaks 0.1-0.6 mm long; perigynia flattened (not inflated), not suborbicular in cross section; pistillate scales light to dark-colored, dark scales lacking a white hyaline apex; 2-styled with biconvex achenes; uncommon to common in NM; 3400-13,000 ft.
6 Pistillate scales usually with broad pale midportion with light brown marginal stripes, spikes light colored; ligule usually broadly U-shaped to horizontal, usually shorter than wide; sheaths pale, fronts usually red spotted ......................... C. emoryi
6 Pistillate scales usually dark with narrow, light-colored midvein (sometimes broad in Carex aquatilis); spikes dark-colored; ligule V or U-shaped, as long or longer than wider; sheaths often red-brown, fronts not red spotted
7 Some lower pistillate scale midveins excrurent as a short awn; leaf blades 3-10(12) mm wide; perigynia beaks often bidentate and ciliate at the apex ......................................................... C. nebrascensis
7 Pistillate scales lacking awns; leaf blades 1-6(8) mm wide; perigynia beaks entire or minutely bidentate, not ciliate at the apex (sometimes ciliate in C. scopulorum)
8 Basal sheaths ladder-fibrillose; southwestern NM; 4500-8500 ft ......................................................... C. senta (in part)
8 Basal sheaths not ladder-fibrillose; northern NM; 7000-13,000 ft
9 Inflorescence elongate, (4)-6-18(21) cm long; proximal bract longer to slightly shorter than the inflorescence; proximal spike 1-5(7) cm long ......................................................... C. aquatilis
9 Inflorescence congested, 2-8 cm long; proximal bract shorter than the inflorescence; proximal spike 0.5-3.1 cm long ......................................................... C. scopulorum

KEY F: Multiple spikes per culm, stigmas 2 (in C. muriculata), perigynia glabrous, spikes sessile, terminal spike androgyrous or staminate or pistillate
1 Delicate plants, culms arching, flexible; mostly less than 5 perigynia per spike (6, or rarely up to 8 in C. radiata)
2 Rhizomes inconspicuous; mature perigynia planconvex to biconvex in cross-section, not plump, the faces not or inconspicuously veined, the margins not serrulate, 1-4 per spike; spikes 2-4(7) ......................................................... C. disperma
2 Rhizomes conspicuous; mature perigynia biconvex to planoconvex in cross-section, plump, the faces or not inconspicuously veined, the margins serrulate, 1-6(8) per spike; spikes 3-5(8) ......................................................... C. radiata
1 Coarse plants, culms upright and stiff; mostly more than 5 perigynia per spike (sometimes fewer in C. jonesii and C. occidentalis)
3 Plants rhizomatous, with clear separation between small groups of 1-several culms; distance between the culms along the rhizome mostly greater than 1 cm long
4 Rhizomes flexible, 0.6-1.6 mm thick; plants of dry habitats
5 Plants mostly monoeocious; inflorescence 2-9 mm wide, not appearing shaggy

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### Monocotyledonous Plants - Cyperaceae

6. Culms to 30 cm tall; inflorescence compact, 0.7-2 cm long; all spikes tightly overlapping and indistinguishable; perigynia 2.8-3.8 mm long; beak 0.3-0.8 mm long; culms smooth just below the inflorescence. **C. duruscula** (in part)

6. Culms to 90 cm tall; inflorescence elongate, 1-3.5 cm long; lowest spikes loosely overlapping and distinguishable; perigynia 3.6-6 mm long; beak 1.2-2.5 mm long; culms usually scabrous just below the inflorescence. **C. sicca**

5. Plants mostly dioecious; stamine inflorescences 7-20 mm wide, pistillate inflorescence 8-20 mm wide, appearing shaggy. **C. douglasii**

4. Rhizomes stout, 1.2-3.6 mm thick; plants of wet to mesic habitats

7. Perigynia 0.8-1.5(2) cm long, spikes and branches nearly indistinguishable. **C. jonesii**

7. Inflorescence 0.8-1.5(2) cm long, spikes and branches nearly indistinguishable. **C. agrostoides**

9. Inflorescence usually greater than 1.5 cm long, spikes and branches more readily distinguishable

10. Beaks of perigynia light colored and contrasting with the dark and shiny bodies; perigynia with two prominent ridges on either side of a dorsal central groove, otherwise without nerves, with a distinct hyaline flap at the top of the dorsal suture; known from a single high elevation wetland in Rio Arriba County. **C. diandra**

10. Beaks of perigynia the same color as the bodies; perigynia lacking two ridges, with or without nerves on at least one face, lacking a distinct hyaline flap at the top of the dorsal suture; NM distributions various.

11. Perigynia 2.5-5 mm long, 1-2.5 mm wide; proximal leaf sheaths tight, not or indistinctly striped, without prominent green cross veins; northeastern NM. **C. gravida**

11. Perigynia 2.2-4.8 mm long, 0.9-2 mm wide; proximal leaf sheaths tight, not or indistinctly striped, without prominent green cross veins; NM distributions various.

12. Inflorescence branched, at least some spikes attached to the lower branches of the inflorescence; generally wet habitats

13. Inflorescence bracts hair-like; perigynia 2.2-2.8 mm long, sharp-margined basally. **C. vulpinoidea**

13. Inflorescence bracts broader, not hair-like; perigynia 2.6-4.6 mm long, round-margined basally

14. Culms 4-6 mm wide with the angles winged; sheath fronts cross-rugulose; leaf blades 2-8(11) mm wide; inflorescence robust, spiky with long acute-tipped perigynia pointing in all directions; perigynia 3.6-4.6 mm long. **C. stipata**

14. Culms 1.5-3.5 mm wide, sharp angled but not winged; sheath fronts not cross-rugulose; leaf blades 0.7-4(4.4) mm wide; inflorescence softer, if spiky then not so robust; perigynia 2.6-4.2 mm long. **C. agrostoides** (in part)

12. Inflorescence unbranched, all spikes attached to the main axis of the inflorescence; generally dry habitats

15. Stigmas 3; achenes trigonous; perigynia muricate-warty; limestone substrates; southeast NM. **C. muriculata** (in part)

15. Stigmas 2; achenes lenticular to biconvex; perigynia smooth; various habitats, wide-ranging in NM

16. Pistillate scales as long and wide as the perigynia, mostly concealing them; mature perigynia planocovex but not plump, with marginal nerves usually on the margins of the body, rarely one nerve pushed over onto the ventral face, mostly unnerved on the faces; beak prominently (and doubly) serrulate on the margins, obviously bidentate; perigynia uniformly oriented in the spikes, giving the inflorescence a smooth appearance. **C. occidentalis**

16. Pistillate scales usually shorter and narrower than the perigynia, the perigynia readily visible; mature perigynia plumply planocovex, with at least one of the marginal nerves pushed over onto the ventral face, many-nerved dorsally and often ventrally; beak smooth or finely (and singly) serrulate on the margins, obliquely cleft or only slightly bidentate; some of the perigynia with random orientations in the spikes, giving the inflorescence a rough appearance. **C. vallicola**

**KEY G: Multiple spikes per culm, stigmas 2, perigynia glabrous & unwinged, spikes sessile, terminal spike gynandrous**

1. Inflorescence compact and capitulate, spikes often indistinguishable. **C. illota**

1. Inflorescence elongate, spikes easily distinguishable

2. Perigynia radiating in all directions (star-shaped) at maturity; perigynia widest near the base, with spongy thickened tissue at the base apparent

3. Perigynia 2.1-3(3.2) mm long; beaks 0.3-1 mm long. **C. interior**

3. Perigynia (2.6)2.8-3.5 mm long; beaks 0.9-1.5 mm long. **C. echinata**

2. Perigynia spreading, ascending, and/or appressed, not radiating in all directions at maturity; perigynia widest well above the base, spongy thickened tissue at base not apparent

4. Perigynia planocovex, 2.5-3.8(4) times longer than wide, margins with a definite edge, surfaces smooth; beaks 0.9-1.8(2.5) mm long

5. Ligule of distal leaf on culm about as long as wide, 0.7-2(2.7) mm long; achenes 1.7-2.1 mm long; inflorescence with 2-4(5) spikes. **C. deweyana**

5. Ligule of distal leaf on culm much longer than wide, (2)3.4-7.1 mm long; achenes 1.2-1.6(2.1) mm long; inflorescence with 4-6(9) spikes. **C. bolanderi**
4 Perigynia biconvex, (1.4)1.6-2.7 time longer than wide, margins rounded, surfaces smooth to papillose; beaks up to 1 mm long
6 Spikes light-colored, the lower spikes well separated; pistillate scales hyaline throughout, sometimes tinged brown or brown in the middle with green midveins; perigynia dorsal sutures lacking dark coloration or dark coloration present, but not extending for the entire length of the beaks
7 Spikes (2)3-8 mm long, with 1-11 perigynia; perigynia with the dorsal suture well developed, often extending the length of the beak or more, sometimes with a white hyaline flap ............................................. C. brunnescens
7 Spikes 3-14 mm long with (2)5-23(30) perigynia; perigynia with the dorsal suture poorly developed, not extending the length of the beak, lacking a white hyaline flap ........................................................................................................... C. canescens
6 Spikes darker colored, mostly strongly overlapping; pistillate scales reddish-brown or light chestnut brown with hyaline margins; perigynia dorsal sutures dark colored for the entire length of beaks
8 Perigynia 1.5-2.3 mm long, papillose; beaks 0.2-0.4(0.5) mm long; inflorescence with (3)4-5(6) spikes................................. C. praeceptorum
8 Perigynia (2)2.4-3.8 long, smooth; beaks 0.5-1 mm long; inflorescence with (1)3(4) spikes .......................... C. lachenalii

**KEY H: Multiple spikes per culm, spikes similar, stigmas 2, all spikes sessile and gynecandrous, perigynia winged**

Section *Ovales*, excluding *C. illoa*

Sedges in *Carex* Section *Ovales* are among the most difficult to identify. Many *Ovales* species are characterized by high variation. Some hints will help you: A) When collecting, include at least 6 (preferably more) inflorescences to ensure good representation of the variation on a plant. B) When determining perigynia characters, select mature perigynia from the middle third of the lower spikes and use measurements from the larger ones that are normal in shape. C) Examine many perigynia from your specimen before deciding which way to go in the key regarding perigynia characters, but especially shape and beak characters. Many treatments discuss beaks as either terete and entire, or winged and serrulate to the tip. Tip characters have more variation than this implies, often on one spike. Some beaks that are terete are also serrulate to the tip (*Carex ebenea*). D) Discern whether the upper spikes are distinguishable by seeing if you can easily see the boundaries of the upper spikes without magnification or dissection, at arm’s length. E) Once you have arrived at a tentative determination, make sure that your specimen matches the species description.

1) Longest perigynia up to 4 mm long; wet areas
2) Most inflorescences having 1-3 lower inflorescence bracts longer than the head (often broken off on dried specimens); broad (usually hyaline) margins of the basal portion of the lowest inflorescence bract longer than 1/2 the length of the lowest spike; perigynia bead tips terete and entire in the distal 0.3-0.8 mm ................................................................. C. athrostachya
3) Few inflorescences having 1-3 lower inflorescence bracts longer than the head, if so, the broad (usually) hyaline margins of the basal portion of the lowest inflorescence bract less than 1/2 the length of the lowest spike; perigynia winged and serrulate to the tips, or less commonly entire in distal up to 0.5 mm in *C. subfusca*
4) Upper spikes usually indistinguishable, usually tightly clustered; most perigynia apices acuminate to acute, more nearly terete, serrulate to the tip or sometimes as much as 0.5 mm of distal portion entire; widespread in northern and southwestern NM.......... C. subfusca (in part)
5) Upper spikes usually distinguishable, clustered to moniliform; most perigynia apices acute and winged to tip, rarely terete in the distal 0.2 mm, often serrulate to the tips; rare plants of northern NM
6) Lowest inflorescence internode 2-4.5 mm long; upper spikes usually clustered; spikes (2)5-9; presently known only from Sandoval County ........................................................................................................................................ C. hebbii
7) Lowest inflorescence internode (2)4-9 mm long; spikes moniliform; spikes 3-5(8); presently known only from Rio Arriba County ................................................................................................................................................ C. tenera

1) Longest perigynia longer than 4 mm; wet or dry areas
5) Longest perigynia up to 5 mm long (rarely up to 5.2 in *C. phaeocephala*)
6) Upper spikes distinguishable
7) Perigynia less than 2 times as long as wide, body suborbicular; spikes often clavate due to the large number of male flowers at the base, often rough textured (due to prominent beaks on more widely spreading perigynia) .............................................. C. brevior
7) Perigynia more than 2 times as long as wide, body various, but not orbicular; spikes not clavate (except in *C. tahoensis*), smooth textured (perigynia more appressed than in the former)
8) Plants found at or above tree line, of dry places; culms to (5)15-45 cm tall; perigynia tips hyaline .......... C. praccaephalal
8) Plants found below tree line (rarely up to tree line in *C. tahoensis*), of wet to dry places; culms up to 120 cm tall; perigynia tips hyaline or not
9) Spires 3-4(6); achenes nearly filling the middle third of the perigynia; culms loosely clustered, arising from short linear rhizomes; dry places ............................................................... C. tahoensis (in part)
9) Spires (1)3-10(14); achenes mostly filling the lower half of the perigynia; culms densely cespitose; wet places (C. pratlica might be found in dry places)
10) Most perigynia winged to tip; pistillate scale apices acute to acuminate; moist areas below 8500 ft........................................ C. practica (in part)
10) Most perigynia terete at the tip, terete portion 0.4-1 mm long; pistillate scale apices acute to obtuse; mostly wet areas over 8500 ft
11) Perigynia 3.6-4.5 mm long; spikes 5-9(11) mm long; inflorescence 0.6-2.2 cm long; .... C. pachystachya (in part)
11) Perigynia (3)7(4-5) mm long; spikes 8.5-20 mm long; inflorescence (1.7)2.5-5 cm long .......... C. praticola

6) Upper spikes congested and indistinguishable
12) Culms to 25(40) cm tall, often arching; distance from the beak tips to the tops of the achenes (2.3)2.6-3.8 mm; alpine tundra, above 11,800 ft ................................................................. C. haydeniana
12) Culms to 120 cm tall, rarely arching; distance from the beak tips to the tops of the achenes (1.2)1.5-3 mm; plants growing in forested areas or meadows below 11,800 ft, rarely higher
13) Perigynium dorsal suture long white-hyaline, tips hyaline; scales dark brown, sometimes with a metallic sheen, hyaline margins of middle scales 0.2-0.5 mm wide ................................................................................................................................. C. macloviana
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13 Perigynium dorsal suture not long white-hyaline, tips brown; scales to tan to brown, without a metallic sheen, hyaline margins of middle scales 0.1-0.3(0.5) mm wide

14 Perigynia planoconvex, narrowly wing-margined, 0.45-0.6 mm thick

15 Perigynia 3.6-4.5 mm long, 1.1-2 mm wide, slightly spreading when mature, veined or not, sometimes with coppery sheen, most perigynia beaks entire in distal 0.3-0.6 mm, sometimes a few serrulate to tips

15 Perigynia 2.4-4(4.5) mm long, 0.9-1.2(1.5) mm wide, ascending when mature, veined, never with coppery sheen, most perigynia beaks serrulate to tips, sometimes up to 0.5 mm of distal portion entire

15 Perigynia flat except where distended over the achene to thinly planoconvex, broadly wing-margined, 0.3-0.5 mm thick

16 Lowest inflorescence internode up to 3 mm, inflorescence (0.7)1.1-2.4 cm long, the base truncate; perigynia usually widest below the top of the achene

16 Lowest inflorescence internode usually greater than 4 mm, inflorescence (1.5)2-3.6 cm long, the base tapered; perigynia usually widest at the top of the achene

5 Longest perigynia more than 5 mm long

17 Upper spikes indistinguishable; most perigynia winged to tip

18 Perigynia not thick, flat except over the achene

19 Perigynia 3.3-5.4(6.8) mm long, (1)1.2-2.2 mm wide; pistillate scale apices acuminate to acute; spikes (13)-9(13), (5)-6-12(16) mm long; moist areas, 5000-8100 ft

19 Perigynia (4.8)5-2-7(7.2) mm long, (1.6)1.8-3-5(3.8) mm wide; pistillate scale apices acute; spikes 2-(7), 8-21 mm long; dry areas, 6700-11,000 ft

20 Perigynia up to 2.3 times as long as wide, (2.2)-3.3-5(3.8) mm wide; spikes 8-15 mm long; proximal inflorescence internode (2)-4-5 mm long

20 Perigynia more than 2.1 times as long as wide, (1.6)1.8-2.9(3) mm wide; spikes 9-21 mm long; proximal inflorescence internode (2)-4-10 mm long

18 Perigynia thick, planoconvex, with achenes more nearly filling the perigynia

21 Perigynia usually nerveless ventrally, usually winged to tips; spikes obovoid, with few staminate flowers at the base of each spike; hyaline margins on pistillate scales 0.5 mm wide

21 Perigynia usually nerveless ventrally, winged to tips or not; spikes narrowly fusiform, lanceloid, to oblanceoloid, often with many staminate flowers at the base of each spike; hyaline margins on pistillate scales 0.2-0.8 mm wide

22 Perigynia 6-8.4 mm long; distance from perigynium beak tip to top of the achene (1.8)3.2-4.6 mm; pistillate scales shorter and narrower than the perigynia, or equal to the perigynia, pale green to light brown with a pale or green midvein

22 Perigynia 4.4-4.8(6.2) mm long; distance from perigynium beak tip to top of the achene 1.7-2.2 (2.6) mm; pistillate scales usually covering the perigynia, bronze with a straw to tan midvein

23 Perigynia 1.6-1.8 mm wide; spikes 3-(7,8); 9-21 mm long

23 Perigynia 1.1-1.8 mm wide; spikes 5-12(13), 6-15 mm long

24 Spikes 9-15 mm long; proximal inflorescence internode usually 1-3 mm, rarely up to 5 mm; perigynia (3.5)-5.3-7.1 mm long; dry places, over 9000 ft

24 Spikes 6-10 mm long; proximal inflorescence internode usually at least 3 mm long; perigynia (3.5)4-5.6 mm long; wet places, 5700-9700 ft

Carex agrostoides Mackenzie [resembling Agrostis] [Carex alna of NM reports, Carex chihuahuensis Mackenzie]. Plants densely cespitose or rhizomatous with thick, straight, smooth, short, brown rhizomes; culms 20-110 cm tall, 1-3.5 mm thick, longer than the leaves; leaf blades 0.7-4(4.4) mm wide; inflorescence (2.5-)3.2-9(13) cm long, dense to elongate, composed of several upper spikes sessile on the rachis and (1)-2-9 lower multiple-spiked branches, lower internodes (5)-10-30 mm long; spikes similar, androgynous, erect to spreading, 5-40 mm long, 3-10 mm wide, the proximal bract with a broad expanded hyaline basal portion, (0.4)-1.7-5.5(9.5) cm long, shorter or longer than the inflorescence; pistillate scales similar in size to the perigynia, bronze with a green midvein and broad hyaline margins; perigynia 2.6-4.2 mm long, 1-1.8 mm wide, ascending, green or pale, turning tan or black at maturity, shiny to dull, weakly to strongly nerved, ovate to lanceolate, planoconvex, the margins rounded, the base spongy to coriaceous, the bead 0.6-0.8 mm long; stigmas 2; achenes 1.5-1.8 mm long; section Multiflorae, Key F.

Mountain springs, mountain streambanks and ciénegas in the plains; 4600-6200 ft; common in southwest NM.

Carex albonigra Mackenzie [white and black]. Plants loosely cespitose from short rhizomes; culms 10-31 cm tall, longer than the leaves; leaf blades 1.5-4.5(5) mm wide, flat, the sheaths pale green to purplish red; inflorescence (1.2)1.7-2.8(3.4) cm long, composed of 2-3(4) similar looking closely aggregated erect spikes, the terminal spike 9-16 mm long, gynoeceous, the lateral spikes 6-13(15) mm long, pistillate, ovoid to ellipsoid to obovoid, short pedunculate, the proximal bract shorter than or equal to the inflorescence; pistillate scales slightly shorter than to longer than and as wide as the perigynia, broadly ovate, dark brown to black with whitish hyaline margins, with or without a narrow paler
midstripe, the apices obtuse; perigynia 2.8-3.3 mm long, 1.1-1.9 mm wide, ascending, dark brown to black, sometimes light-colored proximally, nerveless, papillate, ovate to elliptic to obovate to orbicular, abruptly contracted to an entire to slightly bidentate beak 0.1-0.4 mm long; stigmas 3; achenes 1.6-1.7(1.9) mm long, 0.8-1(1.3) mm wide, trigonous, nearly filling the body of the perigynia; section Racemosea, Key D. Alpine rock fields and meadows above timberline, 11,400-12,600 ft; known only from the Sangre de Cristo Mts and on Sierra Blanca Peak (Otero Co.). Similar species: Immature specimens of Carex albonigra, C. bella, and C. chalciolepis can easily be confused because without mature perigynia, the spikes of C. chalciolepis often appear slender like the other two, and the scales of C. albonigra and C. bella both appear more “shaggy”, like C. chalciolepis. The nodding aspect of C. bella and C. chalciolepis inflorescences also may not appear until full maturity, especially in dwarfed alpine plants. In these cases, the few staminate scales at the base of the spike will be diagnostic for C. bella, but it may not be possible to separate the other two.

*Carex amplifolia* Boott [broad-leaved]. Plants forming large clumps or stands from stout rhizomes; culms 50-90(100) cm tall, shorter to longer than the leaves; leaf blades (5)-7-15(20) mm wide, the sheaths pale green to reddish, sometimes red-spotted; inflorescence 15.5-26 cm long, composed of 1-2(3) erect terminal staminate spikes and 3-5(7) ascending to spreading lateral pistillate spikes, the staminate spikes (3)-5-8 cm long, the pistillate spikes 3-12 cm long, cylindric, sub sessile to pedunculate, the proximal bract longer than the inflorescence; pistillate scales shorter and narrower than the perigynia, mucronate to awn-tipped; perigynia 2.4-3.1(3.6) mm long, 1.3-1.7 mm wide, spreading, brownish-green, obovoid to subspherical, sub-inflated, with 3-7 strong nerves, abruptly contracted to a minutely bidentate beak 0.7-1.1 mm long, sometimes bent; stigmas 3; achenes 0.9-1.9 mm long, 0.6-1.3 mm wide; section Anomala, Key C. Bogs, wet meadows, streamsides in conifer forests, often in shaded areas; 6100-8800 ft; known only from several locations in the Black Range and along the Mimbres River in west central NM. Similar species: *Carex amplifolia* can be confused with *C. ultra*; both are robust and have long pistillate spikes, but the perigynia of *Carex amplifolia* have subspherical bodies abruptly constricted to long, narrow, sometimes bent beaks, while those of *C. ultra* are narrowly obovoid with short stubby beaks. *Carex amplifolia* forms rhizomatous stands, and has soft, green, lax leaves, while *C. ultra* is clump-forming with stiff, harshly scabrous-edged, and often glaucous leaf blades.

*Carex* *apachense* ined. [of the Apache people and their lands]. Plants densely cespitose, forming small clumps from short rhizomes; culms 25-75 cm tall, longer or shorter than the leaves; leaf blades 1.4-4 mm wide; inflorescence (1.5)2-3.6 cm long, elongate, the base V-shaped, composed of 5-10(15) erect, gynandrous spikes, the spikes 6-10 mm long, (3.5)-7 mm wide, ovoid, similar, sessile, the upper spikes strongly overlapping and often indistinguishable, the proximal internode usually at least (3)4 mm long, the proximal bract scale-like, shorter than the inflorescence; pistillate scales shorter and narrower than the perigynia, deep brown with a pale or green midvein and hyaline margins; perigynia (3.5)-4-5.6 mm long, 1.1-1.8 mm wide, ascending, green to golden brown, usually many-nerved on both sides, broadly wing-margined to the round base; narrowly to broadly ovate, flat except over the achene, long tapering to the dark, terete beak, entire in the distal 0.2-0.4 mm distance from perigynium beak tip to top of the achene (2.0)-3.1-4.3 mm, usually widest at the top of the achene; anthers 1.8-2.2 mm long; stigmas 2; achenes (1)1.2-1.4(1.6) mm long; section *Ovales*, Key H. Moist to wet meadows, along streams; 5400-9700 ft; mostly known from southwestern NM. Similar species: We have used the provisional name *Carex* *apachense* ined. for plants that morphological and molecular evidence suggest belong to an undescribed taxon (pers. comm. A. Hipp, Morton Arboretum). These plants resemble *C. microptera*, but differ by having more elongate inflorescences, perigynia that are broadest at or above the top of the achene, and longer anthers. They range from southeast AZ into southwestern NM, with a few locations further north. *Carex microptera* is more widespread, but is less common than *Carex* *apachense* in southwestern NM, though the two overlap in the White Mountains in AZ. *Carex* *apachense* has also been confused with *C. wootonii*, which has larger perigynia with beaks that are usually winged to their green or pale tips, while those of *Carex* *apachense* are not as winged to their dark, terete tips. This provisional name also applies to herbarium specimens we earlier annotated as *Carex cf. microptera* “Pinaleno”. Note: No official nomenclatural novelty is proposed herein.

*Carex aquatilis* Wahlenberg [aquatic] WATER SEDGE [Carex variabilis Bailey]. Plants rhizomatous, rhizomes stout, scaly, 1.4-3.5 mm thick; culms arising singly or a few together, 20-120 cm tall, usually shorter than the leaves; leaf blades 2.5-6 mm wide, basal sheaths brown or reddish, not ladder-fibrillose, ligules rounded at the apex; inflorescence (4)-6-18(21) cm long, composed of 1-2(4) terminal staminate spikes and 2-4(7) lateral pistillate spikes 0.9-5(7) cm long, with peduncle up to 1 cm long, rarely longer, proximal bract leaf-like, longer to slightly shorter than the inflorescence; pistillate scales shorter to longer than the perigynia, ovate to lanceolate, dark with pale green or white midvein or none, apex awnless; perigynia 2.3-6.6 mm long, 1.3-2.3 mm wide, ascending, dull, papillate, unevined, elliptic or obovate, the beak 0.1-0.4 mm long; stigmas 2; achenes 1-1.8 mm long; section Phacocystis, Key E. Moist to wet meadows; 7000-12,100 ft; common in the mountains of northern NM. Our plants belong to var. *aquatilis*. Similar species: *Carex aquatilis* can be confused with other wetland sedges with dark-colored spikes in northern NM. *Carex kelloggii* is cespitose, usually has a single male spike at the top of the inflorescence, and the perigynia are veined and abruptly stipitate while *C. aquatilis* has long rhizomes, usually has 1-2 staminate spikes at the top of the inflorescence, and the perigynia are veinless and not abruptly stipitate. *Carex nebrascensis* has veined perigynia with bidentate beaks and pistillate scales that are often awn-tipped while *C. aquatilis* has veinless perigynia with entire beaks and pistillate scales that are not awn-tipped. *Carex aquatilis* has longer inflorescences (6-18 cm) than *C. scopulorum* (2-8 cm), which has a more compact and darker inflorescence. Also, the proximal inflorescence bract in *C. scopulorum* is always shorter than the inflorescence while the proximal inflorescence bract in *C. aquatilis* is slightly shorter to longer than the inflorescence. See also discussion under C. emoryi. §

*Carex atherodes* Sprengel [awn-like]. Plants colonial from long rhizomes, forming large stands; culms 30-110(125) cm tall, often shorter than the leaves; leaf blades 3-9 mm wide, lower surface papillate, sparsely to densely pubescent throughout or near the ligule, the sheaths brown to reddish-purple to black, the sheath fronts becoming ladder-fibrillose; inflorescence 12-35 cm long, composed of (1)-2-8 erect terminal staminate spikes (1-4 of these rarely androgynous) and 1-4 erect, remote, lateral pistillate spikes, the staminate spikes 2-6 cm long, the pistillate spikes (2)-4-7 cm long, cylindric, pedunculate, the proximal bract longer than the inflorescence; pistillate scales shorter or longer than the perigynia, lanceolate to ovate with a conspicuous scabrous awn 1.2-6 mm long; perigynia 6.8-2.9(9) mm long, (1)1.3-1.8 mm wide, ascending to spreading, green to straw-colored with many strong nerves, the body lanceoloid to ovoid-lanceoloid, smoothly tapered above to a deeply bidentate beak (2.1)2.5-4.2 mm long, with long slender, spreading teeth 1.6-2.2(3.6) mm long; stigmas 3; achenes 2.8-3.1 mm long, 1.4-1.7 mm long; see also discussion under C. emoryi.
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Carex athrostachya Olney [with crowded spikes] [Carex teniuirostris Olney]. Plants densely cespitose; culms (5)20-60(80) cm tall, longer than the leaves; leaf blades 1.5-4(5) mm wide; inflorescence 0.9-2.2 cm long, compact, base truncate or tapered, composed of (4)-7-10(15) sessile, gyenocandrous spikes, the spikes 6-10 mm long, spreading to erect, similar, ovoid, the proximal bract usually much longer than the inflorescence, lowest with base up to 3.5 mm wide, the wide basal (usually hyaline) margin of the proximal inflorescence bract greater than ½ the length of the lowest spike; pistillate scales narrower and shorter than the perigynia, golden to reddish brown with pale center and hyaline margins; perigynia 2.8-4 mm long, (0.8)-1.5(1.8) mm wide, ascending, green to light brown, nerved dorsally and sometimes ventrally, planoconvex, elliptic to ovoid, to tapering to a broad stipitate base, the beak terete and entire in distal 0.3-0.8 mm, the distance from perigynium beak tip to top of the achene 1.9-2.5 mm; stigmas 2; achenes 1.2-1.6 mm long; section Ovales, Key H. ●Wetlands, seasonally flooded ponds, depressions and streams; 6000-9900 ft; widespread in NM. ●Similar species: Other Ovales with long inflorescence bracts (C. subfusca, C. wootonii) don’t have inflorescence bracts that are broad past the midpoint of the first spike nor perigynia with broad stipitate bases.

Carex aurea Nuttall [golden] GOLDEN SEDGE. Plants rhizomatous to loosely cespitose from long slender rhizomes 0.7-1(1.8) mm thick; culms 5-41 cm tall, usually shorter than the leaves; leaf blades 1.3 - 3.5 mm wide, the sheaths cream to brown; inflorescence 2-8(13) cm long, composed of 1 terminal staminate (rarely gymnandrous) spike, 3-14(26) mm long and 1-(4)7 lateral pistillate spikes, 4-21(28) mm long, lowest sometimes with peduncles 12+ cm long, sometimes basal; proximal bract leaf-like, longer than the inflorescence, the sheath (23)-15(20) mm long; pistillate scales about as wide and up to as long as the perigynia, brownish with pale green midvein and hyaline margins, the apices obtuse to cuspidate; perigynia (1.4)2-3.8(3.1) mm long, 0.9-1.9 mm wide, spreading, pale green maturing to yellow-orange, veined or veinless, globose to obovoid, nearly sealless; stigmas 2(3); achenes 1.3-1.8(2) mm long, 1.4-1.1 mm wide; section Bicolores, Key E. ●Wet meadows, seepage slopes, springs, and marginal to sluggish streams; 5500-11,600 ft; scattered in the western ⅔ of NM. ●Similar species: The globose perigynia of Carex aurea might lead one to Key C species, with three stigmas, which C. aurea rarely has. Superficially, the inflorescences look similar to those of C. blanda, C. conoidea, and C. microdonta (all rare species in NM), but those plants always have three stigmas and perigynia that never turn golden yellow at maturity. Carex blanda has perigynia with short, bent beaks; C. conoidea has perigynia with impressed nerves, neither character being found in C. aurea. Carex microdonta has perigynia 2.6-4.2 mm long, generally longer than those of C. aurea. See also, note with C. microdonta.

Carex aureolensis Steudel [from Aureola, Iowa]. Plants colonial from long rhizomes, forming large clumps; culms (20)30-65(85) cm tall, shorter than the leaves or appearing so because of the long inflorescence bracts; leaf blades (2)4-9 mm wide, scabrous, the sheaths purplish red, not fibrous, sepaloid-nodulous, the sheath fronts papery-membranous; inflorescence 6-13 cm long, composed of 1(2) erect terminal staminate spike and 3-5 erect gymnandrous (rarely pistillate) lateral spikes, the lateral spikes (11)18-38(45) mm long, (5)7-11 mm wide, broadly cylindrical, the proximal bract much longer than the inflorescence; pistillate scales (0.4)0.6-1.2 mm wide, shorter than the perigynia, hyaline with green midrib extending into a scabrous awn (1.4)2.1-5.3(9) mm long, the awn exceeding the perigynia; perigynia (3.2)4.3-5.4(6) mm long, 1.3-2.2(5) mm wide, ascending initially, widely spreading when mature, brown to dark brown proximally, green to straw-colored distally, many-nerved, obconic, inflated, the beak (1.2)1.5-2.8 mm long, bidentate with teeth 0.3-1 mm long; stigmas 3; achenes (1.2)1.9-2.9 mm long, (0.9)-1.5 mm wide; section Saururusae, Key C. ●Mountain springs and along associated streams; 4300-5600 ft; known only from three locations: in the Guadalupe (Eddy Co.) and Florida (Luna Co.) mountains. ●Similar species: Carex aureolensis might be confused with C. utriculata, but Carex aureolensis typically has shorter pistillate spikes with awned scales that are translucent hyaline with a green midrib, unlike the merely acuminate-tipped, non-hyaline, brownish scales of C. utriculata. While they share a rhizomatous, wetland habitat, Carex utriculata is a montane species of the north, and C. aureolensis is a lower-elevation woodland to scrublands species of the extreme southern part of the state.

Carex bebbii (L. H. Bailey) Olney ex Fernald [for Michael Schuck Bebb (1833-1895), distinguished American botanist] [Carex tribuloides W. Herbert var. bebbii L.H.Bailey]. Plants densely cespitose; culms (14)20-67(90) cm tall, longer than the leaves; leaf blades 1-4 mm wide; inflorescence 1.2-6 cm long, dense, ovoid to linear-oblong, composed of (2)5-9 gymnandrous spikes, the proximal internode length 2-4.5 mm, the spikes 4-9 mm long, erect to spreading, sessile, similar, ovoid to globose, the proximal bract scale-like or setaceous-prolonged; pistillate scales narrower than and shorter than or equal to the perigynia, lanceolate to oblange-lanceolate, pale to reddish brown with pale or green midvein, sometimes with narrow hyaline margins; perigynia (1.9)2-7.3 mm long, 0.9-1.3(1.6) mm wide, ascending, light to dark reddish brown, nerveless or finely nerved dorsally, nerveless ventrally or with several nerves at the base only, winged to the base, flat to planoconvex, ovate or elliptic, the beak winged and serrulate to the tip, the distance from perigynium beak tip to top of the achene (0.9)-1.3-2 mm; stigmas 2; achenes 1.1-1.4 mm long; 0.7-0.8 mm wide; section Ovales, Key H. ●Wet meadows and streambanks; 7900-8800 ft; rare in NM. ●Similar species: Carex bebbii could be confused with C. subfusca due to the small perigynia of both, but C. bebbii spikes are evenly distinct and rounded, giving them a ‘beaded’ look, while those of C. subfusca are usually less distinguishable at least distally.

Carex bella L.H. Bailey [handsome] SOUTHWESTERN SHOWY SEDGE. Plants cespitose from short rhizomes; culms 15-64(75) cm tall, longer than the leaves, often drooping with age; leaf blades (0.8)1.2-4.1(6) mm wide, flat, the sheaths green to dark reddish-brown; inflorescence (2.8)4-9(11) cm long, elongate, compact in dwarf specimens from high elevations, composed of (12)-5 gymnandrous spikes, cylindric or narrowly ellipsoid, the lateral spikes (6)11-28(35) mm long, often more than 3 times as long as wide, with progressively fewer staminate flowers and longer peduncles on the lower spikes, the mature lower spikes often drooping; pistillate scales shorter than the perigynia so that at least the tips of the perigynia are visible, occasionally as long as the perigynia, ovoid, dark reddish brown with a lighter tan or green midvein, the apices acute, rarely obtuse, or with the midvein extending as an awn up to 0.6 mm long; perigynia 2.4-3.2(3.6) mm long, 1.2-2(2.4) mm wide, ascending, light green or beige, sometimes with reddish to black mottling, smooth, nerveless or obscurely several nerved, elliptic or obovate, rounded at the apex, with beak 0.1-0.5(0.6) mm long; stigmas 3; achenes trigonous, 1.8-2.6 mm long, 0.8-1.6 mm wide,
Montane conifer forests to alpine rock fields and meadows, but most common in subalpine forests; 7600-12,200 ft; widespread in the mountains in the northern part of the state, found also in the Sacramento Mtns. **Similar species:** *Carex chalciolepis* also haspendent inflorescences, but the spikes tend to be shorter and broader, and the pistillate scales longer, exceeding the perigynia. Short alpine specimens of *C. bella* with upright spikes might be confused with *C. albonigra*; however, both the pistillate scales and perigynia of *C. albonigra* are dark, while the pale green perigynia sharply contrast with the dark pistillate scales in *C. bella*. The apices of the pistillate scales are more obtuse in *C. albonigra* than in *C. bella*. There are usually one or more staminate scales at the base of the lowest spike in *C. bella*, while this never occurs in *C. albonigra* or in *C. chalciolepis*.

**Carex bella** Dewey [charming, mild]. Plants densely cespitose; culms 14-53 cm tall, ascending, lax, or occasionally decumbent, rarely erect; leaf blades 1-10 mm wide; inflorescence composed of one terminal staminate spike and 3(4) lateral pistillate spikes, the staminate spike 9-20 mm long, sessile to pedunculate, the pistillate spikes 15-18 mm long, pedunculate, the proximal bract leaffike, the spike 1-4 mm long; pistillate scales shorter than perigynia, hyaline except for green midvein that extends as a conspicuous awn; perigynia 2.5-3.8(4.1) mm long, 1.3-2.2 mm wide, 4-18 per spike, closely overlapping, more than 20 veined, obovoid to ellipsoid-obovoid, beak 0.1-0.6 mm long, abruptly bent; stigmas 3; achenes obovoid, 2.1-3.2 mm long, 0.8-1.8 mm wide; section *Laxiflorae*, Key C. ● Wide range of habitats, often weedy; 6400 ft; known from one location at Ghost Ranch (Rio Arriba Co.) in a moist habitat near stream. **Similar species:** The short, conspicuously bent perigynium beak distinguishes *C. bella* from all other NM *Carex* taxa (i.e., *C. aurea*, *C. conoidea*, *C. microdonta*) with similar inflorescence arrangement.

**Carex bolanderi** Ohn. [for Henry Nicholson Bolander (1831-1897), California State Botanist] [Carex deweyana Schwein. var. bolanderi (Ohney) W. Boott]. Plants cespitose; culms 20-75(115) cm tall, leaf blades 0.6-3.5(5.9) mm wide, ligule of distal leaf (2)3.4-7.1 mm long, much longer than wide; inflorescence 1.5-4.5(10) cm long, usually with a tight cluster of spikes at the top and several more distant below, composed of 4-6(9) sessile, easily distinguished, gynandrous or pistillate spikes, the proximal internode 5-15(20) mm long the spikes 8-12(25) mm long; pistillate scales, the proximal pistillate bract of the cauline inflorescence leaf-like, shorter to longer than the inflorescence; pistillate scales shorter than perigynia, perigynia 2.3-3.4(4.2) mm long, 0.8-1.4 mm wide, ascending, the pistillate spikes 3-8 mm long, each with 1-5 perigynia, the proximal pistillate bract of the perigynia nearly orbicular, planoconvex, the distance from perigynium beak tip to top (2.6)3.4-4.6 mm long, (2)2.2-3 mm wide, less than 2 times as long as wide, green to tan, nerveless ventrally and sometimes nerv ed dorsally, widely bro winged to the base, body of the perigynia nearly orbicular, planoconvex, the distance from perigynium beak tip to top of the achene 1.4-2.4 mm; stigmas 2; achenes 1.5-2.2 mm long; section *Deweyana*, Key G. ● Wetlands and riparian areas, streamside and at springs in montane coniferous forest habitats; 6700-8,800 ft; known from north-central and southwest NM. **Similar species:** Perigynia beaks greater than 1 mm long distinguish *Carex bolanderi* from *C. brunnescens*, *C. canescens*, and *C. praceptorum*. *Carex lachenalii* occurs in alpine habitats and has dark spikes, while *C. bolanderi* occurs in conifer forests and has light-colored spikes.

**Carex brevior** (Dewey) Mackenzie ex Lunell [shorter] [Carex festuca ca Schkuhr ex brevier (Dewey) Fernald, Carex straminea Willdenow var. brevieri Dewey]. Plants densely cespitose; culms 20-70 cm tall, longer than the leaves; leaf blades 1-2.8 mm wide; inflorescence (1.3)2-3.5(6.5) cm long, elongate, composed of 3-6(10) gynandrous spikes, the spikes 4-13 mm long, 3-7 mm wide, sessile, overlapping, erect, similar, distinguishable, clavate due to the high number of male flowers at the bases, proximal bract scale-like or sessile, oblong, shorter than the inflorescence; pistillate scales narrower and shorter than the perigynia, pale yellow brown with green midvein (that fades in time) and narrow hyaline margins; perigynia (2.6)3-4.6 mm long, (2)2-3 mm wide, less than 2 times as long as wide, green to tan, nerveless ventrally and sometimes nerved dorsally, widely bro winged to the base, body of the perigynia nearly orbicular, planoconvex, the distance from perigynium beak tip to top of the achene 1.4-2.4 mm; stigmas 2; achenes 1.5-2.2 mm long; section *Oxales*, Key H. ● Wet meadows and swales, springs and seeps, stream banks and lakeshores; 5400-8200 ft; known from northern NM. **Similar species:** Mature *Carex brevior* inflorescences are coarse textured, somewhat spiky, with clavate to nearly globose spikes and broad, nearly orbicular perigynia. Immature spikes can resemble those of *C. scoparia*, but even immature perigynia of *C. brevior* have broadly winged bodies, while those of *C. scoparia* are more than twice as long as wide. Also, mature *C. scoparia* spikes are fusiform (equally tapered at both ends), while those of *C. brevior* are often clavate due to the many male florets at the base of each spike, a character only shared with the much larger fruited *C. petasata*, which grows in dry areas.

**Carex brevipes** W. Boott ex B.D. Jackson [short-stalked] [Carex deflexa Hornemann var. boottii L.H. Bailey, Carex globosa F. Boott var. brevipes W. Boett ex Mackenzie, Carex rossii W. Boett var. brevipes (W. Boott ex B.D. Jacks.) Kükenthal]. Plants loosely cespitose; culms 5-17(31) cm tall, usually shorter to occasionally longer than the leaves; leaf blades 0.9-2.4(3.2) mm wide, the sheaths reddish brown, old sheaths forming a weakly fibrous base; inflorescence of two types, basal and cauline, the bas al inflorescences composed of 1-2 pistillate spikes on a slender peduncle, the cauline inflorescences 1-4.3 cm long, composed of 1 terminal staminate spike, subtended by 1-4 lateral pistillate spikes, the staminate spike 5.1-7(12) mm long, the pistillate spikes 3-8 mm long, each with 1-5 perigynia, the proximal pistillate bract of the cauline inflorescence leaf-like, shorter to longer than the inflorescence; pistillate scales shorter than the perigynia; perigynia 2.3-3.4(4.2) mm long, 0.8-1.4 mm wide, ascending, yellow to gray green, with two marginal nerves, pubescent, obovoid to ellipsoid, suborbicular in cross-section, contracted to a narrow stipe-like base, abruptly contracted to the beak, the beak 0.5-1.5(1.6) mm long, often bent, acuminate, the margins ciliate-serrulate, bidentate, the teeth 0.1-0.5 mm long, stigmas 3; achenes (1.3)1.6-1.8 mm long, 0.9-1.2(1.4) mm wide, obovoid in outline, obtusely trigonous in cross-section; section *Acrocytis*, Key B. ● Alpine rock fields and tundra at or above timberline. 11,800-12,400 ft; known from a few locations in the Sangre de Cristo Mtns. **Similar species:** *Carex brevipes* resembles a diminutive version of *C. rossii*, with a looser growth form. Its high elevation habitat overlaps with the habitat of *C. rossii*, but should prevent it from being confused with any of the other *Acrocytis* taxa, which are generally found at lower elevations.

**Carex brunnescens** (Persoon) Poir. [brownish] [Carex curta Hornemann var. brunnescens Persoon]. Plants cespitose; culms 10-60 cm tall; leaf blades 0.7-2.5 mm wide; inflorescence 10-50 mm long, composed of 3-10 sessile, easily distinguished gynandrous spikes, usually with a tight cluster of spikes at the top and several more distant below, proximal internodes 5-14 mm, the spikes (2)3-8 mm long, sub-globose to short-oblong, of 1-11 perigynia; pistillate scales shorter than the perigynia, white hyaline, often brown in the middle with a green midvein; perigynia 1.9-2.7 mm long; 79
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long, (0.7)0.9-1.2(1.5) mm wide, 1.6-2.5 times longer than wide, appressed-ascending to loosely spreading or reflexed when mature, green or brown, often dark brown in age, the dorsal suture usually extending the length of the beak and sometimes with a white hyaline flap, nerved on both sides with two prominent marginal nerves, smooth to papillate, biconvex, ovate to elliptic, widest at or near the middle, the apex tapering to a conspicuously serrate beak 0.2-0.7 mm long; stigmas 2; achenes 1.3-1.5 mm long, 0.7-1.1 mm wide; section Glareosae, Key G. ●Boggy wetlands; 8400-8700 ft; known from Valles Caldera National Preserve in north-central NM. ●Our plants belong to subsp. brasunensis. Similar species: Short, poorly defined perigynia beaks (up to 0.7 mm) of Carex brunnescens distinguish it from C. bolanderi and C. deweyana, which both have beaks 0.9 mm or longer. The light-colored, widely separated (though sometimes overlapping) proximal spikes of C. brunnescens separate it from C. lachenalii and C. praeceptorum, which both have dark-colored, crowded, strongly overlapping proximal spikes.

Carex buxbaumii Wahlenberg [for Johann Christian Buxbaum (1683-1730), German botanist]. Plants colonial from long, slender rhizomes; culms 25-45(75) cm tall, stiffly upright, shorter to longer than the leaves; leaf blades 1.5-3(4) mm wide, the sheaths reddish brown to dark brown, the sheath fronts light-colored, becoming ladder-fibrilllose; inflorescence 1.5-4.5(5) cm long, elongate, composed of 1 terminal gynandrous spike and 1-3(4) lateral pistillate spikes, the upper spikes overlapping; the lowest remote, the spikes all oblong-ovoid, the terminal spike (10)18-22(40) mm long, the lateral spikes 5-21 mm long, sessile to short pedunculate, the proximal bract shorter to longer than the inflorescence; pistillate scales usually much longer than the perigynia, lanceolate to ovate-lanceolate, brown to reddish-black with a pale center and raised midvein, tapering to awned apices 0.5-2(3.5) mm long; perigynia 2.5-3(4) mm long, 1.2-1.6(2) mm wide, ascending, pale green, elliptic to obovate, smooth to strongly nerved on the faces, strongly and densely papilllose throughout, rounded to taperd at the top to a short beak, up to 0.2 mm long; stigmas 3; achenes trigonous, 1.5-2.2 mm long, 1.1-1.5 mm wide, nearly filling the body of the perigynia; section Racemosae, Key D. ●Wet meadows, fens and bogs; 10,300 ft; known from one location in the San Pedro Parks Wilderness (Rio Arriba Co.). ●Similar species: Carex buxbaumii is distinctive; the combination of lanceolate to ovate-lanceolate pistillate scales with prominent awns, stiffly upright culms, ladder-fibrilllose sheath fronts, rhizomatous habit, and wetland habitat distinguish it from the other species in section Racemosae.

Carex canescens Linnaeus [white] SILVER SEDGE. Plants cespitose; culms 15-40(60) cm tall; leaf blades 1-3(4) mm wide; inflorescence 1.5-4.2(5) cm long, composed of 3-7(8) sessile, easily distinguished gynandrous spikes, the proximal ones more separated from the distal spikes, the proximal verticillate (2.3)-14(16) mm long; spikes 3-14 mm long, mostly oblong, but occasionally subglobose, consisting of (2)3(23) perigynia; pistillate scales a little shorter and about the width of the perigynia, ovate, hyaline, sometimes tinged brown or green with a green or light-colored midvein; perigynia (1.6)3-2.7 mm long, (0.7)0.9-1.2(1.3) mm wide, (1.4)6-2.7 times longer than wide, appressed-ascending, usually pale green to yellowish-green, sometimes yellowish-brown when mature, the dorsal suture inconspicuous and not extending the length of the beak, nerved on both faces, papilllose, elliptic-ovate, biconvex, widest at or near the middle, the apex tapered to an ill-defined, blunt beak, 0.1-0.5(0.6) mm long; stigmas 2; achenes 1.5 mm long, 0.8-1(1.2) mm wide; section Glareosae, Key G. ●Bogs, fens, lakeshores, streamedges, and other wetlands; 8000-12,000 ft; common in northern NM. ●Our plants belong to subsp. canescens. Similar species: The short, poorly defined beak of Carex canescens distinguishes it from C. bolanderi and C. deweyana (with at least 0.9 mm long). The light-colored and widely separated (though sometimes overlapping) proximal spikes of C. canescens separate it from C. lachenalii and C. praeceptorum, which both have dark-colored, crowded, strongly overlapping proximal spikes.

Carex capillaris Linnaeus [hair-like] [Carex capillaris Linnaeus var. elongata Olney, Carex capillaris Linnaeus var. major Drejer]. Plants cespitose, culms 5-35(60) cm tall; leaf blades 0.7-3 mm wide; inflorescence 3-19 cm long, composed of one terminal staminate spike and 2-4 lateral pistillate spikes, the staminate spike (2)4(10) mm long, erect or flexuous, longer than, even with, or occasionally shorter than the upper lateral spikes, the pistillate spikes (4)5-15(20) mm long, the proximal ones pendent on long flexuous peduncles, the proximal bract usually shorter than the inflorescence, the sheath (4)5-6 cm long; pistillate scales shorter and narrower to wider than the perigynia, pale to medium brown with hyaline margins; perigynia (2.3)5.3-3.5(5.5) mm long, (0.6)1.7-1.2(2) mm wide, pale green to light or dark brown and sometimes shiny, with 2 prominent nerves, glabrous, ellipsoid to lanceoloid-ellipsoid, stipitate, acute apex, beak 0.3-1.1 mm long, prominent, smooth or serrate; stigmas 3; achenes (1.2)-1.3-1.7 mm long, 0.6-0.9(1) mm wide; section Chlorostachyae, Key C. ●Springs, streamedges, fens, bogs and wet meadows; 8500-12,000 ft; found in conifer forest and alpine sites in the Sangre de Cristo and Sacramento mtns. ●Similar species: Carex capillaris is easily distinguished from other Carex taxa with pendant lateral spikes (ie. C. hysterica, C. luzulina, C. magellanica, C. sprengelii), per characters in the key. It is more widespread than any of these similar taxa.

Carex chalciolepis Holm [with copper-colored scales] HOLM’S SEDGE [Carex atrata of NM reports, Carex atrata Linnaeus var. chalciolepis (Holm) F.J. Hermann]. Plants cespitose, from short rhizomes; culms 10-60(75) cm tall, shorter than to often much longer than the leaves, often drooping with age; leaf blades (0.8)1.2-6 mm wide, the sheaths tan to purplish-red; inflorescence 1.5-5.1 cm long, compact, often nodding when mature, composed of (1)(2-4)5 overlapping but distinct, similar-looking spikes, the proximal spike usually slightly remote, the terminal spike 1.2-2.4 mm long, ovoid, gynandrous; lateral spikes (7)10-26(20) mm long, oblong, pistillate, the lowest rarely gynandrous, short pedunculate; proximal bract shorter than or equal to the inflorescence; pistillate scales up to 1 mm or more longer than the perigynia, lanceolate to ovate-lanceolate, dark reddish brown to purplish black throughout or with a slightly lighter midvein, sometimes with hyaline margins or nearly entirely hyaline, the apices acute; perigynia 2.9-4.8 mm long, 1.5-2.4 mm wide, ascending, dark red-brown to reddish black, sometimes tan, or with marginal portions bright green or tan, or entirely tan, nerveless, distally papilllose, broadly ovate, flattened but distended by achene, abruptly contracted to the beak, the beak 0.2-0.4(0.5) mm long; stigmas 3; achenes trigonous, (1.5)18-2.12.5 mm long, 0.8-1(1.4) mm wide, filling proximal half or less of the perigynia; section Racemosae, Key D. ●Subalpine and alpine meadows, rock fields; 10,300-13,000 ft; found only in the northern Sangre de Cristo mountain range and on Sierra Blanca Peak (Lincoln Co.). ●Similar species: See discussion under Carex albonigra and C. bella.

Carex conoidea Willdenow [cone-like]. Plants cespitose from short rhizomes; culms (2)8-35(75) cm tall; leaf blades 1.8-3.2(5.6) mm wide; inflorescence 3-8(10) cm long, composed of one terminal staminate spike and 1-3 lateral pistillate spikes, occasionally also having spikes on long filiform peduncles from basal or lower leaf axes, the staminate spike (5)8-26(30) mm long, the pistillate spikes 5-25(29) mm long, with 5-36(86) perigynia, sessile to pedunculate, the lateral peduncles scabrous, the proximal bract leaf-like, shorter than to exceeding the terminal spike, the sheath 8+
C. disperma

Most meadows, lakeshores and stream-sides; 8600-8800 ft; known from two northern locations: Sangre de Cristo mountains and Valles Caldera. Similar species: Perigynia with impressed veins and scabrous ribs. "C. conoidea" from other Carex taxa (i.e., C. aurea, C. blanda, C. microdon) with similar inflorescence architecture and perigynium shape.

Carex deweyana Schweinitz  [for Chester Dewey (1784-1867), eminent American caricologist]. Plants cespitose; culms (9)-14-52(89) cm tall; leaf blades 1.1-3.1(4.2) mm wide, the ligule of distal leaf 0.7-2.2(7.7) mm long, about as long as wide; inflorescence (12)20-43(56) mm long, composed of a tight cluster of spikes at the top and several more distant below, easily distinguished, proximal internode 7-26(34) mm long, the spikes 2-4(5), sessile, mostly gynoecandrous or pistillate, terminal spike 7-14 mm long, lateral spikes 5-11 mm long; pistillate scales ovate to oblong-ovate, hyaline with green midvein, the apices acuminate to short; perigynia 3.3-6.4 mm long, 1.1-1.5(1.7) mm wide, 2.5-3.8 times longer than wider, ascending to erect, pale, thin, translucent, narrowly ovate to narrowly elliptic, tapering to the prominent beak, the beak serratulate, 0.9-1.8 mm long, apex bidentate with teeth 0.1-0.5(0.7) mm long; stigmas 2; achenes 1.7-2.1 mm long, 1.1-2.2 mm wide; section Deweyanae, Key G. Moist conifer forest or along shaded streambanks in montane conifer forest: 6500-9100 ft; known from southern, south central, and southwest NM. Our plants belong to var. deweyana. Similar species: The long perigynium beak (at least 0.9 mm long) of Carex deweyana distinguishes it from C. brunnescens, C. canescens, and C. praeceptorum, all of which have shorter beaks. Carex lachenalii occurs in alpine habitats and has dark spikes, while C. deweyana occurs in conifer forests and has light-colored spikes.

Carex diandra Schr ank  [with 2 stamens (a misnomer)]. Plants densely cespitose from fibrous rhizomes; culms 20-100 cm tall, usually longer than the leaves; widest leaf blades 1-3.1 mm wide, the sheath fronts hyaline, red-spotted; inflorescence 1.5-5.5 cm long, dense to elongate, typically composed of several upper spikes sessile on the rachis and (0)-1-7 lateral, multiple-spiked branches, the branches with 2-10 spikes, internode between lowest branches 1.5-12 mm long, the spikes 3-9 mm long, 1.5-4 mm wide, erect to spreading, androgynous, few-flowered, the proximal bract setaceous, the inflorescences similar in size to the perigynium, straw-colored to brownish with a pale midvein, the margins hyaline; perigynia 2.3-3.2(8.9) mm long, 1.1-1.4 mm wide, spreading to ascending, green to dark chestnut brown to black at maturity, with two prominent raised ridges on either side of a dorsal central groove, otherwise nerveless, shiny, with a distinct hyaline flap at the top of the dorsal suture, deltoid-ovoid, unequally biconvex to round in cross-section, beak 1.1-1.3 mm long, brown to black at maturity, with two prominent raised ridges on either side of a dorsal central groove, otherwise nerveless, shiny, with a distinct hyaline flap at the top.

Carex divergens Dewey [2-seeded] [Carex tenella Schkuhr]. Plants fine, loosely cespitose or long rhizomatous, the rhizomes brown, scaly, to 1.5 mm thick; culms 6-60 cm tall, 0.2-0.6 mm thick, usually longer than the leaves, weak, arched or nodding; leaf blades 0.7-1.8(2.5) mm wide, the sheaths pale brown; inflorescence 1.3-3.1 cm long, elongate, composed of 2-4(7) sessile, globose, androgyrous spikes, the lowermost spikes well-separated, the uppermost more or less contiguous, the spikes 3-5 mm long, 2-4 mm wide, often seemingly pistillate as the staminate flowers are hard to see, each with 1-4 perigynia, the stamine flowers 1-3, forming an inconspicuous cone at the top of the spike, the proximal bract 0.4-1.1 cm long, shorter than the inflorescence, sheathless; pistillate scales shorter than to as long as the perigynia, hyaline with a prominent pale midvein; perigynia 2.4-3.6 mm long, 1.1-1.7 mm wide, spreading to ascending, pale green maturing to olive-green, becoming shiny dark brown, both faces many nerved, broadly stipitate, ellipsoid to obovate, uni- to biconvex in cross-section, the beak 0.2-0.5 mm long; stigmas 2; achenes (11.5)-1.75(2) mm long; section Dispermae, Key F. Wetlands, lake margins, floating logs, sometimes forming floating mats in deeper water; 7400-11,600 ft; in NM, known only from Lagunitas Lakes (Rio Arriba Co.). Similar species: Carex diandra can be confused with C. simulata, since they share high elevation, inundated habitats, inflorescence architecture and perigynium shape. Carex diandra perigynia have longer beaks that contrast in color with the body, whereas C. simulata perigynia beaks are short and of the same color as the body. Carex diandra is cespitose, while C. simulata forms large rhizomatous stands. Carex diandra occurs in high elevation wetlands in northern NM, while C. agrostoides occurs at low elevation springs in southwest NM.

Carex disperma Dewey [2-seeded] [Carex tenella Schkuhr]. Plants fine, loosely cespitose or long rhizomatous, the rhizomes brown, scaly, to 1.5 mm thick; culms 6-60 cm tall, 0.2-0.6 mm thick, usually longer than the leaves, weak, arched or nodding; leaf blades 0.7-1.8(2.5) mm wide, the sheaths pale brown; inflorescence 1.3-3.1 cm long, elongate, composed of 2-4(7) sessile, globose, androgyrous spikes, the lowermost spikes well-separated, the uppermost more or less contiguous, the spikes 3-5 mm long, 2-4 mm wide, often seemingly pistillate as the staminate flowers are hard to see, each with 1-4 perigynia, the stamine flowers 1-3, forming an inconspicuous cone at the top of the spike, the proximal bract 0.4-1.1 cm long, shorter than the inflorescence, sheathless; pistillate scales shorter than to as long as the perigynia, hyaline with a prominent pale midvein; perigynia 2.4-3.6 mm long, 1.1-1.7 mm wide, spreading to ascending, pale green maturing to olive-green, becoming shiny dark brown, both faces many nerved, broadly stipitate, ellipsoid to obovate, uni- to biconvex in cross-section, the beak 0.2-0.5 mm long; stigmas 2; achenes (11.5)-1.75(2) mm long; section Dispermae, Key F. Wetlands, lake margins, floating logs, sometimes forming floating mats in deeper water; 7400-11,600 ft; in NM, known only from Lagunitas Lakes (Rio Arriba Co.). Similar species: Carex diandra can be confused with C. simulata, since they share high elevation, inundated habitats, inflorescence architecture and perigynium shape. Carex diandra perigynia have longer beaks that contrast in color with the body, whereas C. simulata perigynia beaks are short and of the same color as the body. Carex diandra is cespitose, while C. simulata forms large rhizomatous stands. Carex diandra occurs in high elevation wetlands in northern NM, while C. agrostoides occurs at low elevation springs in southwest NM.

Carex douglasii Boott [for David Douglas (1798-1834), prominent botanical collector] DOUGLAS’S SEDGE. Plants forming dioecious (occasionally monoecious) colonies, culms arising singly or several from slender rhizomes, the rhizomes 0.8-1.4 thick, brown; culms 4-25 cm tall, longer than the leaves, smooth below the inflorescence; leaf blades up to 3 mm wide, the sheaths pale to brown; inflorescence dense and head-like, often unisexual, but often having some opposite gender flowers (or spikes) mixed in, the lower branches usually with multiple spikelets, the staminate inflorescences lanceoloid, 1.4-4.4 cm long, 0.7-2 cm wide, the staminate spikes 5-12 mm long, 1.8-3.2 mm wide, the staminate basal inflorescence bracts 8-10 mm long, broad, basally hyaline margined, the pistillate inflorescence 15-33 mm long, 8-20 mm wide, subglobose to ovoid to fusiform, the pistillate spikes 6-15 mm long, 1-5 mm wide, the pistillate basal inflorescence bracts scarious-setaceous, 6-17(39) mm long, shorter or longer than the inflorescence; pistillate scales longer and wider than the perigynia, 4-8 mm long; perigynia (33.5)-4.2(4.8) mm long, 1.2-2.1 mm wide, ascending, straw-colored to brown, nerveless, round tapering to a stipitate base, narrowly elliptic, elliptic-ovate, obovate, or obvate-lanceolate, planoconvex in cross-section, the beak 1.6-1.9 mm long; anthers 2.4-4 mm long; stigmas 2; achenes (1.41)-6.2 mm long; section Divisae, Key F. Seasonally flooded depressions, grasslands to forests; 6600-10,000 ft; northern NM. Similar species: Carex douglasii is often confused with C. praeegracilis and C. duriuscula, two other rhizomatous species that tolerate dry, alkaline sites. The pistillate inflorescences of C. douglasii are larger and more robust than either of these, with stigmas that are long and form a tangled mat that persists through maturity. Carex praeegracilis is often dioecious (like C. douglasii), but it has a narrower, more elongate inflorescence, darker culm bases and stouter, darker rhizomes. Carex duriuscula is usually androgyrous, and both the inflorescence and perigynium are smaller than in C. douglasii. Carex siccata is monoecious, with narrower inflorescences, culms which are scabrous below the inflorescences and is most often found in forests, while C. douglasii has culms that are smooth below the inflorescence and is most often found in open sites.

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Monocotyledonous Plants - Cyperaceae
Monocotyledons - Cyperaceae

Carex duriuscula C.A. Meyer [somewhat hard] needle leaf sedge [Carex echinata Bailey, Carex stenophylla auctores, Carex stenophylla Wahlenberg var. echinaria (Bailey) Breitung]. Plants rhizomatous, the shoots arising 2 to several per cluster, the rhizomes 0.6-1.4 mm thick, brown, covered with sheaths that disarticulate into fibers with age; culms 6-30 cm tall, usually longer than the leaves, bluntly to sharply trigonous (though smooth) below the inflorescence; leaf blades 0.3-1.5(2.3) mm wide, tapering to a long, slender tip, the sheaths light to dark brown, disarticulating into fibers; inflorescence 0.7-2 cm long, 2.8 mm wide, dense, composed of 3-8 sessile, androgynous spikes or the plants rarely unisexual in a clone, often infected with smut, then producing perigynia that are globose, smooth, and gray, the spikes 4-9 mm long, 3.5 mm wide, ovoid, indistinguishable, the; the proximal bracts 4-14 mm long, shorter than the inflorescence; pistillate scales as long or longer than the perigynia, 2.4-4.1 mm long, straw-colored to dark reddish brown with hyaline margins and pale midvein, the apices acuminated or with a short protruding midvein; perigynia 2.8-3.8 mm long, 1.2-1.6 mm wide, greenish to dark reddish brown, black at maturity, shiny, often with stiff short hairs on the upper portion of the dorsal face, elliptic-ovate to nearly orbicular, thickly planoconvex in cross-section, beak 0.3-0.8 mm long; stigmas 2; anthers 2.3-2.9 mm long; achenes 1.5-2.1 mm long; section Divisae, Key F. ●Dry prairies, grasslands, and openings in woodlands and forests; 6300-11,500 ft; northern and western NM. ●Similar species: see discussion under C. douglasii. Carex duriuscula only occurs in dry locations in contrast to C. praegracilis which occurs in moist to wet habitats. It has finer rhizomes than C. praegracilis and has smooth culms below the always unbranched inflorescence with spikes sessile on the main axis versus roughened culms below the main axis of the often-branched inflorescence of C. praegracilis. Carex duriuscula could be confused with C. siccata. However, C. siccata usually has a roughened culm below the inflorescence, a longer and narrower inflorescence, with longer perigynia that are mostly in the upper and lower spikes and male flowers that occur predominantly in the middle spikes.

Carex ebeno Murray Rydberg [ebony-colored] EBONY SEDGE. Plants densely cespitose; culms 10-50 cm tall, longer than the leaves; leaf blades 2.3-5.5 mm wide; inflorescence 1.2-2.5 cm long, dense, tapered at base, composed of 5-12 erect to spreading, sessile, gynandroous, similar spikes, the spikes 9-15 mm long, 4.5-6.5 mm wide, ovoid, some strongly overlapping and indistinguishable, the proximal internode usually 1-3 mm, rarely up to 5 mm, the proximal bract lacking, scale-like, or bristle-like; pistillate scales narrower and shorter than the perigynia, dark brown, sometimes with a green or gold midvein (that fades in time) and narrow hyaline margins; perigynia (3.5)5.3-7.1 mm long, 1.1-1.5(1.7) mm wide, green to coppery or golden brown, usually nerved on both sides, broadly winged to the base, lanceolate to ovate, planoconvex, long-tapering to the terete beak, often serrulate to the tips, distance from perigynium beak tip to top of the achene 2.9-4 mm; stigmas 2; achenes 1.5-1.9 mm long; section Ovales, Key H. ●Subalpine and alpine meadows, openings in conifer forests, edges of wetlands and lakes, talus; 9000-13,500 ft; known from northern NM and the slopes of Sierra Blanca Peak (Otero Co.). ●Similar species: Sometimes Carex microptera has narrow perigynia, but they are not as long as those of C. ebena. Also, both C. microptera and C. macloviana grow in wetter places than C. ebena. Carex haydeniana can also grow in dry alpine places, but it has shorter perigynia than C. ebena.

Carex eburnea Booth [ivory-colored]. Plants cespitose; culms (12)15-25(30) cm tall; leaf blades 0.2-0.5(1) mm wide, wiry, involute; inflorescence (1.5)2-2.5(3.5) cm long, composed of one terminal staminate spike and 2-4 lateral pistillate spikes, one or more of the perigynia, white hyaline with green or brown midrib; perigynia 1.5-2.2 mm long, 0.7-1.1 mm wide, light green becoming dark brown, beak 0.2-0.4(0.5) mm long; stigmas 3; achenes 1.5 mm long, 0.6-0.7 mm wide; section Albae, Key C. ●Wet, spring-fed meadow in conifer forest; 8800-8900 ft; known only from one location in Brown Canyon in the Sacramento Mtns (Otero Co.). ●Similar species: The very thin, wiry leaves and the lateral pistillate spikes overtopping the shorter central staminate spike and the very short perigynia distinguish C. eburnea from all other Carex in Key C. Populations of Carex mckittrickensis, a slightly more robust close relative known from just over the Texas border in the Guadalupe Mtns. are far closer geographically than any other records of C. eburnea in the western states, but our single specimen fits better in C. eburnea. E.L. Gillespie (2005) makes a convincing case that C. mckittrickensis does not merit distinction as a species and is no more morphologically divergent from C. eburnea than other regional populations.

Carex echinata Murray [prickly] [Carex angustior Mackenzie]. Plants densely cespitose; culms 9-35(60) cm tall, equal to or taller, sometimes shorter than the leaves, slender, wiry; leaf blades (0.4)1.2-2.5(5) mm wide; inflorescence 1-3 cm long, composed of 2-6 sessile, gynandroous, easily distinguished spikes, the proximal internode 2-7(8) mm long, the terminal spike (5)7-12 mm long, clavate with a prominent narrow staminate basal portion less than to more than half the length of the spike, the lateral spikes (3)4-8 mm long, sometimes wholly pistillate; pistillate scales shorter than the perigynia, ovate, inconspicuous, mostly hyaline, brown in the middle; perigynia (2.6)2.8-3.5 mm long, 0.9-1.5 mm wide, (1.9)2-2.9 mm long as times as wide, becoming spreading to reflexed, giving the short lateral spikes a star-like appearance, green to dark brown when mature, planoconvex, broadest slightly above the base, the base plumose, somewhat swollen with spongy tissue, serrulate throughout the prominent beak, beak 0.9-1.5 mm long, tip nearly entirely to bidentate up to 0.3 mm; stigmas 2; achenes 1.3-1.7 mm long, 0.9-1.1 mm wide; section Stellulatae, Key G. ●Along subalpine streams, in fens and wet meadows; 9000-10,800 ft; known from north-central NM. ●Our plants belong to subsp. echinata. Similar species: The gynandroous, clavate terminal spikes with narrow prominent staminate portions of Carex echinata distinguish it from C. disperma and C. radiata, both of which have androgynous terminal spikes and widely separated, ovoid to rounded, short sessile spikes that lack the starburst appearance of C. echinata.

Carex egglestonii Mackenzie [for Willard Webster Eggleston, 1863-1935, Vermont botanist]. Plants densely cespitose; culms 30-80 cm tall, longer than the leaves; leaf blades (1.5)2-7.4(6) mm wide; inflorescence 1.5-3.1 cm long, compact, of 2-5(6) gynandroous spikes, the spikes 8-15 mm long, broadly ovoid, similar, sessile, the proximal internode (2)4-5 mm long, the proximal bract bristle-like to leaf-like, usually shorter than the inflorescence; pistillate scales narrower and shorter than the perigynia, ovate or ovate-lanceolate, gold to brown, sometimes with a green or gold midvein, the hyaline margins 0.2-0.5 mm wide, the apices acute to acuminate; perigynia 5.2-5.9(7.2) mm long, (2.2)3-3.5(3.8) mm wide, 1.8-2.3 times as long as wide, green to brown, not nerved or sometimes up to 6 nerved dorsally, broadly ovate, usually flat except over the achene, the margin flat, 0.5-1.1 mm wide, the beak wid of to tip, distance from perigynium beak tip to top of the achene (2.2)3.2-3.6(4.3) mm; stigmas 2; achenes 1.5-2.4 mm long, 1.2-1.7 mm wide; section Ovales, Key H. ●Subalpine and alpine meadows, steep grassy slopes, talus; 9700-9800 ft; known from San Pedro Parks Wilderness, Rio Arriba Co. in northern NM. ●Similar species: Carex egglestonii will most often be confused with C. wootonii and C. ebena, which are both contrasted in couples 18 and 24 in Key H.
**Carex emoryi** Dewey. Plants loosely to densely cespitose in tufts of several culms, with extensive rhizomes 1.5-3.5 mm thick; culms 12-120 cm tall, shorter or longer than the leaves; leaf blades 2-4(6) mm wide, usually with a U-shaped to nearly horizontal ligule up to 0.5 mm long, the sheaths straw to brown, not ladder-fibrillose; inflorescence (7)10-21 cm long, composed of 2-3 terminal staminate spikes and 3-5 remote lateral pistillate spikes, these (1)2-6 cm long, with peduncle up to 1 cm long, the proximal bract leaf-like, shorter to longer than the inflorescence; pistillate scales shorter than to longer and narrower than the perigynia, oblong, margins light brown surrounding a broad pale mid-portion, apex lacking awns, usually spring flowering with perigynia and pistillate scale deciduous by mid-summer; perigynia 1.7-3.2 mm long, 1.2-2.1 mm wide, ascending to spreading, green to straw, papillose, veinless or up to 5 veined on each face, ovate to elliptic, beak 0.1-0.4 mm long, entire; stigmas 2; achenes 1.5 mm long; section Phacocystis, Key A. •Banks of slow-moving streams, and floodplain meadows; northern NM and south along the Rio Grande; Carex emoryi is the dominant sedging lining the Rio Grande and similar large streams and associated drains and ditches at lower elevations; 3400-8800 ft. •Similar species: Carex emoryi can be confused with other rhizomatous wetland sedges, but C. emoryi can be identified by the pistillate scales with wide pale mid-portion and light-colored spikes, its rhizomatous and spring flowering habit, and its propensity to occur on the edges of streams at relatively low elevations. Rhizomatous wetland sedges with pistillate spikes stripped of scales and perigynia in stream environments below 7000 ft are typically C. emoryi, except in the Gila region, where such plants are likely to be C. senta. Carex senta has dark pistillate scales and shiny reddish-brown sheaths that become ladder fibrilllose, both of which are lacking in C. emoryi. Carex aquatilis has dark pistillate scales with narrow (sometimes wide) mid-veins and lacks red spots on the lower sheath fronts, while C. emoryi has lighter scales with pale wide mid-portions and usually has red spots on the lower sheath fronts. Carex kelloggii is cespitose, usually has one staminate spike at the top of the inflorescence and perigynia which are abruptly and narrowly stipitate, while C. emoryi is rhizomatous, always has more than one staminate spike in the inflorescence and the perigynia are attenuate to broadly stipitate. Carex nebrascensis has awn-tipped pistillate scales and bidentate beaks, both of which are lacking in C. emoryi. Carex scopulorum does not occur in the low-riverine habitats where we find C. emoryi.

**Carex filifolia** Nuttall. Plants densely cespitose, forming tufts; culms 6-30 cm tall, mostly shorter than the leaves, mostly smooth, bases crowded with old sheaths; leaf blades (0.2)0.3-0.8 mm wide near base, wiry, involute-cylindric, the sheaths straw to yellow brown, sharply contrasting with the green leaves, ladder-fibrillose; inflorescence composed of a single terminal androgynous spike 15-26 mm long, the staminate portion mostly longer than or equal to the pistillate portion, with 2-5(7) pistillate flowers, inflorescence bract lacking; pistillate scales wider and longer than the perigynia, broadly ovate or obovate, light to dark brown with broad hyaline margins, with a pale midvein, the apices obtuse; perigynia 2-3.5 mm long, 1-2 mm wide, ascending, straw to yellowish-green or cream-colored with base of beak and uppermost part of perigynia brown to dark brown, nervous, body glabrous to sparsely hirsute and ciliate on the upper portion near the base of the beak, avoid to obvoid, abruptly or gradually contracted to a cylindric hyaline beak (0.2)0.4-1 mm long; stigmas 3; achenes trigonous, 1.8-2.6(3) mm long, 1.1-1.3(1.5) mm wide; section Filifoliae, Key A. •Alpine rock fields and meadows above timberline, 11,100-13,200 ft; known from the Sangre de Cristo Mtns. and on Sierra Blanca Peak. •Similar species: Carex elynoides can be confused with both C. filifolia and C. oreocharis, its two relatives in Section Filifoliae. For the most part, these three species are separated by both habitat and elevation per the key, with only minimal overlap. In general, Carex elynoides is a smaller plant than the other two, though depauperate specimens of both can be found in areas of habitat stress. Carex elynoides is also easily confused with Kobresia myosuroides, which shares the identical habit and habitat. However, Kobresia myosuroides spikes appear to have a mixture of stamine and pistillate flowers for most of the length (see description for more precise morphology) while Carex elynoides spikes have a basal pistillate portion and a distinctive staminate upper portion, evident even when immature. Also, the perigynia of *Kobresia* are open on the side, contrasting with the fully enclosed perigynia of Carex.

**Carex scopulorum** Mackenzie. Plants densely cespitose, forming irregular mats; culms 4-12(20) cm tall, mostly shorter to about as long or longer than the leaves, mostly smooth, bases crowded with old straw to brown sheaths; leaf blades 0.2-0.6(0.8) mm wide near base, wiry, involute-cylindric; inflorescence a single terminal androgynous spike 7-17(19) mm long, the staminate portion mostly longer than or equal to the pistillate portion, with (1)3-12 pistillate flowers, inflorescence bract lacking; pistillate scales wider and longer than the perigynia, broadly ovate or obovate, light to dark brown with broad hyaline margins, with a pale midvein, the apices obtuse; perigynia 2-3.5 mm long, 1-2 mm wide, ascending, straw to yellowish-green or cream-colored with base of beak and uppermost part of perigynia brown to dark brown, nervous, body glabrous to sparsely hirsute and ciliate on the upper portion near the base of the beak, avoid to obvoid, abruptly or gradually contracted to a cylindric hyaline beak (0.2)0.4-1 mm long; stigmas 3; achenes trigonous, 1.8-2.6(3) mm long, 1.1-1.3(1.5) mm wide; section Filifoliae, Key A. •Alpine rock fields and meadows above timberline, 11,100-13,200 ft; known from the Sangre de Cristo Mtns. and on Sierra Blanca Peak. •Similar species: Carex elynoides can be confused with both C. filifolia and C. oreocharis, its two relatives in Section Filifoliae. For the most part, these three species are separated by both habitat and elevation per the key, with only minimal overlap. In general, Carex elynoides is a smaller plant than the other two, though depauperate specimens of both can be found in areas of habitat stress. Carex elynoides is also easily confused with Kobresia myosuroides, which shares the identical habit and habitat. However, Kobresia myosuroides spikes appear to have a mixture of stamine and pistillate flowers for most of the length (see description for more precise morphology) while Carex elynoides spikes have a basal pistillate portion and a distinctive staminate upper portion, evident even when immature. Also, the perigynia of Kobresia are open on the side, contrasting with the fully enclosed perigynia of Carex.
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pinon-juniper woodlands) in the northern and western mountains. (5450)6000-8900 ft. ♦Similar species: Without mature perigynia, Carex geophila could easily be confused with C. planostachys, as they share both habitat and coarse tan to brown fibrous leaf bases. When mature perigynia are present, the lack of multiple conspicuous nerves in C. geophila distinguishes it from C. planostachys, in which many nerves are obvious on each face of the perigynia. Carex geophila has staminate spikes that appear wider, with a greater number of more imbricate scales than any of the other Acroclysis taxa with basal spikes.

**Carex haydeniana** L.H. Bailey [pregnant or heavy] [Carex haydeniana Bailey var. lunellana (MacKenzie) F.J. Hermann, Carex lunellana Mackenzie]. Plants cespitose; culms 20-120 cm tall, widest leaf blades 3-6.5(8) mm wide, the sheaths conspicuously loose at the base, usually often green-and-white striped with cross veins on the dorsal (back) surface, the ventral (front) surface hyaline, occasionally cross-rugulose with fragile, often torn summit, the ligules (1)2-5(7) mm long; the staminate portion much longer than the pistillate portion and separated from it by a segment of bare rachis, with 1-2(3) pistillate flowers, inflorescence bract lacking; pistillate scales longer than the perigynia, nearly oblong, ovate or lanceolate, the apices acuminate, often awned, green to brown with a pale midvein and hyaline margin; perigynia (4.4)4.9-6.4(8.4) mm long, (1.8)2.2-2.8 mm wide, appressed-erect to ascending, greenish yellow to brown, glabrous, glossy, obturid, spreading to a spongy narrow base, the apex rounded to a minute beak or beakless; stigmas 3; achenes trigonous, 3.5-5(6.2) mm long, (1.2)2.2-2.5(2.8) mm wide; section Fimriculmes, Key A. ♦Dry montane forests and woodlands, open slopes and meadows, often in shade, 6300-10,200 ft; known from mountainous areas in northern NM. ♦Similar species: Carex geyeri and C. pithophila share the character of a single staminate spike above 1-3 somewhat remote perigynia. However, C. pithophila often has basal spikes, and each perigynium is a highly reduced spike. In addition, C. pityophila is a smaller, cespitose plant, with hairs and a beak on the perigynia, while C. geyeri forms large, loose, colonial stands, and has larger, shiny, glabrous, often beakless perigynia.

**Carex gravida** L.H. Bailey [pregnant or heavy] [Carex gravida Bailey var. lunellana (MacKenzie) F.J. Hermann, Carex lunellana Mackenzie]. Plants cespitose; culms 20-120 cm tall, widest leaf blades 3-6.5(8) mm wide, the sheaths conspicuously loose at the base, primarily often green-and-white striped with cross veins on the dorsal (back) surface, the ventral (front) surface hyaline, occasionally cross- rugulose with fragile, often torn summit, the ligules (1)2-5(7) mm long; the inflorescence (1)2-5.5 cm long, 5-15(18) mm wide, composed of (9)19 androgynous spikes, proximal internodes 1-1.5 times as long as proximal spikes, the spikes usually sessile (but sometimes on inflorescence branches), spikes 4-13 mm long, composed of 5-15 perigynia; pistillate scale bodies shorter or slightly longer than length of perigynium, hyaline or brown with green to 1.5 times as long as proximal spikes, the spikes usually sessile (but sometimes on inflorescence branches), spikes 4-13 mm long, composed of 5-15 perigynia; pistillate scale bodies shorter or slightly longer than length of perigynium, hyaline or brown with green center, the apices acuminate to short-awned; perigynia 3.5-5.5 mm long, 2-3 mm wide, spreading to ascending, cream to brown with green margins, the sperses distalate distally, lanceolate to ovate, the beak (0.6)0.8-1.3(1.6) mm long, the beak teeth 0.2-1 mm long; stigmas 2; achenes 1.8-2.2(2.5) mm long, (1.6)1.8-2.2 mm wide; section Phaestoglochin, Key F. ♦Rocky sandy soil; 4000-6700 ft; uncommon in northeast NM near Clayton Lake State Park (Union Co.), perhaps other areas. ♦Similar species: The loose and thicker basal leaf sheath with green-and-white stripes on the back and different Carex gravida from both C. occidentalis and C. vallicola, in which the basal leaf sheaths are tight, narrower, and lack green and white stripes on the back. The inflorescences of C. gravida are much wider (usually greater than 1 cm) than those (usually less than 1 cm) of C. occidentalis and C. vallicola. Carex vulpinoidea more consistently has cross-rugulose leaf sheaths than C. gravida. Carex vulpinoidea also has prominent setaceous bracts that extend substantially beyond the spikes and perigynia just 1.3 mm wide which contrast with the 2.3-5 mm wide perigynia of C. gravida.

**Carex gynocrates** Wormskjold ex Drejer [ruled by the female, for the pistillate spikes] [Carex dioica Linnaeus subsp. gynocrates (Wormskjold ex Drejer) Hulten, Carex dioica Linnaeus var. gynocrates (Wormskjold ex Drejer) Ostenfeld]. Plants rhizomatous, with culms arising singly or several together, the rhizomes threadlike; culms 2-20 cm tall, longer than the leaves, slender, erect; leaf blades 0.2-0.9 mm wide, involute; inflorescence 4-16(19) mm long, composed of a single androgynous or unisexual spike, the staminate portion often shorter than or equal to the pistillate portion on androgynous inflorescences, with 3-13(15) pistillate flowers on inflorescences that are androgynous or pistillate, inflorescence bract lacking; pistillate scales shorter and wider than the perigynia, broadly ovate, light brown with lighter hyaline, translucent margins, apex acute to obtuse, lowest scale sometimes awnless; perigynia 5-10 mm long, 1.1-1.7 mm wide, ascending when young, to spreading or occasionally somewhat deflexed at maturity, yellowish, yellowish or green when young to dark brown and shiny when mature, finely to strongly nerved, ovoid, oblong, or plumply elliptic, biconvex, beak 0.2-0.9 mm long; stigmas 2; achenes 1.2-1.7 mm long, 1-1.2 mm wide, biconvex; section Physoglochin, Key A. ♦Moosy, peaty bogs in coniferous forests, or on gravelly streambanks, 10,300-11,100 ft; found in the northern Sangre de Cristo Mts in NM. ♦Similar species: Carex gynocrates is one of 4 single-spike sedges that occur in high elevation wetlands in NM. The other 3, C. leptalea, C. microglochin, and C. microspora, have 3 stigmas, compared to 2 for C. gynocrates. The perigynia of all four are sufficiently distinct that they should not be easily confused.

**Carex haydeniana** Olney [for Ferdinand Vanderveer Hayden (1829-1887), prominent American geologist] [Carex macloviana d’Urvillé subsp. haydeniana (Olney) Roy L. Taylor & MacBryde]. Plants densely cespitose; culms 4-2.5(40) cm tall, equal to or longer than the leaves, often flexuous; leaf blades 1.2-5 mm wide; inflorescence 1-2 cm long, compact, tapered, the base truncate or rese, composed of 5-7(9) erect to spreading, gynandroce, mostly indistinguishable spikes, the spikes 6.5-10 mm long, 4.5-8 mm wide, broadly ovoid, sessile, the proximal spike scale-like, sometimes broad at the base, usually shorter than the inflorescence; pistillate scales narrower and shorter than the perigynia, reddish, coppery to dark brown, sometimes with a whitish or pale gold midvein; perigynia 4.5-5 mm long, (1.2)1.4-2.2 mm wide, straw to brown, often with green wings, often nerved on the dorsal side, sometimes nerved ventrally, lance-ovate to broadly ovate, flat except over the achene, broadly wing-margined to the broad round base, abruptly acuminate to the terete beak, distance from perigynium beak tip to top of the achene (2.3)2.6-3.8 mm; stigmas 2; achenes 1.2-1.7 mm long; section Ovales, Key H. ♦Rocky or gravelly alpine slopes and clearings; 11,800-12,300 ft; known from near the CO border in the Sangre de Cristo Mts. ♦Similar species: Carex microptera is usually much taller and usually grows in wetter areas, and has perigynia that are not as wide, tapering more gradually to the beaks. The culms of C. haydeniana are also frequently more flexuous than those of C. microptera. Carex macloviana has perigynia dorsal sutures and beak tips white hyaline, while those of C. haydeniana are not white hyaline.

**Carex heliophila** Mackenzie [sun-loving] [SUN SEDGE] [Carex inops L.H. Bailey subsp. heliophila (MacKenzie) Crins, Carex pensylvanica Lamark var. digyna Boeckeler, Carex pensylvanica Lamark subsp. heliophila (MacKenzie) W.A. Weber]. Plants tufts on long rhizomes; culms 13-35 cm tall, shorter to longer than the leaves, scabrous distally; leaf blades (0.7)1.2-2.8 mm wide, the sheaths purplush-red and fibrous; inflorescence cauleine only, 1.5-3.5 cm long, composed of a terminal staminate or occasionally androgynous spike and 1-2(3) lateral pistillate spikes, the staminate spike (8)11-19 mm long,
on a peduncle 1-9(14) mm long, the pistillate spikes 5-11 mm long, each with 1-10(15) perigynia, globose to ovoid, the proximal bract 8-21(33) mm long, shorter than the inflorescence; pistillate scales shorter to longer than the perigynia, ovate, reddish brown to pale brown with a lighter or greenish midstripe and hyaline margins, the apices acute to acuminate to short-awned; perigynia 2.8-4(4.9) mm long, 1.2-2.2 mm wide, erect to ascending to spreading, pale green to brown with two prominent marginal nerves, short-pubescent, obovoid to ovoid, nearly orbicular in cross section when fully mature, contracted below to a stipitate base, abruptly contracted to the beak, the beak (0.4)0.5-1.3(2.8) mm long, straight to bent, the margin ciliate-serrulate or not, deeply bidentate, with teeth 0.1-0.8(2.1) mm long; stigmas 3; achenes 1.6-2.5 mm long, 1.1-1.8 mm wide, obtuse, trigonous to nearly orbicular in cross-section; section *Acrocytis*, Key B. ● Mixed conifer and ponderosa pine forests, juniper woodlands and montane grasslands in north-central and northeastern NM. 6000-10,500 feet. ● Similar species: *Carex heliophila* lacks a basal inflorescence, which distinguishes it from six other *Carex* taxa with pubescent perigynia which also have basal spikes (*C. brevipes*, *C. geophila*, *C. ptyophila*, *C. planostachys*, *C. rossii*, *C. aff. rossii* sp. nov.). However, hybrid specimens are known, which can have basal spikes on long thin peduncles. These hybrid plants otherwise resemble *Carex heliophila*, with its stiff upright inflorescence, large staminate spikes, and robust habit, though they tend to be sterile. *C. heliophila* has only two prominent marginal nerves on the perigynia, has darker staminate and pistillate scales, and is found mostly in the central to northern part of the state, while *C. leucodonta* has numerous fine nerves between the two prominent nerves, very pale scales, and is known from only one record in the southwestern mountains.

**Carex hystericina** Muhlenberg ex Willdenow [porcupine-like, a misspelling of *hystricina*] BOTTLEBRUSH SEDGE. Plants densely clumping from short rhizomes; culms (15)20-85(100) cm tall, shorter to longer than the leaves; leaf blades (1.4)2-5.8(8) mm wide, sedge-like, the sheaths pale to reddish, ladder-fibrillose, old leaves and sheaths often present, brown; inflorescence 5-25(30) cm long, composed of 1 terminal staminate spike (rarely gynandrous or mixed) and 2-4(6), lateral pistillate spikes, the staminate spike (1.5-2.5)(5.4) mm long, the pistillate spikes 1-3.5(6) cm long, 2.4 mm wide, erect to spreading on flexuous, filiform peduncles, the proximal bract (4)13-37 mm long, longer than the inflorescence; pistillate scales much narrower and shorter than the perigynia, inconspicuous, abruptly narrowed to scabrous awns 1.2-6 mm long, the awns often longer than the scale bodies; perigynia 4.7-7.3 mm long, (0.8)1.2-2.3 mm wide, strongly ovate, ovate to lanceoloid to ellipsoid, inflated, tapering to a prominent slender beak 1.5-2.7(3.5) mm long, beak bidentate with erect to slightly spreading teeth, the teeth (0.2)0.3-0.7(0.9) mm long; stigmas 3; achenes 1.3-2.5 mm long, 1-1.2 mm wide; section *Vesicariae*, Key C. ● Pond margins, springs and seeps, streams and stream banks; 3900-7300 ft; widely scattered in NM. ● Similar species: *Carex sprengeli* also has spikes on filiform, flexuous peduncles and perigynia with very long beaks, but *C. sprengeli* perigynia have only two prominent nerves while those of *C. hystericina* have numerous prominent nerves. *Carex hystericina* lacks the dense mass of fibrous “horse hair” found at the base of *C. sprengeli* culms.

**Carex illota** L.H. Bailey [dirty, unwashed]. Plants cespitose; culms (10)16-32(38) cm tall; leaf blades (1)1.4-2.5(3) mm wide; inflorescence 6-12 mm long, compact, ovoid to suborbicular, composed of 2-4(6) gynandrous spikes, the spikes 3-6(8) mm long, sessile, indistinct, orbicular to ovoid, prickly in appearance due to spreading, protruding perigynia; pistillate scales usually shorter than perigynia, dark brown, usually with pale or green midstripe; perigynia 2.1-2.9(3.2) mm long, 0.8-1.3 mm wide, ascending-spreadinng to spreading to slightly reflexed, gold to dark brown, ovate-lanceolate, planoconvex, margin unwinged and smooth through the poorly defined medium to dark brown beaks with prominent dark dorsal sutures; stigmas 2; achenes 1.2-1.5 mm long, 0.8-1 mm wide; section *Ovales*, Key G. ● Seeps, springs, and wet meadows, often in mixed coniferous forests; 10,400-12,000 ft; uncommon in northern NM. ● Similar species: The compact capitulate head with wingless, smooth-margined perigynia distinguish it from all other taxa in Keys G and H (section *Ovales*). *Carex illota* is easily distinguished from *C. jonesii*, but *C. illota* is gynandrous and *C. jonesii* is androgynous. However, this difference is not always clear. The perigynia of *C. jonesii* are more stream-lined, widest at the base and tapering to the tip, while those of *C. illota* are widest significantly above the base and the beaks are more pronounced. In addition, *C. jonesii* contains notable spongy material at the base of the perigynium, while *C. illota* contains very little spongy material at the perigynium base.

**Carex interior** L.H. Bailey [inland] - Monocotyledonous Plants - Cyperaceae. Plants densely cespitose; culms (10)14-53 cm tall, mostly taller than the leaves, slender, wiry; leaf blades 0.4-2.9 mm wide; inflorescence 1-2.3(3.4) cm long, composed of 2-5 sessile, easily distinguished gynandrous or pistillate spikes, lower spikes remote with proximal internode 2-9 mm long, the terminal spike 5-11 mm long, gynandrous with a narrow staminate portion less than to more than half the length of the spike, the lateral spikes 3-7 mm long, pistillate or gynandrous with just a few staminate flowers at the base; pistillate scales shorter than the perigynia, inconspicuous, ovate, mostly hyaline, brown in the middle; perigynia 2.1-3(3.2) mm long, 0.9-1.7 mm wide, 1.5-2.5 times as long as wide, becoming spreading to reflexed at maturity, green to dark brown when mature, broadest slightly above the base, suturate from the shoulders up through the short, stubby beak, the beak 0.3-1 mm long, nearly entire to bidentate to 0.3(0.5) mm; stigmas 2; achenes 1.2-1.6 mm long, 0.9-1.2 mm wide; section *Stellulatae*, Key G. ● Bogs, seeps, wet meadows and springs; 6000-11,000 ft; in mountains of northern NM and the Sacramento Mtns. of south-central NM. ● Similar species: The clavate gynandrous terminal spike with prominent narrow basal portion of *Carex interior* distinguish it from *C. disperma* and *C. radiata*, both of which have androgynous terminal spikes and widely separated, short sessile spikes that lack the starburst appearance of *C. interior*.

**Carex jonesii** L.H. Bailey [for Marcus Eugene Jones, 1852-1934, prominent American botanist] - Monocotyledonous Plants - Cyperaceae. Plants loosely cespitose or arising singly from compactly branched rhizomes; culms 20-40(60) cm tall, longer than the leaves; leaf blades 1-3.5 mm wide; inflorescence 0.8-1.5(2) cm long, ovoid to short cylindric, composed of 4-10 indistinguishable androgynous spikes, mostly sessile on the inflorescence axis, but sometimes sessile on lower inflorescence branches, lower internodes not more than 3 mm long, usually not visible, the spikes 4-7 mm long, 1-8 mm wide, erect to spreading, similar, the proximal bract scale-like, sheathless, often scarcely longer than a pistillate scale; pistillate scales shorter than to as long as the perigynia, coppery to hyaline to dark brown, shiny; perigynia 2.5-2.9(4.8) mm long, 0.9-1.5 mm wide, 3-12 per spike, green maturing to brown, strongly 7-11 nerves dorsally, 5-9 nerves ventrally when mature, narrowly lanceolate to ovate-lanceolate, widest near the slightly spongy base, base mostly rounded; anthers 1.6-1.8 mm long; stigmas 2; achenes (1.1)1.5(2) mm long; section *Vulpinae*, Key F. ● Wet subalpine meadows, seeps, and stream banks; 9400-10,600 ft; uncommon in northern NM. ● Similar species: See note with *C. illota*. 85
Monocotyledonous Plants - Cyperaceae

**Carex kelloggii** W. Boott [for Albert Kellogg (1813-1887), prominent California botanist] [Carex lenticularis Michaux var. lipocarpa (Holm) L. Standley, Carex lenticularis Michaux var. pallida (W. Boott) Dorn, Carex vulgaris Fries var. lipocarpa Holm]. Plants cespitose, forming clumps or tussocks, rhizomes sometimes present, then 1-2.5 mm thick, the internodes short; culms 15-80 cm tall, shorter or longer than the leaves; leaf blades 1-4 mm wide, the sheaths straw to light brown, not ladder-fibrillos, free portion of the ligules 0.5-2 mm long; inflorescence 5-12(17) cm long, composed of 1(2) terminal staminate spike(s) and 3-4(7) lateral pistillate spikes, 0.7-4.5 cm long, lower spikes sessile or with pedicillate up to 11 cm long, the proximal bract leaf-like, often longer than the inflorescence; pistillate scales narrower and shorter than to equaling the perigynia, oblong-ovate, dark with a narrow to broad midvein not extending to the apex, the apices obtuse to acute, ament, perigynia 1.8-3.2(3.5) mm long, 1-1.8 mm wide, ascending to spreading, dull white or green, nerveless or sometimes with 5-7 nerves on each face, elliptic to ovate, the stipae abrupt, narrow, conspicuous, the beak 0.1-0.5 mm long, entire; stigmas 2; achenes ca 1 mm long; section Phacocystis, Key E. ● Wet meadows, seasonally wet pond or lake margins, and marginal to sluggish streams; 6900 -12,500 ft; uncommon in the western 2/3 of NM. ● Similar species: Carex kelloggii is unique in Section Phacocystis in its densely cespitose habit, lighter colored bases, and pistillate spikes that are smooth to slightly rough, tightly packed perigynia. It often has only one staminate spike, and no staminate portion on the distal ends of the upper lateral pistillate spikes, as many of the other species in section Phacocystis do. See also similar species discussion under Carex emoryi.

**Carex lachenalii** Schlkhr [for Werner de la Chenal/de Lachenal (1736-1800), Swiss professor of botany] [Carex bipartita Allioni var. austromontana F.J. Hermann]. Plants cespitose; culms 9-30 cm tall; leaf blades 0.8-2.2 mm wide; inflorescence 10-25 mm long, composed of (1)3(4) sessile, distinct but conspicuously overlapping gynecandrous spikes, the spikes 4-8 mm long, oblong, of 10-20 perigynia; pistillate scales subequal to perigynia, oblong-ovate, the apices obtuse, red-brown with yellowish brown center and hyaline margins; perigynia (2)2.4-3.8 mm long, 0.9-1.5 mm wide, 2.3-2.7 times longer than wide, ascending, pale yellow-green turning to yellowish brown with age, smooth, with well-developed dorsal suture that extends the length of the beak and somewhat onto the perigynium body and is darker than adjacent body, obovate to ovate, biconvex, substipitate, tapering to a beak 0.5-1 mm long, the beak with a hyaline tip, either smooth or with a few serrulate teeth; stigmas 2; achenes 1.2-1.5 mm long, 0.9-1 mm wide; section Glaucesae, Key G. ● Alpine wet meadows, shallow pond shores; 12,500-12,600 ft; known from the Sangre de Cristo Mtns. in northern NM. ● Similar species: The dark spikes and alpine habitat preference distinguishes Carex lachenalii from C. deweyana and C. bolanderi which have light-colored spikes and occur in conifer forests. The crowded, dark, strongly overlapping spikes of C. lachenalii distinguish it from C. brunnescens and C. canescens, which both have light-colored, well separated (though sometimes overlapping) spikes.

**Carex lepalea** Wahlenberg [slender, delicate]. Plants cespitose, forming loose clumps from short, pale rhizomes; culms 90-60 cm tall, usually longer than the leaves, hair-like, lax; leaf blades 0.2-1.3 mm wide, flat, soft; inflorescence a single terminal androgyne spike 3-15 mm long, the staminate portion usually shorter than the pistillate portion and often inconspicuous, with 2-9(13) pistillate flowers, the inflorescence bract lacking; pistillate scales shorter than the perigynia, obvate to ovate to lanceolate, green to brown with a pale midvein, the apices acute to acuminate, sometimes awned, the proximal scale awns sometimes prolonged as bristles, early deciduous; perigynia 2.4-4.9(5.4) mm long, 0.8-1.3 mm wide, ascending, pale green to straw, with many fine nerves, oval-elliptic with a constricted pithy stipe-like beak, the apex rounded to retuse, beak lacking; stigmas 2; achenes trigonous, 1.3-1.9 mm long, 0.7-1.2 mm wide; section Leptocystis, Key A. ● Mossy bogs, wet meadows, streamside in conifer forests, 10,600-11,200 ft, known from one location near Wheeler Peak in the Sangre de Cristo Mtns. ● Similar species: Carex leptalea might be confused with C. disperma due to the similar egg-shaped perigynia, loosely cespitose habit and habitat preference for mossy wet substrates, but C. leptalea is single-spiked, and C. disperma has several, often remote spikes. In addition, C. disperma perigynia each have an inconspicuous beak, while C. leptalea perigynia are beakless.

**Carex leucodonta** Holm [white-toothed]. Plants loosely cespitose; culms 15-50 cm tall, longer to much longer than the leaves; leaf blades 2.3-5.4(8) mm wide, the sheaths brown, persistent, forming brown fibrous bases; inflorescence cauline only, 3-5 mm long, composed of 1 staminate terminal spike subtended by 2-3 lateral pistillate spikes, the staminate spike (10)12-24(30) mm long, sometimes with a few female flowers mixed in, the pistillate spikes 5-10 mm long, each with 1-8(10) perigynia, the lowest sometimes branched, the proximal pistillate bract leaf-like, longer or shorter than the inflorescence; pistillate scales about as long as or slightly longer than the perigynia, pale green with hyaline margins and sometimes a darker green midstripe; perigynia 3.4-4.4(2) mm long, (1.5)1.7-2.2(2.4) mm wide, ascending, dull green to straw-colored, 10-25 mm long, the nerves prominent, short-pubescent, obvate to almost globose in outline, suborbicular in cross section, contracted to a stipitate base, abruptly contracted to beak, the beak 0.5-1 mm long, terete, shallowly bidentate, the teeth up to 0.3 mm long; stigmas 3; achenes (1.6)1.8-2.6 mm long, 1.4-2.2(2.4) mm wide, globose; section Acrocsys, Key B. ● Open ponderosa pine forest (7500 ft) in the Pinos Altos Mtns. of the Gila National Forest (Grant Co); currently known from a single observation (Alexander 2017). ● Similar species: see discussion under Carex heliophila. Crins & Rettig (2002) subsumed C. leucodonta into a broadly circumscribed C. turbinata Liebm. However, we are following Reznicek and Gonzalez (pers. comm. 2013-2014) who believe that the two should remain separate, with C. turbinata occurring only in Mexico.

**Carex limosa** Limaeus. [of marshy or muddy habitats]. Plants colonial, rhizomatous, roots covered with dense white felt pubescent; culms 15-40(60) cm tall, arising singly or in small groups from both horizontal and/or vertical rhizomes, bases often purplish red; leaf blades (0.8)1-2.5(3) mm wide, the sheath fronts red-dotted; inflorescence (3.5)4-6.8(5) cm long, composed of one terminal staminate spike and (0)1-2(3) lateral pistillate spikes, the staminate spike 14-19(21) mm long, the pistillate spikes 5-20 mm long, with (4)7-25(30) perigynia, pendent to ascending on flexuous peduncles, occasionally androgyne, the proximal inflorescence bract 2-6(6.7) cm long, usually shorter than the inflorescence, the sheath up to 3 mm long; pistillate scales longer than, as long as and wider to as wide as the perigynia, 3.4-8.5(5.5) mm long, (1.7)8-2.5(3.4) mm wide, ovate, yellowish-brown to dark reddish brown, sometimes with a green midstripe, cuspidate to awn-tipped; perigynia 2.5-3.5(4) mm long, 1.2-2.3(2.6) mm wide, green to yellow green with conspicuous nerves, ovoid, compressed trigonous, strongly papillose, the beak to 0.1(0.5) mm long, the orifice entire; stigmas 3; achenes (1.5)1.8-2.2(2.7) mm long, 1-1.3(2) mm wide; section Limosae, Key C. ● Bogs and fens, sometimes a component of floating mats; 10,200-11,700 ft; known from two locations in the Sangre de Cristo Mtns. ● Similar species: The ovate persistent pistillate scales that conceal the perigynia in Carex limosa distinguish it from the similar C. magellanica, which has early deciduous lanceolate scales that are much narrower than the perigynia.
Carex luzulina Olney [Resembling Luzula]. Plants cespitose to short rhizomatous; culms 15-60(90) cm tall, much longer than the leaves; leaf blades 1.8-3.7(9) mm wide, clustered near the base, yellowish-green; inflorescence 6-14 cm long, composed of one terminal staminate spike and (2)3-5(6) lateral androgynous to pistillate spikes, the terminal spike (11)13-18(66) mm long, erect, the lateral spikes 7-19(32) mm long, erect, lower spikes remote and sometimes pendulous, the proximal inflorescence bract (5)16-45 mm shorter than inflorescence, the sheath (12)17-29(58) mm long, inflated; pistillate scales dark reddish-brown to brown purple with hyaline margins, midvein scabrous, elevated, green or pale, to 0.2 mm wide; perigynia (3)3.5-5.5 mm long, 0.9-1.6(1.8) mm wide, 2.5-3 times long as wide, ciliate to green or purple, distal margins often ciliate-setose, narrowly elliptic to lanceolate, tapered at both ends, not inflated, the beak 0.5-1.5 mm long, the tip reddish brown to purple; stigmas 3; achenes 1.3-2 mm long, 0.7-1.1 mm wide; section Aulocystis, Key C. • Wet meadows, bogs; 9800 ft; known from one location in the San Juan Mtns. Our plants belong to var. abalata (L.H. Bailey) F.J. Hermann [removed from] Carex luzulina var. abalata. Similar species: Carex luzulina var. abalata can be distinguished from all other similar sedges by the narrowly elliptic to lanceolate perigynia that are tapered at both ends, the prominent dark perigynia beak tips, the dark reddish brown to purple pistillate scales with contrasting light-colored midrib that does not extend to the tip, the long (15-30 mm) inflated inflorescence bract sheaths and the yellowish-green leaf blades concentrated toward the base of the plant.

Carex macloviana D’Urville [from the Falkland Islands] [Carex festiva Dewey]. Plants densely cespitose; culms 9-52(60) cm tall, equal to or longer than the leaves; leaf blades 4-18 cm long, (1.7)2-3.6 mm wide; inflorescence 0.9-2.6 cm long, compact, the base tapered, truncate, or retuse, composed of 3-(5) erect to spreading, gynandrous spikes, the spikes 5-10.5 mm long, 4-7 mm wide, ovoid to broadly ovate, strongly overlapping and mostly indistinguishable, similar, sessile; proximal bract scale-like; pistillate scales narrower and shorter than the perigynia, gold to brown, sometimes with a paler midvein, hyaline margins 0.2-0.5 mm wide, lower scale apices usually obtuse; perigynia 3.5-4.5 mm long, (1.1)1.3-2 mm wide, 0.4-0.5 mm thick, straw, gold, red-brown or coppery, sometimes with metallic sheen, margins often brown, darker than perigynium body, curved or not, wings 0.3-0.4 mm wide, usually with white-hyaline dorsal suture margins and white hyaline tip, narrowly to broadly ovate, planeocarp, entire in distal 0-0.3 mm, distance from perigynium beak tip to top of the achene (1.2)1.6-2.4 mm; stigmas 2; achenes (1.2)1.4-1.9 mm long; section Ovales, Key H. • Wet areas and dry meadows in subalpine or alpine habitats; 8900-12,000 ft; rare in northern NM. Similar species: Carex macloviana differs from C. microptera by the characters given in couplet 14 in Key H. See note under C. haydeniana.

Carex magellanica Lamarck [from the Strait of Magellan region]. Plants rhizomatous, with stems arising singly, in small clusters, or sometimes forming larger loose clumps, the roots covered with yellowish felty pubescence; culms (10)30-50(70) cm tall; leaf blades (11)1.5-3(4) mm wide, the sheaths brownish to reddish purple; inflorescence 3-10 cm long, composed of one terminal staminate spike and 1-3 lateral pistillate spikes, the staminate spike 7-10(20) mm long, erect or slightly drooping, the pistillate spikes 5-13(22) mm long, each with 5-20 perigynia, pendent on flexuose peduncles, the proximal bract 3-15 cm long, as long or longer than the inflorescence, the sheath up to 3 mm long; pistillate scales mostly narrower and conspicuously longer than the perigynia, narrowly lanceolate to ovate-lanceolate, tapering to an acute apex, (2.8)3.8-5.3(7) mm long, (0.6)0.9-1.9(2) mm wide, reddish-brown proximally to yellowish-brown distally, early deciduous; perigynia 2-3.2(3.8) mm long, (1.1)1.7-2.2(2.5) mm wide, green turning deep brown to cream, conspicuously nerved, coriaceous, papillose, broad to broadly ovate at maturity, pale green to straw, conspicuously nerved, with vestigial rachilla exserted 0.6-2.2 mm beyond the orifice making deflexed at maturity, pale green to straw, conspicuously nerved, with vestigial rachilla exserted 0.6-2.2 mm beyond the orifice making deflexed at maturity, pale green to straw, conspicuously nerved, white-hyaline dorsal suture margins and white hyaline margins 0.2-0.5 mm wide, lower scale apices usually obtuse; perigynia 3.5-4.5 mm long, 1-2 mm wide, ascending, green to olive-green to light reddish brown, often rust-spotted on the body, with many obscure to prominent nerves, narrowly ovoid to oblong-ovoid, beak 0.3-0.9(1) mm long, nearly entire; stigmas 3; achenes 1.9-2 mm long, 1.1-1.2 mm wide; section Limosae, Key C. • Wet meadows, bogs, and fens; 10,300-10,500 ft; known only from the San Pedro Parks Wilderness. Our plants belong to subsp. irrigua (Wahlenberg) Hiitonen [supplied with water] Carex limosa Limaeus var. irrigua Wahlenberg, Carex pauperula Michaux. Similar species: The minute beak less than 0.1 mm long of Carex magellanica distinguishes it from four other NM Carex taxa with tepid or spreading lateral spikes (C. capillaris, C. hystericina, C. luzulina, C. sprengelii), which have distinct beaks at least 0.3 mm long. The early deciduous lanceolate pistillate scales, which are narrower than and exposing the perigynia in C. magellanica distinguish it from the similar C. limosa, whose scales are not deciduous and conceal the perigynia.

Carex microdonta Torrey & Hooker [small-toothed]. Plants colonial, rhizomatous, the culms usually single, or rarely 2-3 culms together from long rhizomes, rhizome internodes often exceeding 5 cm; culms 7-48(56) cm tall; leaf blades 2-6(8) mm wide, the basal sheaths brown; inflorescence 8-20(22) cm long, composed of one erect terminal staminate spike and 2-4(5) erect, lateral, pistillate (rarely androgynous or staminate) spikes, the lowest spike pedunculate, arising in the lower third of the culm, sometimes almost basal, the staminate spike 1.1-4.1(5) cm long, the pistillate spikes 0.7-2.8(3.1) cm long, the pistillate spike bracts leaf-like, short to longer than the inflorescence; pistillate scales shorter to longer and narrower than the perigynia, leaving the perigynia exposed, green with hyaline margins, apices often awl-like and sometimes scabrous; perigynia 2.6-4.1(4.2) mm long, 1-2 mm wide, ascending, green to olive-green to light reddish brown, often rust-spotted on the body, with many obscure to prominent nerves, narrowly ovoid to oblong-ovoid, beak 0.3-0.9(1) mm long, nearly entire; stigmas 3; achenes 1.7-2.7 mm long, 1.1-1.6 mm wide. Section Grandulares, Key C. • Limestone seeps in arid to mesic woodland sites; 6800-7100 ft; found only from one location in the Guadalupe Mtns. • Similar species: The position of the lowest pistillate spike at or below the culm mid-point distinguish Carex microdonta from other Carex taxa with similar inflorescence structure (C. blanda and C. conoidea), but not C. aurea, which can also have basal, or near basal spikes.

Carex microglochin Wahlberg [small-barbed]. Plants rhizomatous, with culms arising singly or several together; culms 2-45 cm tall, longer than the leaves, stiffly erect; leaf blades 0.3-1 mm wide, involute; inflorescence a single terminal androgynous spike 6-14 mm long, the staminate portion shorter than to equal to the pistillate portion, with 3-10 pistillate flowers, the inflorescence bract lacking; pistillate scales shorter and wider than the perigynia, brown, ovate-triangilar, apex obseuse to subacute; perigynia 3.4-4.7 mm long, 0.6-1 mm wide, erect when young, becoming deflexed at maturity, pale green to straw, conspicuously nerved, with vestigial rachilla exserted 0.6-2.2 mm beyond the orifice making the perigynium look even longer, often curving at the tips, lance-subulate to an ill-defined beak; stigmas 3; achenes trigonous, 1.9-2.4 mm long, 0.5-0.9 mm wide; section Leucoglochin, Key A. • Moist areas in alpine tundra, seeps, gravelly streambanks, fens, peaty ground and bogs, 10,800-11,700 ft; known from one location in the northern Sangre de Cristo Mtns. Our plants belong to subsp. microglochin. Similar species: Carex microglochin is distinctive when mature with its strongly reflexed lance-subulate perigynia and rhizomatous habit. When immature, the upright spikes might be confused with those of C. gynocrates, which shares a similar growth habit and habitat, but perigynia in C. gynocrates are plumply elliptic with a distinct beak, whereas C. microglochin perigynia are lance-subulate, tapering to an defined beak.

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Carex micropoda  C.A. Meyer  [small-footed]  [Carex crandalli Gandoger, Carex pyrenaica Wahlenberg subsp. micropoda (C.A. Meyer) Hultén]. Plants densely cespitose, forming tufts; culms 5-30 cm tall, shorter to longer than the leaves; leaf blades 0.25-1.5 mm wide, wiry, involute, the sheaths not fibrous, the sheath fronts membranous, numerous light-brown to straw dead leaves and sheaths present in clump; inflorescence a single terminal androgyneous spike, 6-20 mm long, the stamine portion shorter than the pistillate portion, with (3)-7-21 pistillate flowers, the inflorescence bract lacking; pistillate scales mostly shorter than the perigynia, mostly ovate to occasionally lanceolate, deciduous, dark brown, sometimes glossy, with a pale midvein and narrow hyaline margins, apex obtuse to acute; perigynia 2.7-4.5 mm long, 0.7-1.5 mm wide, ascending initially, spreading at maturity, glabrous, light green to mid-green, becoming dark brown at maturity, marginal nerves 2, elliptic to narrowly ovate or lanceolate in profile with a narrow, cylindrical green suture to about 0.4 mm long, gradually tapered to a conspicuous hyaline beak 0.1-0.5 mm long; stigmas 3(2); achenes trigonous (biconvex), 1.2-1.8 mm long, 0.7-1 mm wide; section Donnera, Key A.  ● Alpine meadows, slope tops, and snowmelt basins; 11,500-12,600 ft; Sangre de Cristo Mts.  ● Similar species: See discussion under Carex gymnocrates. Carex micropoda and C. elynoides can occur in similar alpine habitats. In addition to the characters in the key, C. micropoda usually has much taller culms than C. elynoides.

Carex microptera  Mackenzie  [small-winged] SMALLWING SEDGE  [Carex festivella Mackenzie, Carex limnophila F.J. Hermann, Carex macloviana D’Urvillé subsp. microptera (Mackenzie) B. Bovin, Carex macloviana D’Urvillé var. limnophila (F.J. Hermann) Dorm, Carex macloviana D’Urvillé subsp. festivella (Mackenzie) A. Love & D. Love]. Plants densely cespitose; culms 15-80(110) cm tall, usually longer than the leaves; leaf blades 10-50 cm long, 1.4 mm wide; inflorescence (0.7)1.1-2.4 cm long, compact, the base tapered, truncate, or retuse, composed of 4-10(14) erect to spreading, gynoecandrous, strongly overlapping and mostly indistinguishable spikes, the spikes (4)5-9(14) mm long, ovoid to broadly ovoid, sessile, similar, the proximal internode 0.5-3(4) mm long, proximal bract scale-like, usually shorter than the inflorescence, but sometimes leaf-like and longer; pistillate scales shorter and narrower to as wide as the perigynia, usually with a pale midvein, hyaline margin 0.0-0.2 mm wide, the apices acute, perigynia (2.5)3-1.4(4.8) mm long, 1.1-1.2 mm wide, 0.3-0.5 mm thick, green to brown or tan, dorsally nerved, ventrally nerved or not, broadly wing-margined to the round-tapering base, flat except where distended over the achene to thinly planoconvex, narrowly to broadly ovate, tapering to the long, dark beak, most perigynia serrulate to the terete tip, a few sometimes entire in the distal 0.0-0.4 mm, distance from perigynia beak tips to top of the achenes 1.5-2(2.4) mm, perigynia usually widest below the top of the achene; achenes 1.2-1.8 mm long, 0.7-1 mm wide, anthers 1.3-1.9 mm long; stigmas 2; section Ovales, Key H.  ● Moist to wet meadows and along streams; 5800-11,800 ft; widespread in mountain areas of NM.  ● Similar species: Carex microptera perigynia lack the metallic sheen and the hyaline tips and dorsal suture margins of C. macloviana. The inflorescences of C. microptera are typically truncate or retuse at the base, while those of C. subfusca are typically tapered. Also, the perigynia of C. microptera are thinner with wider wing-margins than those of C. subfusca. Perigynia in C. microptera are not perigynia in the tip as in C. wootonii, and C. microptera grows in wetter areas than C. wootonii. Carex microptera growing at high elevations with narrow perigynia appear similar to C. ebenea, but the perigynia are shorter than those of C. ebenea and they grow in at least seasonally moist areas, while C. ebenea usually grows in dry sites. See note under Carex “apachense” for discussion of an unnamed segregate taxon.

Carex muriculata  F.J. Hermann  [with sharp points]. Plants cespitose; culms (10)20-60(80) cm tall; leaf blades 1.2-2.7 mm wide, the sheaths brown to dark brown, fibrilloso; inflorescence (1.6)2.5-7 cm long, oblong to linear-oblong, composed of 3-6 androgyneous spikes (lateral spikes sometimes appearing pistillate, but with cryptic male flowers), the spikes 5-19(22) mm long, sessile or subsessile on very short peduncles, the proximal inflorescence bract leaflike, 6-27 cm long, sometimes tapering to a narrow bristle and much longer than the inflorescence; pistillate scales exceeding and usually concealing perigynia, oblong-lanceolate, with green to brown center and whitish to pale brown translucent sides, strongly 3-veined, the midvein occasionally scabrous, the apices acuminate, occasionally tapering to an aawn, the aawn occasionally scabrous; perigynia 3.4-4.9 mm long, 1.1-1.4 mm wide, ascending to spreading, green to brown dark, prominently 8-16 veined, leathery, muricate-warty with tiny hairs or hairs projecting from the murications, ellipsoid, trigonous in cross-section due to prominent achenes, stipitate, the beak 0.6-1.3 mm long, brown, bidentate, the teeth 0.2-0.6 mm long; stigmas 2; achenes 1.9-2.9 mm long, 0.9-1.3 mm wide, trigonous; section Schiedeanae, Key B.  ● Carex muriculata is known only from dry limestone habitats in southeast NM; 5000-5900 ft.  ● Similar species: Carex muriculata is unique among NM Carex in having perigynia with muricate-warty surfaces.

Carex nebrascensis  Dewey  [from Nebraska] NEBRASKA SEDGE. Plants rhizomatous, the rhizomes 1.5-3.2 mm thick, scaly, often forming large colonies; culms arising singly or in small clusters, 15-80 cm tall, shorter or longer than the leaves; leaf blades 3-10(12) mm wide, green to glaucous, the sheaths dirty white to dark brown, not laddered-fibrilloso, the summit U-shaped to truncate; inflorescence 5-19 cm long, composed of 1-3 erect terminal staminate spikes and 2-4 erect, lateral pistillate spikes, proximal pistillate spike 1.5-5 cm long, lower spikes sessile or with peduncle up to 2(4) mm long, the proximal bract leaf-like, shorter or longer than the inflorescence; pistillate scales equal to or longer than the perigynia, lanceolate, dark with a proximal light-green, the midvein of at least the lower scales often recurved and awned, the aawn to (3) mm long; perigynia (2.2)2.5-4 mm long, (1.2)1.6-2.5 mm wide, erect to divergent, dull, leathery, 3-7 nerved on each face, elliptic to obovate, the beak 0.3-0.6 mm long, brown, bidentate with teeth to 0.2 mm, the orifice often ciliate; stigmas 2; achenes 0.3-2.5 mm long; section Phacocystis. Key E.  ● Wet meadows, seeps, springs, fens, ditches, and margins of seasonally flooded wetlands and sluggish streams, often in areas used by cattle; 5400-12,100 ft; common in northern NM with fewer populations in the western part of the state.  ● Similar species: The combination of awned scales, strongly named perigynia with bidentate ciliate beaks, and wide leaf blades separates Carex nebrascensis from other species in Section Phacocystis.

Carex nelsonii  Mackenzie  [for Aven Nelson (1859-1952), teacher and eminent Wyoming botanist]. Plants densely cespitose from short rhizomes; culms 9-19(30) cm tall, longer than the leaves; leaf blades flat, (1.5)2-3 mm wide, the sheaths light brown to reddish brown; inflorescence 0.9-1.8(2.5) cm long, compact, composed of 3-4 similar, strongly overlapping spikes, the terminal spike gynoecandrous, (6)-8-13 mm long, the lateral spikes (5)7-9 mm long, pistillate, sessile to rarely short pedunculate; proximal bract shorter than or rarely equal to the inflorescence; pistillate scales shorter than or equal to and slightly narrower than the perigynia, ovate, dark brown to purplish-black to the margins, the apices acute; perigynia 3.3-4 mm long, 1.1-5 mm wide, 2.8-3.9 times longer than wide, ascending to spreading, light-colored proximally, purplish black distally with light-colored margins, distally papillose, flattened, marginal nerves only, narrowly elliptic to narrowly ovate,
tapering to a dark bidentate beak (0.3)0.5-0.8(0.9) mm long; stigmas 3; achenes trigo-
nous, 1.3-1.7 mm long, 0.9 mm wide, filling proximal half or less of the perigynia; section Racemosae, Key D. • Moist alpine meadows, edges of spring outflows; 12,200-12,400 ft; known only from one location in the Sangre de Cristo Mtns near the CO border. • Similar species: Carex nova has much wider perigynia that contract abruptly to the beak, usually taller culms, is more widespread, and ranges to lower elevations. Carex albonigra has the lower spikes separated, short pedunculate, and more upright, while those of C. nelsoni tend to be more tightly clustered, sessile, and spreading.

Carex nova L.H. Bailey [new] BLACK SEDGE. Plants loosely cespitose from short rhizomes; culms 14-48(60) cm tall, longer than the leaves; leaf blades flat, (0.9)1.8-4 mm wide; the sheaths light brown to dark reddish brown; inflorescence 0.9-2 cm long, compact, composed of 3-4 similar looking closely proximate spikes, the terminal spike 7-12 mm long, gynoe-ccdurous, the lateral spikes 4-13 mm long, pistillate, remote, sessile to rarely short pedunculate, the proximal bract shorter to longer than the inflorescence; pistillate scales mostly shorter and narrower to sometimes longer than the perigynia, ovate to lanceolate, dark brown to purplish black, the apices acute; perigynia 2.5-4 mm long, 1.1-2(3) mm wide, 1.3-2.5(2.8) times longer than wide, ascending to spreading, pale yellow to dark brown or purplish-black distally, lighter-colored proximally, papillose, with marginal nerves only, obovate to suborbicular, flattened, abruptly contracted to a bidentate beak 0.2-0.5(0.6) mm long; stigmas 3; achenes trigo- nous, 1.6-1.9 mm long, 0.7-1 mm wide, filling proximal half or less of the perigynia; section Racemosae, Key D. • Moist subalpine and alpine meadows, seeps, springs and lake margins; 9400-12,500 ft; known only from the Sangre de Cristo Mtns. • Similar species: see discussion under Carex nelsoni. §

Carex obtusata Liljeblad [blunt]. Plants rhizomatous, with culms widely spaced, arising singly or several together, the rhizomes slender but tough, dark brown to reddish-purple; culms 4-25 cm tall, mostly equal to or longer than the leaves, erect; the sheaths reddish-purple with dark red dots on sheath fronts; leaf blades 0.5-1.6(2) mm wide, flat or channelled, inflorescence a single terminal androgynous spike, 5-16(20) mm long, the staminate portion about as long as the pistillate portion, with 2-6(14) pistillate flowers, the inflorescence bract lacking; pistillate scales mostly shorter and as wide as the perigynia, ovate to lanceolate, pale brown to reddish-brown with hyaline margins and a pale midvein, apex obtuse to acute to mucronate or awned; perigynia 2.4-4.1 mm long, 1-1.6(1.8) mm wide, ascending to spreading, dark brown to deep red-brown, shiny when mature, finely to strongly nerved, ellipsoid to obovoid, beak prominently bidentate, 0.5-1.3 mm, tip hyaline; stigmas 3; achenes trigo- nous, 1.7-1.9 mm long, 1.2 mm wide; section Obtusatae, Key A. • Montane grasslands, open forests, ponderosa pines savannas and rocky ridges, 6500-10,500 ft; found in widely scattered locations in the northern half of the state. • Similar species: Carex obtusa might be confused with C. duriuscula, since both are of similar stature and habit, and share similar habitats. However, C. duriuscula inflorescences are composed of multiple spikes in a compact head, while C. obtusata inflorescences each contain a single spike. Carex duriuscula has brownish bristles, while those of C. obtusata are red-purple. Carex rupestris grows at higher elevations than C. obtusata, and also lacks the spotted sheath fronts of the latter species.

Carex occidentalis L.H. Bailey [western] WESTERN SEDGE. Plants densely cespitose from short rhizomes; culms 15-90 cm tall, as long as or longer than the leaves; leaf blades 1.4-2.8 mm wide, the sheaths brownish or green; inflorescence 1.5-5.5 cm long, 4-11 mm wide, usually elongate, unbranched, composed of 4-12 similar androgynous spikes, the staminate flowers often inconspicuous; spikes 4-10 mm long, 3-6 mm wide, erect to spreading, with 1-8 perigynia per spike, proximal inflorescence bract absent or setaceous and up to 2 cm longer, shorter than the inflorescence; pistillate scales similar in size to the perigynia, brown with green center and hyaline margins; perigynia 3-4.8 mm long, 1.4-1.9 mm wide, ascending to spreading, green maturing to straw, brown or black, smooth, shiny, nerveless, sharp margined, often doubly serrulate below the middle, elliptic to oblong-elliptic, planoconvex in cross-section, beak 0.6-1.3 mm long; stigmas 2; achenes (1.3)1.9-2(2.4) mm long; section Phaestoglochin, Key F. • Dry grasslands, woodlands, forest, more mesic habitats at lower elevations; 5400-11,500 ft; common throughout NM, except the lower eastern plains. • Similar species: Carex occidentalis is NM’s most abundant upland sedge. Carex occidentalis is often confused with the less common C. vallicola. Carex occidentalis pistillate scales are about as long as the perigynia, whereas C. vallicola scales are usually shorter. Carex occidentalis perigynia are thinner and more serrulate along the upper margins (usually doubly so) than C. vallicola perigynia, which can be entire to very finely and singly serrulate along the upper margins. Carex occidentalis perigynia are more uniformly oriented in the spikes in an ascending pattern, while those of C. vallicola are more randomly oriented, giving the inflorescence a more “irregular” texture. Both C. occidentalis and C. vallicola are cespitose, unlike the similar C. siccata, a rhizomatous sedge which has a narrow and elongate inflorescence, but in which the middle spikes are often wholly staminate. All three of these species prefer dry meadows and forests, though they can occasionally be found on the periphery of riparian zones. Carex praegracilis often shares the same inflorescence shape as C. occidentalis, but C. praegracilis prefers wet habitats, is often dioecious, and the lower inflorescence is usually branched. (The inflorescence of C. occidentalis can appear all pistillate late in the season when the anthers have fallen, so look carefully for remaining filaments in the upper scales of each spike.) When seen in the field, the cespitose habit of C. praegracilis is distinct from the cespitose growth form of C. occidentalis.

Carex oreocharis Holm [mountain-beauty]. Plants densely cespitose, forming mats or tusfts; culms 6-30(50) cm tall, longer or sometimes shorter than the leaves, sometimes scabrous below the inflorescence; leaf blades (0.3)0.8-1.5(2.8) mm wide near base, folded or channelled, frequently curled at the tips, the sheaths reddish-brown to dark brown, contrasting sharply with the green leaves; inflorescence a single terminal androgynous spike 11-35 mm long, the staminate portion longer than the pistillate portion, with 3-15 pistillate flowers, the inflorescence bract usually lacking, proximal scale sometimes resembling a bract with an awn 0.1-4 mm long; pistillate scales wider and mostly longer than the perigynia, ovate or lanceolate to broadly orbicular, yellowish green to brown with broad hyaline margins and a pale or green midvein, the apices obtuse to awn tipped; perigynia (2.7)3-4.2 mm long, 1.2-2.1 mm wide, straw to pale yellowish green, appressed to erect, sometimes short pubescent, nerves 0-5(8), margins ciliate near the beak, broadly ovoid to obovoid, usually abruptly contracted to a cylindrical hyaline beak 0.2-1 mm long; stigmas 3; achenes trigonous, 2.2-3 mm long, 1.1-1.9 mm wide; section Filifoliae, Key A. • Mountain meadows, dry slopes, and grasslands, 7500-10,900 ft; found in the northern Sangre de Cristo Mtns. and the Magdalena Mtns. • Similar species: Carex oreocharis is distinguished by its cespitose habit, culms with single spikes, folded or channelled leaf blades that curl at the tips and its propensity to occur in montane grasslands. See discussion under Carex elynoides.
**Carex pachystachya** Chamisso ex Steudel [thick-spiked] Chamisso sedge **[Carex mucloviana** D’Urville subsp. *pachystachya* (Chamisso ex Steudal) Hulten] . Plants densely cespitose; culms 15-60(120) cm tall, longer than the leaves, conspicuously striate; leaf blades 2.2-2.7 mm wide; inflorescence 0.6-2.2 cm long, compact to elongate, composed of 4-10(14) gynandrous spikes, the upper spikes sometimes indistinguishable, proximal internode 1-2(4.5) mm long, the spikes 5-9(11) mm long, broadly fusiform, scale-like or leaflike, usually shorter than the inflorescence, occasionally up to 2.5 times longer than the inflorescence; pistillate scales shorter and narrower than the perigynia, ovate to ovate-lanceolate, brown and shiny, with a pale or green midvein, apex acute to obtuse; perigynia 3.6-4.5 mm long, 1.1-2 mm wide, 0.45-0.6 mm thick, slightly spreading when mature, green or tan to brown, darker at margins, typically (57)-91(11) veined on both sides, sometimes nerveless ventrally, planoconvex, narrowly wing-margined to the round-tapering base with wings to 0.2-0.4 mm wide, widest below the top of the achene, most perigynia entirely in the distal 0.3-0.6 mm, a few sometimes serratulate to the tip, tapering to the terete beak; beak tip brown, 1.9-2.7 mm from tip to top of achene; stigmas 2; achenes 1.2-1.4 mm long, 0.8-1.2 mm wide; section *Ovales*, Key H. •Montane canyons along streams; 9800 ft; known from one location east of Tierra Amarilla, Rio Arriba Co. •Similar species: *Carex pachystachya* is most easily confused with *C. microptera*. They occur in the similar habitats and both can have compact inflorescences, but the thicker perigynia of *Carex pachystachya*, cause them to spread more widely at maturity than those of *C. microptera*. *Carex pachystachya* perigynia sometimes have a more shiny texture than most other *Ovales*, and sometimes have a cuppery ting.

**Carex pellita** Willdenow [covered with a hide] WOOLLY SEDGE **[Carex lanuginosa auctores]**. Plants colonial from short rhizomes; culms 15-100 cm tall, shorter to longer than the leaves; leaf blades 2-4.5(7) mm wide, the sheaths reddish-purple, becoming ladder-fibrosil; inflorescence 5-30 cm long, elongate, composed of 1-3 terminal staminate spike(s), the lower ones when present shorter, sessile or pedunculate and 2-3(4) well-separated, erect to ascending lateral pistillate spikes, the terminal staminate spike 1.5-5 cm long, the pistillate spikes 1.4-2.5 cm long, the lowest pistillate spike on a slender peduncle 8+ cm long, the upper pistillate spikes sessile or on short peduncules, sometimes with a few staminate flowers at the summit, the proximal inflorescence branch erect to spreading, shorter to longer than the inflorescence; pistillate scales shorter or longer than the perigynia, lanceolate to ovate, red brown with a pale or greenish midstripe and hyaline margins, apices acutate to acuminate awned; perigynia 2.5-3.8(5.2) mm long, 1.4-2.1(2.8) mm wide, ascending, brown, green or reddish brown, nerved on both sides, nerves hidden by uniform dense pubescence throughout, inflated, ovoid, rounded and spongy-thickened below, abruptly contracted to beaked, the beak (0.5)-0.9-1.2(1.5) mm long, deeply bidentate, the teeth 0.4-0.6 mm long, stigmas 3, achenes 1.5-2.1 mm long, 0.8-1.3 mm wide, trigonous; section *Paludosae*, Key B. •*Carex pellita* is a common wetland sedge that occurs in a wide variety of habitats including pond and stream edges, grassy and boggy meadows, seepage, and seasonally wet sites. 4700-10,900 ft. Widespread in NM except not present in the eastern central and southeastern regions of the state. •Similar species: the obviously densely pubescent perigynia distinguish *Carex pellita* from all other rhizomatous wetland *Carex*. The wetland habitat preference of *C. pellita* easily distinguishes it from all other *Key B* species except *C. atherodes*. *Carex atherodes* perigynia are nearly glabrous with only a few bristles along nerves of the perigynia compared to the densely pubescent perigynia of *C. pellita*. §

**Carex petasata** Dewey [brimmed (the perigynium)] **[Carex liddoni Boott]**. Plants densely cespitose, forming small clumps from short rhizomes; culms 28-85 cm tall, longer than the leaves; leaf blades 0.8-3 mm wide; inflorescence 1.7-4.3 cm long, elongate, composed of (2)3-6(7) gynandrous spikes, the spikes 8-20 mm long, 3-6 mm wide, narrowly fusiform to oblanceoloid, this latter shape due to more basal staminate flowers than in most other *Key B* species, distinct, erect, sessile, similar, the proximal bract lacking, scale-like, or bristle-like, shorter than the inflorescence; pistillate scales shorter and narrower than the perigynia, or equal to the perigynia, pale green to light brown with a pale or green midvein, with hyaline margins 0.2-0.8 wide; perigynia 6.4-8 mm long, 1.7-2.4 mm wide, appressed, light olive green to brown, usually many-nerved on both sides, narrowly wing-margined to the cuneate base, lanceolate to ovate, planoconvex, long tapering and winged to the tip, distance from perigynium beak tip to top of the achene (1.8)3.2-4.6 mm; anthers 3 mm long; stigmas 2; achenes 2.2-3.3 mm long; section *Ovales*, Key H. •Dry to wet meadows, grasslands, and open clearings in forests; 5100-11,900 ft; uncommon in mountain areas of NM. •Similar species: The inflorescence of *Carex petasata* is lighter-colored than those of most *C. wootonii*, with more male flowers at the base of each spike, and with the perigynia more consistently veined on the ventral face. *Carex petasata* has longer perigynia than those of *C. tahoensis, C. pheocephala* and *C. praticola*. What we are calling *C. tahoensis* is a plants of smaller stature, with an inflorescence that is more likely to be a golden light brown than the drab olive of the larger sized *C. petasata*. §

**Carex pheocephala** Piper [dark-headed]. Plants densely cespitose, forming small clumps from short rhizomes; culms (5)15-45 cm tall, longer than the leaves; leaf blades (0.4)0.8-2.5 mm wide, flat or folded; inflorescence (0.9)1-2.7(3.5) cm long, elongate, the proximal internode (2)4-6(10) mm long, the base tapered, composed of (2)3-7 gynandrous spikes, the spikes 6-16 mm long, ovoid to broadly ovoid, distinct, erect, sessile, similar, the proximal bract scale-like, or bristle-like, shorter than the inflorescence; pistillate scales equaling or slightly shorter than the perigynia with beaks exposed, often sessile, or sometimes exposing the side of the perigynia, lanceolate to ovate, gold, red-brown or dark brown with a pale midvein, hyaline margins 0.1-0.3(0.5) mm wide; perigynia (3.4)3.6-4.5(2) mm long, (1.1)-1.5(2.3) mm wide, ascending, pale green to pale yellow to brown or red-brown, sometimes with green margins, veinless to few-nerved ventrally, several nerved dorsally, ovate or elliptic-oblong, flat to planoconvex, brown to dark brown with hyaline tip, more or less smooth for (0.2)0.3-0.7 mm from the beak tip, beak 0.7-1.3 mm long, distance from perigynium beak tip to top of the achene (1.3)1.7-2.3(2.8) mm; stigmas 2; achenes (1.3)1.5-2 mm long, (0.8)-0.9(1.1) mm wide; section *Ovales*, Key H. •Alpine or windswept high montane rocky areas; 10,100-12,700 ft; uncommon in mountain areas of north-central NM. •Similar species: *Carex petasata* has longer perigynia and occurs below treeline, while *C. pheocephala* occurs primarily above treeline.

**Carex pityophila** Mackenzie [pine-loving]. Plants cespitose; culms 3-12 cm tall; leaf blades 0.8-1.5(2.6) mm wide, folded or involute, wiry, the bases reddish to purplish brown, the old sheaths becoming slightly fibrous or ladder-fibrosil; inflorescence of two types, basal and cauline, the basal inflorescences composed of 1-2(3) perigynia on a filiform peduncle, the cauline inflorescences 12-26 mm long, composed of 1 terminal staminate spike subtended by 1-2 lateral pistillate spikes, the staminate spike 4.8-8.3(11.5) mm long, 0.7-1.5 mm wide, on a peduncle as long or longer than the spike, the lateral pistillate spikes each with a single perigynium or very rarely two, usually somewhat separate along the rachis, the proximal pistillate bract of the cauline inflorescences narrow to involute, subequal to slightly longer than the inflorescences; staminate scales with dark purplish-black coloring, the pistillate scales shorter than or equal to the perigynia; perigynia 3.4-6 mm long,

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1.1-1.7 mm wide, erect to ascending, green to yellowish brown, with two marginal nerves, veinless, finely pubescent, ellipsoid to ovoid, abruptly contracted to beak; the beak 0.7-1.7 mm long, straight, smooth or weakly ciliate-serulate, bidentate, the teeth 0.1-0.7 mm long, stigmas 3; achenes obovoid, 1.9-2.1 mm long, 1.4-1.6 mm wide, obtusely trigonous in cross-section; section *Acrocystis*, Key B. 
●Pinyon-juniper woodland, ponderosa pine, and mixed coniferous forests in the mountains of northern NM. 7300-9900 ft. 

Similar species: *Carex pityophila* is most likely to be confused with depauperate specimens of the other section *Acrocystis* taxa in northern NM. It is a small, wiry plant with very few perigynia in its inflorescence and the terminal staminate spike is usually separated from the pistillate flowers by a long peduncle. *Carex aff. rossii* sp. nov. has several perigynia per pistillate spike and generally flatter, more lax leaves. Both have darker colored pistillate spikes than *C. rossii* and all three species have fewer flowered staminate spikes with less overlapping scales than *C. geophila*.

**Carex planostachys** Kunze [with wandering spikes] [*Carex lativena* S.D. & G.D. Jones]. Plants densely cespitose; culms 4-15 cm tall, shorter than the leaves; leaf blades 0.9-2 mm wide, green, the sheaths tan to dark brown, often becoming ladder fibriborne, forming a dark brown scabrous fibrous base; inflorescences of two types, basal and cauline, the basal inflorescences composed of (12)-3(4) pistillate spikes (3)-7(11) mm long on a slender peduncle, the cauline inflorescences 8-27 mm long, composed of 1 staminate terminal spike, closely subtended by (0)1-2(3) lateral, pistillate spikes, the staminate spike 6-12(15) mm long, the pistillate spikes (4)-5(9) mm long, the proximal pistillate bract of the cauline inflorescences leaf-like, shorter or equal to the inflorescence; pistillate scales shorter or longer than the perigynia in the basal spikes, and slightly shorter, as long as, or slightly longer than the perigynia in the terminal spikes, ovate to lanceolate, greenish-white to tan or reddish with hyaline margins, the apices acute, acuminate or cuspidate; perigynia 3-4.9 mm long, (0.7)1-2.1 mm wide, ascending, pale green to straw colored, with 14-18(27) prominent nerves to 0.1 mm wide, glabrous proximally and hirsutidulous distally (or nearly glabrous throughout), obovoid, triangular to suborbicular in cross-section, contracted below to a white to brown stipitate base, contracted above to beak, the beak straight to strongly bent, 0.1-1 mm long, bidentate; stigmas 3; achenes (1.5)1.9-2.5(2.6) mm long, 0.9-1.6 mm wide, ovoid to obovoid, trigonous with 2 faces convex, 1 face concave, the apices truncate to retuse or obtuse; section *Hallerianae*, Key B. 

Dry, rocky oak-juniper woodland in southern NM. 4200-6800 ft. 

Similar species: The multiple conspicuous nerves on *C. planostachys* perigynia distinguish it from all other section *Acrocystis* taxa in NM with basal spikes and perigynia that have no cares between the two marginal ones. We are including *Carex lativena* S.D. Jones and G.D. Jones in *C. planostachys*. The characters that separate the two (width of nerves and retuse achenes on *C. lativena*) seem ill-defined and perhaps a factor of maturity rather than genetics (pers. correspondence with D. Poinexter, 2018).

**Carex praegeracilis** W. Boott [very graceful] BLACKKREEPER SEDGE [*Carex camporum* Mackenzie, *Carex latibrosa* Mackenzie]. Plants rhizomatous, often in dense colonies, the rhizomes 1.4-3.6(4) mm thick, coarse, knotty, dark brown or black, culms arising singly, or a few together with internodes between culms up to 2(4) cm long; culms 5-65 cm tall, usually longer than the leaves, usually sharply triangular and scabrous below the heads; leaf blades 1-3.5 mm wide, the sheaths brown to nearly black; inflorescence 1-3(5) cm long, dense to elongate, composed of 4-12 upper spikes sessile on the main rachis and 0-5 multiple-spiked lower branches, the lower branches sometimes separate; spikes similar, erect to spreading, 4-8 mm long, 3-6 mm wide, androgynous or unisexual, with 4-20 perigynia, the staminate flowers inconspicuous, the proximal bract 5-15(30) mm long, with a broad hyaline margin at base, mostly shorter than the inflorescence; pistillate scales similar in size to the perigynia, bronze with a green midvein and brown hyaline margins, becoming pale in age; perigynia 2.3-8.8 mm long, 1.1-1.8 mm wide, ascending, green or pale, maturing to brown or black, serulate to smooth, dull to shiny, nerveless on the ventral face, 0-7 nerved dorsally, elliptic to oblong-elliptic, oblongconvex in cross-section, base rounded to truncate, beak 0.7-1.3 mm long; anthers 1.4-3.2 mm long, the apiculus bristly; stigmas 2; achenes 1.5-1.8 mm long; section *Divisa*, Key F. 

Though inconspicuous, *C. praegeracilis* is a common wetland sedge that occurs at springs, in seeps, cienegas, floodplains, often in agricultural areas subject to livestock grazing, and in seasonally wet areas; 3500-11,800 ft; northern and western NM. 

Similar species: *Carex praegeracilis* is extremely variable in habit and growth pattern, ranging from seemingly depauperate, widely spaced shoots in alkaline hardpan, to dense lush turf in wet riparian areas. In the northern part of the state, it could be confused with *C. simulata*, another rhizomatous, mostly dioecious species. *Carex simulata* likes wetter zones while *C. praegeracilis* favors drier wetland edges, or areas that dry out seasonally. In contrast to *C. praegeracilis*, *C. simulata* has light-colored rhizomes and culm bases, and shorter perigynia with beaks 0.5 mm long or less. *Carex praegeracilis* can be confused with *C. occidentalis*, which, though usually cespitose, can have short dark brown rhizomes. *Carex occidentalis* grows in dry forests (though it can also grow on the edge of riparian areas), and is always monoecious, while *C. praegeracilis* needs some moisture for a period during the year and is often dioecious. Spikes of *C. occidentalis* are virtually always attached to the main axis, while spikes of *C. praegeracilis* are often attached to branches in the lower part of the inflorescence. *Carex praegeracilis* perigynia beaks are often only obscurely bidentate and serulate, while *C. occidentalis* perigynia beaks are obviously bidentate and usually doubly serrulate. Also, see discussion under *C. agrostoides*.

**Carex pratolica** Rydberg [a meadow-dweller]. Plants densely cespitose; culms (1.3)0-70(95) cm tall; leaf blades (1.5)2-3 mm wide; inflorescence (1.7)2.5-5.5 cm long, elongate, often nodding, sometimes moniliform, composed of 4-10 gynecandrous spikes, the spikes 8.5-20 mm long, 3-9 mm wide, oblateconvex to broadly ovoid, smooth, distinct, sessile, the proximal bract scale-like to bristle-like, shorter than the inflorescence; pistillate scales equaling to longer than to equaling the perigynia, white, gold, coppery, or brown with a white or green to brown midvein,
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Carex disperma
8500 ft; rare in northern NM. Our specimens have smaller perigynia than as described in Ball and Reznicek (2002).

Carex radiata (Wahlenberg) Small [radiating]. Plants without conspicuous rhizomes; culms 13-40(80) cm tall; leaf blades 1.1-1.5(1.9) mm wide; inflorescence 19-42(70) mm long, composed of 3-5(8) spikes each with 1-6(8) erect, spreading, or reflexed perigynia, the proximal internodes 2-4+ times longer than the proximal spikes, spikes androgynous (though male flowers often hard to notice), 2-4.5 mm long, 2-5 mm wide, spreading to erect, the proximal bract 6-26 mm long, shorter (rarely longer) than the inflorescence, threadlike; pistillate scales shorter than the perigynia, ovate, hyaline with green or brown midvein; perigynia 2.2-2.8(3.8) mm long, 0.8-1.2 mm wide, green to pale yellow or pale green with two green marginal nerves, the faces not to weakly curved, the margins serrulate distally, elliptic to ovate, planoconvex to biconvex in cross-section, base spongy, cuneate to slightly stipitate; beak (0.1)0.3-0.7 mm long; stigmas 2; achenes (1.2)1.3-1.6 mm long, 0.9-1.2(1.4) mm wide; section Phaeostegochin, Key F. Moist to wet meadows, open dry woods, rocky areas; 9100-9300 ft; known from one location in Rio Arriba County. Similar species: The inflorescence of Carex petasata is lighter-colored and has longer perigynia than C. praticola. The perigynia of C. praticola have terete tips compared to the winged perigynia tips of C. tahoensis.

Carex rossii Boott [for John Ross (1777-1856), Arctic explorer]. Plants cespitose; culms 7-25(40) cm tall, usually shorter than the leaves; leaf blades 0.8-3.2(4) mm wide, lax, the sheaths usually reddish brown, the old sheaths slightly fibrous; inflorescences of two types, basal and cauline, the basal inflorescences composed of 1-2 pistillate spikes on a slender, elongate peduncle, the cauline inflorescences 1-3.5 cm long, composed of one terminal staminate spike (rarely lacking), subtended by 2-4 lateral pistillate spikes, the staminate spike 6-13(16.5) mm long, the pistillate spikes 4-11 mm long with 3-6(15) perigynia, the proximal pistillate bracts of the cauline inflorescence leaf-like, usually much longer than the inflorescences; staminate scales pale to slightly tinged with brown or red, the pistillate scales shorter than the perigynia; perigynia 3.2-4.9 mm long, 1.1-1.7(1.9) mm wide, ascending, green to pale brown, with two marginal nerves, sometimes with a few faint nerves on the faces, finely pubescent, obvoid to elliptoid in outline, suborbicular in cross section, contracted to a narrow stipe-like base, abruptly contracted to beak, the beak 0.8-2 mm long, straight (rarely slightly bent), acuminate, with ciliate-serrulate margins, bidentate, the teeth 0.1-0.8 mm long; stigmas 3; achenes (1.9)2-2.5 mm long, 1.1-1.7(1.4) mm wide, globose to obvoid to elliptoid in outline, obtusely trigonous in cross-section; section Acrocystis, Key B. Moist to wet meadows, open dry woods, rocky areas; 9100-9300 ft; known from one location in Rio Arriba County. Similar species: Carex rossii can be confused with C. brevipes, C. pityophila, and C. “aff. rossii”, all of which share reddish bases and lax, lush leaves. See discussion under C. brevipes. Both C. pityophila and C. “aff. rossii” differ from C. rossii in generally having fewer perigynia per pistillate spike, shorter culms, and thinner, more involute inflorescence bracts that barely exceed the inflorescence. Carex rossii also usually has pale staminate spikes, while both C. “aff. rossii” and C. pityophila have staminate spikes with darker, purple-red colored scales.

Carex “aff. rossii” ined. [a provisional name, similar to Carex rossii]. Plants cespitose; culms 7-15 cm tall, usually shorter than the leaves; leaf blades 0.8-3.4(3.7) mm wide, flat, lax, the sheaths usually reddish to orangish brown, the old sheaths slightly fibrous; inflorescence of two types, basal and cauline, the basal inflorescences composed of 1-2 pistillate spikes on slender, elongate peduncles, the cauline inflorescence 0.8-3.5 cm long, composed of 1 staminate terminal spike (rarely lacking), subtended by 2-4 lateral pistillate spikes, the staminate spike 7.5-13 mm long, on a short peduncle or often with a pistillate flower close to its base, the pistillate spikes 4-11 mm long with 1-4 perigynia, the proximal pistillate bracts of the cauline inflorescences narrow, sometimes involute, subequal to slightly longer than the inflorescence; staminate scales with dark purplish-black coloring, the pistillate scales shorter than the perigynia; perigynia 3.2-4.5 mm long, 1.2-1.8 mm wide, ascending, green to pale brown, with two marginal nerves, sometimes with a few faint nerves on the faces, finely pubescent, obvoid to elliptoid in outline, suborbicular in cross section, contracted to a narrow stipe-like base, abruptly contracted to beak, the beak 0.7-1.4 mm long, straight (rarely slightly bent), acuminate, with ciliate-serrulate margins, bidentate, the teeth 0.1-0.9 mm long; stigmas 3; achenes (1.9)2-2.5 mm long, 1.1-1.3(1.7) mm wide, globose to obvoid to elliptoid in outline, obtusely trigonous in cross-section; section Acrocystis, Key B. Alpine summits, meadows and rocky ridges, riparian zones, canyon bottoms, and shady, moist depressions. 7100-8500 ft; rare in northern NM. Our specimens have smaller perigynia than as described in Ball and Reznicek (2002). Similar species: Carex disperma can be discerned based on characters as given in the key.

Carex petasata
This putative new species is based on work within section Acrocystis by D.B. Poindexter for his dissertation at University of North Carolina at Chapel Hill. Carex “aff. rossii” appears to be far more common in NM than C. rossii, which differs as per the discussion under C. rossii. The range of “Carex aff. rossii” includes AZ, CO, NM, NV, and UT. Note: No official nomenclatural novelty is proposed herein.

Carex ruprestris Allioni [growing among rocks]. [Carex ruprestris Bellardi ex Allioni var. drummondiana (Dewey) Bailey, Carex drummondiana Dewey]. Plants rhizomatous, with culms in loosely cespitose tufts or forming large patches of sparse turf, the rhizomes scaly, brown; culms 4-12(15) cm tall, erect, shorter to slightly longer than the leaves; leaf blades 1.4-3(3.8) mm wide, flat or channelled, the tips often curling, the sheaths reddish-purple to brownish; inflorescence a single terminal androgynous spike, 8-21 cm long, the staminate portion shorter than or as long as the pistillate portion, with 3-10 pistillate flowers, inflorescence bract lacking; pistillate scales longer and wider than the perigynia, ovate to circular-ovate, ovate, hyaline with brown margins and a pale midvein, the upper scale apices obtuse, the lower scale apices acute to awn tipped; perigynia (2.5)2.9-3.7(4) mm long, 0.9-1.6(2) mm wide, erect to ascending, cream to pale green, dark brown distally, several-nerved, elliptoid to obovoid, the beak 0.1-0.2 mm long, dark brown, entire, sometimes with a fringe of tiny, tooth-like hairs; stigmas 3; achenes trigonous, 2.1-2.8 mm long, 0.9-1.4 mm wide; section Ruprestris, Key A. Alpine summits, meadows and rocky ridges, 11,800-13,000 ft; found in the northern Sangre de Cristo Mnts. Similar species: Carex ruprestris grows in the same habitat as C. elynoides, but is rhizomatous and has much wider leaves that often curl at the tip. See discussion under Carex obtusata.

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Carex saxatilis Linnaeus [of rocky places]. Plants colonial from rhizomes 1.2-2.6 mm thick; culms (8)16-45(80) cm tall, shorter to longer than the leaves, triangular, scabrous angled above; leaf blades (1)1.5-3.5(7) mm wide, long-tapered to a narrow tip, the sheaths brown to reddish brown; inflorescence (3)4-8(14) cm long, composed of (1-2)3 terminal staminate spikes and (1-2)3 lateral pistillate spikes, the staminate spikes 15-30(40) mm long, the pistillate spikes 9-21(40) mm long, the lowest sometimes pendant, the proximal bract (0.6)4-17(29) cm long, shorter to longer than the inflorescence; pistillate scales mostly shorter than to as long as the perigynia, ovate to ovo-lanceolate, dark brown to reddish black, often with white hyaline apices, the apices acute or obtuse; perigynia 2.2-4.2(5) mm long, 1.1-2.2(9) mm wide, 2 times as long as wide, ascending to spreading, dark brown becoming reddish black distally with dark yellowish proximal portion, nervesventrally, 4-6 nerved dorsally, elliptic, ovate, or ovate-lanceolate in profile, moderately inflated at maturity, loosely enclosing the achene; beak (0.2)0.9(3.1) mm long, smooth, very shallowly bidentate with teeth up to 0.2 mm long; stigmas (2-3); achenes (1.6)1.8-2.6 mm long, 1.3-1.8 mm wide; section Vesticariae. Key C. ♦Fens, bogs, lakeshores, ponds and slow moving streams; 10,300-11,600 ft; known only from the San Pedro Parks Wilderness (Rio Arriba Co.) and Glacier Lakes (Colfax Co.). ♦Similar species: Carex saxatilis could be confused with C. scopularum, as both are high elevation wetland sedges with dark, short pistillate spikes. Carex saxatilis has narrower leaf blades and culms more widely spaced along the rhizomes, and has moderately inflated perigynia that loosely enclose the achene, while C. scopularum forms denser colonies, has wider leaf blades and flattened perigynia more tightly enclosing the achene. Beaks of C. saxatilis perigynia are longer and more-biplicate than those of C. scopularum.

Carex scoparia Schkuhr ex Willdenow [broom-like]. Plants densely cespitose, rarely short rhizomatous; culms (17)20-76(100) cm tall, mostly longer than the leaves; leaf blades 1.2-4(4.2) mm wide; inflorescence (1)1.2-4 cm long, usually elongate, composed of (1)3(9) spreading to erect, gynandrous spikes, the spikes (5)6-12(16) mm long, ellipsoid, pale green to light brown, sessile, similar, distinct, the proximal bract scale-like with a bristle tip (often broken off in herbarium specimens); pistillate scales shorter and narrower than the perigynia, ovate, the apices acuminate to acute, light brown, sometimes with a pale green or pale midvein, hyaline margins 0.2-2 mm wide; perigynia 3.3-5.4(6.8) mm long, (1)2.2-2.2 mm wide, more than twice as long as wide, erect to ascending, cream to green to light brown, nerved or not, ovate to narrowly ovate, flat except over the achene, beak winged, ciliate-serrulate to the tips, distance from beak tips to top of the achene 2-3 mm; stigmas 2; achenes (1)1.2-1.7 mm long, 0.7-0.9(1) mm wide; section Ovales. Key H. ●Wetlands, wet meadows, streamside, edges of ponds, seasonal ponds, in wet or saturated soils; 5000-8100 ft; uncommon in NM. ●Our plants belong to var. scoparia. Similar species: Carex bebbii has smaller perigynia. Carex subfuscus usually has spikes that are not as obviously distinguished as those of C. scoparia and the pistillate scale apices are not as obviously acuminate as in C. scoparia. See comments under C. brevior.

Carex scopularum T. Helm [of the Rocky Mountains]. Plants rhizomatous, the rhizomes 1.4-6 mm thick; culms 7-40(65) cm tall, shorter or longer than the leaves; leaf blades 1.6-3.5(6) mm wide, the sheaths red brown to dark brown, not ladder-fibrillose; inflorescence dark, 2.8-2 cm long, composed of 1 terminal spike (0.8)1-2(2.5) cm long, stamine or androgyrous, occasionally gynandrous or with perigynia between staminate flowers on the spike, sometimes a second staminate spike below the terminal spike and 1-5 lateral pistillate or androgyrous spikes 1-5, erect, 0.5-3.1 cm long, proximal bract shorter than the inflorescence; pistillate scales narrower and shorter or longer than the perigynia, black, with pale midvein (often inconspicuous), awnless; perigynia 2-3.1(4) mm long, 1.2-2.3 mm wide, ascending, dull, pale brown, nerveless, elliptic or obovate, beak 0.1-0.5(0.6) mm long, entire, sometimes ciliate at the apex; stigmas 2; achenes ca 1.4 mm long; section Phacocystis, Key E. ●Seeps, springs and edges of lakes and ponds in alpine and subalpine habitats. 9600-13,000 ft; uncommon in northern NM. New Mexico specimens are somewhat intermediate between var. scopularum and var. bracteosa (Standley et al 2002), but more consistently exhibit the features of var. scopularum. ●Similar species: In its high elevation habitats, Carex scopularum is only likely to be confused with C. aquatilis. See discussion under that species.

Carex senta Boott [neglected]. Plants loosely to densely aspitose, the rhizomes 1.6-4 mm thick; culms arising in large clumps, 40-80(100) cm tall, longer than the leaves; leaf blades 1-6(8) mm wide, the sheaths red-brown, often shiny, ladder-fibrillose, ligule U-shaped, longer than wide; inflorescence (5)7-15(19) cm long, composed of 2-3 terminal staminate spikes and 2-4 lateral pistillate spikes, each with a peduncle up to 2(4) cm long, proximal pistillate spike 2-8 cm long, proximal bract shorter or longer than the inflorescence; pistillate scales narrower and shorter than to equaling the perigynia, oblong to lanceolate, dark with a greenish midvein, awnless; perigynia 3-3.5 mm long, 1.5-2.2(3.4) mm wide, ascending, dull, leathery, weakly to strongly 5-7 nerved on each face, ovate to obovate, beak brown, 0.2-0.3 mm long, entire; stigmas 2; achenes 1.5 mm long; section Phacocystis, Key E. ●Along rivers, streams and lakes, often forming tussocks on midstream rocks; 4500-8500 ft; uncommon in southwest NM. ●Similar species: This is the only sedge in NM section Phacocystis that has shiny red-brown basal leaf sheaths that become ladder-fibrillose. Standley’s (2002) statement that, “Collections from New Mexico identified as C. senta are C. stricta” is incorrect.

Carex siccativa Dewey [dried] DRYSPIKE SEDGE [Carex aenea of authors, not Fernando nor Willdenow, Carex foenea Fernando var. tuberculata F. Hermann]. Plants rhizomatous with culms arising singly from long, brown rhizomes, the rhizomes 0.6-1.6 mm thick, scaly with pithy cortex that can be peeled off; culms 15-90 cm tall, as long as or longer than the leaves, scabrous angled to more rarely smooth below the inflorescence; leaf blades 1.3-3.5 mm wide, the sheaths pale brown; inflorescence 1-3.5 cm long, 3-9 mm wide, usually elongate, cylindrical to slightly clavate, unbranched, composed of 4-9, ascending spikes, upper spikes often indistinguishable, terminal spike androgyrous or appearing pistillate, often subtended by one or more short staminate spikes and thus appearing falsely gynandrous, the middle spikes stamine or androgyrous, the lower spikes stamine, pistillate, or androgyrous; spikes 5-10 mm long, 1.8-4 mm wide, sessile, the proximal bract inconspicuous, setaceous, shorter than the inflorescence; pistillate scales shorter than to as long as the perigynia, brown with pale or green center and hyaline margins; perigynia 3.6-6 mm long, 1.2-3 mm wide, ascending, green to brown or black, about 10-nerved dorsally, nerveless ventrally, sharply margined, elliptic to ovate, planoconvex in cross-section, beak 1.2-2.5 mm long; anthers 2.3-3.4; stigmas 2; achenes 2 mm long; section Ammoglacin, Key F. ●Forests and grasslands, alpine meadows; 6600-12,300 ft; mountains of the western ½ of NM. ●Similar species: Carex siccativa is one of the most common woodland sedges in western NM, but has often been mistaken for other taxa. The arrangement of staminate and pistillate flowers/spikes in the inflorescence of this taxon described above is unique in NM Carex, most notably the often stamine condition of the middle spikes, with only the upper, or sometimes both upper and lower spikes androgyrous each containing few perigynia. This often gives the inflorescence a "narrow-waisted" look, which has led some
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authors to say that the plant appears “falsely gynaecandrous”, since the middle spikes look like they are part of the upper spike, and the few staminate flowers on the top of the top spike are early deciduous. This inflorescence architecture is readily discernable at early stages before mature perigynia are formed by noting where anthers and stigmas are showing. Infrequently in NM, Carex siccata will demonstrate all androgyne spikes, but it can still usually be determined by rhizome characters coupled with habitat, along with perigynia shape. At early stages, the entire inflorescence can appear linear and compact, and may even be mistaken for single-spiked species. Carex siccata can resemble Carex cincta but usually has finer rhizomes. Carex stevenii, Carex cinnamomea, Carex complanata, and Carex canescens, Carex hookeri are more oval heads composed of more consistently androgyne spikes each containing smaller perigynia. The rhizomes of Carex cincta are uniformly light brown to tan, unlike the dark rhizomes of Carex praegracilis. Carex simulata, which shares the light-colored rhizomes, is almost always found in standing water, while Carex cincta never is. See discussion under Carex douglasi.

Carex simulata Mackenzie [resembling Carex gynandra]. Plants rhizomatous, often forming large, dense, unisexual, clonal stands, the rhizomes 1.2-3 mm thick, light to medium brown, the culms arising singly, internodes between culms up to 7 cm long; culms 12-60 cm tall, usually longer than the leaves, sharply triangular, usually minutely scabrous below the inflorescence; leaf blades 1-3 mm wide, the sheaths brown, often with red-spotted hyaline fronts; inflorescence compact into a narrow, fusiform head, mostly unisexual, lowest branches often with 2-several spikes, the staminate heads 2-3 cm long, with 5-8 lanceoloid spikes, the staminate spikes 4-9 mm long, 1-3 mm wide, the pistillate heads 1.3-2.8 cm long, with 7-12 ovoid spikes, the pistillate spikes 4-8 mm long, 3-4 mm wide, the proximal pistillate bract broad-based, 0.2-4 cm long, usually shorter than the inflorescence; pistillate scales wider and longer than the perigynia, coppery to reddish brown to dark brown, rarely black, with broad hyaline margins; perigynia 1.7-2.4 mm long, 1.3-1.5 mm wide, chestnut to dark reddish brown, smooth, glossy, 2-6 armed dorsally, nerveless ventrally, ovate to rhombic-oblanceolate, planoconvex to biconvex in cross-section, base rounded, spongy, beak 0.3-0.5 mm long; anthers 2.2-2.8 mm long, apiculus papillate; stigmas 2; achenes 1.2-1.5 mm long; section Divisae, Key F. ● Wetlands with saturated soils, often in standing water; 6100-11,700 ft; northern and western NM. ● Similar species: see discussions after Carex praegracilis and Carex diandra.

Carex sengrellii Dewey ex Sprengel [for Kurt Polykarp Joachim Sprengel (1776-1833), Prussian physician-botanist]. Plants loosely cespitose; culms 30-65(90) cm tall, the bases covered with dense fibrous remains (“horse hair”) of the previous year’s leaves; leaf blades (1.8)2-4 mm wide, up to 40 cm long; inflorescence 10-20 cm long, composed of one terminal staminate spike and (13-5) lateral pistillate spikes, the staminate spike 10-20(22) mm long, erect or slightly drooping, the pistillate spikes (10)13-26(35) mm long, pendent on mostly long, fleuous peduncles, the peduncles (6)18-80 mm long, the proximal bract shorter than to equaling the inflorescence; pistillate scales mostly shorter than but sometimes as long as the perigynia, ovate to ovate-oblong, the apices acuminate, hyaline tinged with chestnut-brown with green midrib, proximal scales sometimes awned; perigynia (4.5)4.8-5.5(6.5) mm long, (1)1.2-1.8(2) mm wide, tan to golden-green, glabrous with two marginal nerves, oblong, orbicular in cross-section, the top of the body broad, abruptly contracted to a thin, tubular beak 1.9-2.8 mm long with bidentate teeth (0.3)0.6-1 mm long; stigmas 3; achenes (2)2.2-2.5 mm long, 1.4(1.8) mm wide; section Hymenochlaenae, Key C. ● Riparian areas in canyon bottoms, mesic habitats in conifer forests or woodlands; 7400-8800 ft; known from the Jemez Mountains and Sugarite State Park near the Colorado border. ● Similar species: The dense fibrous culm base, as well as the rounded apex of the perigynium body are terminal by long tubular beak, distinguish C. sengrellii from all other similar Carex taxa with spreading or pendent lateral spikes (C. capillaris, C. hystericina, C. limosa, C. magellanicus).

Carex stevenii (Holm) Kalela [from Steven’s Mine, Clear Creek County, Colorado] [Carex alpina Liljeblad var. stevenii T. Holm, Carex media of NM authors, Carex media R. Brown var. stevenii (Holm) Fernald, Carex norvegica Retzius subsp. stevenii (Holm) D.F. Murray]. Plants cespitose, from short, slender rhizomes; culms 10-60 cm tall, longer than the leaves; leaf blades 1.1-3.2(4) mm wide, the sheaths tan to purplish red, the fronts hyaline; inflorescence (9)16-30 mm long, compact, composed of 1 terminal gynandrous spike and 1-3 (typically 2) lateral pistillate spikes, the spikes short-ovoid to oblong, the terminal spike often longer than the lateral spikes, the lateral spikes (3)4-10 mm long, the lowermost spike sometimes slightly remote, the proximal bract shorter or longer than the inflorescence; lateral spikes (3)4-10 mm long, the inflorescence 2-6 cm long, dense to elongate, spike in appearance due to long perigynia beaks, composed of 10-15 multiple-spiked branches, upper not distinguishable, lower distinguishable, the proximal bract scabrous, sheathless; spikes numerous, similar, androgyne, 3-7 mm long, 2-8 mm wide, spreading, 4-10 flowers per spike; pistillate scales shorter than to as long as the perigynia, hyaline to yellow-brown, with a green midvein; perigynia 3.6-4.6 mm long, 1-1.6(2) mm wide, green becoming brown at maturity, nerves 5-15, prominent on both sides, broadest near the base, the base spongy, truncate to conolate, often basally bulbous, lance-triangular, planoconvex or biconvex in cross-section, tapering gradually to the tip, or sometimes abruptly narrowing above the middle forming a trigon shape, the beak 2-3.5 mm long; anthers 1.4-1.5 mm long; stigmas 2; achenes 1.3-2.3 mm long; section Valpiniae, Key F. ● Wetland, often inundated with flowing water, near springs, along lakes and streams; 6000-9800 ft; mountainous areas of NM. ● Our plants belong to var. stipata. Similar species: Carex vulpinoidea shares the dense, branched inflorescence character, and the cross-rugulose sheaths of C. stipata, but the inflorescence of the former is finer textured, with multiple setaceous inflorescence bracts, and it has smaller perigynia that are somewhat flattened, and lateral spikes that are generally pendent at maturity, with a few staminate flowers at the base.

Carex stipata Muhlenberg ex Willdenow [crowded] AWL-FRUIT SEDGE. Plants densely cespitose forming large tussocks, from short, stout, dark rhizomes; culms 20-75(120) cm tall, 4-6 mm wide, mostly shorter than, but sometimes longer than the leaves, sharply and broadly winged below the head; the leaf blades 2-8(11) mm wide, the sheaths brown, the sheath fronts cross-rugulose near summit; inflorescence 2-6 cm long, dense to elongate, spike in appearance due to long perigynia beaks, composed of 10-15 multiple-spiked branches, upper not distinguishable, lower distinguishable, the proximal bract setaceous, sheathless; spikes numerous, similar, androgyne, 3-7 mm long, 2-8 mm wide, spreading, 4-10 flowers per spike; pistillate scales shorter than to as long as the perigynia, hyaline to yellow-brown, with a green midvein; perigynia 3.6-4.6 mm long, 1-1.6(2) mm wide, green becoming brown at maturity, nerves 5-15, prominent on both sides, broadest near the base, the base spongy, truncate to conolate, often basally bulbous, lance-triangular, planoconvex or biconvex in cross-section, tapering gradually to the tip, or sometimes abruptly narrowing above the middle forming a trigon shape, the beak 2-3.5 mm long; anthers 1.4-1.5 mm long; stigmas 2; achenes 1.3-2.3 mm long; section Valpiniae, Key F. ● Wetland, often inundated with flowing water, near springs, along lakes and streams; 6000-9800 ft; mountainous areas of NM. ● Our plants belong to var. stipata. Similar species: Carex vulpinoidea shares the dense, branched inflorescence character, and the cross-rugulose sheaths of C. stipata, but the inflorescence of the former is finer textured, with multiple setaceous inflorescence bracts, and it has smaller perigynia that are broader above the base, without swollen pithy tissue at the base. The inflorescence of C. agrostoides is also branched, though with a softer feel.
than that of *C. stipata*. The perigynia of *C. agrostoides* can be similar in shape, with the swollen bases, the violin-like “waist”, and prominent nerves. However, the culms of *C. stipata* are stouter, with winged margins, while the culms of *C. agrostoides* lack wings. Also, *C. agrostoides* lacks the cross-rugulose sheath fronts of *C. stipata*.

**Carex subfusca** W. Boott [nearly or slightly brown, the scales]. **BROWN SEDGE**. [Carex macloviana D’Urvill. subsp. subfusca (W. Boott) T. Koyama]. Plants densely cespitose; culms 10-80(105) cm tall, longer than the leaves; leaf blades 0.8-2 mm wide; inflorescence 1.1-3 cm long, compact to elongate, rarely somewhat moniliform, the base tapered, composed of 4-12(14) erect to spreading, gynandrous, similar, mostly indistinguishable spikes, the spikes 4-12 mm long, 1.7-7 mm wide, broadly ovoid to narrowly ellipsoid, sessile, similar, the proximal bract usually shorter than the inflorescence, but sometimes leaf-like and longer, wide (usually hyaline) basal portion of the proximal bract less than half as long as the lowest spike; pistillate scales, shorter and narrower to sometimes covering the perigynia, light green to brown, usually with a pale, straw, or green midvein and hyaline margins; perigynia 2.4-4(4.3) mm long, 0.9-2(1.5) mm wide, ascending, green to tan or brown, dorsally nerved, dorsal suture not hyaline marginated, ventrally nerved or not, narrowly to broadly ovate, narrowly wing-marginated to the round-tapering base, planoconvex to biconvex, beak winged and serrulate to tip or less often tip terete and distally entire for up to 0.5 mm, distance from beak tip to top of the achene 1.2-1.8(2) mm; stigmas 2; achenes 1-1.6 mm long; section *Ovaes*, Key H.● Moist to wet meadows, streambanks, forest margins; 5500-10,700 ft; widespread in northern and southwestern NM.● Similar species: see notes under *Carex athrostachya*, *C. microptera*, and *C. scoparia*.

**Carex tahoensis** Smiley [for the Lake Tahoe region]. Plants densely cespitose; culms (15)40-70 cm tall, longer than the leaves; leaf blades 1.5-2.2(2.5) mm wide, folded or revolute; inflorescence (1.5)2-3.2 cm long, compact to elongate, composed of 3-6(6) gynandrous spikes; the spikes 5-15 mm long, lanceoloid, often slightly clavate due to a larger number of male flowers at the base, distinct, erect, similar, sessile, the proximal bract scale-like or bristle-like, shorter than the inflorescence; pistillate scales usually covering the perigynia, red-brown with a straw to tan midvein, with hyaline margins 0.2-0.8 mm wide, the apices generally acute to short-awned, hyaline; perigynia 4.4-8.6(2) mm long, 1.4-2(2.6) mm wide, appressed, green to brown with age, many-nerved on both sides, lanceolate to ovate to oblong-lanceolate, the base long-tapering, planoconvex, distended by achene, beak 0.8-1.7 mm long, serrulate and winged to the tip or nearly so, the distance from beak tip to top of the achene 1.7-2.2(2.6) mm; stigmas 2; achenes (1.7)2-2.2(2.5) mm long, 1.2-1.4(1.6) mm wide; section *Ovaes*, Key H.● Grasslands, sagebrush slopes, open rocky and sandy slopes, subalpine and alpine meadows; 9400-9900 ft; known from two locations in northern NM (Rio Arriba and Taos counties).● Similar species: see notes under *Carex petasata*, *C. phaeocephala* and *C. pratitola*.Our NM collections are similar to others from the Rocky Mtns. and mountain ranges of the Colorado Plateau, which have been identified as this taxon. However, we think that they may be different from the *C. tahoensis* described from California. More taxonomic work is needed to determine the relationships here.

**Carex tenera** Dewey [soft, delicate, tender]. Plants densely cespitose; culms 20-75(90) cm tall, usually longer than the leaves, flexible; leaf blades 1.3-2.5 mm wide; inflorescence 1.5-3 cm long, elongate, proximal internode (2)4-9 mm long, moniliform, sometimes nodding, composed of 3-5(8) erect to spreading, gynandrous, spikes, the spikes obvoid to globose, tapering to base, 5-11 mm long, similar, distinct, sessile, the proximal bract with threadlike awn to 2 mm long; pistillate scales shorter and narrower than the perigynia, ovate, brown hyaline to pale brown, with a green to pale midvein; perigynia (2.1)2.8-3.8(4) mm long, 1.4-2 mm wide, erect to loosely spreading, green to straw-colored with a brown to red-brown tip, dorsal nerves (1)4-9, ventral nerves 0-8, ovate to broadly ovate, planoconvex, distance from perigynium tip to top of the achene 1-2(2.7) mm, the beak winged and serrulate to the tip or nearly so; stigmas 2; achenes 1.3-1.7 mm long, 0.9-1.2 mm wide; section *Ovaes*, Key H.● Dry to wet open forested meadows, seeps; 8000-8100 ft; Rio Arriba Co.● Our plants belong to var. *tenera*.● Similar species: *Carex subfusca* has similar-sized perigynia, but its inflorescence is usually not moniliform nor nodding. *Carex pratitola* has a nodding moniliform inflorescence, but the perigynia are much larger than those of *C. tenera*.

**Carex ultra** L.H. Bailey [more than, stouter than *Carex laciniata*]. [Carex spissa var. ultra (L.H. Bailey) Kükenthal]. Plants densely cespitose from stout rhizomes 50-160 cm tall, often longer than the leaves; leaf blades 6-15 mm wide, often glaucous, thick, stiff, roughly antorsely scabrous on margins and keel, basal sheaths brown or reddish, with sheath fronts densely red-spotted or blotched, ladder-fibrillobose; inflorescence 18-50 cm long, composed of 1-3 terminal staminate spikes and 3-6 erect lateral pistillate spikes, the staminate spikes 2-12 cm long, the pistillate spikes 2-13 cm long, 0.5-0.8 mm wide, cylindrical, the lowest stiffly long-pedunculate, the proximal bract leaf-like, shorter than the inflorescence; pistillate scales shorter to as long as the perigynia, the apices acute to acuminate, the tip often ciliate-serrulate; perigynia 4-4.8(6.2) mm long, 1.4-2(2.6) mm wide, appressed, green to brown with age, many-nerved on both sides, lanceolate to ovate to oblong-lanceolate, the base long-tapering, planoconvex, distance from perigynium tip to top of the achene 1-2.2 mm, the beak winged and serrulate to the tip or nearly so; stigmas 2; achenes 1.3-1.7 mm long, 0.9-1.2 mm wide; section *Ovaes*, Key H.● Our plants belong to var. *tenua*.● Similar species: see notes under *Carex petasata*, *C. phaeocephala* and *C. pratitola*.Our NM collections are similar to others from the Rocky Mtns. and mountain ranges of the Colorado Plateau, which have been identified as this taxon. However, we think that they may be different from the *C. tahoensis* described from California. More taxonomic work is needed to determine the relationships here.

**Carex utriculata** Boot [bladery] NORTHWEST TERRITORY SEDGE. Plants colonial, in dense stands from rhizomes; culms 22-100 cm tall, shorter than the leaves; leaf blades (13)10 mm wide, the sheaths spongy-thickened, often cross-walled with a brick-like pattern, brown, rarely reddish in smaller plants, the ligules of the lowest leaf blade shorter than the apex, rounded, sometimes acute; inflorescence (8)10-30(35) cm long, composed of (12)5-6(6) terminal staminate spikes and (1)2-3(4) ascending lateral pistillate spikes, the staminate spikes 0.9-9 cm long, the pistillate spikes 0.9-6(9) cm long, the upper usually sessile, the lower usually on short peduncles, the proximal bract leaf-like, 10-55 cm long, usually longer than the inflorescence; pistillate scales shorter and narrower than the perigynia, lanceolate-ovate to narrowly lanceolate, the apices acute to acuminate, the tip often ciliate-serrulate; perigynia 3-5(5.8) cm long, 1-2(3) mm wide, ascending to widely spreading, green to straw-colored to reddish-brown, 6-10 veined, ovoid to ellipsoid, densely packed, inflated, the beak prominent, 0.8-1.8 mm long, bidentate with straight to curved teeth 0.2-0.5 mm long; stigmas 3; achenes 1.1-2 mm long, 0.9-1.1 mm wide; section *Vescaria*, Key C.● Wet meadows, marshes, pond and lake margins, and stream banks; 5600-12,000 ft; common and widely scattered in the western ⅔ of NM, especially in the north.● Similar species: *Carex utriculata* is often confused with the much less frequently encountered *C. vesicaria*. They grow in similar habitats, but *C. utriculata* grows in deeper water, while *C. vesicaria* prefers shorelines and damp meadows. *C. vesicaria* has larger perigynia that often appear to be more ascending, while those of *C. utriculata* are smaller and more spreading when mature.
Monocotyledonous Plants - Cyperaceae

Carex vallicola Dewey [a valley-dweller] [Carex rashby Mackenzie, Carex vallicola Dewey var. rashby (Mackenzie) F.J. Hermann].
Plants cespitose or rarely short rhizomatous; culms 12-45 cm tall, longer than the leaves, crowded; leaf blades (0.5)1-3 mm wide, the sheaths green; inflorescence 1.3-2 long, 4-9 mm wide, usually elongate, unbranched, composed of 5-8 sessile androgynous spikes, the spikes similar, 5-8 mm long, 2-6 mm wide, erect to spreading, green, glossy, 7-17 nerves proximally dorsally, nerves ventrally, the marginal nerves pushed to the ventral face at maturity, marginal serrations none to scant, ovate, biconvex in cross-section, beak 0.5-1 mm long; anthers 1.2-2.4 mm long; stigmas 2; achenes 1.6-2.7 mm long; section Phaestoglochis, Key F. • Dry grasslands, woodlands, forests, more mesic habitats at lower elevations; 6900-9400 ft; northern and western NM. Similar species: see discussion following Carex occidentalis.

Carex vescaria Linnaeus [bladder-like].
Plants densely clumping or colonial from short, stout rhizomes; culms 30-95 cm tall, shorter than the leaves; leaf blades 1.5-6(8) mm wide, the sheaths rarely spongy-thickened or cross-walled, the sheaths red to purplish brown, sometimes ladder-fibrillose, the fronts often red-spotted, ligules of lowest leaf usually twice as long as wide, the apices acute; inflorescence 10-22 cm long, composed of 1-3(5) terminal staminate spikes and (1)2-3 ascending widely separated lateral pistillate spikes, the staminate spikes 1.2-6.5 cm long, the pistillate spikes 1.4-5(7.5) cm long, the upper sessile, the lower usually on short peduncles, the proximal bract leaf-like, 10-35 cm long, longer than the inflorescence; pistillate scales narrower and shorter than the perigynia, awoless or sometimes tapering to a smooth awn; perigynia 3.8-7.5 mm long, (1.5)2.2-3.4 mm wide, mostly strongly 7-12 nervet, lanceoloid to ovoid-lanceoloid, inflated, the beak 1.1-2 mm long, bidentate with straight or curved teeth 0.3-1.2 mm long; section Vesicariae, Key C. • Wet meadows, pond margins, and stream banks; 7700-8400 ft; known only from a few widely scattered locations (Cibola and Rio Arriba counties). Similar species: see discussion under Carex utricularis.

Carex viridula Michaux [greenish] [Carex oederi auctores, Carex oederi Retzias subsp. viridula (Michaux) Hultén].
Plants cespitose; culms 10-35 cm tall, straight or arching; leaf blades 1.5-3(4.5) mm wide; inflorescence composed of 1 staminate (occasionally androgynous) spike, and 1-4(7) lateral pistillate (rarely androgynous) spikes, the terminal spike 3-12 mm long, cylindric, the lateral spikes 4-12 mm long, ovoid or oblong to globose, sessile or pedunculate, proximal spike sometimes remote, the inflorescence 100-1000 spikelets in corymbose involucre, the proximal bract leaf-like or bristle-like, shorter or longer than the inflorescence; pistillate scales shorter and narrower than the perigynia, pale brown to golden brown with green, 1.3-1.7 mm long, erect to sometimes widely diverging; pistillate scales much shorter than the perigynia, pale brown to golden brown with green, the midrib keeled, the apex obtuse; perigynia 1.8-3 mm long, 0.8-1.4 mm wide, yellow to green to brown, with several prominent nerves, abruptly narrowed to the beak, beak 0.3-1.1 mm long, straight or slightly bent, smooth or minutely serrulate; stigmas 3; achenes 1-1.6 mm long, 0.6-1 mm wide; section Ceratocystis, Key C. • Wet meadows, alkaline seeps, streams; 7800-10,000 ft; known only from canyons in the Sacramento Mtns. (Otero Co.) and one location in Taos Co. • Our plants belong to var. viridula. Similar species: The leafy inflorescence bracts of Carex viridula from other small Carex taxa with similar inflorescence structure (i.e. C. blanda, C. conoidea, C. microdonta).

Carex vulpinaeoida Michaux [resembling Carex vulpinae] FOX SEDGE, Plants cespitose from short to long, stout rhizomes; culms (20)30-100 cm tall, shorter than to as long as the leaves; leaf blades up to 3.5 mm wide, leaf sheaths ventrally cross-nugulose near summit, the ligules up to 2 mm long; inflorescence (1.6)3-5 cm long, dense to elongate, composed of 10-15 densely aggregated branches of multiple spikes each, lower internodes 20(25) mm long, the proximal spike up to 14 cm long, sheathless, upper inflorescence bracts shorter, but usually obvious, appearing hair-like throughout the inflorescence; spikes numerous, similar, sessile, androgynous, spreading, 3-9 mm long, 2-6 mm wide; pistillate scales narrower than to equal the perigynia, hyaline to greenish brown; perigynia 2.2-2.8 mm long, 1.3 mm wide, green to straw-colored, or pale brown, dull, veinless or few nervet dorsally, veinless ventrally, the margins sharp, the base spongy, truncate to cordate, ovate, planoconvex in cross-section, the beak 0.8-1.2 mm long; anthers 1.4-1.5 mm long; stigmas 2; achenes 1.2-1.4(1.6) mm long; section Multiflorae, Key F. • Wetlands along streams and lakes; 5300-8200 ft; northern and southwest NM. Similar species: The hair-like inflorescence bracts of Carex vulpinaroida set it apart from all other species it might be confused with in NM. See also discussion following C. spicata.

Carex wootonii Mackenzie [for Elmer Ottis Wooton (1865-1945), premier New Mexico botanist] WOOTON’S SEDGE, Plants densely cespitose, forming small clumps from short rhizomes; culms (15)21-70(75) cm tall, longer than the leaves; leaf blades 1-4 mm wide, inflorescence 1.7-4 cm long, elongate or compact, composed of 3-7(8) gynoecondium, similar spikes, the spikes 9-21 mm long, obovoid, erect, cespitose, often distinct, the proximal internode (2)4-10 mm long, the proximal bract leaf-like or bristle-like, shorter or longer than the inflorescence; pistillate scales shorter and narrower than the perigynia, reddish or golden brown with a pale or green midvein, hyaline margins 0.5-5 mm wide; perigynia (4.8)5.3-7(7.2) mm long, (1.6)8-2.9(3) mm wide, 2.1-3.1(3.5) times longer than wide, apressed, forest green when fresh, usually lacking nerves on either side, broadly wing-margined to the rounded base, narrowly ovate to ovate, planoconvex to flat, long tapering to the usually winged beak, serrulate or nearly so to the beak tip, winged to tip or not, distance from beak tip to top of the achene 2-3.6 mm; stigmas 2; achenes 1.6-3 mm long, 1.3-1.7 mm wide; section Ovales, Key H. • Dry places in open meadows and slopes, clearings in forests, and rocky areas; 6700-11,000 ft; widespread in central to western NM. Similar species: The inflorescence of Carex petasata is lighter-colored than in most C. wootonii. Carex wootonii has longer perigynia than C. tahoesiensis, C. pheocephala and C. pratlicola. See notes under Carex “apachense” and C. petasata.

Cladium [a small branch] SAW-GRASS [1].
Plants grass-like, perennial, cespitose from short, stout rhizomes, very robust in our species; culms terete to rounded trigonous, leaves cauline, blades flat to involute, ligules absent; inflorescence terminal and lateral, composed of 100-1000 spikelets in corymbose panicles (poo’s), with 3rd-4th order branching in our species; inflorescence bracts spreading, leaflike; spikelets with 5-6 florets each spirally arranged along the rachilla; flowers bisexual or staminate, perianth absent; stamens 2-3; pistil style with 3 stigma branches, base thickened, persistent; fruit an achene, terete. - 4 species worldwide, 3 listed in the Flora of North America, 1 documented in NM. • Alfred, K.W. 2003. Plant distribution reports [Cladium californicum]. The New Mexico Botanist 26:7. • Tucker, G.C. 2002. Cladium, pp. 240-242. IN: Flora of North America, vol. 23. Oxford University Press.
*Cladium californicum* (S. Watson) O’Neil  [of California]  **CALIFORNIA SAW-GRASS**  *(Cladium mariscus (Linnaeus) Pohl var. californicum S. Watson)*. Plants perennial, very robust, with culms in large clumps from stout (10 mm thick) short rhizomes; 1-2 m tall, 5-10 mm wide; leaves with flat to v-shaped blades, as long as the culms, 7-10 mm wide, margins harshly scabrid; inflorescence terminal and lateral, pedunculate, composed of many spikelets in a compound panicle with 3rd-4th order flexuous branches; inflorescence bracts 3-4+, leaf-like, the proximal longer than the lateral inflorescence cluster that it subtends; spikelets in clusters of (3)4-6, 3 mm long, ellipsoid to lanceoloid; floral scales 5-6, 2.5-3 mm, glabrous, brown with prominent midrib; stigmas 3, stamens 2, anthers 2 mm long; achenes ovoid, 1.5-2 mm long.  ● Alkaline marshes and springs, streamsides; 3200-5600 ft; known from several locations in the southeastern counties, and the wet ciénega below Blue Hole Spring in Santa Rosa (Guadalupe Co.).
Cyperus [the ancient Greek name for various sedges] FLAT-SEDGE [24].

Plants grass-like, perennial or less frequently annual, cespitose from short rhizomes to colonial from long-creeping rhizomes, or fibrous rooted only in the annual species; culms trigonous to rounded in cross section, solid, without nodes, glabrous to less frequently scabrous; leaves three-ranked, mostly clustered at or near the base, blades usually well-developed and linear, flat with face towards the culm to V- or M-shaped, or involute in a few species, rarely reduced to sheaths only, ligules absent; inflorescence terminal, occasionally appearing pseudo-lateral when forced to the side by a strong upright bract, umbellate to capitulate, composed of one to many spikes, the spikes in a sessile cluster at the top of the culm, or elevated on bare rays (most frequently unequal in length), or more usually a combination of both, second and third order umbellate branching present in some species; inflorescence bracts spirally arranged at the base of the first order branching, leaflike, spreading to ascending, sometimes reflexed; spikes composed of few to numerous (rarely one) spikelets, either digitately, subdigitately, or spicately arranged along an axis (the rachis); spikelets with few to many florets, usually distichously arranged along a rachilla, very rarely spirally arranged, flattened (compressed) to quadrangular or terete in cross section; flowers bisexual, in the axil of a scale, the scale base often decurrent onto the rachilla forming hyaline “wings”; perianth absent; stamens (1,2) 3; pistil with 1 style and 2 or 3 stigma branches; fruit an achene, either lenticular or trigonous corresponding with the number of stigma branches, stipitate or not. About 600 species worldwide, about 96 listed in the Flora of North America. Recent molecular work (Bauters et al. 2014, Larridon et al. 2014) has shown that both Lipocarpha and Kyllinga (and other genera) are nested within a paraphyletic Cyperus sensu stricto, and new combinations have been made for the former species of these genera now as members of a monophyletic Cyperus sensu lato.

Monocotyledonous Plants - Cyperaceae

1 Stigmas 2; achenes lenticular; spikelets highly compressed or terete in cross-section (if terete, the florets spirally arranged)

2 Spikelets with one fertile floret subtended by 1-3 scales; spikes 1-3(4), compact, ovoid to subspherical, sessile

3 Annual, diminutive; spikes 1-2(3), subequal, seemingly lateral; primary inflorescence bract ascending to vertical and often appearing to be an extension of the culm; floral scales 1-2 per spikelet, with outer scale opaque and inner scale membranous or sometimes absent; anthers 0.1-0.2 mm; achenes terete (Lipocarpia micrantha)………………………………………C. subsquarrosus

3 Parennial, cespitose; spikes 1-3(4), unequal, terminal, the primary spike vertical and larger than the others; inflorescence bracts spreading to reflexed; floral scales 2(3) per spikelet, similar in texture; anthers (0.4)0.6-0.8(1) mm; achenes biconvex (Kyllinga odorata)………………………………………………………………………………………………………C. sesquiflorus

2 Spikelets with more than one fertile floret, typically more than 3; spikes 1-many, compact to open, of varying shapes, sessile to pedunculate

4 Florets spirally arranged on the spikelet rachilla (atypical for the genus); spikelets 100+ in number, densely packed into a single ovoid to subglobose capituleate head; stigmas 2 or 3 …………………………………………………………………………………………………………………C. michelianus

4 Florets distichously arranged on the spikelet rachilla (typical for the genus); spikelets 2-60 in number, loosely distributed along the spike rachis, or digitately arranged in a radiating cluster; stigmas always 2

5 Spikes loosely cylindric with an obvious rachis; floral scales widely spreading so that the spikelets have a sawtooth edge; plants annual……………………………………………………………………………………………………………………………………………C. flavicamus

5 Spikes subcapitate, lacking an obvious rachis; floral scales appressed so that the spikelets have a smooth edge; plants perennial or annual

6 Perennial with slender rhizomes, often producing dense clumps; spikes with (3)5-25(60) spikelets; floral scales 1.9-2.7 mm long; anthers 0.6-0.8 mm long………………………………………………………………………………………………………C. niger

6 Annual with fibrous roots; spikes with 3-5(8) spikelets; floral scales 1.5-2.1 mm long; anthers 0.4-0.5 mm long………………..………………………………………C. bipartitus

1 Stigmas 3; achenes trigonous; spikelets compressed, quadrangular, or terete in cross-section (not spirally arranged, except C. michelianus)

7 Spikelets borne in digitate clusters or in umbellate heads; spikelets compressed in cross-section (except in Cypresmicellalus)

8 Plants annual (occasionally biennial in C. acuminatus), lacking rhizomes or tuberous rootstocks

9 Florets spirally arranged on the spikelet rachilla (atypical for the genus); numerous spikelets (100+), densely packed into a single ovoid to subglobose capituleate head (spike); stigmas 2 or 3 ………………………………………………………………………………………………………………………………………C. michelianus

9 Florets distichously arranged on the spikelet rachilla (typical for the genus); spikelets 2-75, digitate in a subspherical head, or subdigitate in a hemispheric cluster; stigmas 3

10 Floral scales 2 keeled at the base, with 3-5 ribs visible on each side, ribbed almost to the margins, awned tip 0.5-1.0 mm long, strongly excurved ………………………………………………………………………………………………………………………………………………C. squarrosus

10 Floral scales single keeled, with 0-2 ribs visible on each side, with a wide area smooth to the margins, cusp up to 0.5 mm long, slightly excurved ………………………………………………………………………………………………………………………………………………………………………C. acuminatus

8 Plants perennial with rhizomes or tuberous rootstocks

11 Inflorescence a single dense spike (head); spikelets 20-60(100), tightly radiating; inflorescence bracts horizontal to deflexed parallel to culm; floral scales often milky white; culms 4-30 cm tall……………………………………………………………………………………………………………………………………………C. anidus

11 Inflorescence usually of more than one spike; spikelets usually less than 20 per spike, ascending in a loose cluster; inflorescence bracts strongly ascending; floral scales not milky-white; culms 15-50(60) cm tall

12 Floral scales (2.3)2.8-3.2 mm, distal scales with apical cusp 0.3-1 mm; achenes broadly ellipsoid; anthers 0.8-1.4 mm; upper culms usually scabrous on the angles; plants of sandy substrates …………………………………………………………………………………………………………………………………………………………………………………………C. schweinitzii

12 Floral scales (1.6)1.8-2.4 mm, distal scales with apical cusp 0.1-0.3 mm; achenes ovoid to obovoid; anthers 0.4-0.6 mm; upper culms usually smooth on the angles; plants primarily of rocky slopes…………………………………………………………………………………………………………………………………………………………………………………………C. sphaerocephalus

7 Spikelets borne in linear spikes (sometimes the rachis so shortened that the spikes appear almost head-like, or with a few ascending spikes from a common terminus), compressed, quadrangular, or terete in cross-section

13 Apex of floral scales with a definite cusp or awn-like tip greater than 0.2 mm long

14 Plants annuals, small, slender, tufted, with fibrous roots; larger culms generally less than 0.8 mm wide; floral scales with strongly excurved awned tips……………………………………………………………………………………………………………………………………………………………………C. squarrosus

14 Plants perennial, robust, rhizomatous; larger culms generally more than 1 mm wide; floral scales with a straight to slightly spreading cusp

15 Floral scales deciduous (the empty rachilla generally remaining persistent on the spike); spikelets strongly compressed, more than 2x as wide as thick, mostly strongly ascending throughout the spike

16 Most inflorescence bracts slightly ascending (at least less than 45 degrees above horizontal) to reflexed; spikelets sessile (the central one longest), forming an elongate head, very rarely with 1 short ray…………………………………………………………………………………………………………………………………………………………………………………………C. fenderianus

16 Most inflorescence bracts ascending at greater than 45 degrees above horizontal; most spikes usually on elongate rays, spikes of varying lengths

17 Floral scales (2.3)2.8-3.2 mm, distal scales with apical cusp 0.3-1 mm; achenes broadly ellipsoid; anthers 0.8-1.4 mm; upper culms usually scabrous on the angles; plants of sandy substrates ……………………………………………………………………………………………………………………………………………………………………………………………C. schweinitzii
Monocotyledonous Plants - Cyperaceae

17 Floral scales (1.6)1.8-2.4 mm, distal scales with apical cusp 0.1-0.3 mm; achenes ovoid to obovoid; anthers 0.4-0.6 mm; upper culmus usually smooth on the angles; plants primarily of rocky slopes ....... C. sphaerocephalus

15 Floral scales persistent with spikelets deciduous as a unit (including the rachilla); spikelets quadrangular to slightly compressed, less than 2x as wide as thick, mostly spreading at right angles to the rachis at mid spike

18 Longest spikelets (2.2)-4-10(18) mm, floral scales 1-5; distal scale with glabrous midrib, the macro 0.1-0.3(0.5) mm; anthers (0.3)0.4-0.6 mm ................................................................. C. retroflexus

18 Longest spikelets 9-21 mm, floral scales 3-8(13); distal scale with scabrid midrib, the macro 0.6-1.9 mm; anthers 0.5-1.3 mm ........................................................................................................ C. floribundus

13 Apex of floral scales obtuse to acute, lacking any extension, or with a tiny cusp (0.1-0.2 mm long)

19 Spikelets quadrangular to terete, sometimes slightly compressed in cross-section, less than 1.5 times as wide as thick

20 Plants perennial with short rhizomes; spikes less than 1 cm wide, the rays usually with solitary spikes; spikelets with 1-5 floral scales

21 Inflorescence a cluster of 3-6 sessile spikes, sometimes with 1-5 additional spikes on rays; floral scales laterally pale green to whitish; achenes (1.6)1.8-2(2.2) mm long; plants of the sky island ranges in the Bootheel ................................................................. C. pallidicolor

21 Inflorescence of one sessile spike, with 4-11 additional spikes elevated on rays; floral scales laterally tan to brown; achenes 1.2-1.7 mm long; plants known from two locations (Donna Ana & Rio Arriba cos.) .................. C. retrorsus

20 Plants annual to short-lived perennial, with primarily fibrous roots (rarely producing rhizomes in Cyperus strigosus); spikes often significantly wider than 1 cm (except in depauperate specimens), the rays often with clusters of spikes at the apex; spikelets with 3-12(30) floral scales

22 Floral scales 3.2-4.5(6) mm; spikelets generally appearing straight and stiff, falling whole from the rachis of the spike; plants short-lived perennials with thickened corn-like bases (rarely producing rhizomes) ............... C. strigosus

22 Floral scales less than 3.2 mm long; spikelets often appearing somewhat flexuous, with the floral scales deciduous from the rachilla or the rachilla disarticulating at each joint and falling with the scale; plants small to robust annuals without corn-like bases or rhizomes

23 Floral scales 1.3-1.5 mm long, spreading at maturity, imbricate, deciduous from the persistent rachilla of the spikelet ................................................................. C. erythrorhizos

23 Floral scales 2-2.8(3.2) mm long, generally remaining appressed at maturity and not imbricate; spikelets disarticulating at each joint of the rachilla, each scale remaining attached to its rachilla joint ........... C. odoratus

19 Spikelets compressed in cross section, more than 1.5 times as wide as thick

24 Floral scales 1-2 mm long; spikelets densely packed on the spike rachis, the rachis either hidden completely or poorly visible between the spikelets; plants annual

25 Floral scales 1-1.5 mm long; achenes (0.4)0.7-1 mm long; inflorescence bracts (3)5-7(11); plants native, from widely scattered locations in NM.................................................................................. C. ericoides

25 Floral scales 1.5-2 mm long; achenes 1.3-1.4 mm long; inflorescence bracts 3-4; plants introduced, known from the Rio Grande corridor in central NM................................................................. C. glomeratus

24 Floral scales (1.8)2-4.5(6) mm long; spikelets loosely to moderately packed on the spike rachis, the rachis usually easily visible between the spikelets; plants annual or perennial

26 Floral scales and spikelet rachilla persistent; plants perennial, colonial, with fine rhizomes bearing tubers in mature plants (often not collected)

27 Spikelets golden orange-brown, 10-20(25) per spike ............................................................... C. esculentus

27 Spikelets purplish to reddish-brown, (2.3)-7(12) per spike ......................................................... C. rotundus

26 Floral scales or spikelets as a whole deciduous; plants annual or perennial, the rhizomes if present not bearing tubers

28 Floral scales 2.3-3.1 mm long, often with some pink to reddish tinge; plants annual; culms 5-25 cm tall, 1-1.5 mm wide; widely scattered in the southwestern mountains and river corridors ........................................... C. parishii

28 Floral scales 3-4.5(6) mm, tan with yellowish or reddish brown; plants perennial (sometimes flowering first year like an annual); culms 20-100 cm tall (shorter in depauperate C. strigosus), 1.6 mm wide; rare in NM, known only from a few location

29 Floral scales reddish brown at maturity, deciduous; plants robust perennials with long rhizomes; anthers 1.5-2 mm long; known from one roadside collection north of Santa Rosa (Guadalupe Co.) ........ C. setigerus

29 Floral scales yellowish-green to yellowish-brown at maturity, persistent (the spikelet falling whole); plants short-lived perennials to annuals with hardened corn-like bases, rarely producing rhizomes; anthers 0.3-0.5 mm long; known only from a few collections in the Bootheel (Hidalgo Co.) ...................................... C. strigosus

Cyperus acuminatus Torrey & Hooker [sharpened, with a long tapering point] [Cyperus cyrtolepis Torrey & Hooker]. Plants annual, tufted with fibrous roots; culms (10)-20-30 cm tall, longer than the leaves; leaf blades 1-2(4) mm wide; inflorescence composed of 1 terminal and 1-4 additional hemispheric to spheric heads (spikes) elevated on rays, 7-12(15) mm wide, the (15)25-50(75) spikelets arranged digitately within each head; inflorescence bracts 3-6, the longest strongly ascending to vertical and longer than the inflorescence; spikelets compressed, with 8-20(35) imbricate flowers; floral scales 1-2 mm long, 2 keeled, laterally faintly 1 ribbed, yellowish, yellowish green to light reddish brown, the apex acuminate and slightly excurred; anthers 0.5 mm long; stigma 3; achenes trigonous, ellipsoid, brown, 0.8-1.1 mm long, 0.3-0.4 mm wide. ●Wet shorelines and riverbanks, disturbed soils, 5100-6300 ft; infrequent and known from a few widely scattered locations in southwestern NM. ●Similar species: Cyperus squarrosus is another annual with subpherical heads, but is far more common, generally smaller in stature, and has floral scales with widely spreading to recurved awn-like tips, and with strong lateral ribbing.
Cyperus andinus Palla ex Kükenthal [from the Andes Mountains]. Plants perennial, cespitose from short stout rhizomes; culms 4-30 cm tall, longer than the leaves, clothed at the base with old sheaths; leaf blades 1-2.5(3) mm wide; inflorescence composed of one terminal hemispherical to subcylindrical cluster of (5)20-60(100) sessile spikelets, the spikelets distinguishable to the naked eye; inflorescence bracts 2-5, horizontal to greatly reflexed and almost parallel to culm; spikelets compressed, with 8-12(24) closely imbricate flowers; floral scales 1.7-3.2 mm long, keeled, laterally ribless, base greenish to tan, upper sides and apex whitish, the apex acuminate to mucronate; anthers (0.4)0.6-0.8(1.1) mm long; stigmas 3; achenes trigonous, obovoid, brown to blackish, 0.8-0.9 mm long, 0.5-0.8 mm wide. ◆Clearings in woodlands and forests, 7600 ft; rare and known from one location in Sierra County, northern Black Range. ◆Similar species: Cyperus fendlerianus is unlikely to be confused with any other NM species; while the very common C. fendlerianus shares its drier woodland habitat and also has a capitulate inflorescence with reflexed bracts, its inflorescence is composed of several obvious sessile spikes, with the upright central one being longer than the lateral ones. Cyperus andinus has sometimes been included in C. seslerioides of Mexico, but the two plants seem to remain distinct even in mixed populations. Cyperus seslerioides has shorter scales and achenes, and its tightly clustered spikelets are not easily distinguished by the naked eye.

Cyperus bipartitus Torrey [two-parted, the styles] [Cyperus rivalaris Kunth]. Plants annual, tufted with fibrous roots; culms 3-25 cm tall, shorter than the leaves; leaf blades 1-2 mm wide; inflorescence composed of 1 terminal and 1-4 additional hemispheric heads elevated on rays, 7-12(15) mm in width, the 3-5(8) spikelets arranged digitately within each head; inflorescence bracts 2-3, horizontal to ascending and longer than the inflorescence; spikelets compressed, with (6)10-26(32) closely imbricate flowers; floral scales 1.9-2.7 mm long, 2 keeled, laterally ribless, light to dark brown, the apex obtuse; anthers 0.4-0.5 mm long; stigmas 2; achenes lenticular, obovoid, black, 1-1.3 mm long, 0.6-0.8 mm wide. ◆Emergent shorelines, stream banks, ditches, and disturbed areas, 4000-6700 ft; infrequent and known from few widely scattered locations. ◆Similar species: Cyperus niger has very similar spikelets digitately arranged, but is a perennial with fine rhizomes (but often densely tufted). It is generally more robust, has larger scales, with more spikelets clustered in each head, but deapurate specimens could be mistaken for Cyperus bipartitus. In these cases, the floral scales of Cyperus niger tend to be darker brown to almost blackish, and the achenes are more elliptical in shape compared to the obovate ones of Cyperus bipartitus.

Cyperus erythrorhizos Mühlenberg [red-rooted] REDROOT FLAT-SEDGE. Plants annual, small to very robust, tufted with fibrous roots; culms 5-25(100) cm tall, equal to slightly longer than the leaves; leaf blades 2-5(11) mm wide; inflorescence composed of 1 terminal cluster of 1-3(6) sessile spikes and 2-6(12) additional spikes or clusters of sessile spikes on rays, spikes 10-30(55) mm long, (6)10-16(23) mm wide, with 20-40(80) spikelets arranged cylindrically along the rachis; inflorescence bracts (3)5-7(11), horizontal to slightly ascending; spikelets quadrangular to slightly compressed, with 6-16(30) closely imbricate flowers; floral scales deciduous, 1.3-1.5 mm long, laterally yellowish to reddish brown and ribless, medially green and 3-ribbed, the apex obtuse with small mucro; anthers 0.2-0.3 mm long; stigmas 3; achenes trigonous, ovoid, grey to brown, (0.4)0.7-1 mm long, 0.4-0.6 mm wide. ◆Emergent shorelines, 3900-5600 ft; known from widely scattered locations. ◆Similar species: Cyperus erythrorhizos is often confused with both C. esculentus and C. odoratus, which can all be quite variable in size. It can be distinguished from both by its significantly shorter, more imbricate, and deciduous floral scales. The floral scales of C. esculentus are persistent, and those of C. odoratus disarticulate completely with the joints of the rachis, while in C. erythrorhizos, the rachis remains persistent after the scales fall.

Cyperus esculentus Linnaeus [good for eating] YELLOW NUTSEDGE, CHUFA [Cyperus esculentus var. leptostachys Boeckeler, Cyperus esculentus Linnaeus var. macrostachys Boeckeler]. Plants perennial, with rhizomes bearing edible tubers, the stems rising singly or in small clumps; culms (20)30-40(65) cm tall, longer than the leaves; leaf blades 2-6.5 mm wide; inflorescence composed of 5-10 spikes, one to several sub-sessile and the rest elevated on rays, spikes 18-30 mm long, 18-35 mm wide, with 10-20(25) spikelets arranged cylindrically along the rachis; inflorescence bracts (3)4-5(7), horizontal to ascending; spikelets compressed, with 9-42 imbricate flowers; floral scales persistent, (1.8)2.0-3.1 mm long, laterally yellowish to orangebrown brown and 3-ribbed, medially brown to green and 3-ribbed, the apex obtuse to subacute; anthers (1)1.2-1.5(2.1) mm long; stigma 3; achenes trigonous, ellipsoid, brown, (1.1)1.3-1.6 mm long, 0.3-0.6(0.8) mm wide. ◆Widespread in many habitats, both natural and disturbed, riparian areas, washes, ditches, croplands, roadside margins, 3600-8900 ft; throughout the state except in the arid deserts and high mountains. ◆Similar species: Cyperus esculentus is most similar to the introduced C. rotundus, both of which have tubers on the rhizomes. Cyperus esculentus is usually a little more robust, with more spikelets per spike, and golden orange inflorescences compared to the darker, reddish purple ones of C. rotundus. See discussion under C. erythrorhizos and C. odoratus for confusion with those taxa. Two varieties have been recognized in New Mexico (see synonymy): the far more common var. leptostachus, with spikelets 2 mm wide or less and scales 1.8-2.7 mm long, and the infrequent var. macrostachys, with spikelets 2-3 mm wide and scales 2.7-3.4 mm long. These varieties are of questionable distinction, as the actual specimens seem to represent a continuous range, and the two characters are not consistently aligned within a given variety. §

Cyperus fendlerianus Linnaeus [for Augustus Fendler (1813-1883), German-born botanical collector who visited Santa Fe in 1847] FENDLER'S FLAT-SEDGE, Plants perennial, with stems rising singly or in small clumps from short stout rhizomes; culms (7)20-70(85) cm tall, longer than the leaves; leaf blades (2)3-5(7) mm wide; inflorescence composed of (1)3-4(6) sessile spikes in a compact head with the longest erect and the others clustered at its base, very rarely one additional head elevated on a ray, central spike (12)18-30 mm long, (6)12-20 mm wide, with (8)15-30 spikelets arranged cylindrically along the rachis; inflorescence bracts (2)3-6(10), horizontal to fully reflexed; spikelets slightly compressed, with 5-8(10) flowers; floral scales deciduous, 2.4-2.8(3.4) mm long, ovate to orbicular laterally yellowish to greenish brown and 2.5 ribbed, medially brown to green and 3 ribbed, the apex obtuse, mucronate; anthers 0.4-0.8 mm long; stigma 3; achenes trigonous, obovoid, brown, 1.6-1.9 mm long, 1.1-1.4(1.6) mm wide. ◆Clearings in woodlands and forests, 4900-9500(10,500) ft; widespread in all mountainous parts of the state. ◆Similar species: Cyperus fendlerianus is closely allied to Cyperus sphaerolepis, based on the similar shape of the floral scales and achenes. However, in Cyperus sphaerolepis the majority of the spikes are elevated on rays, and the inflorescence bracts are typically strongly ascending, while in Cyperus fendlerianus, the spikes are all sessile, forming a compact head, forcing the bracts more horizontally or downward. Occasional hybridization can be found between these two species.
Cyperus flavicomus Michaux [with yellow hairs] \[Cyperus albomarginatus Martius & Schrader ex Nees]\]. Plants annual, tufted with fibrous roots; culms 30-75 cm tall, longer than the leaves; leaf blades 2-8 mm wide, often withered by anthesis; inflorescence composed of 1-7 terminal spikes and (3)-5-11 additional spikes or clusters of spikes elevated on rays; each spike with 6-60 spikelets arranged cylindrically along a rachis shorter than or equal to the width of the spike; inflorescence bracts 3-7, horizontal to ascending; spikelets highly compressed, with 6-24 spreading flowers, so that the mature spikelet edge looks sawtoothed; floral scales (1.4)-1.7-2.3 mm long, laterally ribbed, light to reddish brown with conspicuous clear margins, the apex acute to obtuse; anthers 0.4 mm long; stigmas 2; achenes lenticular, obovoid, black to dark reddish brown, 1.2-1.6 mm long, 0.6-1.1 wide mm. ● Moist draws and grasslands in oak woodland, 4000-5700 ft; of pantropical distribution, in NM known only from the Animas and Peloncillo Mountains in Hidalgo County. ● Similar species: Cyperus flavicomus is unique among New Mexico flat-sedges in its annual habit combined with 2-stigmatic pistils, and the saccate-edged spikelets with translucent-margined floral scales. §

Cyperus floribundus (Kükenthal) J. Rich, Carter, & S. D. Jones [with abundant flowers] \[Cyperus uniflorus Torrey & Hooker var. floribundus Kükenthal]\]. Plants perennial, cespitose from short rhizomes; culms 15-40 cm tall, slightly longer than the leaves; leaf blades 1-2 mm wide; inflorescence composed of one terminal spike and 4-14 additional single spikes elevated on rays, each spike with (5)20-35(60) spikelets arranged cylindrically along a rachis shorter than the width of the spike; inflorescence bracts 3-6, ascending to strongly ascending; spikelets deciduous, quadrangular, with 3-8(13) flowers; floral scales appressed, persistent, 2.6-4.8 mm long, laterally whithish to reddish brown and several ribbed, medially green, the apex acute with mucro 0.3-0.5 mm long, distal sterile scale involute with longer cusp, often hooked; anthers 0.5-1.3 mm long; stigmas 3; achenes trigonous, narrowly ellipsoid, light to reddish brown, 1.8-2.4 mm long, 0.6-0.8 mm wide. ● Sandy, open areas, 4360 ft; known from a single collection in Curry Co. ● Similar species: Cyperus floribundus is similar to its close relative Cyperus retroflexus, both previously treated as varieties of Cyperus uniflorus. It shares similar habitat, and differs primarily in the characters given in the key.

* C. glomeratus Linnaeus [clumped]. Plants annual, possibly biennial, single-stemmed to tufted with fibrous roots; culms 30-60(90) cm tall, shorter to slightly longer than the leaves; leaf blades 4-8 mm wide; inflorescence composed of a cluster of 1-5 sessile terminal spikes and 3-8 additional spikes or clusters of spikes elevated on rays; each spike with 50+ spikelets arranged cylindrically and densely along the rachis; inflorescence bracts 3-4, horizontal to ascending; spikelets slightly compressed, with 8-16 imbricate slightly spreading flowers; floral scales 1.4-2 mm long, ribbing obscure, reddish brown, the apex obtuse; stigmas 3; achenes trigonous, narrowly oblong, light gray, 1.3-1.4 mm long, 0.5 mm wide. ● Riverbanks and lakeshores, 4700-5000 ft; known only from the Rio Grande floodplain near Albuquerque; native to Eurasia. ● Similar species: Cyperus glomeratus would most likely be confused with robust specimens of Cyperus odoratus or Cyperus erythrorhizos.

* C. michelianus (Linnaeus) Delile [for Pier Antonio Micheli (1679-1737), Italian botanist]. Plants annual, densely tufted with fibrous roots; culms 2-25 cm tall, slightly shorter to longer than the leaves; leaf blades 1.2-5.5 mm wide; inflorescence a single dense terminal head, composed of numerous sessile spikelets digitately aggregated on short, hidden rays; inflorescence bracts 3-6, horizontal to slightly reflexed; spikelets slightly compressed, with 10-20 imbricate slightly spreading flowers, spirally arranged on the rachis; floral scales 2 mm long, laterally ribbed, green to yellowish white, the apex with a slightly recurved mucro; stigmas 2(3); achenes plano-convex or trigonous, narrowly oblong, light gray, ca. 1 mm long. ● Wet areas along riverbanks, floodplains, pond margins, 3900-4400 ft; native to Asia, first collected in 2008, known only from along the Gila River in southwest NM (Grant Co.). ● Similar species: Cyperus michelianus is unlikely to be confused with any other species of Cyperus in New Mexico. It superficially resembles the former species of Kyllinga, from which it differs in that the subspherical heads are composed of multi-flowered spikelets with the scales spirally arranged, while in Kyllinga the heads are composed of highly reduced flattened spikelets with one fertile floret only.

Cyperus niger Ruiz & Pavon [black] \[Cyperus niger Ruiz & Pavon var. capitatus (Britton) O’Neill, Cyperus niger Ruiz & Pavon var. castaneus (S. Watson) Kükenthal]\]. Plants perennial, densely tufted from fine rhizomes; culms 5-40(95) cm tall, shorter to longer than the leaves; leaf blades 1.5-3 mm wide; inflorescence composed of 1 terminal and rarely 1-2 additional hemispheric heads elevated on rays, 7-20 mm wide, the (3)-5-25(60) spikelets arranged digitately within each head; inflorescence bracts 2-3, horizontal to reflexed; spikelets tightly compressed, with 4-18 closely imbricate flowers; floral scales 1.5-2 mm long, 2 keeled basally, laterally ribless, chestnut brown to blackish, the apex obtuse; anthers 0.6-0.8 mm long; stigmas 2; achenes lenticular, obovoid, brown to black, 1.1-1.4 mm long, 0.6-0.8 mm wide. ● Chénegas, wet meadows, ditches, riverbanks, seeps and springs, 3900-7400 ft; found occasionally in the southwestern mountains, and in the north-central part of the state. ● Similar species: See discussion under Cyperus bipartitus.

Cyperus odoratus Linnaeus [fragrant] FLAT-SEDGE \[Cyperus forier L.C.M. Richard, Cyperus ferrugineoscens Boeckeler, Cyperus odoratus Linnaeus var. squarrosus (Britton) Jones, Wipff, & Carter, Cyperus speciosus Vahl, Cyperus speciosus Vahl var. squarrosus Britton]\]. Plants annual to less frequently short-lived perennial, single-stemmed to tufted with fibrous roots; culms (5)10-50(130) cm tall, longer than the leaves; leaf blades 4-12 mm wide; inflorescence composed of a cluster of 1-5(12) sessile terminal spikes and (0)6-9(12) additional spikes or clusters of spikes elevated on rays; each spike with 50+ spikelets arranged cylindrically and densely along the rachis; inflorescence bracts 4-8(10), horizontal to ascending; spikelets terete to slightly flattened, with (4)8-12(30) appressed to slightly spreading flowers; floral scales 2-2.8(3.2) mm long, laterally and medially ribbed, reddish brown to stramineous on the sides, green medially, the apex entire or emarginated with small mucro, each flower disarticulating with its rachis joint; anthers 0.2-0.3(0.9) mm long; stigmas 3; achenes trigonous, narrowly ellipsoid to oblanceolate, brown, 1.2-1.5(1.9) mm long, 0.5-0.6(0.75) mm wide. ● Riverbanks and lakeshores, emergent shorelines, disturbed wet areas, 2900-5800 ft; occasional and widespread in the lower elevations. ● Similar species: Cyperus odoratus is unique among NM flat-sedges in that its spikelets disarticulate at each joint of the rachis. However, this character is not always readily evident before full maturity, and consequently, plants are often confused with Cyperus esculentus and Cyperus erythrorhizos, and might be with the newly introduced Cyperus glomeratus. All four share similar lower to mid-elevation wet habitats, can be weedy in habit, and highly variable in size. Very short, imbricate scales (1.5 mm or less) will separate out both Cyperus erythrorhizos and Cyperus glomeratus. Cyperus esculentus is perennial and has tubers on the rhizomes (not usually collected), but also tends to have fewer flowers more sparsely distributed on the rachis of the spike, and golden orange in color, compared to the reddish brown coloration of Cyperus odoratus. Cyperus odoratus also has shorter anthers (0.3-0.7 mm long), compared to those of C. esculentus which are 1-2 mm long.
Cyperus pallidicolor (Kukenthal) G.C. Tucker [for the pale green color of the floral scales] [Cyperus subambigus Kukenthal var. pallidicolor Kukenthal]. Plants perennial, with stems tufted from short rhizomes; culms (10)30-50(80) cm tall, longer than the leaves; leaf blades 2-5 mm wide; inflorescence composed of 3-6 sessile spikes in a compact head, occasionally in robust late season plants 1-5 additional spikes elevated on rays, each spike with (10)25-60(100) spikelets arranged cylindrically along the rachis; inflorescence bracts (3-4)(6)(8) horizontal to reflexed; spikelets terete, with 1-4 flowers, deciduous as a unit; floral scales appressed, 2-6.3-3 mm long, broadly ellipsoid, laterally whitish to green and 3-4 ribbed, medially green and 3 ribbed, the apex rounded; anthers 0.6-0.8 mm long; stigmas 3; achenes trigonous, ellipsoid, reddish to dark brown, (1.6)1.8-2(2.2) mm long, 0.6-0.9 mm wide. Moist in alk/juniper woodland, 5200-5300 ft; found only in the Sky Island mountain ranges in Hidalgo County. Similar species: Cyperus pallidicolor has been confused with Cyperus aggregatus in the past, which is a southeastern species with more golden colored spikelets. A specimen from the Peloncillos appears to have some influence from Cyperus hermaphroditus, which typically has longer spikes and spikelets with more flowers, and more of a brownish coloration, and is found in adjacent southern AZ.

Cyperus parishii Britton ex Parish [for Samuel Bonsall Parish (1838-1928), southern California naturalist]. Plants annual, tufted with fibrous roots; culms 5-25 cm tall, longer than the leaves; leaf blades 2-4 mm wide; inflorescence composed of 1 terminal spike and 1-6 additional spikes elevated on rays, spikes 15-25 mm wide, with 5-30 spikelets arranged cylindrically along a rachis shorter than the width of the spike; inflorescence bracts 2-5, ascending; spikelets compressed, with (4)8-12 imbricate flowers; floral scales deciduous, 2.3-3.1 mm long, laterally 2-4 ribbed, red, reddish purple to light reddish brown, medially green, the apex acute to obtuse; anthers 0.3-0.4 mm long; stigmas 3; achenes trigonous, brown to dark purplish brown, 1.1-1.3 mm long, 0.6-0.9 mm wide. Streambanks, springs, desert washes, 3900-7600 ft; found in the SW portion of the state. Similar species: Cyperus parishii has been mistaken for both Cyperus esculentus and Cyperus odoratus, with which it shares scales of similar length. Cyperus odoratus has terete spikelets with florets that disarticulate at each joint of the rachilla, while Cyperus parishii has flattened spikelets with a rachilla that disarticulates only at its base. Cyperus esculentus has spikelets with persistent scales and rachilla, and its scales have a golden/orangish appearance, compared to those of Cyperus parishii which have a pink to reddish coloration.

Cyperus retrorsus Buckley [bent backwards] [Cyperus retrorsus Buckley var. pumilis (Britton) R. Carter & S.D. Jones, Cyperus uniflorus Torrey & Hooker, non Thunberg, Cyperus uniflorus Torrey & Hooker var. retrorsus (Buckley) Kukenthal]. Plants perennial, with stems tufted from short rhizomes; culms (5)15-40(80) cm tall, longer than the leaves; leaf blades (0.5)-1.3(2.4) mm wide; inflorescence composed of one sessile spike and 3-6(9) additional spikes elevated on rays, each spike with (5)20-35(65) spikelets arranged cylindrically along the rachis; inflorescence bracts 3-6, horizontal to strongly ascending, attenuate and often curling at maturity; spikelets quadrangular in cross-section, with 1-5 flowers, deciduous as a unit; floral scales appressed, 2.6-3.9 mm long, narrowly ovate, laterally whitish green with red spots or a deep red central area and 3-6 ribbed, medially green to tan, the apex rounded to acute and mucronate, the terminal sterile scale involute and sometimes hooked; anthers (0.3)-0.4-0.6 mm long; stigmas 3; achenes trigonous, ellipsoid, reddish to light brown, (1.8)2-2.4 mm long, 0.6-0.9 mm wide. Damp to dry, sandy soils in desert scrub to pinyon-juniper woodlands, 3400-5500 ft; found primarily at lower elevations in the southeastern corner of the state. Similar species: Cyperus retrorsus is closely related to Cyperus floribundus, and differs primarily in the characters given in the key. The reddish color of the spikelets and attenuate, curling bract tips will distinguish it from Cyperus pallidicolor.

Cyperus retroflexus Chapman [bent backwards] [Cyperus ciliarius (Elliot) Britton]. Plants perennial, with stems tufted from short rhizomes; culms 20-50(-85) cm tall, longer than the leaves; leaf blades 1.5-4(5) mm wide; inflorescence composed of one sessile spike and 4-8(11) additional spikes elevated on rays, each spike with 40-120 spikelets arranged densely and cylindrically along the rachis; inflorescence bracts 3-6(10), ascending; spikelets subterete, with 2-5 flowers, deciduous as a unit; floral scales appressed, 1.8-2.5 mm long, oblong, laterally tan to brown and 3-4 ribbed, medially green, the apex rounded to acute; anthers 0.3-0.5 mm long; stigmas 3; achenes trigonous, oblong-ellipsoid, brown, 1.2-1.7 mm long, 0.5-0.6 mm wide. Damp to dry, sandy soils in open woods and thickets, 3900-6400 ft; introduced, native to the SE US & NE Mexico, known from only two collections, both presumed waifs, at Ghost Ranch (Rio Arriba Co.) and in a nursery in Las Cruces (Doña Ana Co.). Similar species: Cyperus retroflexus is similar in overall habit, but the floral scales and achenes are both longer than those of Cyperus retrorsus, and the spikelets are not as densely packed along the rachis of the spike. Cyperus pallidicolor has a group of sessile spikes tightly clustered, with only several additional spikes elevated on rays in mature specimens, while Cyperus retroflexus usually has just one terminal sessile spike, with the majority elevated on rays.

Cyperus rotundus Linnaeus [round, probably for the root nodules] PURPLE NUTGRASS. Plants perennial, with rhizomes bearing edible tubers, the stems rising singly or in small clumps; culms 10-35(40) cm tall, longer than the leaves; leaf blades 2-6 mm wide; inflorescence composed of 4-10 spikes, one to several sub-sessile and the rest elevated on rays, spikes 12-30 mm long, 12-50 mm wide, with (23-7)(12) spikelets arranged cylindrically along the rachis; inflorescence bracts (2-3)-5, horizontal to ascending; spikelets compressed, with 6-36(42) imbricate flowers; floral scales persistent, (1.8)2.6-3.3 mm long, ovate, laterally purple to reddish brown and 2-3 ribbed, medially green, the apex obtuse; anthers 1-2.5 mm long; stigmas 3; achenes trigonous, ellipsoid, black, 1.4-1.7(1.9) mm long, 0.8-1.1 mm wide. Croplands, lawns, ditches, and roadside margins, 3600-4300 ft; native to Africa and Eurasia, infrequent and known from few locations in southern NM. Similar species: See discussion under Cyperus esculentus, a far more widespread species in New Mexico.

Cyperus schwinitzii Torrey [for Lewis David de Schweinitz 1780-1834, German-American botanist & mycologist]. Plants perennial, with stems rising singly or in small clumps from short stout rhizomes; culms (10)20-50 cm tall, longer than the leaves, upper portion usually scabrous on the angles; leaf blades 2-6 mm wide; inflorescence composed of one loose cluster of sessile ascending to upright spikelets, with 3-5 additional spikelet clusters elevated on rays, the spikelets arranged digitately to sub-digitately on a short rachis, most strongly ascending; inflorescence bracts 3-7, mostly ascending to erect; spikelets slightly compressed, with (1.5)-10(14) flowers; floral scales deciduous, spreading, 2.3(2)-8.3 mm long, broadly to oblong-ovate, laterally tan and 2-3 ribbed, medially green and 3 ribbed, the apex rounded, with prominent cusp, cusp longer on distal scales; anthers 0.8-1.4 mm long; stigmas 3; achenes trigonous, broadly ellipsoid to obovoid, brown to black, 2-2.4 mm long, 0.9-1.4 mm wide. Sandy soils, dunes, from pinyon-juniper woodland to prairies, 4300-7500 ft; occasionally mostly in the northern half.
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of the state. Similar species: *Cyperus schweinitzii* appears similar in habit and inflorescence morphology to *Cyperus sphaerocephalus*, and the two have often been confused in herbarium records. *Cyperus schweinitzii* has larger scales and achenes, and the upper culm is usually more scabrous on the angles than those of *Cyperus sphaerocephalus*. *Cyperus schweinitzii* also prefers sandy soils in a variety of habitats, while *Cyperus sphaerocephalus* is more of a forest floor and southern woodland species.

**Cyperus sesquiflorus** (Torrey) Mattfeld & Kukenthal [one and one-half, referring to the larger middle spike] [Kyllinga odorata var. Vahl]. Plants perennial, densely cespitose, with rhizomes; culms 10-25(45) cm tall; leaf blades 2-3(4) mm wide; inflorescence composed of 1-3(4) tightly clustered, sessile spikes, with the central one upright and much longer than the lateral ones; central spike 6-12(18) mm long, 4-8 mm wide, with (50)75-100 spikelets highly compacted, arranged cylindrically along the rachis; spikelets compressed, 2-3 mm long, with 2(3) scales, only the lower one bisexual and fertile; scales 2-2.5 mm long, whitish, with 2-3 lateral ribs; anthers (0.4)0.6-0.8(1) mm long; stigmas 2; achenes biconvex, broadly ovate, reddish to dark brown, 2-2.5 mm long, 0.7-0.9 mm wide. ● Damp grasslands (in its natural habitat), 6400 ft; known from one collection at Ghost Ranch (Rio Arriba Co.), a probable waif. Similar species: See comments under *Cyperus michelianus*.

**Cyperus setigerus** Torrey & Hooker [bristly]. Plants perennial, with rhizomes; culms 50-100 cm tall; leaf blades 4-7 mm wide; inflorescence composed of 1-4 terminal spikes and 5-13 additional spikes or clusters of spikes on rays, 2nd. order rays sometimes present, spikes 5-25 mm long, 15-70 mm wide; with 5-30 spikelets cylindrically arranged along the rachis; inflorescence bracts 3-8, ascending; spikelets compressed, with 6-24 flowers; floral scales imbricate, appressed to somewhat spreading, deciduous, 3-4 mm long, laterally reddish to yellowish brown and 3-4 ribbed, medially green and 1-3 ribbed, the apex obtuse; anthers 1.5-2 mm long; stigmas 3; achenes trigonous, oblong, dark brown, 1.5 mm long, 0.4-0.5 mm wide. ● Ditches, roadsides, croplands, 5350 ft; known from one roadside collection north of Santa Rosa (Guadalupe Co.). Similar species: *Cyperus schweinitzii* might be found in similar locations to *C. setigerus*. To date, the few collections of both have been found in widely separated parts of the state, though in theory, based on habitat records from other states, *Cyperus schweinitzii* might be found in similar locations to *C. setigerus*.

**Cyperus sphaerocephalus** Boeckeler [for the suborbicular shaped floral scales] [Cyperus rubyi Britton, *Cyperus fendlerianus* Boeckeler var. deblisi (Britton) Kukenthal]. Plants perennial, with stems rising singly or in small clumps from short stout rhizomes; culms (8)15-40(60) cm tall, longer than the leaves, upper culms usually smooth on the angles; leaf blades 1-3(5) mm wide; inflorescence composed of 1-3 sessile arising to upright spikelets, with (1-2)(11) additional spikelets elevated on rays; the spikelets arranged subdigitately to cylindrically on a short rachis, most strongly ascending; inflorescence bracts 2-3(7), mostly ascending to erect; spikelets slightly compressed, with (1-4)(14) flowers; floral scales deciduous, spreading, (1-4)1.8-2.4 mm long, broadly ovate to suborbiculate, laterally and 3-4 ribbed, medi ally green and 1-3 ribbed, the apex obtuse, with short cusp; anthers 0.4-0.6 mm long; stigmas 3; achenes trigonous, ovoid to obvoid, brown to reddish-brown, 1.4-1.6(1.9) mm long, 1.4-1.4 mm wide. ● Clearings in montane forests and pine/oak or pinyon/juniper woodlands, rocky slopes and grasslands, 4800-8000 ft; primarily found in the southern half of the state. Similar species: See discussion under *Cyperus schweinitzii*. Hybrids between *C. fendlerianus* and *C. sphaerocephalus* are occasionally found, and are intermediate in morphological character, with the more robust scales of *C. fendlerianus*, and the spikes elevated on rays like in *C. sphaerocephalus*.

**Cyperus squarrosus** Linnaeus [rough, from projecting parts] AWNED FLAT-SEDE [Cyperus aristatus Rothboell, nomen illeg., *Cyperus infensus* Muhlenberg]. Plants annual, tufted with fibrous roots; culms 2-16 cm tall, longer than the leaves; leaf blades 0.5-2.5 mm wide; inflorescence composed of 1 terminal spike and infrequently (1-3) additional spikes elevated on rays, the spikelets arranged subdigitately to cylindrically on a short rachis, most strongly ascending; inflorescence bracts 2-3, mostly ascending to erect; spikelets slightly compressed, with (1-4)(8-14) flowers; floral scales deciduous, spreading, (1-4)1.8-2.4 mm long, broadly ovate to suborbiculate, laterally and 3-4 ribbed, medially green and 1-3 ribbed, the apex obtuse, with short cusp; anthers 0.4-0.6 mm long; stigmas 3; achenes trigonous, ovoid to obvoid, brown to reddish-brown, 1.4-1.6(1.9) mm long, 1.4-1.4 mm wide. Receding shorelines and flood plains, gravelly road margins, soil pockets in exposed bedrock, disturbed moist soils, 3900-9100 ft; throughout the state except in the southeastern plains. Similar species: *Cyperus squarrosus* is one of the smallest flat- and sedges in Mexico, and is distinctive in its strongly ribbed floral scales with long excurved awns. It differs from the other two diminutive annuals in its strongly flattened spikelets with a distichous floral arrangement, whereas both *C. michelianus* and *C. subsquarrosus* have spikelets with spirally arranged florets. See discussion under *C. acuminatus.*

**Cyperus strigosus** Linnaeus [scraggily]. Plants perennial, tufted from short rhizomes; culms (1)20-40(90) cm tall, with corm-like bases; leaf blades 1-4(8) mm wide; inflorescence composed of 1-4 terminal spikes and (1-3)6(8) additional spikes or clusters of sessile spikes on rays, 2nd. order rays sometimes present, spikes (6)10-28(50) mm long, 10-40 mm wide, with (5)12-50 spikelets arranged cylindrically along the rachis; inflorescence bracts (3-5)(7-10) mm long, appressed to somewhat spreading, deciduous as a unit; floral scales compressed, with (4-10)(20-34) spreading flowers; floral scales 1.2-1.8(2.2) mm long, deciduous, laterally strongly 7-9 ribbed, green to tan to reddish brown, the apex cuspidate and strongly excurved; anthers 1.5-2 mm long; stigmas 3; achenes trigonous, obovoid to ovate, to tan to reddish-brown, 0.7-0.8(1.1) mm long, 0.3-0.4(0.5) mm wide. Damp grasslands (in its natural habitat), 6400 ft; known mainly from Hidalgo County in the Bootheel region. Similar species: *Cyperus strigosus* could be confused with both *C. esculentus* and *C. odoratus*, which can also be quite variable in size. It can be distinguished from both by its significantly smaller floral scales and stiffly straight spikelets. The floral scales of *C. esculentus* are persistent and more orange tinged, and those of *C. odoratus* are terete and dissectulate completely with the joints of the rachis, and the spikelets in *C. odoratus* are often somewhat curving and flexible compared to the stiffly straight ones of *C. strigosus*. See also discussion under *C. setigerus*.

**Cyperus subsquarrosus** (Muhlenberg) Bauters [somewhat squarrose] [Hemicarpha micrantha (Vahl) Britton, Lipocarpha micrantha (Vahl) C. Tucker, Scirpus micranthus Vahl]. Plants annual, cespitose, diminutive; culms 2-20 cm tall, 0.2-0.5 mm wide; leaves with blades ½-3/4 the total length of the culm, ca. 0.5 mm wide or less, flat to involute; inflorescence terminal, composed of 1-2(3) sessile clustered spikes; inflorescence bracts 1-2, leaflike, the longest erect; spikes 1-3(5) mm long, ovoid (to globose); floral scales 0.9-1.6 mm long, yellowish to reddish-brown with a greenish midvein,
oblanceolate to obovate, the apex tapering to an acute point, shorter than the body of the scale, spreading to slightly recurved; anthers 0.1-0.2 mm long; stigmas 2, stamens 1, anthers 0.1-0.2 mm long; achenes obovoid to terete, 0.4-0.6(0.7) mm long. ● Sandy soils, emergent shorelines, streambanks, pond margins; 5000-5200 ft; rare in NM, known only from a few collections in Hidalgo County.

Similar species: The three species of *Cyperus* section *Neohemicarpha* (formerly in *Lipocarpha*) native to the southwest are almost identical in stature and vegetative features, and differ only in characters of the floral scales. *Cyperus aristulatus* has scales with recurved awns as long as the scale body, and *C. hemidrummondii* has shorter, obtuse-tipped, appressed scales. Very few collections of these taxa exist in the Southwest, and of the three, *C. subsquarrosus* is by far the most common. We have been unable to track down valid collections of *C. aristulatus* or *C. hemidrummondii* for New Mexico.

† *Eleocharis* [a beautiful marsh plant] SPICE-RUSH [16].

Plants grass-like, perennial or less frequently annual, cespitose from short rhizomes to colonial from long-creeping rhizomes, the rhizomes in some species terminating in tubers or bulbs, some species stoloniferous, or fibrous rooted only in the annual species; culm terete to highly compressed in cross section, spongy or hollow, without nodes, glabrous; leaves 2 per culm, basal, blades absent, reduced to sheaths only, sheaths sometimes with a “tooth” or mucro projecting beyond the apex, ligules absent; inflorescence terminal, composed of a single spikelet; inflorescence bract lacking; spikelet terete, ovoid to cylindric, with 4-500+ florets spirally arranged along the rachilla; flowers bisexual, in the axil of a scale, the proximal 1-2(3) scales empty in some species, perianth of (0) 3-6(10) bristles, the bristles retrorsely (or antrorsely) barbed or smooth, shorter to longer than the achene; stamens 1-3; pistil with 1 style and 2 or 3 stigma branches, the style base usually persistent as a tubercle on the top of the achene, often markedly distinct in shape, color, and texture, but sometimes similar and appearing as a beak-like continuation of the achene; achene biconvex, plano-convex, or trigonous to subterete. About 200 species worldwide, about 67 listed in the Flora of North America. *Eleocharis albida* Torrey, *E. montana* (Kunth) Roemer & Schultes, and *E. uniglumis* (Link) Schultes have been reported for the state by various authors, but no specimens are known; it is unlikely that these occur in New Mexico.

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1 Stigmas 2 (or a mix of 2 & 3, with up to ½ flowers with 3 stigmas in several annual species); achenes biconvex (or up to ½ compressed trigonous)

2 Plants perennial, colonial with rhizomes; stigmas almost always 2

3 Proximal scale nearly orbicular, clasping 100% of the culm circumference; 2nd proximal scale always with flower; culms 0.3-0.8(1.4) mm wide, averaging 0.6 mm wide, terete; spikelet 3-18 mm long; floral scales 15-50.........................E. erythropoda

3 Proximal scale usually longer than wide, clasping ⅓-⅔ of the culm circumference; 2nd proximal scale without or with flower; culms 0.5-5.0 mm wide, averaging 1.3 mm wide, terete or compressed; spikelet 5-40 mm long; floral scales 30-100

4 Stem often strongly compressed; distal sheath summit truncate, sometimes with apical tooth present; spikelets 5-40 mm long, the apex often sharply pointed; 2nd proximal scale with or without flower.................................E. macrosicythus

4 Stem terete to slightly compressed; distal sheath summit oblique, often splitting, without apical tooth; spikelets 5-25 mm long, the apex rounded to pointed; 2nd proximal scale always without flower.................................E. palustris

2 Plants tufted annuals, with fine fibrous roots only (late season plants may rarely develop rhizomes), or tiny matted perennials with fine rhizomes that appear like roots; up to ½ flowers with 3 stigmas in some species

5 Tubercles not strongly dorsally compressed, cross sectional shape similar to shape of achene, differentiated from the achene with a distinct change in color and texture or constriction; mature achenes dark brown to black; distal leaf sheath apex oblique or with an acute to acuminate tip, without apical tooth

6 Distal leaf sheath apex thin, inflated and membranous, often wrinkled and disintegrating; mature achenes dark brown, the tubercle as high as the achene; perianth bristles white or clear; culms 2-15 cm tall ...............E. atropurpurea

6 Distal leaf sheath apex thickened, persistent, with an acute tip on one side; mature achenes black, the tubercle significantly shorter than wide, cap-like when seen from the side; plants definitely tufted, without fine rhizomes

7 Achenes 0.3-0.5 mm long, 0.3-0.4 mm wide; perianth bristles white or clear; culms 2-15 cm tall .........................E. geniculata

7 Achenes 0.5-1.1 mm long, 0.3-0.7 mm wide; perianth bristles brown; culms 3-45 cm tall.............................E. geniculata

5 Tubercles strongly dorsally compressed, cross sectional shape proportionally much thinner than the cross-sectional shape of the achene; distinct but more or less confluent with the achene; mature achenes stramineous to dark brown; distal leaf sheath apex oblique to acute, often toothed

8 Larger spikelets lanceoloid to subcylindric; tubercles not more than ⅓ as high as the achene; perianth bristles shorter than achene to equaling tubercle, or often absent

8 Larger spikelets broadly ovoid to lanceoloid; tubercles ⅓ -⅔ as high as the achene; perianth bristles equaling to exceeding the tubercle.................................E. engelmannii

1 Stigmas all or mostly 3; achenes trigonous

9 Floral scales cleft at the apex (at least on the lower scales); culms subterete to strongly compressed ..................E. compressa

9 Floral scales all entire; culms terete to slightly compressed

10 Achenes with a network of strong vertical ridges interconnected by fine horizontal ridges; tubercle separated from the achene by a distinct constriction

11 Plants annual, tufted, usually with many stems radiating from a central clump of fibrous roots, rarely producing rhizomes; culms 0.1-0.2 mm thick, often some curving upward, usually less than 3 cm tall in our specimens; floral scales 1-1.5 mm long, apex narrowly acute to acuminate; anthers 0.3-0.5 mm long.................................E. bella

11 Plants perennial, with fine rhizomes (hard to see) forming large, fine irregular colonies; culms wider, 0.2-1.0 mm thick, usually straight, 3-25 cm tall; floral scales 1.5-2.5(3.5) mm long, apex rounded to acute; anthers 0.6-1.5 mm long..................E. acicularis

10 Achenes without a regular pattern of ridges; tubercle either confluent with achene or with a distinct constriction

12 Tubercle distinct from achene, with a definite constriction where it joins the rounded top of the achene; distal sheath apex usually with tooth on some culms; plants colonial from rhizomes, the rhizomes 0.5-2 mm thick

13 Spikelets narrowly lanceoloid to cylindrical, 3-20 mm long; floral scales 15-40, 3-4 per mm of rachilla length ..........E. parishii

13 Spikelets ovoid or ellipsoid to subcylindric, 4-12 mm long; floral scales 30-100, 6-10 per mm of rachilla length.............E. montevidensis

12 Tubercle confluent with the achene, the achene tapering into an acute to acuminate tip; distal sheath apex without a tooth; large plants either tufted from very short rhizomes, or small colonial plants from fine rhizomes, the rhizomes 0.1-1 mm thick

14 Robust plants, tufted from short stout ascending or horizontal caudex-like rhizomes, often forming large dense colonies; culms to over 1 m tall, compressed, with some culms arching to decumbent and rooting at the tip; bulbs not present at the rhizome tips; floral scales 20-40...............................E. rostellata

14 Small plants, colonial from fine rhizomes; culms less than 35 cm tall, subterete to slightly compressed, erect, never rooting at the tips; bulbs or tubers often present at the rhizome tips; floral scales 3-25

15 Achenes 1.5-2.7 mm long; perianth bristles rudimentary to equaling the achene; floral scales 3-10, 2.5-6 mm long; rhizomes 0.2-1 mm thick; culms 5-35 cm tall..............................................E. quinquiflora

15 Achenes 0.7-1.1 mm long; perianth bristles absent or rudimentary, less than ⅓ of the achene length when present; floral scales 6-25, 1.7-2.5 mm long; rhizomes 0.1-0.2 mm thick; culms 2-9 cm tall...............................E. coloradoensis

Eleocharis acicularis (Linnaeus) Roemer & Schultes [needle-like] NEEDLE SPIKE-RUSH [Eleocharis acicularis (Linnaeus) Roemer & Schultes var. porcata S.G. Smith, Scirpus acicularis Linnaeus]. Plants perennial, colonial from fine rhizomes; culms 1-60 cm tall, 0.2-0.5(0.7) mm wide, terete to occasionally compressed; distal sheath tight to inflated, the apex rounded; spikelet 2-8 mm long, 1-2 mm wide, ovoid, lanceoloid, to subcylindric; floral scales 4-25, 1.5-2.5 mm long, red or purplish brown to tan with a green midrib, the apex blunt to acute; bristles usually absent, occasionally 2-4 present; anthers 0.7-1.5 mm long; stigmas 3; achenes trigonous to subterete, 0.7-1.1 mm long, 0.3-0.6 mm wide, with longitudinal and fine
horizontal ridges, tubercle pyramidal to depressed, with basal constriction. ● Wet shorelines and riverbanks, meadows, springs, and disturbed soils, 6300-10,000 ft; frequent in mountainous areas. ● Similar species: *Eleocharis bella* is a distinctly tufted annual with similar achenes, but shorter anthers (0.3-0.5 mm long), far less common, and generally smaller yet in stature than *E. acicularis*. *Eleocharis quinqueflora* is another small rhizomatous perennial of mountainous habitats, but has slightly bulbous bases, achenes without the horizontal striations, and a confluent tubercle. *Eleocharis coloradoensis* is an additional small, mat-forming rhizomatous perennial that is easily separated from *E. acicularis* per the key if fruit are present. If not, tubers should be looked for on the rhizomes of the former, which are never present on *E. acicularis*. In addition, the proximal scale of *E. coloradoensis* always subtends a flower; while that of *E. coloradoensis* is empty. The spikes of *E. coloradoensis* are typically pale colored, compared to the darker ones of *E. acicularis*, and it grows at slightly lower elevations, and is less common.

**Eleocharis atropurpurea** (Reitz) J. Presl & C. Presl [dark purple] [Scirpus atropurpureus Reitz]. Plants annual, densely tufted; culms 2-12(19) cm tall, 0.2-0.4 mm wide; distal sheath tight to culm, the apex acute; spikelet 2-6(8) mm long, 1-2.5 mm wide, ovoid to ellipsoid; floral scales up to 100, 0.6-1.3 mm long, dark reddish brown to tan, the apex rounded to acute; bristles (0)4-6, typically 4, vestigial to exceeding the tubercle; anthers 0.3-0.5 mm long; stigmas 2; achenes black, biconvex, obvoid, 0.3-0.4 mm long, 0.3-0.4 mm wide, smooth, tubercle whitish, flattened to conubic, with basal constriction. ● Floodplains, shorelines and riverbanks, stock ponds, 4000-4400 ft; rare, known only from one collection in the White Sands area. ● Similar species: *Eleocharis atropurpurea*, *E. engelmannii*, *E. geniculata*, and *E. obtusa* are all annuals that can look similar in habit, and vary in size enough to be confused with one another. If mature fruit is present, the dark shiny black achenes with contrasting whitish tubercles will separate *E. atropurpurea* and *E. geniculata* from the others, and then size will separate these two per the key. If the plants are immature, toothless sheaths will separate the same pair, but there will be no way to definitively tell these two apart without fruit, except that plants taller than 20 cm would indicate *E. geniculata*.

**Eleocharis bella** (Piper) Svenson [handsome, beautiful] [Eleocharis acicularis (Linnaeus) Roemer & Schultes var. bella Piper]. Plants perennial, colonial from fine inconspicuous rhizomes, the rhizomes often ending in 2.5-4 mm long broadly oblong tubers with a terminal bud; culms 1-7(9) cm tall, 0.2-0.5 mm wide, soft and spongy; distal sheath membranous, often disintegrating, the apex rounded; spikelet 2-5(6) mm long, 1-2.5 mm wide, ovoid to ellipsoid; floral scales 5-10(25), 1.7 mm long, 2.5 mm wide, with light green midrib and reddish brown margins, the apex rounded to acute and sometimes slightly recurved; bristles short; anthers 0.3-0.5 mm long; stigmas 3; achenes trigonous to subterete, 0.6-1.1 mm long, 0.3-0.4 mm wide with fine longitudinal and horizontal ridges, tubercle pyramidal to depressed, appressed to achene with/without much constriction. ● Bare, drying out soil on shorelines, riverbanks, and seasonally wet depressions (4200) 7500-8000 ft; uncommon in the southwestern mountains, with one anomalous location in an eastern prairie pothole. ● Similar species: See discussion under *Eleocharis acicularis*. Anther measurement is key for accurate determination.

**Eleocharis coloradoensis** (Britton) Gilly [from Colorado] [Eleocharis parvula sensu M&H, Eleocharis parvula (Roemer & Schultes) Link var. anachaea (Torrey) Svenson, Scirpus coloradoensis Britton]. Plants perennial, colonial from inconspicuous rhizomes, the rhizomes 2-3 mm thick; culms 8-45 cm tall, (0.2)0.5-1 mm wide, 1-2 times wider as thick; distal sheath membranous, the apex obtuse to sub-truncate, without tooth; spikelet 4-8 mm long, 2-4 mm wide, ovoid; floral scales 20-60, spreading in fruit, 2-3(4) mm long, tan to dark brown with a lighter midregion, the apex acute to acuminate, hyaline, usually bisid to subcylindrical in the proximal scales, entire in the upper scales; bristles 0-5, shorter than to as long as the achene; stigmas 3; anthers 0.6-1.2 mm long; achenes yellow to brown, trigonous but usually with some biconvex, ovoid to obpyriform, 0.8-1.1 mm long, 0.6-0.8 mm wide, finely rugulose, tubercle with basal constriction, depressed or rudimentary. ● Seasonal seeps and depressions, meadows, woods, 7600 ft; rare, known from one location in Colfax Co. ● Our plants belong to var. *acutisquama* (Buckley) S.G. Smith [with pointed scales] [Eleocharis acutisquama Buckley]. Similar species: *Eleocharis acicularis*, which often shares its diminutive colonial habit. The small tubers on the rhizomes are also diagnostic. *Eleocharis quinqueflora* is similar to *E. coloradoensis* in having tubercles confluent with the achenes, but this taxon has darker spikelets and grows at higher elevations in wet mountain meadows than *E. coloradoensis*. Also, *E. quinqueflora* has bulbous culm bases, and sometimes vegetative buds on short rhizomes, but without the tuberous portions that are often present in *E. coloradoensis*.

**Eleocharis compressa** Sullivant [compressed, for the culms]. Plants perennial, colonial from short to long rhizomes, the rhizomes 2-3 mm thick; culms 8-45 cm tall, (0.2)0.5-1 mm wide, 1-2 times wider as thick; distal sheath membranous, the apex obtuse to sub-truncate, without tooth; spikelet 4-8 mm long, 2-4 mm wide, ovoid; floral scales 20-60, spreading in fruit, 2-3(4) mm long, tan to dark brown with a lighter midregion, the apex acute to acuminate, hyaline, usually bisid to subcylindrical in the proximal scales, entire in the upper scales; bristles 0-5, shorter than to as long as the achene; stigmas 3 (occasionally some 2); anthers 0.7-2 mm long; achenes yellow to brown, trigonous but usually with some biconvex, ovoid to obpyriform, 0.8-1.1 mm long, 0.6-0.8 mm wide, finely rugulose, tubercle with basal constriction, depressed or rudimentary. ● Floodplains, drying shorelines and riverbanks, ponds, ditches, 2900-6700 ft; uncommon in widely scattered locations. ● Similar species: The confluent tubercle and smooth surface separates this species from *Eleocharis acicularis*, which often shares its diminutive colonial habit. The small tubers on the rhizomes are also diagnostic. *Eleocharis quinqueflora* is similar to *E. coloradoensis* in having tubercles confluent with the achenes, but this taxon has darker spikelets and grows at higher elevations in wet mountain meadows than *E. coloradoensis*. Also, *E. quinqueflora* has bulbous culm bases, and sometimes vegetative buds on short rhizomes, but without the tuberous portions that are often present in *E. coloradoensis*.

**Eleocharis engelmannii** Steudel var. monticola (Fernald) Svenson, Eleocharis monticola Fernald, *E. obtusa* (Willdenow) Schultes var. engelmannii (Steudel) Gilly. Plants annual, densely tufted; culms to 2-40 cm tall, 0.5-1.5(2) mm wide, straight; distal sheath tight to culm, sometimes slightly flaring near apex, the apex acute to rounded, sometimes with tooth to 0.3 mm long; spikelet 5-10(20) mm long, 2-3(4) mm wide, lanceolate to subcylindrical to ovoid; floral scales 25-100(200), 2-2.5 mm long, brown to tan, the apex rounded to acute, similar to tubercle, the proximal scale with tooth to 0.3 mm long; bristles (0)5-8, vestigial to equaling the achene; anthers 0.3-0.7(1) mm long; stigmas 2-3; achenes brown, biconvex, ovoid, 0.9-1.1(1.5) mm long, 0.7-1.1 mm wide, smooth, tubercle depressed, subdeltoid, confluent with and almost as wide as the achene, 2/5 or less as high as wide. ● Receding shorelines and riverbanks, seasonal wetlands, ponds, 7200-8400 ft; occasional in widely scattered locations in the mountains. ● Similar species: *Eleocharis atropurpurea*, *E. engelmannii*, *E. geniculata*, and *E. obtusa* are all annuals that can look similar in habit, and vary in size enough to be confused with one another. They all have spikelets with rounded achenes, but those of *E. engelmannii* are often (but not always) more elongate than those of the other three. *Eleocharis engelmannii* and *E. obtusa* are a pair that can be separated from the others by the achene and tubercle differences used in the key, and also by culms that tend to be straighter than those of *E. atropurpurea* and *E. geniculata*, and with sheath apices often toothed.
**Eleocharis erythropoda** Steudel. [red-footed]. Plants perennial, colonial from rhizomes; culms 8-55(80) cm tall, 0.3-1.6 mm wide, distal scale thickness and sometimes red-spotted at tip, the tip obtuse to subacute, with tooth rarely present; spikelet 3-18 mm tall, 2-3(5) mm wide, ovoid, or lanceoloid, to subellipsoid; floral scales 15-50, 2-3.5 mm long, medium to deep tan to brown, the apex rounded in proximate scales, acute in distal ones; bristles (0)4, tan to medium brown; anthers 1-1.8 mm long; stigmas 2; achenes light yellow, biconvex, obvoid, 0.9-1.9 mm long, 0.7-1.2 mm wide, smooth or lightly rugose, tubercle pyramidal, higher to lower than wide, with basal constriction at achene. ● Wet shorelines and riverbanks, meadows, springs, fens, and ponds, (5000-6000-8900 ft); widely scattered throughout the state at mid elevations. ♦ Similar species: *Eleocharis erythropoda* is part of the *E. palustris* complex, and is subsumed into that taxon by some authors. Of the three colonial species with two stigmas in this group in NM, *E. erythropoda* is the easiest to separate from the others based on the consistently narrower culms and proximal scale that completely wraps the culm. *Eleocharis uniglumis* is a fourth species in this complex that has been reported previously for NM, but no documented records are known. It would be separated from *E. erythropoda* by having smaller floral scales that are 1.8-2.5 mm wide compared to those of *E. erythropoda*, which are 1.8 mm or less wide. See discussion under *E. macrostachya* for more on this whole complex. In scale and habit, *E. erythropoda* might also be confused with *E. parishii*, a species with three stigmas whose spikelets are similar in color and shape and whose basal sheaths often have a reddish color. In looking at dried specimens, it is important to examine a number of flowers when counting stigmas, as the stigmas are brittle and often broken off, sometimes making for the appearance of 2 where there were originally 3. In addition to the stigmas, the sheaths of *Eleocharis parishii* have a longer apical tooth, and have teeth more consistently than does *E. erythropoda*.

**Eleocharis flavescens** (Poiret) Urban. [yellowish]. Plants perennial, colonial from fine inconspicuous rhizomes, forming mats; culms 1.5-15(42) cm long, 0.2-0.5 mm wide, soft and spongy; distal scale membranous and somewhat inflated, the apex long subulate; spikelet 2-5(9) mm long, 1-3 mm wide, ovoid to ellipsoid, the apex acute to acuminate, floral scales 4-40(65), 1.2-1.5(3) mm long, with a green midrib and tan to brown margins, the apex rounded to acute; bristles (0)7-9, retrorsely scabrous, shorter than to as long as the achene; anthers 0.6-1.2 mm long; stigmas 2 (rarely 3); achenes biconvex to thickly trigonous, obvoid, 0.75-1.1 mm long, 0.5-0.7 mm wide, dark brown to blackish, slightly longitudinally striate, tubercle pyramidal with acute to rounded apex, distinctly separate from achene with minor constriction at base. ● Wet shorelines and floodplains, ditches, springs, and mudflats, 4200-5600 ft; infrequent in widely scattered locations. ♦ Our plants belong to var. *flavescens*. Similar species: *Eleocharis coloradensis* shares the diminutive and rhizomatous habit of *E. flavescens*, but has achenes with confluent tubercles and bulbs on the rhizomes. The achenes of *E. flavescens* are most similar to those of *E. geniculata*, but the achenes of *E. flavescens* are dark brown rather than black, and *E. geniculata* is a strongly tufted annual. New Mexico (and some AZ) plants do not fit the species concept of *E. flavescens* perfectly; the sheath summit looks more like those of *E. geniculata* and *E. atropurpurea*, but the tubercle shape is not correct for either species, and the achenes are too large for the latter (as the specimens were originally determined). These may represent a cryptic taxon. More work is needed.

**Eleocharis geniculata** (Linnaeus) Roemer & Schultes. [having small knee-like joints]. [Eleocharis caribaea sectores not (Rottboell) S.F. Blake, Scirpus geniculatus Linnaeus]. Plants annual, densely tufted; culms to 45 cm tall, 0.2-1 mm wide, often curving upwards; distal scale loose, the apex acute to acuminate; spikelet 1-3 mm long, 1-4 mm wide, ovoid to orbicular, the apex obtuse; floral scales to 125, 0.8-3 mm long, straw to green to brown, the apex rounded to acute; bristles (0)4-8, typically 7, vestigial to ½ as long as achene; stigmas 2, anthers 0.6-0.8 mm long; achenes black, biconvex, obvoid, 0.5-1.1 mm long, 0.3-0.7 mm wide, smooth, tubercle whitish, flattened to subonic, with basal constriction. ● Floodplains, shorelines, riverbanks, stock ponds, 4500-6500 ft; uncommon in widely scattered locations. ♦ Similar species: See discussion under *E. atropurpurea*, a very similar plant that differs mainly in its smaller achenes and culms. See also *E. flavescens*.

**Eleocharis macrostachya** Britton. [large-spiked]. Plants perennial, colonial from substantial rhizomes; culms 10-100 cm tall, 0.5-2.5(3.5) mm wide, terete to compressed; distal scale with the apex obtuse to truncate, with tooth present occasionally; spikelet 5-40 mm long, 2-5 mm wide, ovoid to narrowly lanceoloid, the tip usually acute; floral scales 30-80, 2.5-5.5 mm long, medium to red or chestnut-brown with a tan to green midrib, the apex rounded in proximate scales, acute in distal ones; bristles 4(5), usually present to small; anthers 2; stigmas 2, anthers 1.3-2.7 mm long; achenes yellow to dark yellowish brown, biconvex, obvoid, 1.1-1.9 mm long, 0.8-1.5 mm wide, smooth or with fine horizontal ridges, tubercle pyramidal, as high as much higher than wide, with basal constriction. ● Wet shorelines and riverbanks, meadows, springs, ditches, pastures, and ponds, 3100-11,600 ft; widely scattered throughout the state. ♦ Similar species: *Eleocharis macrostachya* is part of the *E. palustris* complex, which also includes *E. erythropoda* and *E. uniglumis*. While treated as separate species by the Flora of North America authors, others subsume all of these taxa into one highly variable complex under the name of *E. palustris*, due to overlapping diagnostic characters that are not correlated with range or habitat across the continent. The key will allow some specimens to be placed in one taxon or another, but many will be found to be intermediate, and several of the important characters are almost impossible to determine from pressed specimens where one cannot see all sides of the culm to determine the degree of basal scale constriction, or whether a flattened stem is truly that or an artifact of pressing. Specimens with few culms may not be sufficient to show tooting on the sheath apex, which is uncommon in this complex. In the field, it may be best to identify populations of robust plants with highly flattened culms, and possessing long spikelets with an acute apex as *Eleocharis macrostachya*. Due to the large number of collections not complete enough for an accurate determination, elevation, habitat and range for *E. macrostachya* and *E. palustris* have been combined in this treatment.

**Eleocharis montevidensis** Kunth. [from Montevideo, Uruguay]. [Eleocharis arenicola Torrey]. Plants perennial, colonial from fine rhizomes; culms 25-50 cm tall, 0.5-1.2 mm wide, terete to elliptic; distal scale tight to culm, the apex truncate to rounded, with apical tooth present on sheath apices of some to all of the culms; spikelet 4-12 mm long, (1.5)2-3 mm wide, ovoid to ellipsoid, rarely lanceoloid; floral scales 30-100, 1.5-2.5 mm long, orange brown with a green midrib, the apex rounded to obtuse in proximate scales, sometimes acute in distal ones, sometimes horizontally wrinkled and recurved; bristles 5-6(7), usually present, tan to brownish; anthers 0.8-1.5 mm long; stigmas 3; achenes dark brown, compressed trigonous, 0.7-1 mm long, 0.6-0.8 mm wide, smooth, tubercle pyramidal, as high as wide or occasionally depressed, with basal constriction. ● Wet shorelines and riverbanks, meadows, springs, and ponds, 3500-5800 ft; occasional in the extreme southern part of the state at lower elevations. ♦ Similar species: *Eleocharis montevidensis* forms a species pair with *E. parishii*. They are similar in habit and habitat, and differ primarily in the characters given in the key. The overall trend is for the spikelets of *E. montevidensis* to be more
ovate and rounded at the tip, but there is enough variation even within a population that some more lanceoloid spikelets approaching those of E. parishii can be found. However, in these cases the floral scales of E. montevidensis will be packed more densely on the rachilla. The range of E. montevidensis is restricted to the southern part of the state, while E. parishii is more widespread, throughout the state.

**Eleocharis obtusa** (Wildenow) Schultes [blunt, for the spikelets and floral scales] [Eleocharis obtusa (Roth) Roemer & Schultes var. obtusa (Wildenow) Küstenh., Scirpus obtusus Wildenow]. Plants annual, densely tufted; culms to 3-50(90) cm tall, 0.2-2 mm wide, straight; distal sheath tight to slightly flaring at the apex, the apex acute to obtuse, sometimes with tooth to 0.3 mm long; spikelet (2)5-13 mm long, (2)3-4 mm wide, broadly ovoid to less frequently lanceoloid or ellipsoid; floral scales 15-150, 1.5-2.5 mm long, brown with a bright green midstripe, the apex broadly rounded; bristles (5)6-7, exceeding the achene; anthers 0.3-0.6 mm long; achenes brown, biconvex, obvoid, 0.9-1.2(1.3) mm long, 0.7-0.9 mm wide, deltoid, sub-confluent with and almost as wide as the achene, 1.3-2.5 as high as wide. *Receding shorelines and riverbanks, seasonal wetlands, ponds, 6450 ft; rare in NM, known only from one early collection in Las Vegas (San Miguel Co.).

*Similar species: See discussion under E. engelmannii, the more common species of this pair in NM.*

**Eleocharis palustris** (Linnaeus) Roemer & Schultes [of marshy or swampy ground] COMMON SPIKE-RUSH [Eleocharis glaucescens (Wildenow) Schultes, Scirpus palustris Linnaeus]. Plants perennial, colonial from substantial rhizomes; culms 30-115 cm tall, 0.5-5 mm wide, terete to slightly compressed; distal sheath apex obtuse to truncate, with tooth absent; spikelet 5-25 mm long, 3-7 mm wide, ovate to lanceoloid, the apex obtuse to acute; floral scales 30-100, 3.5 mm long, brown with a tan to green midrib, the apex rounded in proximate scales, acute in distal ones; bristles 4(5), usually present, tan medium brown; anthers 1.5-2.2 mm long; stigmas 2; achenes tan to dark brown, biconvex, obvoid, 1.1-2 mm long, 1.15 mm wide, smooth or with fine horizontal ridges, tubercle pyramidal, as high to much higher than wide, with basal constriction. *Wet shorelines and riverbanks, meadows, springs, ditches, pastures, and ponds, 3100-11,600 ft; widely scattered throughout the state.*

*Similar species: See discussions under E. macrostachya, and E. rostellata. Eleocharis planifrons is quite variable in size and habit, and occasionally one will find plants that are of smaller stature and appear more clumped, but key to this species based upon number of stigmas and achene/tubercole morphology, along with some rhizomes being present.*

**Eleocharis parishii** Britton [for Samuel Bonnall Parish (1838-1928), southern California naturalist] PARISH’S SPIKE-RUSH, Plants perennial, colonial from rhizomes; culms 10-50 cm tall, 0.2-0.7(1) mm wide, terete to elliptic; distal sheath tight to culm, the apex truncate to rounded, with apical tooth present on some to all of the sheath apices; spikelet 3-20 mm long, 1.5-2.5 mm wide, narrowly lanceoloid, to subcylindric; floral scales 4-25, 1.5-2.5 mm long, orange brown with a green midrib, the apex rounded to obtuse in proximate scales, acute in distal ones; bristles 3-7, usually present, tan to whitish; anthers 1.1-2 mm long; stigmas 3; achenes yellowish to dark brown, compressed trigonous, 0.8-1.4 mm long, 0.5-0.7 mm wide, smooth, tubercle pyramidal, often higher than wide, with basal constriction. *Wet shorelines and riverbanks, meadows, springs, and ponds, 3900-8000 ft; most frequent in the southwestern quarter of the state, but also following the central mountain ranges north.*

*Similar species: See discussions under E. erythropoda and E. montevidensis.*

**Eleocharis quinqueflora** (F.X. Hartman) O. Schwartz [five-flowered, for the few-flowered spikelets] [Eleocharis pauciflora (Lightfoot) Link, Eleocharis pauciflora (Lightfoot) Link var. subtoriflora (Beauviaux) Svensson, Scirpus pauciflorus Lightfoot, Scirpus quinqueflora F.X. Hartman]. Plants perennial, colonial from rhizomes, the rhizomes 0.2-1 mm thick, often ending in resting buds, or these found among culm bases; culms 5-33 cm tall, 0.2-0.5(1.2) mm wide, subterete to compressed; distal sheath membranous to papery, the apex subtruncate to acute; spikelets 3-8 mm long, 1.5-4 mm wide, ellipsoid to lanceoloid; floral scales 3-10, 2.5-6 mm long, blackish brown in center, marginally membranous, the apex acute; bristles (0)3-6, rudimentary to equaling the tubercle, often unequal; anthers 2.2-5.5 mm long; stigmas 3; achenes tan to brown, equilaterally to compressed trigonous, obvoid, 1.6-2.3 mm long, 0.7-1.3 mm wide, smooth to finely longitudinally ridged, tubercle similar in color to the achene, confluent, without a basal constriction. *Wet meadows, seeps & springs, and fens in the mountains, 8500-11,800 ft; moderately common at higher elevations in the Sangre de Cristo and Jemez mountains in the northern part of the state.*

*Similar species: If achenes are present, the confluent tubercle and smooth surface would separate this species from Eleocharis coloradoensis and its relatives when achene and achene/tubercole morphology, along with some rhizomes are also diagnostic. The achenes of E. coloradoensis also have a confluent tubercle, but it typically is a shorter plant with lighter colored spikelets and grows at lower elevations in muddy areas. It has tuberous buds terminating some of the rhizomes (which are distinctly different in their tuberous nature than the simple resting buds of E. quinqueflora).*

**Eleocharis rostellata** (Torrey) Torrey [small-beaked] BEAKED SPIKE-RUSH [Scirpus rostellatus Torrey]. Plants perennial, tufted from short horizontal to ascending rhizomes, but forming dense stands by rooting at the long, bent-over culm tips; culms 20-100 cm tall, 0.35-2 mm wide, strongly compressed, 1.5 times or more as wide as thick; distal sheath tight to culm, apex rounded; spikelets 5-17 mm long, 2.5-5 mm wide, ovoid; floral scales 20-40, 3.5-6 mm long, tan to medium brown, the apex rounded to subacute; bristles 5-6, 0.3-6 mm long; stigmas 3 (rarely a mix of 3 and 2); achenes tan to brown, variable in shape within an inflorescence, ovoid to obvoid, 1.5-2.5 mm long, 1.1-2 mm wide, smooth to finely rugulose or reticulate, tubercle similar in color to the achene, without a basal constriction, or absent. *Wet alkaline meadows, seeps, springs, and fens, often dominant or co-dominant in its habitat, 3000-8800 ft; widespread and lower to mid elevations throughout the state.*

*Similar species: The long, arching culms rooting at the tips are unique and diagnostic, but not always present. Both E. coloradoensis and E. quinqueflora also have achenes with confluent tubercles and are rhizomatous, but both are much smaller plants than E. rostellata. Sometimes E. rostellata has been confused with E. palustris and its relatives when achenes are not present and stigmas are not readily countable, due to its robust nature and tendency to form large monocultures. However, E. rostellata is a clumping species with short rhizomes and tight internodes, that spreads into large swaths by rooting at the stem tips, which may not be evident on collections, while E. palustris complex plants have long rhizomes (even though sometimes as many as 20 or more culms may cluster at a node). The bases of E. rostellata are stramineous with an orangish tint at best, never with red coloring as in the E. palustris complex. The spikelets are also tan in color, while those of the E. palustris complex are usually much darker.*
Monocotyledonous Plants - Cyperaceae

Eriophorum [woolly] COTTONSEEDGE, COTTONGRASS [2].

Plants grass-like, perennial; cespitose to colonial from long-creeping rhizomes; culms terete to trigonous; leaves basal and cauleine, sometimes reduced to bladeless sheaths; blades flat to filiform, ligules present; inflorescence terminal, composed of a single upright to many spikelets arranged in a subcapitate to subumbellate panicle; inflorescence bracts 1–several, leaflike to scale-like; spikelets with (10–)20–200 florets spirally arranged along the rachilla; flowers bisexual, each in the axil of a scale; perianth persistent, composed of (8–)10–25 hair-like smooth straight elongate bristles, obscuring the scales in the spikelet; straignts 1–3; style with 3 stigma branches, deciduous; fruit an achene, trigonous. About 25 species worldwide, 11 listed in the Flora of North America.


1 Spikelets solitary, erect ................................................................. E. scheuchzeri

Eriophorum angustifolium Honckeny [narrow-leaved] Eriophorum polystachion Linnaeus. Plants perennial, colonial from long-creeping rhizomes; culms to 1 m tall, 1.2–2 mm wide distally; leaves with flat to channelled blades, with trigonous tip, 1.5–6(8) mm wide, distal blade longer than its sheath; inflorescence terminal, composed of (12)–10–15 pendent spikelets in subumbels; inflorescence bracts 1, leaflike, similar to distal leaf; spikelets 10–20 mm long in flower, 20–50 mm long in fruit, ovoid; floral scales 5–10 mm long, brown, grey, paler distally with prominent midrib fading to tip; perianth bristles 10 or more, white to pale yellow, 15–30 mm long; stigmas 3, stamens 1–3, anthers 2–5 mm long; achenes obovate to subglobose, 2–5 mm long. Marshes, bogs, fens, wet meadows; 10,400–11,900 ft; known from the northern mountains, primarily Sangre de Cristos and San Pedro Parks Wilderness. Our plants belong to subsp. angustifolium. Similar species: Eriophorum gracile. Found in Colorado, was mistakenly reported from NM. It is similar to E. angustifolium, but slighter in stature, with shorter anthers and scales, the proximal scales being ribbed, unlike the smooth scales of E. angustifolium.

- Meinshausen

Fimbristylis [fringed style] FIMBRY [1]. Plants grass-like, annual or perennial (in our single species); cespitose with fine fibrous roots or rhizomatous with culms single to clustered in small tufts; culms wiry, terete, compressed, or angulate, ribbed; leaves basal; blades linear to filiform, flat to folded or terete; sheaths glabrous and scarious margined, ligules absent or if present of erect short hairs; inflorescence terminal on slender culms, composed of few to many spikelets arranged in simple to compound anthelae, or capitulate in a few species; inflorescence bracts 2–5, spreading to erect, leaflike to scale-like; spikelets ovoid to lanceoloid or cylindric, 8–100+ florets spirally arranged along the rachilla; flowers bisexual, in the axil of a scale; perianth absent; stamens 1–3; style with 2–3 stigma branches (2 in our species), the style base enlarged and deciduous; fruit an achene, biconvex or trigonous. About 200 species worldwide, 16 listed in the flora of North America.


Fimbristylis puberula (Michaux) Vahl [somewhat downy or hairy]. Plants perennial, with culms in small tufts from orangish, slender rhizomes; culms wandlike, up to 100 cm tall, 1 mm wide; leaves with blades 1/3 to as long as the length of the culm, 1–2 mm wide, involute, scabrid-ciliolate; inflorescence terminal, composed of 2–20 spikelets in simple to compound anthelae; inflorescence bracts 1, per ray, leaflike proximal than shorter than the inflorescence; spikelet 5–10 mm long, ovoid, cylindrical, or ellipsoid; floral scales 2.5–3.5 mm long, glabrous, reddish brown with midrib excurrent as a macro, the apex obtuse; stigmas 2, filibrate, stamens 3, anthers 2–2.5 mm long; achenes lenticular-obovoid, ca. 1 mm long. Moist sandy or silty soils in prairie swales or along streambanks; 3400–4600 ft; known from two locations, the wet culena below Blue Hole Spring in Santa Rosa (Guadalupe Co.), and along the Pecos River in the Bitter Lake Refuge near Roswell (Chaves Co.). Our plants belong to var. interior (Britton) Kral [inland] Fimbristylis interior Britton, Fimbristylis spadicea sensu M&H.

Fuirena [for George Fuiren, 1581–1628, Danish physician-botanist] UMBRELLA-SEEDGE [1]. Plants grass-like, annual or perennial; cespitose with fine fibrous roots or rhizomatous with culms single to clustered in small tufts; culms 3–5 angled; leaves cauline only, hairy; blades flat in our species; sheaths closed, ligules tubular, scarious; inflorescence terminal and axillary, composed of sessile or pedunculate clusters of one to several spikelets; inflorescence bract(s) spreading to sub-erect, leaflike; spikelets ovoid, with 20–50 florets spirally arranged along the rachilla; flowers bisexual, each in the axil of a scale; perianth of two types, the outer set of 3 sharp, short bristles, the inner set of 3 stipitate, spatulate longer scales; stamens 1–3(6); style with 3 stigma branches, the style base narrow and persistent; achene trigonous-thromboid. About 30 species worldwide, 7 listed in the flora of North America.


Fuirena simplex Vahl [simple, undivided]. Plants annual or perennial, mostly cespitose; culms tufted or individual, 10–100 cm tall, 0.5–1.5 mm wide, 14–18 ribbed; leaves cauline, blades flat, linear to lance-linear, 2–20 mm wide, margins pilose to hispid-ciliolate, faces glabrous to hirsute or scabrous on the veins; inflorescence composed of 1–3(5) clusters of spikelets; proximal inflorescence bract (when more than one cluster of spikelets is present) leaflike, longish, shorter than to longer than the inflorescence; each cluster subtended by 1–4 leaflike bracts each associated with a spikelet; spikelets 3–15(20) mm long, ovoid, lance-ovoid, or cylindric; floral scales 1.5–2.5 mm long, scabrid, midrib excurrent as a spreading to excurved awn 2/3 or more as long as the scale body, antrosely scabrous, the scale apex rounded; perianth bristles retrorsely barbed, perianth blades long-clawed, with apical retrorsely barbed bristle; stigmas 3, filibrate, stamens 3, anthers 1–3, 0.4-
1.4 mm long; achene with stipe and beak, 1.2 mm long. Moist soils at seeps and springs, along streambanks; 4300-5900 ft; known primarily from the Guadalupe and San Andreas mountains in southern NM. We have two varieties:

<table>
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<th>Variety</th>
<th>Characteristics</th>
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<tbody>
<tr>
<td>a</td>
<td>Anthers 0.9-1.4 mm long; spikelets 1-5(7); 6-20 mm long; scales with 3-9 ribs, light colored...var. simpliciuscula</td>
</tr>
<tr>
<td>b</td>
<td>Anthers 0.4-0.7 mm long; spikelets 1-12, 3-7 mm long; scales with 3 principal ribs, occasionally with 1-2 less strong ribs, dark colored...var. aristulata (Torrey) Kral [short-awned]</td>
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Plants grass-like, perennial, densely cespitose with short rhizomes usually not apparent; culms rounded to trigonous; leaves basal and cauline, basal sheaths persistent, blades involute to filiform, glabrous, ligules present; inflorescence terminal, spicate to tightly panicle with 10-30 spikelets; proximal inflorescence bracts (when present) leaflike to scale-like; spikelets each with 1-4 sessile flowers spirally arranged along the rachilla, the distal spikelets usually 1-flowered and stamine, the proximal spikelets 1-flowered and pistillate or 2-4 flowers on pedicels, flowers proximally 1-3 staminate and distally 1-3 staminate, persistent and making an obvious tuft below the current year's blades; flowers unisexual, perianth absent; stamens 3; style with 3 stigma branches, the style base persistent; achene trigonous, included within the perigynium. About 30 species worldwide, 3 listed in the Flora of North America.

**1 Inflorescence a spike, unbranched; inflorescence bract 0; basal sheaths somewhat glossy, with blades deciduous; plants of drier tundra habitats .......................................................... K. myosuroides**

Plants perennial, densely cespitose; culms 5-20(35) cm tall; leaves with filiform blades 0.2-0.5 mm wide, basal sheaths slightly glossy, persisting and making an obvious tuft below the current year's blades; inflorescence terminal, 10-30 mm long, 2-3 mm wide, composed of many spikelets in a simple unbranched spike, the proximal spikelets androgy nous with 2 flowers (the lowest rarely one-flowered and pistillate), the distal single-flowered and stamine; inflorescence bract absent; scales subtending the perigynia 2.3-5.5 mm long, glabrous, brown with midvein distinct almost to tip, the apex obtuse or cuspidate; stamens 3; anthers 1.5-1.5 mm long; stigmas 3, perigynia brown, 2.3-5.5 mm long, open on one side to base; achenes trigonous, 2.8-2.8 mm long. Alpine tundra and scree slopes; 10,000-12,800 ft; known only from the Sangre de Cristo Mountains in northern NM.

**2 Plants typically robust; spikelets dark brown in color; scales often pale with brown dots, the apex obtuse to acutish, nearly equaling the perigynia.**

**Kobresia simpliciuscula** (Wahlenberg) Mackenzie [nearly simple or undivided] [Carex simpliciuscula Wahlenberg]. Plants perennial, densely cespitose; culms 5-35 cm tall; leaves with channeled blades 0.2-1.5(2) mm wide, basal sheaths dull, persisting with the previous year's blades; inflorescence terminal, (8)10-35 mm long, (2)3-8 mm wide, composed of many spikelets in a compact panicle, the proximal spikelets androgy nous with 2 flowers or pistillate and 1-flowered, the distal single-flowered and stamine; inflorescence bract brown with a hyaline margin, shorter than the inflorescence; scales subtending the perigynia 2-3 mm long, glabrous, brown with midvein distinct almost to tip, the apex obtuse to subacute; stamens 3, anthers 1-2 mm long; stigmas 3, perigynia brown, 2.5-3.2 mm long, open on one side to base; achenes trigonous, 2.3 mm long. Wet montane to alpine meadows, bogs; 10,800-10,900 ft; known only from a few locations in Colfax Co., in the northern Sangre de Cristo Mountains.

**Schoenoplectus** [a twisted reed] BURLRUSH [4].

Plants grass-like, perennial (ours), colonial from long, tough rhizomes (ours); culms terete to trigonous, smooth, glabrous; leaves all basal, rarely 1(2) cauline, confined to the bottom 1/3 or less of the culm, blades rudimentary to well developed, flat to channeled, ligules present, membranous; inflorescences terminal, appearing lateral, composed of 1-100+ spikelets in capitulate clusters to open panicles; inflorescence bracts 1-5, leaflike to stem-like, the proximal erect (ours); spikelets terete, ovoid to lanceoloid or subcylindric, each with 8+ flowers spirally arranged along the rachilla, scales deciduous, each subtending a flower or the proximal empty; flowers bisexual, perianth of 0-6(8) bristles; stamens 3; style with 2-3 stigma branches, base not or scarcely enlarged, deciduous leaving an apiculus; achene bicongrate to trigonous. About 77 species worldwide, 17 listed in the Flora of North America. **Schoenoplectus californicus** (C.A. Meyer) Sojak has been reported for the state by M&H, but no specimens are known; it is unlikely that this taxon occurs in New Mexico.

**1 Inflorescence branches well-developed and evident, the spikelets borne on branches; culms trigonous; S. tabernaemontani**

1. Plants typically robust; spikelets light brown in color; scales often pale with brown dots, the apex obtach 0.1-0.4(0.8) mm deep, with awn 0.2-0.6 mm long; distal leaf blade much shorter than to equaling (rarely 1.5 times longer than) the sheath; proximal inflorescence bract 1.3-6(6) cm long, other bracts without blades; sides of the mid-culm deeply concave, rarely nearly flat ................. S. americanus

2. Plants usually less robust; spikelets dark brown in color; scales often rich brown, the apex obtuse to acutish, nearly equaling the perigynia.**

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<th>Species</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spikelets scales uniformly orange-brown (sometimes with straw-colored streaks), the dorsal side of scales smooth to sparsely rarely densely scabrous; awns of the scales straight to bent, 0.2-0.8 mm long; many spikelets solitary at the tips of the pedicels, ..........</td>
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Monocotyledous Plants - Cyperaceae

3 Spikelet scales wholly or partially pale grey to tan colored with prominent streaks, the dorsal side of the scales sparsely to often densely scabrous; awns of the awns usually contorted, 0.5-2 mm long, most spikelets in sessile clusters of 2 or more. . . . S. acutus

Schoenoplectus acutus (Muhlenberg ex Bigelow) A.D. Love [sharp-pointed] hardstem bulrush [Scirpus acutus Muhlenberg ex Bigelow]. Plants perennial, colonial from stout, long-creeping rhizomes, 5-15 mm thick; culms cylindric, 1-4 m tall, 2-10 mm wide; leaves 3-4, all basal, blades 1-2, the distal 3-5 mm wide and much shorter than the sheath; inflorescence terminal, appearing lateral, composed of 3-4(190) spikelets in a relatively compact panicle, 2(3) times branched, most spikelets in clusters of 2-8; proximal inflorescence bract erect, appearing as a continuation of the stem; spikelets ovoid, 6-18(24) mm long, with numerous florets spirally arranged along the rachilla; floral scales pale grey to light tan with prominent streaks, lightly to densely scabrid, 3-4 mm long, apex notched 0.3-0.5 mm deep, with contorted awn 0.5-2 mm long (often broken off); perianth bristles (4)6(8), retrorsely barbed, shorter to equaling the achene; stigmas 2(3); anthers 2 mm long; achenes dark grey-brown to almost white, obvoid, plano-convex to weakly trigonous, (1.5)2-3 mm long. . . . Marshes, lakeshores, streambanks, often emergent in water to 1.5 m; 3000-8800 ft; found throughout the state. . . . Similar species: Schoenoplectus acutus is most often confused with S. tabernaemontani. Although many of the characters that separate these two overlap, in general, Schoenoplectus acutus has fewer and more robust spikelets, very rarely any that are not clustered, floral scales that are almost always more scabrid on the back, and rarely scales that are orange-brown colored throughout like those of S. tabernaemontani. . . . We have two weak varieties in New Mexico:

a All styles with 2 stigmas; culms very firm, with air cavities in distal 1/4 mostly 0.5 mm wide... var. acutus. . . . Generally northern half of the state; common in the eastern half of the U.S. . . .

b Some styles with 3 stigmas; culms soft to firm, with larger air cavities in distal 1/4 mostly 1-2.5 mm wide... var. occidentalis (S. Watson) S.G. Smith [western]. [Scirpus acutus Muhlenberg ex Bigelow var. occidentalis (S. Watson) Beekl, Scirpus lacustris Linnaeus var. occidentalis S. Watson, Scirpus occidentalis (S. Watson) Chase]. . . . Widespread throughout the state; common in the western half of the U.S.

Schoenoplectus americanus (Persoon) Volkart ex Schinz & R. Keller [of the Americas] OLNEY'S BULLRUSH [Scirpus americanus Persoon, Scirpus olenyi Gray]. Plants perennial, colonial from stout, long-creeping rhizomes, 2-5 mm diam.; culms sharply trigonous-winged, sides deeply concave to nearly flat, 0.4-2.5 m tall, 3-10 mm wide; leaves ca. 3, all basal, blades 1-3, the distal blade 0.2-1.5 times as long as the sheath, 2-8 mm wide; inflorescence terminal, appearing lateral, composed of 2-20 spikelets sessile in a single capitulate cluster; proximal inflorescence bract erect, 1-3 cm long, appearing as a continuation of the stem; spikelets 5-15 mm long, with numerous florets spirally arranged along the rachilla; floral scales orangish red to light grey-brown with straight awn 0.2-0.6 mm long; perianth bristles (2)5-6(7), retrorsely barbed, shorter than the achene; stigmas 2(3); anthers 1.5-3 mm long; achenes brown, obvoid, plano-convex to compressed trigonous, 1.8-2.8 mm long, with beak 0.1-0.3 mm long. . . . Marshes, ditches, streambanks, pond-shores; 3400-7600 ft; found primarily in the southern half of the state. . . . Similar species: See discussion under Schoenoplectus pungens.

Schoenoplectus pungens (Vahl) Palla [sharp-pointed] THREE-SQUARE BULLRUSH [Scirpus pungens of many NM reports, Scirpus americanus (Persoon) Volkart ex Schinz & R. Keller var. longispicatus Britton, Scirpus pungens Vahl, Schoenoplectus pungens (Vahl) Palla var. longispicatus (Britton) S.G. Smith]. Plants perennial, colonial from stout, long-creeping rhizomes, 1-6 mm thick; culms bluntly trigonous, sides convex to slightly concave, 0.1-2 m tall, 1-6 mm wide; leaves all basal, blades 2-6, the distal blade (1-2) times as long as the sheath, 2-9 mm wide; inflorescence terminal, appearing lateral, composed of 1-5(10) spikelets sessile in a single capitulate cluster; proximal inflorescence bract erect, (1)3-20 cm long, appearing as a continuation of the stem; spikelets ovoid, 5-23 mm long, with numerous florets spirally arranged along the rachilla; floral scales dark orangish red to brown or tan with linear spots, smooth with margins ciliolate, 3-4 mm long, apex notched 0.1-0.4 mm deep, with straight awn 0.2-0.6 mm long; perianth bristles (2)5-6(7), retrorsely barbed, shorter than the achene; stigmas 2(3); anthers 1.5-3 mm long; achenes brown, obvoid, plano-convex to compressed trigonous, 1.8-2.8 mm long, with beak 0.1-0.3 mm long. . . . Marshes, ditches, streambanks, lakeshores, often emergent in water to 0.7 m deep; 3000-8700 ft; found throughout the state; . . . Similar species: See discussion under Schoenoplectus pungens.

Schoenoplectus tabernaemontani (C.C. Gimelin) Palla [for Jacob Theodor von Bergzahnen (?-1590), physician & herbalist] SOFTSTEM BULRUSH [Scirpus tabernaemontani C.C. Gimelin, Scirpus validus Vahl]. Plants perennial, colonial from stout, long-creeping rhizomes, 3-10 mm thick; culms cylindric, 0.5-3 m tall, 2-10 mm wide; leaves 3-4, all basal, blades 1-2, the distal 1-4 mm wide and much shorter than the sheath; inflorescence terminal, appearing lateral, composed of 15-200 spikelets, in a panicule, often with drooping branches, 2-4 times branched, many spikelets single, and others in clusters of 2-4; proximal inflorescence bract erect, appearing as a continuation of the stem; spikelets ovoid, 3-17 mm long, with numerous florets spirally arranged along the rachilla; floral scales uniformly dark to pale orange-brown, sometimes with linear spots, smooth to lightly scabrid, 2-3.5 mm, apex notched 0.2-0.3 mm deep, with straight or bent awn 0.2-0.8 mm long (often broken off); perianth bristles 6, spinulose, equaling the achene; stigmas 2(3); anthers 2 mm long; achenes dark grey-brown, obvoid, plano-convex, 1.5-2.8 mm long. . . . Marshes, lakeshores, streambanks, often emergent in water to 1.0 m deep; 3600-8700 ft; found throughout the state. . . . Similar species: See discussion under Schoenoplectus acutus. . . .


Plants grass-like, perennial, cespitose from short rhizomes; culms terete; leaves basal, rarely cauleine, blades involute to channelled, subterete, ligules absent; inflorescences terminal, usually head-like, composed of 10-25 clustered spikelets; inflorescence bracts spreading to erect, leaffike; spikelets compressed, distichous, dark colored at maturity, with 3-11 florets, the proximal 2-3 sterile; flowers, bisexual, each in the axil of a distal scale; perianth of (0)3-6 bristles; stamens 3; style with 3 stigma branches, deciduous; achenes rounded-trigonoous to subterete in cross section. . . . About 100 species worldwide, 1 listed in the Flora of North America. . . .

Scirpus [classical name for a rush-like plant] BUL Rush [3].

Plants grass-like, perennial, cespitose from short or colonial from long rhizomes; culms trigonous to roundly trigonous, smooth, glabrous; leaves basal and cauline or all cauline, blades well developed, flat to V-shaped, prominently keeled, ligules present; inflorescences terminal (sometimes lateral in the distal 1-3 leaf axils), composed of 50-500 spikelets in subumbellate or corymbose panicles, less than 3.5(5) mm in diameter; inflorescence bracts usually 3-4, leaflike, ascending to spreading; spikelets terete, ovoid to lanceoloid or subhyaline, with 10-20 florets spirally arranged along the rachilla, scales deciduous, each subtending a flower; flowers bisexual, perianth of 0-3 bristles; stamens 1-3; style with 2-3 stigma branches, base not or scarcely enlarged, persistent; achene biconvex, plano-convex, or trigonous. About 35 species worldwide, 18 listed in the Flora of North America. Many species formerly treated in Scirpus are now treated in Bolboschoenus and Schenoplectus, which are also keyed here.

1 Terminal bract of the flowering stem single, generally resembling a prolongation of the culm so the inflorescence appears to be lateral rather than smaller bracts occasionally present but scale-like and not green) ................ go to Schoenoplectus

1 Terminal bracts of the flowering stem 2 or more, leafy and spreading and not resembling the culm

2 Spikelets large, mostly 12-25 mm long, fewer in number (commonly 3-40), more than twice as long as the lemmas (occasionally up to 30 mm)........................................ S. microcarpus

2 Spikelets small, mostly 3-6 mm long, numerous (more than 100) (Scirpus s.s.)

3 Spikelets in open clusters, with all but the central spikelet long pedicellate; perianth bristles smooth, strongly contorted, much longer than achene (sometimes not projecting beyond them because of their contortion) ................................................ S. pendula

3 Spikelets borne closely together in tight clusters with all spikelets sessile within each cluster; perianth bristles barbed, straight, or curved, shorter to longer than achene

4 Stigmas predominantly 2; spikelets in many smaller clusters of 3-18; scales not (or only very shortly) awned; perianth bristles mostly 4 (sometimes up to 6), the teeth thick-walled, sharply tipped, densely crowded over most of the bristle length. S. atrovirens

4 Stigmas predominantly 3; spikelets in fewer, larger clusters of 12-130; scales awned, awns often strongly spreading; perianth bristles 6, the teeth thin-walled, round-tipped, mostly restricted to distal 0.5 mm or less of bristle length ........................................ S. paludosus

Scirpus microcarpus J. Presl & C. Presl [small-fruited] PANICLED BUL Rush. Plants perennial, colonial from long, stout reddish rhizomes, with conspicuous nodes and internodes; culms upright, 50-100(150) cm tall; leaves cauline, 4-11 per culm, basal sheaths reddish, blades 5-15(20) mm wide; inflorescence terminal, composed of very many dense clusters of 3-18 (largest cluster with 6+) spikelets in an open, compound umbel; inflorescence bracts 2-5, leaflike, shorter to longer than the inflorescence; spikelets ovoid to narrowly ovoid, 2-6(8) mm long, 3.5 mm wide, with numerous florets spirally arranged along the rachilla; floral scales green to blackish, 1.1-3.4 mm long, apex rounded to acute or apiculate, apiculus to 0.2 mm long; perianth bristles (3)4(6), stout, shorter than to longer than the achene, retrorsely barbed; stigmas 2 (rarely 3 in some flowers); achene almost white, ovate to obovate in profile, biconvex to plano-convex in cross section, 0.7-1.6 mm long. Marshes, moist meadows, streambanks, lakeshores; 5400-10,400 ft; found in mountainous areas in the northern and southwestern parts of the state. Similar species: Scirpus microcarpus is more common than S. paludosus in NM, and usually has far more diffuse panicles with more, smaller spikelets. In specimens that exhibit an intermediate architecture in the inflorescence, one should count stigmas and look for the longer, more spreading awns on the scales of Scirpus paludosus, which gives the spikelets a rougher, more spiky texture under magnification.

Scirpus paludosus (Britton) Fern. [pale-colored] [Scirpus atrovirens sensu W&S, Scirpus atrovirens Muhlenberg var. paludosus Britton]. Plants perennial, cespitose with short, touch, fibrous rhizomes; culms upright, 60-110(150) cm tall; leaves cauline, 5-10 per culm, basal sheaths green or whitish, blades 8-16 mm wide; inflorescence terminal, composed of a few dense clusters of 12-130 (largest cluster with 40+) spikelets in a relatively compact, compound umbel, the rays unequal; inflorescence bracts 2-5, leaflike, shorter to longer than the inflorescence; spikelets narrowly ovoid, 4-5 mm long, 1.8-2.3 mm wide, with numerous florets spirally arranged along the rachilla; floral scales black to brownish with pale midrib, 1.6-2.8 mm long, apex with a terete to flattened awn to 0.4-0.6(1.2) mm long; perianth bristles 6, stout, shorter to equaling the achene, distally retrorsely toothed; stigmas 3 (rarely 2 in some flowers); achene pale brown to almost white, elliptic to obovate in profile, plumply trigonous (rarely plano-convex) in cross section, 0.8-1.2 mm long. Marshes, moist meadows, streambanks; 5200-8300 ft; found in mountainous areas throughout the state. Similar species: See discussion under Scirpus microcarpus.
spirally arranged along the rachilla; floral scales brown to red-brown with green midrib, 2 mm long, apex mucronate, mucro 0.1-0.3 mm long; perianth bristles 6, slender, much longer than the achene, smooth; stigmas 3; achenes pale to medium brown, elliptic in profile, plumply trigonous (rarely plano-convex) in cross section, 1-1.2 mm long. Marshes, moist meadows, streambanks, often on calcareous substrates; 5100-7500 ft; known only from a few collections near Las Vegas (San Miguel Co.). Similar species: Scirpus pendulus typically has fewer primary rays than S. microcarpus, all of which tend to droop to the same side of the inflorescence, while those of S. microcarpus often radiate in all directions, in a more complex looking inflorescence.
HEMEROCALLIDACEAE    DAYLILY FAMILY    [1/1/1]

Perennial glabrous herbs, sometimes rhizomatous; leaves simple, alternate, distichous, in basal rosettes, parallel-veined; flowers bisexual, actinomorphic, in cymes; flowers somewhat to strongly zygomorphic, 3-merous; perianth of 6 petaloïd tepals in 2 whorls, red, yellow, to orange; stamens 6; pistil single, superior, of 3 carpels, the style single; fruit a capsule; seeds with a fleshy covering. ♦ The members of this family were traditionally placed in a large and polyphyletic Liliaceae, and are currently sometimes included within the Asphodelaceae.


*Hemerocallis fulva* (Linnaeus) Linnaeus [reddish yellow] [Hemerocallis fulva xanthorrhiza] Linnaeus var. fulva Linnaeus. Perennial, 70-150 cm tall; leaves 70-100 cm long, 1-3 cm wide; scapes 10-20-flowered, exceeding the foliage; flowers funnelform not fragrant, on pedicels 3-6 mm long; tepals yellow to orange, 7-8 cm long, with smooth margins; anthers 5-7 mm long; capsules and seeds rarely developed. ● Escaped along roadsides near Rociada, San Miguel County, and expected elsewhere in similar, cool habitats; also known as an escape in Pueblo County, Colorado; native to Asia. ◊ Very common as an invasive plant east of the Missouri River.
Monocotyledous Plants - Hyacinthaceae

**HYACINTHACEAE HYACINTH FAMILY** [0/0/0]

Perennial herbs from bulbs or rhizomes; leaves all basal, alternate, simple, sessile and sheathing, parallel-veined; stipules lacking; flowers bisexual, actinomorphic, often showy; inflorescences usually racemose, scapose; tepals of 6 similar parts, petaloid, united (ours) or distinct; stamens usually 6; pistil single, superior, of 3 carpels; fruit a capsule, the seeds wingless.

*About 65 genera. Important ornamental plants include *Hyacinthus, Hyacinthoides*, and *Muscari*. Plants contain poisonous steroidal saponins. Members of the family were traditionally placed in a large and polyphyletic Liliaceae.

**Muscari** [musk] GRAPE-HYACINTH.

Plants from brown, ovoid bulbs; leaves few, basal, linear, channelled, somewhat fleshy; racemes densely flowered, the distal flowers often smaller, sterile, and different-colored, forming a tuft; flowers fragrant, urn-shaped; tepals connate most of length, the free distal portions reflexed; anthers dark blue.

• About 30 species, several of which are popular ornamentals, including black, white, and pink cultivars.


* M. neglectum Gussone ex Tenore [neglected, over-looked] 


**HYDROCHARITACEAE FROGBIT FAMILY** [4/7/7] [Najadaceae]

Perennial, aquatic herbs, rooted (ours) or unattached and floating; leaves alternate, opposite, whorled, or basal, simple; stipules absent; flowers actinomorphic to slightly zygomorphic, perfect or unisexual; sepals 3 or absent, greenish; petals 3 or absent, whitish; stamens 2-many; pistil single, inferior, of usually 3-6 carpels, the styles 1-several; fruit a capsule, berry, or achene-like.

• We include herein the Najadaceae, with its single genus *Najas*, shown by recent morphologic and molecular studies to be better placed within the Hydrocharitaceae than in its own family. *Vallisneria americana* Michaux was reported for NM by M&H, but no specimens or other reports are known from the state; we include it in the key for comparison.


1 Leaves all basal (not yet known in the state) ............................................................................................ *Vallisneria*

1 Leaves borne on an elongated stem

2 Leaf blades abruptly broadened at the base to sheath the stems .......................................................... *Najas*

2 Leaf blades not broadened as above

3 Plants with rhizomes, often terminated by smooth light-brown turions (tuber-like); erect stems often with scaly green turions (bud-like) in leaf axils ................................................................. *Hydrilla*

3 Plants lacking rhizomes and turions

4 Whorls with 5 or more leaves per node .................................................................................................. *Egeria*

4 Whorls with mostly 2-3 leaves per node, or leaves opposite (2 per node) at the lowermost nodes ........ *Elodea*

**Egeria** [a nymphl] WATERWEED [1].

Perennial dioecious herbs of fresh waters, lacking rhizomes and stolons, the stems rooted in the soil and mostly submersed; leaves cauline, in whorls of 5 or more (rarely opposite), sessile, submersed, 2 cells thick, the blades linear and entire, lacking prickles on the abaxial midvein; flowers unisexual, the staminate and pistillate on different plants, borne in an axillary spathe, raised to the water surface by highly elongating epigynous floral tubes, the 3 petals white; fruits sessile below the floral tube; seeds fusiform, sticky.

• Similar to *Elodea*, and often confused with it (being called BRAZILIAN WATERWEED or BRAZILIAN ELODEA), but easily told by the difference in leaves per node (5+ in *Egeria*, 2-3 in our *Elodea*).

* E. densa Planchon [compact, dense] 

[Anacharis densa (Planchon) Victorin, *Elodea densa* (Planchon) Caspary, *Philotheca densa* (Planchon) Small]. Perennial herbs, the stems 1-3 mm diam; leaves whorled, recurved, 10-40 mm long, 1-5 mm wide; stalk of staminate flowers to 8 cm long. ● About 30 species, several of which are popular ornamentals, including black, white, and pink cultivars.


* M. neglectum Gussone ex Tenore [neglected, over-looked] 


**Elodea** [marshy] ELODEA, WATERWEED [3].

Perennial dioecious herbs of fresh waters, lacking rhizomes and stolons, the stems rooted in the soil and mostly submersed; leaves cauline, in whorls of 2-7 (ours 2-3), sessile, submersed, the blades linear to ovate, entire, lacking prickles on the abaxial midvein; flowers unisexual, the staminate and pistillate on different plants, borne in axillary spathes, raised to the water surface by highly elongating epigynous floral tubes, the 3 petals white; fruits sessile below the floral tube; seeds fusiform to cylindrical, glabrous to hirsute, not sticky.

• Similar to *Egeria*, and often confused with it, but easily told by the difference in leaves per node (2-3 in our *Elodea*, 5+ in *Egeria*).

1 Stamine spathes 4 mm or less long; styles usually 2 mm or less long; leaves usually less than 1.7 mm wide.................................................................................................................. *E. nuttallii*

1 Stamine spathes 6 mm or more long; styles usually more than 2 mm long; leaves usually more than 1.8 mm wide

2 Anthers 2-3 mm long; leaves mostly in 3s; seeds 4.5-6 mm long ............................................................................... *E. canadensis*

2 Anthers 3-5 mm long; leaves in 2s and 3s; seeds about 3 mm long .............................................................................. *E. bifoliata*

**Elodea bifoliata** St. John [2-leaved] 

*[Elodea longivaginata St. John]*. Leaves in 2s and 3s, spreading, 5-24 mm long, 2-4 mm wide, the margins flat; stamine spathes 10-42 mm long; pistillate spathes 10-60 mm long; anthers 3-5 mm long; seeds about 3 mm long, densely covered with long hairs.

• Streams, lakes, wet meadows, borders of ponds; northern and western mountains.

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**Hydrocharitaceae** WATER NYMPH FAMILY

Monocotyledonous Plants - Hydrocharitaceae

**Najas** [water-nymph] WATER -NYMPH

- Leaves mostly in 3s, spreading to recurved, 5-13 mm long, 2-5 mm wide, the margins flat; staminate spathes 8-14 mm long; pistillate spathes 8-18 mm long; anthers 2-3 mm long; styles 2.5-4 mm long; seeds 4.5-6 mm long, glabrous. ●Rivers, streams, lakes, northern mountains, also Grant County.
- Leaves mostly in 3s, often recurved, 4-15 mm long, 1-2 mm wide, the margins folded; staminate spathes 2-4 mm long; pistillate spathes 8-15 mm long; anthers 1-1.5 mm long; styles 1-2 mm long; seeds 4-4.6 mm long, with long hairs at the base. ●Lakes and rivers; known from subalpine zone in Rio Arriba County.

**Hydroilla** [of water] HYDRILLA

- Monoecious or dioecious, perennial herbs of fresh or brackish water, with rhizomes, stolons absent, the stems rooted in the soil and mostly submerged; rhizomatous turions smooth, cream-brown, tuber-like; stem turions axillary, greenish, covered by scales, bud-like; leaves cauline, in whorls of 3-8 per node, sessile, submersed, the blades linear, toothed, with prickles on the abaxial midvein; flowers unisexual, the staminate and pistillate on different or the same plants, borne in axillary spathes, the pistillate on elongating epigynous floral tubes that reach the water surface, the 3 petals white to reddish; fruits sessile below the floral tube; seeds cylindrical, glabrous, not sticky. ●Both Hydroilla and Najas marina have toothed blades and prickles on the lower midveins; in Najas the leaves are expanded proximally into a sheath.

*Hydroilla verticillata* (Linnaeus f.) Royle [whorled] [Serpiciula verticillata Linnaeus f.]. Leaves 8-15 mm long, 1-4 mm wide, the margins serrulate; spathes of 2 connate bracts; flowers single within the spathe, the staminate nearly sessile, the pistillate with an epigynous floral tube 10-50 mm long. ●Slow-moving waters of lakes, ponds, reservoirs, and irrigation ditches; native to Eurasia, Africa, Australia. This is a federally listed noxious weed, known from Sandoval County, but actually could be more common if observations are confused with Egeria or Elodea. Plants have the capacity to spread by stem fragments, tuber-like turions on the rhizomes, and bud-like turions in the leaf axils.

**Najas** [water-nymph] WATER-NYMPH

- Monoecious or dioecious, annual herbs, lacking rhizomes, stolons, and turions, the stems submersed; leaves opposite or appearing whorled, submersed, expanded to a sheath proximally, the blades linear, 1-veined, and usually finely toothed to incised; flowers unisexual, the staminate and pistillate on the same or different plants, a perianth absent, the staminate flowers short-peduncled and borne in an involucre, the pistillate flowers sessile; fruits achene-like; seeds fusiform to obovoid. ●Species about 40, nearly worldwide.

- Leaves 8-15 mm long, 1-4 mm wide, the margins serrulate; spathes of 2 connate bracts; flowers single within the spathe, the staminate nearly sessile, the pistillate with an epigynous floral tube 10-50 mm long. ●Slow-moving waters of lakes, ponds, reservoirs, and irrigation ditches; native to Eurasia, Africa, Australia. This is a federally listed noxious weed, known from Sandoval County, but actually could be more common if observations are confused with Egeria or Elodea. Plants have the capacity to spread by stem fragments, tuber-like turions on the rhizomes, and bud-like turions in the leaf axils.

1 Plants dioecious; leaves coarsely toothed to incised; internodes and the abaxial midvein with prickles. ..............................**N. marina**

- Leaves 8-15 mm long, 1-4 mm wide, the margins serrulate; spathes of 2 connate bracts; flowers single within the spathe, the staminate nearly sessile, the pistillate with an epigynous floral tube 10-50 mm long. ●Slow-moving waters of lakes, ponds, reservoirs, and irrigation ditches; native to Eurasia, Africa, Australia. This is a federally listed noxious weed, known from Sandoval County, but actually could be more common if observations are confused with Egeria or Elodea. Plants have the capacity to spread by stem fragments, tuber-like turions on the rhizomes, and bud-like turions in the leaf axils.

**Najas marina** Linnaeus [of or near the sea] [Najas gracilis (Morong) Small]. Stems branched distally, 6-45 cm long, 1-4 mm wide, the internodes usually with prickles; leaves spreading to ascending, the blades 5-40 mm long, 1-5 mm wide, the margins coarsely serrate to shallowly incised, the abaxial midvein with prickles; staminate and pistillate flowers scattered along the stems; seeds reddish brown, 2-5 mm wide. ●Ponds and lakes; San Juan County. ●Reports of Najas marina from Chaves and Otero counties are without specimen verification.

**Hypoxidaceae** STAR-GRASS FAMILY

[1/1/1]

Perennial herbs from corms or rhizomes; leaves simple, alternate, basal, entire, grass-like, parallel-veined, the bases sheathing; stipules lacking; flowers bisexual, actinomorphic, usually showy, solitary or few on a leafless scape, the flowering portion lower than the leaves; perianth of 4 or 6 (ours) petaloid tepals, free or connate, yellow to orange; stamens 6 (ours) or 3 with 3 staminodes; pistil single, inferior, of 3 united carpels, with 1 or 3 styles; fruit a capsule. ●Members of this small family (about 7 genera) have been variously placed in a large and polyphyletic Liliaceae, or sometimes in the Amaryllidaceae.

**Hypoxis** [sharp-base] STAR-GRASS [1].

- Perennial scapose herbs, glabrous to densely hairy, from rhizomes or corms, the stems below ground, vertical, fleshy; leaves grass-like, linear, entire; scape shorter than the leaves, bearing few-flowered clusters (or single-flowered); tepals 6, spreading, distinct, yellow adaxially, greenish-yellow and pilose abaxially; inferior ovary hairy; capsules with a persistent crown of flower parts. ●About 100 species, especially southern Africa.

1 Plants dioecious; leaves coarsely toothed to incised; internodes and the abaxial midvein with prickles. ..............................**N. marina**

- Leaves mostly 2-5 mm wide (up to 15 mm), glabrous to densely spreading-hairy; inflorescences umbel-like, 1-6-flowered, the proximal 2 flowers paired; tepals 5-15 mm long. ●Moist to dry woodlands and prairies; known only from the Zuni Mountains of Cibola County.
**Monocotyledonous Plants - Iridaceae**

**IRIDACEAE IRIS FAMILY**

Perennial herbs, commonly from bulbs, corms, or rhizomes; leaves, simple, alternate or basal, 2-ranked, often equitant, the bases sheathing, the margins entire; stipules lacking; flowers large to small, actinomorphic or zygomorphic, perfect, subtended by 1-2 bracts; tepals petaloid, similar or dissimilar, distinct or connate; stamens mostly 3; pistil single, inferior, of 3 united carpels; fruit a capsule. ♦ A large, worldwide, and well-known family, including numerous ornamental plants (Gladiolus, Iris). Stigmas of Crocus sativus are the source of the spice saffron.

1 Flowers more than 5 cm wide, outer perianth parts spreading or reflexed, inner perianth parts erect ......................................................... Iris

1 Flowers less than 2 cm wide, all perianth parts spreading ...................................................................................................................... Sisyrinchium

**Sisyrinchium** Sisyrinchium [rainbow] IRIS.

Perennial herbs, with cord-like rhizomes covered with scale-like leaves, the flowering stems erect, terete or slightly flattened; leaves basal, flattened, sword-shaped; flowers large and showy, subtended by 2 spathes, lasting 1-4 days, actinomorphic; tepals petaloid, the sepals (the ‘falls’) spreading to reflexed and generally larger than the petals, the petals (the ‘standards’) erect to spread; styles divided distally into petaloid branches; fruit a capsule. ♦ Nearly 300 species of the Northern Hemisphere; extensively cultivated as ornamental plants, with hundreds of cultivars.

**Sisyrinchium** [rainbow] IRIS.

1 Flowers bright yellow; moist native habitats usually in the mountains .............................................................................................................. I. missouriensis

1 Flowers bright yellow; moist weedy spots, escaped from cultivation ............................................................................................................. I. pseudacorus

**Iris missouriensis** Nuttall [from Missouri] ROCKY MOUNTAIN IRIS [Iris arizonica Dykes]. Plants 25-90 cm tall, the stems simple to 2-branched; leaves 45-60 cm long, to about 1 cm wide, glaucous; inflorescence 1-3-flowered; flowers blue, lavender, to white, with yellowish or white portions, with darker veins; sepals and petals 3-7 cm long, the sepals 1-3 cm wide, the petals to about 1 cm wide; capsules 4-5 cm long. ♦ Widespread in the state on wet slopes, seeps, marshy ground, and clearings in the mountains and upper foothills. §

**Iris pseudacorus** Linnæus [resembling the genus Acroac]. FALSE SWEET-FLAG, YELLOW IRIS. Plants 60-130 cm tall, the stems usually 1-branched; leaves 40-100 cm long, 2-3 cm wide, only glaucous proximally; inflorescence 4-12-flowered; flowers bright yellow, to 10 cm wide; sepals 4-7 cm long, 2-4 cm wide; petals 2-5 cm long, 1-2 cm wide; capsules 4-5 cm long. ♦ A common ornamental widely escaped in temperate North America, and becoming noxious in some places; presently known only from the Rio Grande floodplain in Bernalillo County.

Sisyrinchium [pig snout] BLUE-EYED-GRASS [6].

Annual to perennial herbs, with or without rhizomes, the roots sometimes thickened and fleshy; stems compressed, winged; leaves few, basal or caudine, alternate, simple, entire; inflorescence a one-sided cyme, 1-15-flowered, subtended by 2 spathes; flowers not fragrant, of various colors, the distinct tepals widely spreading to reflexed; fruit a globose capsule, with many black seeds. ♦ About 80 species, mostly New World. Sisyrinchium campestre E.P. Bicknell has been reported for New Mexico, but this species occurs in central Kansas and eastward; plants called this mostly belong to S. montanum.

**Sisyrinchium arizonicum** Rothrock [from Arizona]. [Oreothrix arizonicum (Rothrock) Bicknell]. Perennial herb, tufted, to 60 cm tall, the stems fleshy-thickened, the stems branched, 3-8 mm wide; spathes equal or the outer slightly longer; tepals yellow to orange, with brownish veins, the outer 10-23 mm long, the apices aristate; capsules blackish, ovoid to obovoid, 1.5-2.5 mm long. ♦ Moist meadows and clearings in the forests of the western mountains.

**Sisyrinchium chilense** Hooker [from Chile]. [Sisyrinchium exiguum E.P. Bicknell, Sisyrinchium scalare Chamisso & Schlechtendal]. Perennial herb, tufted, to 30 cm tall, occasionally glaucous, the stems branched, with 1-2 nodes, 2-5 mm wide; spathes subequal, the outer slightly longer or slightly shorter than the inner; tepals bluish violet, the bases yellow, the outer 8-15 mm long, the apices aristate; capsules brown, obovoid to globose, 4-5 mm long. ♦ Moist, sometimes disturbed, areas in the southern mountains and foothills; known from Eddy, Otero, and Sierra counties. ♦ Known previously under the name Sisyrinchium exiguum E.P. Bicknell.

**Sisyrinchium demissum** Greene [weak, hanging down]. Perennial herb, tufted, to 50 cm tall, the stems branched, 1-2 mm wide, with 1-2 nodes; spathes subequal, the outer slightly short to 5 mm longer than the inner; tepals dark bluish violet, the outer 6-15 mm long, the apices rounded to acute and aristate; capsules tan, globose, 7-8 mm long. ♦ Moist, sometimes disturbed, areas in the southern mountains and foothills; known from Eddy, Otero, and Sierra counties; typically on moist but well-drained ground; widespread.

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**Sisyrinchium idahoense** Bicknell [of Idaho]. Perennial herb, tufted, with slight rhizomes, to 45 cm tall, the stems simple, 1.5-2 mm wide; spathes strongly unequal, the outer 13-15 mm longer than the inner; tepals light to deep bluish violet with yellow bases, the outer 8-13 mm long, the apices truncate, rounded, to emarginate, aristate; capsules light to dark brown, globose, 3-6 mm long. ● Moishe meadows, seeps and springs, and forest glades in the northern mountains.

**Sisyrinchium longipes** (Bicknell) Kearney & Peebles [long-stalked] [Hydastylus longipes Bicknell]. Perennial herb, tufted, to 46 cm tall, the stems simple, 0.5-2 mm wide; spathes equal or the outer to 16 mm longer than the inner; tepals yellow to orange, with brownish or purplish veins, the outer 7-11 mm long, the apices acute to rounded; capsules dark brown to black, globose, 4-9 mm long. ● Moishe to wet sites in the western mountains, known from only a few collections.

**Sisyrinchium montanum** Greene [of mountains]. Perennial herb, tufted, to 50 cm tall, the stems simple, 1-4 mm wide; spathes strongly unequal, the outer 1-4 cm longer than the inner; tepals dark bluish violet with yellow bases, the outer 9-15 mm long, the apices emarginate to retuse, aristate; capsules tan to dark brown, globose to obovoid, 4-7 mm long. ● Moishe meadows, stream banks, and clearings in the forest, mostly in the northern mountains. ○ Our plants belong to var. *montanum*.

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**JUNCACEAE** RUSH FAMILY [2/28/29]

Contributed by Max H. Licher & Glenn R. Rink

Grass-like herbs, cespitose or rhizomatous, with fibrous roots; culms usually round, or sometimes compressed in cross section, usually solid, occasionally hollow or septate; leaves simple, linear, parallel-veined, flat (sometimes margins inrolled) to channeled (thicker and grooved) or terete in cross section, entire or with ciliate leaf margins, usually spirally arranged, basal and/or cauline, in some species reduced to bladeless sheaths (cataphylls) only; sheath open or closed, usually auriculate, the auricles rarely joined to form a ligule; inflorescence usually terminal, sometimes appearing lateral, cymose, composed of clusters of flowers or single flowers arranged in panicles, racemes, or corymbbs, sometimes compressed into a compact head, the inflorescence usually subtended by one or more leaf-like bracts, each branch having 1-2 additional bracts, and the individual flowers subtended by 0-2 reduced translucent smaller bracts (bracteoles); flowers perfect (in our species), the perianth radially symmetric, of 6 herbaceous to scarious tepals in 2 ranks, persistent; ovary superior, stigma 1, style 3-branched; stamens usually 3 or 6, anthers basifixed; fruit a capsule, dehiscent, unilocular with 1 basal placenta or 3-septate to 3-loccular with axile or parietal placenta; seeds 3 to many, the outer seed coat hyaline and sometimes forming apical appendages. ○ Genera 7, species about 440, worldwide. Usually associated with wetlands, but some species adapted to alpine habitats.

1 Leaves glabrous, or blades absent; capsules with numerous seeds (in ours); bracteoles when present entire; sheaths open ........ Juncus
1 Leaves ciliate, with hairs at least on the basal margins; capsules with three seeds; bracteoles sub-entire to lacerate or fringed; sheaths closed ......................................................................................................................... Luzula

**Juncus** [the classical name for the plants] RUSH [25].

Plants grass-like, glabrous, perennial, or less frequently annual; perennial plants densely cespitose from short rhizomes to colonial from long-creeping rhizomes, annual plants cespitose and fibrous rooted; culms generally round in cross section, sometimes flattened, solid, without nodes, leafy or not; leaves two or three-ranked, clustered at base or alternate up the culm; blades lacking or well-developed and linear, flat with face towards the culm (grass-like), or flat with edge towards the culm (ensiform, Iris-like), channeled, or terete, with crosswalls (septa) or without; sheaths open from the base, with hyaline or scarious margins, these often prolonged at the top, forming vertical auricles, sometimes confluent and forming a ligule; cataphylls (bladeless basal sheaths) present and diagnostic in some groups/species; inflorescence terminal, sometimes appearing lateral when forced to the side by a vertical bract that looks like an extension of the culm, cymose, diffuse to strongly congested, sometimes with one to many racemose or paniculate clusters (heads or
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glomerules); the branches, clusters, or individual flowers with or without bracts; primary inflorescence bract shorter to much longer than the inflorescence, or sometimes reduced to a scale, flat or terete, sometimes appearing like a continuation of the culm; flowers perfect, with a perianth of six tepals in two ranks, with or without two additional bracteoles (bractlets, or prophylls in some texts), persistent; stamens (1, 2) 3 or 6 (when 3 always under the outer tepals), filaments shorter to longer than the anthers; ovary superior, with 1 style and 3 stigma branches; fruit a capsule, one per flower, septic or not, making them either 3-locular or 1-locular, containing many minute seeds; the seeds ellipsoid to ovoid, sometimes with slender appendages (tails) at one or both ends. About 315 species worldwide, about 95 listed in the Flora of North America.

1. Inflorescence usually at least half the height of the plant; roots fine, fibrous; leaf blades less than 1 mm wide, generally inrolled; plants generally less than 30 cm tall, not of alpine habitats.  J. bufonius

1. Perennial; inflorescence usually at least half the height of the plant; roots coarse and/or rhizomes present; leaf blades narrow or wide, flat, or cylindrical, or margins inrolled; plants of varying heights and habitats, if less than 30 cm tall, then of alpine habitats

2. Flowers borne singly (sometimes on very short pedicels in a loose cluster), a pair of bracteoles present on opposite sides of the base of each flower; leaf blades without sepal (subgenus Poiophylli)

3. Seeds in a capsule (Juncaceae 3: Juncaceae 3:).

3. Seeds not in a capsule (Juncaceae 3:).

4. Inflora arising laterally through what appears to be a slant in the cylindrical or compressed stem; leaf blades absent or present when present, cylindrical or compressed, sometimes corked

4. Inflorescence terminal; leaf blades basal, flat with face toward stem, sometimes involute or canaliculate

5. Flowers usually in heads or clusters, rarely single; bracteoles absent at the base of each flower (though one to several individual bracts may be present in a cluster); leaf blades with or without sepal (subgenus Juncus)

5. Leaf blades flat

6. Leaf blades ensiform (flat with edge towards stem, irises-like, with the free edges becoming fused upwards from the stem), with partial sepal

6. Leaf blades with face towards stem (grass-like), without sepal

7. Leaf blades with or without imperfect sepal; seeds ina capsule, plants 2-40 cm tall, of alpine tundra, cespitose, or rhizomatous and more frequently twisted

7. Leaf blades with sepal; seeds not in a capsule, merely apiculate; plants 3-100 cm tall, of various habitats, rhizomatous to at least some degree

KEY A: Perennial herb; bracteoles present; inflorescence bract erect and stem-like (section Juncotype)

1. Rhizomes long; stems scattered or in lines, in loose colonies; inflorescence generally with more than 5 flowers (except in some depauperate specimens); seeds not scaled; plants generally below subalpine

2. Blades well developed on some upper sheaths, more than 5 cm long, stem-like; culms and leaves often compressed and twisted

2. Blades 0 or poorly developed on any sheaths, less than 1 cm long, not stem-like; culms and leaves usually not much compressed, less frequently twisted

3. Rhizomes short; stems cespitose, in dense tusfs like bunched grass; inflorescence typically with 1-4(7) flowers; seeds ina capsule, plants of subalpine to alpine habitats

3. Leaf blades absent (reduced to bristles only); capsule apex blunt to slightly retuse

3. Leaf blades present on at least some stems; capsule apex either acute or strongly retuse

4. Capsule apex strongly retuse; inflorescence bract reduced and scarious to leaf-like but scarcely exceeding the flowering head

4. Capsule apex acute; inflorescence bract exceeding the inflorescence by 2-4 cm

KEY B: Perennial herb; bracteoles present; inflorescence bracts flat and leaf-like (section Steirochloa)

1. Inflorescence congested, 2 cm long or less; tepals usually with brown stripes marginal to the central green stripe (with immature specimens, these stripes can be very light, but are often thickened or have a different texture than the central stripe); mature capsule, 2.5-3.5 cm long, with 3 chambers, the locular partitions almost to tip, apex retuse; anthers 0.3-0.5 mm long; above 7000 ft.; diverse habitats

1. Inflorescence open (only appearing congested when immature), 1.5-7 cm long; tepals more uniform in color; mature capsules, 3.4-7 mm long, with single chamber, the locular partitions separated except at base, apex obtuse to truncate; anther 0.1-1 mm long; diverse habitats, from low to high elevations

2. Capsules chestnut to dark brown; tepals with obtuse apices, shorter than the capsule

2. Capsules tan to light brown; tepals with acute to acuminate apices, slightly shorter to slightly longer than the capsule in length

3. Auricles stiff, thick-marginated, leathery to cartilaginous, shiny, often yellowish, apex rounded; tepals 4-6 mm long; anthers 0.6-1 mm long

3. Auricles not stiff, thin-marginated, dull, white or translucent, apex rounded to acuminate; tepals 3.3-4.4 mm long; anthers 0.1-0.6 mm long

4. Auricles 0.2-0.6 mm long, thicker and opaque below, thinner and more translucent above, apex generally rounded; bracteoles acuminate, sometimes bristle-tipped; stem with 2-6 strong ridges per side; anthers 0.4-0.6 mm long; plants often with pinkish bases

4. Auricles generally 1-8 mm long until late in season when generally broken or missing, more or less uniformly translucent

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apex generally acute to acuminate; bracteoles generally acute to blunt; stem with or without strong ridges per side; anthers 0.1-0.2 mm long; plants rarely with pinkish bases

**KEY C**: Perennial herb; bracteoles absent; leaves flat with face towards stem, crosswalls (septa) absent (section *Graminifolii*)
1  Perianth segments (tepals) 1.8-3.5 mm long; capsules nearly globose, 1.8-2.9 mm long; stamens 3; inflorescence heads 5-200 in number, with 2-10(20) flowers each; plants cespitose; cataphylls absent at base of culm; leaves to 5 mm wide.............*J. marginatus*  
1  Perianth segments (tepals) 4.5-6 mm long; capsules obovoid, 3.5-5 mm long; stamens 6; inflorescence heads 1-8(12), with 3-12 flowers each; plants from elongate rhizomes, cataphylls present on at least some culm bases; leaves to 3 mm wide...........*J. longistylus*

**KEY D**: Perennial herb; bracteoles absent; leaves channeled to terete, without or with only partial crosswalls (section *Stygiopsis*)
1  Plants rhizomatous; leaves inrolled or folded most of the way to the terete, septate tip, 1-2.5 mm wide in the middle; tepals dark brown to purplish, 4.5-7.5 mm long; inflorescence generally of more than one cluster.....................*J. castaneus*
1  Plants cespitose; leaves channeled to terete, 0.5 mm diameter in the middle, tepals pale to dark brown, 2.5-5.5 mm long; inflorescence a single terminal cluster of flowers
2  Inflorescence bract much longer than the inflorescence, on at least some of the culms; capsule with retuse apex ............*J. biglumis*
2  Inflorescence bract shorter than to almost equaling the inflorescence; capsule apex obtuse to sub-truncate.............*J. triglumis*

**KEY E**: Perennial herb; bracteoles absent; leaves terete, with or without partial crosswalls (section *Ozophyllum*)
1  Some to most mature heads in an inflorescence spheric to subspheric, with flowers spreading significantly below the horizontal (sometimes barely so in *Juncus acuminatus*); flowers greenish to tan colored, sometimes with reddish tinting
2  Plants cespitose, capsules broadly lanceoloid with a bluntly acute tip.........................................................*J. acuminatus*
2  Plants rhizomatous with tuberous nodes (sometimes not present on herbarium collections); capsules narrowly lanceoloid with a long-tapering apex
3  Plants low, 10-40 cm tall; leaves erect to ascending; auricles less than 1 mm long; perianth 3-4 mm long, tepals often reddish, inner tepals equal to or longer than the outer ones; cataphylls sometimes present; anthers 3 or 6....................*J. nodosus*
3  Plants taller, 40-100 cm tall; leaves divaricate, auricles 2-5 mm long; perianth 4-5 mm long, tepals rarely reddish, inner tepals shorter than the outer ones; cataphylls never present; anthers 6..........................*J. torreyi*

1  Most mature heads in an inflorescence hemispheric to obpyramidal (flowers in the mature heads mostly spreading or ascending to erect, few, if any, definitely reflexed), sometimes subspheric, but then flowers dark brown to blackish; flowers various colored
4  Inflorescence highly diffuse, 5-20 cm long, with 30-70(130) heads; capsule twice as long as tepals; stamens 3 .........*J. diffusissimus*
4  Inflorescence compact to moderately diffuse, 0.5-8 cm long, with 1-30(50) heads; capsule slightly shorter to exserted to 1.5 times the length of the tepals; stamens 6
5  Inflorescence of 5–30–(50) heads; tepals 1.8-3 mm long, apex obtuse to acuminate, green to brown
6  Stems decumbent to erect; inflorescence branches spreading, sometimes widely so; inner tepals acuminate ........*J. articulatus*
6  Stems erect; inflorescence branches ascending to erect; inner tepals obtuse ...........................................*J. alpinaarticulatus*
5  Inflorescence of 1–11 heads; tepals 2.5-6 mm long, apex acuminate mucronate, dark brown to almost black
7  Inflorescence a single head (rarely a second one); tepals 2.3-4.9 mm long; anthers 0.25 times to equal the filament length; auricles 0.3-0.6(1.2) mm long; capsules abruptly narrowed to beak to truncate or even retuse; plants with densely branching rhizomes, tending to form loose identifiable clumps ....................................................*J. mertensianus*
7  Inflorescence with (1)2-10 heads; tepals 2.4-6.2 mm long; anthers 2 times times filament length; auricles 1.3-2.5 mm long; capsules more gradually to abruptly narrowed to beak; plants with long rhizomes, tending to express as individual stems in mixed turf composed of other graminoids..........................*J. nevadensis*

*Juncus acuminatus* Michaux [acuminate]. Plants perennial, cespitose; culms terete, 15-90 cm tall, 1-3 mm wide; leaf blades terete, separte, 1-40 cm long, 0.6-2.5 mm wide, auricles 0.4-2.5 mm; inflorescence terminal, composed of 3-25(50) hemispheric to spheric heads; heads 5-30(50) flowered, 6-10 mm diam; flowers without bracteoles, tepals 3-4 mm long, lanceolate with acuminate apices, green to straw, often red-tipped; stamens 3(6), the anthers much shorter than filament length; capsules 3-4 mm long, narrowly ovoid, shorter than to nearly equaling the tepals; apices acute to rounded; seeds 0.4 mm long, not tailed; section *Ozophyllum*, Key E. ♦Streambanks, lakeshores, wet meadows; 5120-5610 (8200) ft; found primarily in the Bootheel region. ♦Similar species: *Juncus articulatus* has smaller, fewer-flowered obconic heads with exerted cataphylls; *Juncus torreyi* and *J. nosophus* both have long-acuminate tepal apices, subulate capsule apices, flowers that spread equally in all directions, and are strongly rhizomatous.

*Juncus alpinoarticulatus* Chaix [alpine-segmented] [*Juncus alpinus* Villars]. Plants perennial, rhizomatous; culms terete, 5-50 cm tall, 1-3 mm wide; leaf blades terete, separte, 1.5-12 cm long, 0.5-1.1 wide, auricles 0.5-1.2 mm long; inflorescence terminal, composed of 5-25 obconic heads; heads 2-10-flowered, 2-6 mm diam; flowers without bracteoles, the tepals 1.8-3 mm long, lanceolate with an obtuse, mucronate apex, green or straw colored; stamens 6, the anthers ¼ of filament length; capsules 2.3-3.5 mm long, obovoid to ovoid, usually longer than the tepals; seeds 0.5-0.7 mm long, not tailed; section *Ozophyllum*, Key E. ♦Wet meadows and marshy lakeshores; 8250 ft; known only from Vermo Park Ranch in northern Colfax County. ♦Similar species: See discussion under *Juncus articulatus*.

*Juncus articulatus* Linnaeus [segmented]. Plants perennial, more or less cespitose; culms terete, (5)10-60 cm tall, 0.5-1.8 mm wide; leaf blades terete, separte, 3.5-20 cm long, 0.5-1.8 wide, auricles 0.5-1.1 mm; inflorescence terminal, composed of 3-20(50) obconic to hemispheric heads; heads 3-5(10)-flowered, 6(12) mm diam; flowers without bracteoles, tepals 1.8-3 mm long, ovate to lanceolate with broadly acute apices, green or reddish to dark brown; stamens 6, the anthers equal to filament length; capsules 2.8-4 mm long, narrowly ovoid, longer than the tepals, apices acute; seeds 0.4 mm long, not tailed; section *Ozophyllum*, Key E. ♦Wetlands, lake and stream margins, ditches, roadside swales; 5085-9515 ft; found primarily in northwestern counties. ♦Similar species: *Juncus alpinaarticulatus* tends to have fewer stems and a more upright branching pattern; it is restricted to higher elevations in the north, generally above the elevation range of *J. articulatus*. *Juncus acuminatus* has larger, many-flowered hemispheric to spheric heads with included capsules. *Juncus torreyi* and *J. nodosus* both have
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tepals with long-acuminate apices and capsules with subulate apices, flowers that spread equally in all directions, and are strongly rhizomatous.

**Juncus balticus** Willdenow [of the Baltic sea region]  
**BALTIC RUSH.** Plants perennial, stems arising singly or a few clumped from long stout rhizomes; culms terete to slightly compressed, rarely twisting, 20-100 cm tall, 0.6-4 mm wide; leaf blades and auricles bladdery, bladdelets straw to rich brown, the tips mucronate to awned; inflorescence appearing lateral, compact to open with many branches, with 3-100+ flowers; flowers individual or several close together, with bracteoles, tepals (2.5-15) 5-6 mm long, lanceolate with acuminate apex, straw to brown with green midvein; stamens 6, the anthers much longer than filament length; capsules (3) 4-6 mm long, ovoid, longer (rarely shorter) than the tepals; seeds 0.6-0.8 mm long, not tailed; section **Juncocytopus**, Key A. ●Wet meadows, stream banks and lakeshores, marshy areas, ditches, often in alkaline areas, tolerating soils that dry out seasonally; 4000-12,530 ft; throughout the state, more common in the north. ●Our plants belong to subsp. **ater** (Rydberg) Snooperup [matt-black] **Juncus articus** Willdenow var. montanus (Engelman) Welsh, **Juncus ater** Rydberg, **Juncus balticus** of NM reports, **Juncus balticus** Willdenow var. montanus Engelman. Similar species: **Juncus mexicanus** develops a blade on the uppermost sheath on one or more culms in a bunch, and has culms more frequently compressed or twisted. §

**Juncus biglumis** Linnaeus [2-glumed]. Plants perennial, loosely cespitose from short rhizomes; culms sub-terete, 2.5-16 cm tall, exceeding leaf lengths; leaves basal, leaf blades nearly terete, imperfectly seaptate, 2-4(8) cm long, 0.5-1.5 mm wide, auricles absent to 0.5 mm long; inflorescence terminal, composed of 1 upright cluster; 1-2(4) flowered, primary bract upright, and longer to much longer than the inflorescence; flowers without bracteoles, tepals 2.5-4 mm long, oblong with obtuse tip, brown to blackish; stamens 6, the anthers much shorter than to equal to filament length; capsules 4.5-5.5 mm long, longer than the tepals, pale with dark margins, narrow ovoid with retuse and apiculate apex; seeds tailed, body 0.7-0.9 mm long, tails short; section **Stygiopsis**, Key D. ●Wet soil or gravel in alpine tundra, slopes, stream sides, mossy pond margins; 12,530 ft; known from one collection in Vermejo Park Ranch in northern Taos County. ●Similar species: **Juncus triglumis** shares a similar habit and habitat, and differs primarily in the characters given in the key; the coloration of the tepals and capsules is also darker in **Juncus biglumis**.

**Juncus bufonius** Linnaeus [toad-like, as to habitat]  
**TOAD RUSH.** Plants annual, cespitose with fibrous roots, single to many-stemmed; culms terete, 2-30 cm tall, 0.2-1.2 mm wide; leaf blades flat with face toward culm to involute, 3-13 cm long, 0.3-1.1 mm wide, the auricles truncate to rounded or absent; inflorescence loose and diffuse or less often compact, usually at least ⅔ total height of plant, with flowers single and usually widely spaced along the axis; flowers 1-20, with 2 scarious bracteoles, tepals 2.4-7(8.5) mm long, the outer slightly longer than the inner or equal, lanceolate with acuminate apex, green to straw; stamens usually 6, sometimes 3, the anthers shorter than to equal to filament length; capsules (2.7) 3.2-4.2 mm long, elliptoid, shorter than the outer tepals; seeds 0.3-0.5 mm long, not tailed; section **Tenogisia**. ●Receding pond and lake margins, streambanks, moist soil in washes, ditches, and roadsides, usually in open and sunny sites; 3900-9130 ft; widespread in the northern and western parts of the state. ●Similar species: Robust specimens might be confused with **Juncus interior**, but the inflorescences of **J. bufonius** start lower on the culm, and generally extend for close to half the height of the plant. §

**Juncus castaneus** Smith [chestnut-colored]. Plants perennial, with solitary culms from long rhizomes; rhizomes 1-1.4 mm thick; culms terete to somewhat flattened, 9-40 cm tall, 1-2 mm wide, slightly exceeding leaf lengths; leaf blades channelled, imperfectly seaptate, 5-20 cm long, 1-2 mm wide, the auricles absent on distal leaves; inflorescence terminal, composed of 1-3(5) upright clusters; clusters 2-10-flowered, the primary bract basally inflated, upright, and longer than the inflorescence; flowers without bracteoles, tepals 4.5-6.6 mm long, lanceolate with acute to obtuse tip, chestnut brown to occasionally paler; stamens 6, the anthers much shorter than the filament length; capsules 6.5-8.5 mm long, longer than the tepals, chestnut to dark brown, narrowly oblong with acute to long-tapering apex; seeds tailed, body 0.6-0.7 mm long, the tails 0.8-1.1 mm long; section **Stygiopsis**, Key D. ●Wet soil in subalpine to alpine tundra, stream sides, and bogs; 10500-12540 ft; found at high elevations only in the Sangre de Cristo Mountains. ●Similar species: **Juncus castaneus** is not likely to be confused with other high elevation rushes.

*Juncus compressus* Jacquin [flattened]. Plants perennial, cespitose; culms slightly compressed, 10-40(80) cm tall, 0.5-1.2 mm wide; leaf blades flat with face towards culm to canaliculate, 5-15(35) cm long, 0.6-2 mm wide, the auricles 0.3-0.5 mm long, scarious to membranous, the basal sheaths green to light brown; inflorescence terminal, composed of 5-60 flowers in a compact and congested cyme with 1-2 primary branches, the proximal bract usually exceeding the inflorescence; flowers with bracteoles, the tepals 1.7-2.7 mm long, ovate to oblange with obtuse apex, with pale brown midvein bordered by darker brown bands and membranous margins; stamens 6, the anthers slightly to much longer than filament length; capsules 2.5-3.5 mm long, broadly ellipsoid to obovate with obtuse to truncate tip with macro, longer than the tepals; seeds 0.3-0.6 mm long, not tailed; section **Steriochloa**, Key B. ●Disturbed soils, ditch banks, roadsides; 5930 ft; native to Europe, and widely naturalized in the US; known in NM from one collection in San Juan County. ●Similar species: The short tepals with an obtuse apex and exerted capsules distinguished this introduced species from others in its section: **Juncus confusus**, **J. dudleyi**, **J. interior**, and **J. tenius**.

**Juncus confusus** Coville [pressed]. Plants perennial, cespitose; culms terete, 30-50 cm tall, 0.5-1.2 mm wide; leaf blades flat with face towards culm to involute, 5-15 cm long, 0.4-1.3 mm wide, auricles 0.2-0.7 mm long, bas al sheaths green to light brown; inflorescence terminal, composed of 3-15 flowers in a compact and congested cyme with 1-2 primary branches, the proximal bract usually exceeding the inflorescence, sometimes upright and superificially resembling a continuation of the stem; flowers with bracteoles, the tepals 3.4-5.5 mm long, lanceolate with acute tip, with deep brown midvein bordered by green to blackish bands and membranous margins; stamens 6, the anthers shorter than filament length; capsule 2.5-3.5 mm long, subglobose to broadly obovoid with strongly retuse tip, shorter than the tepals; seeds 0.4-0.5 mm long, not tailed; section **Steriochloa**, Key B. ●Moist, grassy meadows and streambanks; 8900-10,500 ft; northern mountain ranges. ●Similar species: See discussion under **J. interior**.

*Juncus diffusissimus* Buckley [very open]. Plants perennial, cespitose; culms terete, 25-65 cm tall, 1-3 mm wide; leaf blades terete to compressed, seaptate, 3-20 cm long, 1-2.4 mm wide, auricles 1-2.1 mm long; inflorescence terminal, composed of 30-70(130) hemispheric to obconic heads; heads (1)2-10-flowered, 5-10 mm diam; flowers without bracteoles, the tepals (1.8)2.3-3.2 mm long, the outer longer than the inner, lanceolate with acute apex, green to
straw; stamens 3, the anthers ½ to ⅓ the filament length; capsules 4-5.2 mm long, elongate-lanceolate, strongly exserted; seeds 0.3-0.4 mm long, not tailed; section *Oxyphyllum*, Key E.  ●Marshy shores, sloughs, ditches, in mucky substrates; 5560 ft; known from an irrigation ditch near Farmington, possibly a waif; native eastward in the United States.  ●Similar species: None, no other terete-leaved species has an inflorescence with this many small, diffuse heads.

**Juncus drummondii** E. Meyer  [for Thomas Drummond (1793-1835), Scottish explorer and botanist]. Plants perennial, cespitose; culms terete, 5-30 cm tall, 0.5-1 mm wide, the auricles 0.2-0.4 mm long, yellowish, leafy to cartilaginous throughout with thick rim, the basal sheaths green to tan, rarely pinkish tinged when plant is green; inflorescence terminal, composed of (5)10-80 flowers in a compact to open cyme with up to 5 primary branches, the proximal bract usually exceeding the inflorescence, sometimes upright and superficially resembling a continuation of the stem; flowers with bracteoles (rarely awn-tipped), the tepals 4-6 mm long, lanceolate with acuminate tip, chestnut brown with dull green midstripe; stamens 6, the anthers longer than filament length; capsules 4.5-7 mm long, narrowly oblong with a blunt to retuse tip, slightly shorter to longer than the tepals; seeds 0.5-0.6 mm long, with tails; section *Juncotypus*, Key A.  ●Wet and dry meadows, ponds, talus slopes, and ridges in subalpine and alpine habitats; 10,000-13,000 ft; primarily in the Sangre de Cristo Mountains.  ●Similar species: *Juncus parryi* differs in usually having leaf blades present on a number of stems in a clump and capsules with acute tips, but shares the clumping habit and lateral inflorescence.  *Juncus hallii* differs in having leaf blades present and an inflorescence bract that is often reduced and scarious, or if the bract is longer and more leaf-like, it is less like a rigid extension of the culm.  §

**Juncus dudleyi** Wiegand  [for William Russell Dudley (1849-1911), California botanist] DUDLEY’S RUSH [*Juncus tenuis* Willdenow var. *dudleyi* (Wiegand) F.J. Hermann]. Plants perennial, cespitose; culms terete, 20-60 cm tall, 0.5-2.4 mm wide; leaf blades flat with face towards culm to involute, 5-30 cm long, 0.5-1 mm wide, the auricles 0.2-0.4 mm long, leafy, leafy to cartilaginous throughout with thick rim, the basal sheaths green to tan, rarely pinkish tinged when plant is green; inflorescence terminal, composed of (5)10-80 flowers in a compact to open cyme with up to 5 primary branches, the proximal bract usually exceeding the inflorescence, sometimes upright and superficially resembling a continuation of the stem; flowers with bracteoles (rarely awn-tipped), the tepals 4-6 mm long, lanceolate with acuminate tip, chestnut brown with dull green midstripe; stamens 6, the anthers shorter than to subequal to filament length; capsules 2.2-4.2 mm long, ellipsoid with obtuse to truncate tip with muro, shorter than the tepals; seeds 0.4-0.65 mm long, not tailed; section *Steriochloa*, Key B.  ●Moist areas along stream banks, ditches, and around springs, in either exposed or shady sites, 4900-9040 ft; throughout the state with the exception of the eastern plains.  ●Similar species: See discussion under *Juncus interior*.

**Juncus hallii** Engelmann  [for Eliza Hall (1822-1882), plant collector]. Plants perennial, densely cespitose; culms terete, 20-40 cm tall, 0.8-1 mm wide; leaf blades terete to channeled below, 4-15 cm long, 0.5-1 mm wide, the basal sheaths brown, auricles 0.2 mm long; inflorescence terminal, compact cymose with 2-7 flowers, inflorescence bract reduced and scarious to leaf-like and longer than the inflorescence; flowers individual or several close together, with bracteoles, the tepals 4-5.5 mm long, lanceolate with acuminate tip, light brown with green midstripe; stamens 6, the anthers equal to or slightly longer than filament length; capsules 3.5-5 mm long, oblong-ovoid with a retuse tip, equal to or longer than the tepals; seeds 0.5 mm long, with tails; section *Juncotypus*, Key A.  ●Wet and dry meadows, ponds, streambanks, and rocky slopes, in high montane and alpine habitats; 7952-12,500 ft; infrequent in the northern mountains.  ●Similar species: While most closely related to *Juncus drummondii* and *Juncus parryi*, which have longer tepals and capsules, *Juncus hallii* might be more readily mistaken for *Juncus confusus* of Section *Steirochloa*. They are of similar stature, both have bracteoles and retuse capsules, and the narrow flat leaves of *Juncus confusus* could be mistaken for the channeled leaves of *Juncus hallii*; the tepal striping of *Juncus confusus*, however, is darker and its seeds are not tailed.

**Juncus interior** Wiegand  [for its range in the central United States] INTERIOR RUSH [*Juncus arizonicus* Wiegand, *Juncus interior* Wiegand var. *arizonicus* (Wiegand) F.J. Hermann, *Juncus neomexicanus* Wiegand]. Plants perennial, cespitose; culms terete, 20-60 cm tall, 0.5-3.2 mm wide; leaf blades flat with face towards culm to involute, 5-15(30) cm long, 0.3-1.1 mm wide, the auricles 0.2-0.6 mm long, thickened basally but scarious margined, the basal sheaths often pinkish tinged when plant is green; inflorescence terminal, composed of (5)10-30(50) flowers in a compact to open cyme with 1-2 primary branches, the proximal bract usually exceeding the inflorescence, sometimes upright and superficially resembling a continuation of the stem; flowers with bracteoles (often awn-tipped), the tepals 3-3.8(4.4) mm long, lanceolate with acuminate tip, broad greenish midvein bordered by stramineous-brown bands and membranous margins; stamens 6, the anthers shorter than to subequal to filament length; capsules 2.4-4(4.7) mm long, ellipsoid to subglobose with obtuse to truncate tip with muro, shorter than the tepals; seeds 0.4-0.6 mm long, not tailed; section *Steriochloa*, Key B.  ●Moist areas along stream banks, ditches, and around springs, in either exposed or shady sites; 4500-10,800 ft; throughout the state with the exception of the eastern plains.  ●Similar species: See discussion under *Juncus interior*.

**Juncus parryi** E. Meyer  [for Thomas Drummond (1793-1835), Scottish explorer and botanist] . Plants perennial, cespitose; culms terete to slightly flattened, 8-40 cm tall, 0.8-1 mm wide; leaf blades lacking (rarely present on distal sheath), the basal sheaths light brown, the tips mucronate to awned; inflorescence lateral and near the tip, loosely compact with (12-35) flowers; flowers individual or several close together, with bracteoles, the tepals 4-7.8 mm long, lanceolate with acuminate tip, chestnut brown with dull green midstripe; stamens 6, the anthers longer than filament length; capsules 4.5-7 mm long, narrowly oblong with a blunt to retuse tip, slightly shorter to longer than the tepals; seeds 0.5-0.6 mm long, with tails; section *Juncotypus*, Key A.  ●Wet and dry meadows, ponds, talus slopes, and ridges in subalpine and alpine habitats; 10,000-13,000 ft; primarily in the Sangre de Cristo Mountains.  ●Similar species: *Juncus parryi* differs in usually having leaf blades present on a number of stems in a clump and capsules with acute tips, but shares the clumping habit and lateral inflorescence.  *Juncus hallii* differs in having leaf blades present and an inflorescence bract that is often reduced and scarious, or if the bract is longer and more leaf-like, it is less like a rigid extension of the culm.  §

**Juncus articulatus** Keys  [for its range in the central United States] INTERIOR RUSH [*Juncus articulatus* Keys]. Plants perennial, cespitose; culms terete, 20-60 cm tall, 0.5-2.2 mm wide; leaf blades flat with face toward culm, up to 30 cm long, 1.3 mm wide, the auricles 1.2-5 mm long; inflorescence terminal, composed of 1-8(12) obconic heads on 1-2 short primary branches; heads 3-10(15) flowered, 6-20 mm diam; flowers without bracteoles, the tepals 5-6 mm long, lanceolate with acute to acuminate apex, and pale to deep green midvein with dark brown striping on both sides and scarious margins; stamens 6, the anthers longer than filament length;
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capsules 3-6.5 mm long, obovoid with apex bluntly rounded to slightly retuse, with a mucro up to 1.2 mm long, usually shorter than the tepals; seeds 0.4-0.6 mm long, not tailed; section Graminifolii, Key C. ● Wet mountain meadows, springs, and streambanks, at mid to higher elevations, in ponderosa pine to mixed conifer communities; 5000-10,800 ft; widespread in the mountains in the northern and western parts of NM. ● Similar species: Juncus longistylis is distinctive, but has been confused with J. saximontanus and J. nevadensis, which can also have few-flowered obovoid heads. However, both of these have discernable septa in their iris-like or terete leaf blades, while the blades of J. longistylis are flat with the face towards the stem, and without septa. §

Juncus marginatus Michaux [bordered] Juncus biflorus Elliott, Juncus marginatus var. biflorus (Elliott) Alph. Wood, Juncus marginatus Rostkiovius var. setosus Coville, Juncus setosus (Coville) Small. Plants perennial, cespitose from short, knotty rhizomes; culms slightly compressed, 30-80(130) cm tall, 1-3 mm wide; leaf blades flat with face toward culm, 10-20(45) cm long, 1.5-5 mm wide; the auricles 0.2-1(3) mm long; inflorescence terminal, usually diffuse and wide spreading, occasionally compact, composed of 10-20(200) small hemispheric heads; heads (1)(3)-9(20)-flowered, 3-8 mm wide; flowers without bracteoles, the tepals (1.5)(2)-3(3.2) mm long, broadly ovate-lanceolate with obtuse to acute apex, tan to brown with green midstripe, the inner tepals longer than the outer; stamens 3, the anthers shorter than or equal to the filament length; capsules (1.8)-2.5(2.9) mm long, obovate to nearly globose, shorter than to nearly equaling the tepals; seeds 0.3-0.4(0.6) mm long, not tailed; section Graminifoli, Key C. ● Moist areas along stream banks, ponds, and in seasonally dry washes, at lower to mid elevations in desert scrub or chaparral to oak woodland communities; 5000-5600 ft; known from the Peloncillo Mountains in the Bootheel region. ● Similar species: The inflorescence may look superficially like the open form of Juncus saximontanus, but the leaves are definitive.

Juncus mertensianus Rostkiovius [for Karl Heinrich Mertens (1796-1830), German botanist]. Plants perennial, loosely to densely clumping from rhizomes with short internodes up to 2 cm long; rhizomes 1.2-2 mm thick; leaf blades terete, 0.5-3.5 cm tall, 0.6-1.4 mm wide, slightly exceeding leaf lengths; leaf blades terete, septate, 1.3-15 cm long, 0.3-1.2 mm wide, the auricles 0.2-0.6(1.2) mm long; inflorescence terminal, composed of (12) hemispheric to subsphерic heads; heads 12-60-flowered, 4.5-15 mm diam; flowers without bracteoles, the tepals 3.2-6 mm long, lanceolate to lance-ovate with acute tip and a subsulate macro, dark purplish-brown to black throughout; stamens 6, the anthers much shorter than or equal to filament length; capsules 2.2-2.6 mm long, much to slightly shorter than the tepals, chestnut brown, obovoid with rounded to retuse apex and mucro 0.4-0.7 mm long; seeds 0.4-0.5 mm long, not tailed; section Ozophyllum, Key E. ● Wet soil in alpine meadows, streambanks, springs; 8900-12,000 ft; found at high elevations in the mountains in the northern part of the state. ● Similar species: See discussion under Juncus nevadensis. §

Juncus mexicanus Willdenow ex Roemer & Schultes [of Mexico] MEXICAN RUSH [Juncus arcticus Willdenow var. mexicanus (Willdenow ex J.A. & J.H. Schultes) Baulev, Juncus balticus Willdenow var. mexicanus (Willdenow ex J.A. & J.H. Schultes) Kunte]. Plants perennial, stems arising singly or a few clumped from long stout rhizomes; culms slightly to greatly compressed, often twisted, 8-80 cm tall, 0.6-2 mm wide; leaf blades present on some stems in a population, terete to compressed; not septate, the auricles 0.1-5 mm long; the sheaths straw to rich brown; inflorescence lateral, compact to open with many branches, with 3-60+ flowers; flowers individual or several close together, with bracteoles, the tepals 3.5-5(5.5) mm long, lanceolate with acuminate apex, straw to brown with green midvein; stamens 6, the anthers much shorter than filament length; capsules 2.5-4.2(4.5) mm long, ovoid, shorter to longer than the seeds; seeds 0.6-0.8 mm long, not tailed; section Juncotypus, Key A. ● Wet meadows, stream banks and lakeshores, marshy areas, ditches, often in alkaline areas, tolerating soils that dry out seasonally; 3700-9950 ft; throughout the state, but less common than Juncus balticus. ● Similar species: Juncus balticus is always bladeless, often more robust, and with culms rarely compressed or twisted.

Juncus nevadensis S. Watson [from the Sierra Nevada] Juncus badius Suksdorf, Juncus mertensianus var. badius (Suksdorf) F.J. Hermann, Juncus nevadensis var. badius (Suksdorf) C.L. Hitchcock, Juncus trunca tus Rydberg]. Plants perennial with culms single to several clumped, often from longer rhizomes with internodes up to 3 cm long; rhizomes 0.7-1.8 mm thick; culms terete, 14-70 cm tall, 0.5-2 mm wide, nearly much exceeding most leaf lengths; leaf blades terete to flattened, septate, 1-20(30) cm long, 0.5-2.3 mm wide, the auricles 1-2.6(3.2) mm long; inflorescence terminal, 1-4(15) cm long, composed of 1-4(12) obconic to nearly globose heads with ascending branches; heads (3)(3)-60-flowered, 5-12 mm diam; flowers without bracteoles, the tepals 2.4-4 mm long, broadly lanceolate with acute to awned apex, straw to brown with green midvein; stamens 6, the anthers much shorter than filament length; capsules 2.5-4.2(4.5) mm long, ovoid, shorter to longer than the seeds; seeds 0.6-0.8 mm long, not tailed; section Ozophyllum, Key E. ● Wet soil along stream banks and lakeshores, montane meadows, springs, marshy areas, sometimes in standing water; 8000-10,200 ft. ● Similar species: Juncus nevadensis is most closely related to Juncus mertensianus; some authors have considered them synonymous, though Brooks & Clements (2000) and Kirschner (2002) retain both. The inflorescence of Juncus nevadensis is variable, ranging from single, subspherical, many-flowered heads to open panicles of few-flowered obovoid heads, while Juncus mertensianus always has single (or rarely two proximate) hemispheric to subspherical heads. Juncus nevadensis has long rhizomes with taller more isolated culms, compared to J. mertensianus which has short rhizomes with shorter, more bunched culms. Juncus nevadensis grows in wet montane meadows, usually in ponderosa pine to mixed conifer zones, while Juncus mertensianus grows in subalpine to alpine habitats. In the Southwest, the more prevalent form of Juncus nevadensis has 1-2 heads, though a continuous range of inflorescence types can be found.

Juncus nodosus Linnaeus [having many nodes]. Plants perennial, with stems single or few clumped together from long-creeping rhizomes, rhizomes 0.6-1(1.2) mm diam with occasional small tuber-like segments; culms terete, (4)13-35(70) cm tall, 0.7-2.2 mm wide; leaf blades terete to channelled above, septate; 5-16(30) cm long, 0.6-1.6 mm wide, the auricles 0.2-1.7 mm long; inflorescence terminal, composed of 3-9(15) more or less globose heads; heads (3)8-30-flowered, 5-10(12) mm diam; flowers without bracteoles, the tepals 2.4-3.5(4.1) mm long, lanceolate-subulate with acuminate apex, light to brown, often reddish tinged; stamens 3 or 6, the anthers ½ to equal to the filament length; capsules 3.2-4.2(5) mm long, lance-subulate, longer than the tepals; seeds 0.4-0.5 mm long, not tailed; section Ozophyllum, Key E. ● Stream banks and lakeshores, wet meadows, swamps, ditches, and open wetlands; 5640-9100 ft; found primarily in the northern counties. ● Similar species: Juncus nodosus is less common in NM, but can be confused with depauperate specimens of Juncus torreyi, its closest relative. Juncus nodosus is generally a smaller, less coarse plant, with tepals usually less than 4 mm long, while those of Juncus torreyi are more than 4 mm. The most striking difference is that due to the fewer flowered heads (6-30 flowers) of J. nodosus, they tend to look more “spiky” than those of Juncus torreyi (25-100 flowers), which are more uniformly spherical, even though the flowers and
throughout the western and central US that have been called 

Juncus torreyi  Engelmann  [for Charles Christopher Parry (1823-1890), botanist-surgeon]. Plants perennial, densely cespitose; culms terete, 5-30 cm tall, 0.5-1 mm wide; leaf blades terete to channelled below, 3-12 cm long, 0.5-1 mm wide, the basal sheaths tan to reddish brown or pinkish, the auricles 0.2-0.3 mm long; inflorescence lateral and in the upper ⅔ of the culm, loosely compact with 1-5(4) flowers; flowers individual or several close together, with bracteoles, the tepals 5.5-8 mm long, lanceolate with acuminate tip, light brown with green midstripe; stamens 6, the anthers longer than the filament length; capsules 6-9 mm long, narrowly oblong with an acute tip, usually longer than the tepals; seeds 0.6 mm long, with tails; section Juncotypus, Key A. ● Wet and dry meadows, talus slopes, and ridges, in alpine habitats; 10,800-12,600 ft; found only in the Sangre de Cristo Mountains. ● Similar species: See discussions under Juncus drummondii and J. hallii. §

Juncus saximontanus  A. Nelson  [from the Rocky Mountains] ROCKY MOUNTAIN RUSH [Juncus brunnescens Rydberg, Juncus ensifolius Wikström var. brunnescens (Rydberg) Cronquist, Juncus parvus Rydberg, Juncus tracyi Rydberg, Juncus xiphoides E. Meyer var. montanus Engelmann]. Plants perennial, with stems arising singularly or more frequently a few clumped from long-creeping rhizomes; rhizomes light-colored, 1.2-2 mm thick; culms compressed, 13-70 cm tall, 1.4-2.2 mm wide at the base; leaf blades Iris-like, folded lengthwise with the leaf edges toward the stem and fully connate (fused) above the auricles, 3-20 cm long, 1-6 mm wide, imperfectly sepa
tate; the sep	a oft visible externally in dried specimens, the auricles 0.4-0.6 mm long; inflorescence terminal, highly variable, from compact with few branches and few (2-5) many-flowered heads, to elongate with many branches and many (35+) few-flowered heads; heads 2-20-flowered, usually obconic to hemispheric but sometimes subshapherical; flowers without bracteoles, the tepals 2.7-3.6 mm long, lanceolate with acuminate apex, green to brown or slightly reddish-brown; stamens 6, the anthers shorter than filament length; capsules 2.4-4.3 mm long, oblong, with tip rounded to acute with mucro, about as long to slightly longer than the tepals; seeds 0.4-0.5(1) mm long, not tailed; section Jridofoli. ● Wet meadows, stream banks and lakeshores, marshy areas, ditches, and open wetlands; 4000-11,800 ft; widespread throughout the western & central portions of NM. ● Similar species: This is the only rush with Iris-like leaves in NM, but since the inflorescence is so variable, these plants have been misidentified as a number of other species. In Juncus saximontanus, the membranous sheath margins are also uniquely long tapering to minute or non-existent auricles that are located past the point where the leaf departs the culm. Juncus xiphoides, a closely related and more robust species with wider leaves, tepals that are often red-tipped, and more numerous heads in the inflorescence is found in AZ, but does not range east into NM. §

Juncus tenuis  Willdenow  [slender] [Juncus macer S.F. Gray]. Plants perennial, cespitose; culms terete, (10)15-55(80) cm tall, 0.3-1.6 mm wide; leaf blades flat with face toward the culm to involute, 3-30 cm long, 0.5-1.7 mm wide, the auricles 1.5-6 mm long, thin and membranous throughout, delicate and often broken, the basal sheaths green to tan, rarely pinkish tinged when plant is green; inflorescence terminal, composed of (5)15-45 flowers in a compact to open cyme with 2-5 primary branches, the proximal bract usually exceeding the inflorescence, sometimes upright or superficially resembling a continuation of the stem; flowers with bracteoles, the tepals 3.3-4.4 mm long, lanceolate with acuminate tip, with broad greenish midvein bordered by pale green bands and membranous margins; stamens 6, the anthers shorter than filament length; capsules 3-3.5(4.7) mm long, ellipsoid with rounded to obtuse tip with mucro, shorter than the tepals; seeds 0.3-0.5 mm long, not tailed; section Sterichloea, Key B. ● Moist areas along stream banks and around springs, in either exposed or shady sites; 7120-8000 ft; known from several collections in north-central NM. ● Similar species: See discussion under Juncus interior. Some florists have included both Juncus dudleyi and Juncus interior in a broadly defined Juncus tenuis, and consequently, there are many specimens throughout the western and central US that have been called J. tenuis. However, as currently accepted in a more narrow sense, Juncus tenuis is actually quite rare in the Southwest, and is definitively known from only a few widely scattered locations in NM. §

Juncus torreyi  Coville  [for John Torrey (1796-1873), American physician-botanist] TORREY’S RUSH [Juncus nodosus Linnaeus var. megacephalus Torrey]. Plants perennial, with stems single or few clumped together from long-creeping rhizomes, the rhizomes 1-2.5(3) mm diam, with occasional tuberous nodes; culms terete, (3)15-90(100) cm tall, 1-6(6) mm wide; leaf blades terete to channelled above, sepa
tate, 6-50 cm long, (0.5)1-2.2(4) mm wide, the auricles (1)2-4.2(5) mm long; inflorescence terminal, composed of (1)2-12(20) more or less globose heads; heads 25-100-flowered, (8)10-15 mm diam; flowers without bracteoles, the tepals 4-5 mm long, lanceolate-subulate with acuminate apex, green to light brown, often reddish toward the tip; stamens 6, the anthers ½ of filament length or less; capsules 4-5.1(5.7) mm long, lance-subulate, equal to or longer than the tepals; seeds 0.4-0.5 mm long, not tailed; section Ocephylhum, Key E. ● Stream banks and lakeshores, wet meadows, swamps, ditches, and open wetlands, tolerates alkaline conditions well; 3500-8730 ft; widespread throughout the state, except in the southeast counties. ● Similar species: See discussion under Juncus nodosus. In the Bootheel region, Juncus torreyi might be confused with Juncus acuminatus, which has the same terete, sepa
tate leaves, and globose clusters in the inflorescence. However, Juncus acuminatus is clump-forming, not rhizomatous as is Juncus torreyi, and it has capsules with an acute apex, not subulate as in Juncus torreyi. §

Juncus triglumis  Linnaeus  [3-glummed]. Plants perennial, loosely to densely cespitose from short rhizomes; culms sub-terete, 3-20(30) cm tall, 0.3-0.8 mm wide, exceeding leaf lengths; leaf blades nearly terete, not sepa
tate, 3-4 cm long, 0.3-1 mm wide; the auricles to 1 mm long; inflorescence terminal, composed of 1 upright cluster; 2-4(5)-flowered, 4-9 mm diam, the primary bract equal to or slightly shorter than the inflorescence; flowers without bracteoles, the tepals 3.5-5 mm long, pale brown or darker, oblong-lanceolate; stamens 6, the anthers much shorter than filament length; capsules (4)4.5-5.6 mm long, equal to or longer than the tepals, dark brown, ellipsoid with subobtuse, mucronate tip; seeds tailed, the body 0.5-1 mm, the tails 0.6-1 mm long; section Stygiopis, Key D. ● Wet gravel soils in alpine tundra, mossy pond margins and bogs; 10,300-12,540 ft; known from the Sangre de Cristo Mountains in northern NM. ● Similar species: See discussion under Juncus biglumis. Two varieties are not considered separate, but rather seem to be an expression of a single variety with habitat or range distinction that would help confirm their validity.

a Tepals blackish to pale brown; capsule exerted, usually longer than 4.5 mm… var. triglumis

a Tepals pale brown to straw; capsule scarcely exerted, usually 4-4.5 mm long… var. albensens (Lange) Hulten [whitish] [Juncus albensens (Lange) Fernald].

Luzula [shining] WOODRUSH [3].

Plants grass-like, perennial (our species), densely cespitose from short rhizomes or less commonly with short stolons; culms round in cross section, solid, without nodes, leafy or not; leaves spirally arranged, clustered at base or alternating and reduced up the culm, the blades linear to lanceolate, flat with face towards the culm (grass-like), never separte, sparsely to densely ciliate on the margins, the
Monocotyledonous Plants - Juncaginaceae

sheaths closed, without auricles, cataphylls (bladeless basal sheaths) absent; inflorescence terminal, cymose, paniculate, diffuse to strongly congested, sometimes with one to many racemose or paniculate clusters (glomerules), the branches, clusters, and individual flowers with bracts; primary inflorescence bracts shorter than the racemes, or sometimes reduced to a scale; flowers perfect, with a perianth of 6 tepals, persistent at fruiting, with 1 bract at the pedicel base and 2 additional sub-entire to fringed bracteoles immediately subtending the tepals; stamens 6 in all of our species; ovary superior, with 1 style and 3 sub-erect stigma branches; fruit a capsule, globose to ovoid-trigonal, with a beak formed by persistent style base, one per flower, uni-local, containing 3 seeds; seeds globose to ovoid, sometimes with slender appendages (tails) at one or both ends, the base often with a tuft of fibrous hairs. ▲About 115 species worldwide, but rare in the tropics, about 23 species in North America.

- With about 12 species, widespread in temperate regions of the world.

1 Flowers borne singly or several together on long, slender branch tips in an open, drooping panicle; leaves 3-13 mm wide, sparsely hairy on the lower margins .............................................................. L. parviflora

2 Flowers borne in congested spikes, each with 5-20 sessile or nearly sessile flowers; leaves 1-6 mm wide, obviously hairy along the lower margins

2 Spikes tightly clustered into a single irregularly continuous inflorescence, usually nodding at maturity; leaves 1-4 mm wide; plants of subalpine forests to alpine tundra .......................................................... L. comosa

1 Flowers borne in congested spikes, each with 5-20 sessile or nearly sessile flowers; leaves 1-6 mm wide, obviously hairy along the lower margins

2 Spikes widely separated on ascending, unequal, stiff peduncles, culm strictly upright below inflorescence; leaves 3-6 mm wide; plants of mountain forests and meadows (var. laxa) .......................................................... L. comosa

Luzula parviflora (Ehhrhart) Desvaux [small-flowered] SMALL-FLOWEERED WOODRUSH [Luzuncus parviflorus (Ehhrhart) Coville, Juncus parviflorus Ehhrhart]. Plants perennial, cespitose; culms terete, (8)30-70(100) cm tall, 1-3 mm wide; leaf blades flat, predominantly glabrous with long hairs at the throat and long soft margins, 7-11 cm long, 3.5-5 mm wide, the apex obtuse, the callous thickened; inflorescence a terminal diffuse panicule, composed of 1(4) subsessile and 2-6 pedunculate cylindrical clusters of flowers, the branches stiffly ascending to spreading, of varying lengths; clusters 5-12-flowered with some basal flowers slightly more remote; floral bracteoles clear, with ciliate margins distally, tepals (3.3)3.5-4 mm long, lanceolate with acute to acuminate apex, tan to pale brown; stamens 6, the anthers longer than the filament length; capsules up to 2.5-3 mm long, oblong ovoid to globose, subequal to the tepals; seeds 1.1-1.3 mm long.

Meadows, open woods, and coniferous forests; 8000-10,300 ft; infrequent in the Sangre de Cristo and Jemez mountains with one outlying record from the Black Range. ▲Our plants belong to var. laxa Buchenau [wide or loose] [Luncoceus intermedeum of NM reports, Luzula intermedia of NM reports], with peduncled flower clusters and slightly longer styles and anthers than the more western var. comosa.

Luzula spicata (Linnaeus) Kunth, Juncus spicatus Linnaeus. Plants perennial, single or several-stemmed to densely cespitose; culms terete, (3)5-7(33) cm tall, 0.5-1 mm wide; basal leaf blades flat to somewhat channeled, predominantly glabrous with dense hairs at the throat and sparse hairs along the lower margins, 2-15 cm long, 0.4-4 mm wide, the apex blunt to acute, not thickened; inflorescence a terminal condensed spike-like panicle, often nodding at maturity, composed of 3-12 overlapping floral clusters on short branches; clusters 3-20-flowered; floral bracteoles clear with ciliate margins that disintegrate into tangled woolly hairs, the tepals 2.3-3 mm long, broadly lanceolate, apex acute to acuminate, the inner shorter and narrower than the outer, clear to dark brown the apices awned; stamens 6, the anthers ½ to 3/4 mm long; capsules up to 1.3-2 mm long, globose, shorter than the tepals; seeds 0.8-1 mm long.

Alpine tundra and scree slopes to subalpine forests; 9842-13,160 ft; found only at high elevations in the Sangre de Cristo Mountains.

JUNCAGINACEAE ARROW-GRASS FAMILY [1/2/2]

Annual to perennial, semi-aquatic herbs, with rhizomes, evident stems absent; leaves alternate and basal, simple, with a prominent ligule, the sheaths persisting, stipules absent; inflorescence a terminal scapose spike or spike-like raceme, lacking a spathe; flowers small, actinomorphic, perfect or unisexual (monoeccious); perianth of 6 distinct tepals; stamens 4, 6; pistils 1, 3, or 6, weakly connate, superior; fruits of nutlets or schizocarps. ▲A saline marshy habitats.


Triglochin [3-pointed] ARROW-GRASS

Perennial herbs, with stout rhizomes; leaves erect and terete, the ligule apically entire or 2-lobed; racemes spike-like, longer or shorter than the leaves; flowers bisexual, short-pedicellate, the tepals yellow-green; anthers nearly sessile; pistils separating at maturity. ▲With about 12 species, widespread in temperate regions of the world.

Triglochin maritima Linnaeus [by the sea] [Triglochin concinna Davy, Triglochin concinna Davy var. debilis (Jones) J.T. Howard], Perennial, 30-60 cm tall; leaves mostly shorter than the scape, the sheaths 1-3 cm long, the blades 2-12 cm long, the ligules entire to apically 2-lobed; racemes 6-40 cm long; tepals 1-2 mm long, apically 2-3 mm wide; pistils 6, all fertile; flowering receptacles without wings; schizocarps 2-5 mm long. ▲Marshy meadows and edges of ponds, mostly in the mountains. ▲Small plants with 2-lobed ligules have been segregated as Triglochin concinna, but these features vary indiscriminately

Triglochin palustris Linnaeus.
though the entire range of the species. §

*Triglochin palustris* Linnaeus [in marshes]. Perennial, 10-42 cm tall; leaves mostly shorter than the scape, the sheaths 3-5 cm long, the blades 6-25 cm long, the ligules unlobed; racemes 5-20 cm long; tepals 1-1.6 mm long; pistils 6, 3 fertile and 3 sterile; fruiting receptacles winged; schizocarps 7-8 mm long. ● Marshy meadows and edges of ponds, mostly in the mountains.
Monocotyledonous Plants - Juncaginaceae

Bluewater Creek
Zuni Mts.
Sept. 8
Juncus longistylii

flowers brown to black, in crowded heads, one, or rarely two, to a stem

scalea dark red-brown

Each flower grows from the axial of a bract; capsule (ovary) shorter than tepals

Puerto Nambe ridge
Pecos Baldy 10,300'
Santa Fe Co.
July 17
Juncus mertensianus

Juncus parryi

Juncus saximontanus

Navajo Lake S.P.
Aug. 9
Perennial herbs, commonly from bulbs or rhizomes in some; leaves alternate or whorled, simple, entire, parallel-veined but some reticulate-veined between the main veins, often with a sheathing base; stipules lacking; flowers often showy, actinomorphic (rarely zygomorphic), often solitary, or borne in a terminal raceme or umbel; perianth of 6 petaloid tepals; stamens 6; pistil single, superior, of 3 united carpels, the style single; fruit a capsule. A large worldwide family of 600-700 species, mainly in temperate regions of the Northern Hemisphere. *Lilium* and *Tulipa* are important ornamental plants. This family was traditionally very large, but polyphyletic. A stylized lily, the *fleur-de-lis*, has been used for coats-of-arms, royalty, architecture, military and sports symbols, and Scouting. The family has been restructured to include only monophyletic elements, yielding numerous segregate families.

1 Petals and sepals clearly differentiated from each other................................................................................................. *Calochortus*
2 Petals and sepals similar in size, texture, and color, not clearly differentiated
3 Flowers borne in the axils of the leaves.......................................................................................................................... *Streptopus*
4 Flowers borne at the stem tips
5 Flowers purple-brown, pendent......................................................................................................................................... *Fritillaria*
6 Flowers white, erect......................................................................................................................................................... *Gagea*
7 Flowers whitish or orange-red
8 Leaves whorled at the upper nodes, alternate below, lanceolate; flowers orange-red....................................................... *Lilium*
9 Leaves alternate throughout, lanceolate to ovate; flowers whitish or yellowish............................................................... *Prosartes*
Monocotyledonous Plants - Liliaceae

Calochortus [beautiful herb] MARIPOSA-LILY [5].

Perennial herbs, sometimes bulbous; stems scapose or leafy, simple or branched, glabrous; leaves basal or cauline; inflorescences 1-many-flowered, bracteate; sepals 3, distinct, somewhat petaloid but clearly different from the petals; petals 3, distinct, longer and broader than the sepals, usually variously hairy axially, with an adaxial gland near the base; stigmas 3; fruit a capsule, with many seeds. About 70 species of western North America to Central America. The name, mariposa, is the Spanish word for butterfly.


1 Stems decumbent to weakly erect, usually contorted, often twining among other plants or straggling along ground, branched; petals white with lilac tinge to purplish; petals short, and thick; or petals glabrous; glands not (or only slightly) depressed

- 1 Stems erect, straight, unbranched; petals white, purplish, or yellow; petals usually elongate, simple or branched; glands depressed

2 Glands elongate transversely, either narrow or broad; petal hairs with the tips enlarged or branched and glandular

3 Glands broad, lunate to orbiculate; petal hairs with the tips expanded to slightly lobed; petals pinkish to bluish-gray; anther tips usually obtuse (rarely acute)

- 4 Stems not branching or twining, 10-30 cm long; inflorescences 1-4-flowered; flowers pinkish to bluish gray; sepals shorter than to equaling the petals; petals white, pinkish, to purplish, with hairs near the base that are yellowish, distally enlarged, and gland-tipped; glands round to lunate, surrounded by a deeply fringed membrane; capsules 3-5 cm long. Rocky open slopes and hills in the western region.

- Calochortus ambiguus (M.E. Jones) M. Øvremo [uncertain or doubtful] [Calochortus watsonii M.E. Jones var. ambiguus M.E. Jones]. Plants often bulbous, 10-60 cm tall; stems straight, usually branching; leaves linear-attenuate, 10-20 cm long; inflorescences 1-4-flowered; flowers pinkish to bluish grey; sepals shorter than equaling the petals; petals white, pinkish, to purplish, with hairs near the base that are yellowish, distally enlarged, and gland-tipped; capsules 2-5 cm long.

- Dry sandy or clayey sites in the northwest region.

- Calochortus flexuosus S. Watson [curved, zig-zag]. Plants rarely bulbous; stems twining or straggling over the ground or adjacent plants, 10-20 cm long: leaves 5-10 cm long, linear; inflorescences 1-4-flowered; flowers whitish to pale lavender; sepals 2-3 cm long, lanceolate-ovate; petals 3-4 cm long, white with a lilac-tinge to pale purplish, with white, yellow, and brownish bands proximally; glands lunate, densely short-hairy; capsules 2-5 cm long. Rocky open slopes, rocky mesas and flats, western regions.

- Calochortus aureus S. Watson [golden] [Calochortus nuttallii Torrey & Gray var. aureus (S. Watson) M. Øvremo]. Plants usually bulbous; stems usually not branching or twining or straggling, 10-30 cm tall; leaves 10-20 cm long, linear; inflorescences 1-4-flowered; flowers lemon-yellow; sepals 1-4 cm long, broadly lanceolate; petals 3-3.5 cm long, yellow, with a maroon blotch distal to the gland; glands round, surrounded by conspicuously fringed membranes, densely hairy; capsules 2-5 cm long. Dry sandy or clayey sites in the northwest region.

- Dry sandy or clayey sites in the northwest region.

- Calochortus nuttallii S. Watson [for John Williams Gunnison (1812-1853), American military officer and explorer]. Plants usually bulbous; stems straight, not branching, 20-50 cm tall; leaves linear, 20-30 cm long; inflorescences 1-3-flowered; flowers white, purple, or yellow; sepals lanceolate, 2-3 cm long, shorter than the petals; petals obovate, 3-4 cm long, with a band of many long branching yellow hairs, then a squarish band of short thick hairs; glands densely covered with branching hairs; capsules 3-6 cm long.

- Dry to moist slopes in the mountains and foothills.

- There are two varieties:

  a Petals white or purple... var. gunnisonii. Widespread in the mountains of the state.

  b Petals pale yellow... var. perpulcher Cockerell [very beautiful].

- Endemic to New Mexico, in the northern mountains; Colfax, Mora, and San Miguel counties.

- Calochortus nuttallii Torrey [for Thomas Nuttall (1786-1859), English botanist and explorer] SEGO LILY. Plants usually bulbous; stems usually straight, 20-45 cm tall; leaves linear-involute, 10-30 cm long; inflorescences 1-4-flowered; flowers white; sepals 2-3 cm long, shorter than the petals, whitish adaxially; petals 3-5 cm long, white, broadly obovate, at the base with a red-purple half-moon band above a circular yellow spot, with scattered unbranched slender hairs; capsules 3-5 cm long.

- Dry slopes and plains in the northern and western regions.

- This is the state flower of Utah.

- Erythronium [reddish] FAWN-LILY [1].

Perennial, scapose, bulbous, spring-flowering herbs; leaves 2 at anthesis, basal, narrowed to a slight petiole, glabrous, the margins entire; inflorescences terminating a leafless scape, 1-10-flowered; flowers showy, nodding, with 6 distinct similar tepals; stamens 6; ovary superior, with a single style, the stigmas unlobed or 3-lobed; fruit a capsule. About 27 species, all but a few native to North America.


- *Erythronium grandiflorum* Pursh [large-flowered] AVALANCHE-LILY. Bulbs 3-5 cm long; leaves 6-20 cm long, the blades green, not mottled, lanceolate, somewhat glaucous; inflorescences usually 1-flowered (up to 5); flowers nodding, bright yellow to creamy white, the tepals 2-3.5 cm long, reflexed, narrowly ovate; stigma unlobed; capsules 2-5 cm long, oblong to narrowly oblong. Subalpine meadows and clearings in the far northern mountains. Our material corresponds to subspecies *grandiflorum*, with bright yellow tepals.
Fritillaria [checkered like a dice-box] FRITILLARIA [1].

Perennial, scapose, bulbous herbs, the stems simple and erect and only present when flowering; leaves alternate or whorled proximally; inflorescences loosely racemose, 1-many-flowered; flowers usually nodding, malodorous to fragrant, the 6 tepals similar and distinct, the stamens 6, the ovaries superior; fruit a capsule. ♻ About 100 species throughout the Northern Hemisphere; some of the European species are grown as ornamentals.

Fritillaria atropurpurea Nuttall [dark purple]. Plants 10-60 cm tall; leaves 2-3 per node proximally, 4-12 cm long, linear to lanceolate, shorter than the inflorescence; flowers nodding, brownish purple, mottled yellow and white, 1-2.5 cm long, rounded-keeled abaxially; style branched; capsules 1-2 cm long, angled. ♻ Known only from an 1892 collection from the Chuska Mountains; it has not been collected since and its continued occurrence in the state is doubtful; to be looked for in shaded mountain meadows and grassy slopes of the far northwestern mountains; the drawing is from an Arizona plant.

Gagea [for Thomas Gage (1781-1820), English botanist and baronet] [1].

Perennial, glabrous herbs from short rhizomes, bulb-like basally by persistent leaf sheaths; leaves alternate, simple, linear, entire; stipules absent; inflorescences racemose, 1-several-flowered; flowers fragrant or not, the tepals similar, petaloid, distinct, yellow or white, with darker veins; fruit a capsule. ♻ About 200 or so species of western North America, northern Africa, and Eurasia. Included here are members of the (mostly) white-flowered Llydia, shown to be phylogenetically congruent with the (mostly) yellow-flowered Gagea.

Gagea serotina (Linnaeus) Ker-Gawler [late flowering or fruiting] ALP-LILY [Anthericum serotinum Linnaeus, Llloydia serotina (Linnaeus) Salisbury ex Reichenbach]. Plants slender, 5-20 cm tall; basal leaves longer and broader than the cauline; flowers 1-2, erect to nodding, the tepals creamy white, 1.5-1.5 cm long; capsules 6-8 mm long. ♻ Gravely or rocky slopes and cliffs at high elevations in the central cordillera.

Lilium [ancient Latin name for the lily, from Greek leitron] LILY [1].

Perennial, bulbous (actually bulb-like rhizomes in our species) herbs, the stems erect; leaves cauline, alternate to whorled, sessile; inflorescences racemose to umbellate, 1-many-flowered, bracteate; flowers showy, pendent to erect, often fragrant, of various colors, white, with darker veins; fruit a capsule.

Lilium philadelphicum Linnaeus [from Philadelphia] WOOD LILY [Lilium andinum Nuttall, Lilium montanum A. Nelson, Lilium philadelphicum Linnaeus var. andinum (Nuttall) Ker-Gawler, Lilium umbellatum Pursh]. Bulbs 1.5-3 x 2.5 cm; stems 30-90 cm tall, erect; leaves alternate below, narrowed elliptic to linear, 3-10 cm long; inflorescence umbellate, 1-3-flowered, sometimes more; flowers showy, erect, not fragrant, broadly campanulate, red-orange (rarely yellowish); tepals clawed, 5-8 cm long, outer whorl slightly longer, 2-3 cm wide; capsules 2-8 cm long, 1-2 cm wide. ♻ Uncommon in aspen clearings and wet open places in the central cordillera, but with a wide distribution in northeastern North America.

Prosartes [to fasten or attach] FAIRYBELLS [1].

Perennial herbs, from knobly rhizomes, generally hairy throughout, the stems branched distally; leaves sessile, alternate, simple, entire, the main veins parallel, the minor veins forming a reticulum; inflorescences terminal, with 1-4 flowers; flowers nodding or pendulous, pedicellate; tepals similar, distinct, whitish; fruits berry-like, straw-colored to red. ♻ About 6 species of North America. Formerly included within the Asian genus, Disporum.

Streptopus [twisted stalk] TWISTED-STALK [1].

Perennial, rhizomatous herbs, the stems simple to branched; leaves sessile, alternate, caudine, sessile, elliptic to ovate, the bases rounded to cordate-clasping, parallel-veined from a common base; inflorescences axillary, 1-2-flowered; flowers hanging beneath the leaves, rotate to campanulate, on a bent or twisted stalk (peduncle); tepals similar, deciduous, distinct or basally connate; stamens 6; fruit berry-like. ♻ About 7 species, temperate North America and Eurasia.

Streptopus amplexifolius (Linnaeus) A.P. de Candolle [with clasping leaves] [Uvularia amplexifolia Linnaeus, Streptopus amplexifolius (Linnaeus) A.P. de Candolle var americanus J.A. Schultes]. Plants 30-80 cm tall, grabate, the stems sparingly branched; leaves ovate to oblance lanceolate, 4-12 cm long, 2.5 cm wide, 7-9-veined, subcordate to oblique basally; flowers in clusters of 1-3, narrowly campanulate, creamy to greenish white, 8-15 mm long; berries reddish orange to bright red, 12-18 mm diam, strongly papillose. ♻ Rich, shaded sites in the mountains.

Streptopus philadelphicus (Linnaeus) A.P. de Candolle [in Philadelphia] WOOD LILY [Lilium philadelphicum Linnaeus]. Bulbs 1-2 cm long; leaves alternate, narrowed elliptic to linear, 3-10 cm long; inflorescence umbellate, 1-3-flowered, sometimes more; flowers showy, erect, not fragrant, broadly campanulate, red-orange (rarely yellowish); tepals clawed, 5-8 cm long, outer whorl slightly longer, 2-3 cm wide; capsules 2-8 cm long, 1-2 cm wide. ♻ Uncommon in aspen clearings and wet open places in the central cordillera, but with a wide distribution in northeastern North America.
Monocotyledonous Plants - Liliaceae

Erythronium grandiflorum

May 3
Utah,
Cache Co.

Fritillaria atropurpurea

April 8
Arizona
Yavapai Co.

Lilium philadelphicum

July 10
Jemez Mts.

high park and meadows

yellow

May 3
Utah,
Cache Co.

green and brown

April 8
Arizona
Yavapai Co.

red-orange

Mt. forest openings

July 10
Jemez Mts.

white with dull purple or green lines

Timberline meadows

July 14
Nambé Ridge

leaves nearly cylindrical

Cagea serotina
**MELANTIACEAE DEATH-CAMAS FAMILY** [4/7/7]

Plants mostly herbaceous perennials from rhizomes or bulbous tubers; leaves basal or sub-cauline, alternate (whorled), simple, sheathing, with parallel (palmate) veins; flowers bisexual, actinomorphic, borne in spikes, racemes, or panicles; perianth of 6 sepaloid or petaloid tepals; stamens 6; pistil single, superior or partly inferior; of 3 carpels, the style single; fruit a capsule with winged seeds. ♦ *Veratrum* alkaloids are found in all three of our genera, rendering the plants highly toxic.

The family members were traditionally placed in a large and polyphyletic Liliaceae.

1 Plants 1-2 m tall; leaves obviously disposed along the stem, the larger 10-20 cm wide........................................ ..................
1 Plants mostly much less than 1 m tall; leaves tending to be basal, never as much as 10 cm wide

2 Flowers greenish to yellowish, sessile or nearly so and borne in rather dense clusters, pedicels and branches absent or scarcely evident ........................................................................................................................ ............................................
2 Flowers whitish, cream-colored, to greenish, borne on well-developed and evident pedicels or branches

3 Tepals large, 7-16 mm long ................................................................................................... ..........................................
3 Tepals small, 3-6 mm long

4 Ovary partly inferior; tepal gland bilobed apically (*A. virescens*).................................................................................
4 Ovary fully superior; tepal gland rounded apically ........................................................................... ................

**Anticlea** [the mother of Odysseus] DEATHCAMAS [3].

Perennial, subscapose herbs, with bulbs or rhizomes; leaves mostly basal, alternate, simple, linear, entire, glabrous, the distal ones reduced and grading into floral bracts, the basal ones sheathing, with parallel venation; inflorescences racemose to paniculate; flowers bisexual, sometimes staminate on the panicle branches, actinomorphic; tepals 6, petaloid, often connate basally, with 1 basal nectary bilobed gland adaxially; stamens 6; ovary partly inferior, the pistil 1 with 3 styles and stigmas; fruit a capsule. ♦ Our species were formerly classed in the traditional genus *Zigadenus* (each tepal with 2 glands), which was long known to be polyphyletic. All our species contain one to numerous alkaloids of the *Veratrum*-type and are potentially lethal to humans and livestock; the bulbs particularly are to be avoided.

Hess, W.J. & R.C. Sivinski. 1995. A new species of *Zigadenus* (Liliaceae) from New Mexico, with additional comments on the section *Anticlea* (*Anticlea mogollonensis*). Sida
1 Tepals small, 3-6 mm long (rarely longer).......................................................... A. virescens
1 Tepals large, 7-16 mm long (rarely shorter)

2 Tepals 7-11 mm long; flowers whitish to yellowish green, but not purplish along the margins, ascending......................... A. elegans
2 Tepals 12-16 mm long; flowers reddish purple along the margins and blending to yellowish-green at the middle, nodding......

Anticlea elegans (Pursh) Rydberg [elegant] [Zigadenus coloradensis Rydberg, Zigadenus dilatatus Greene, Zigadenus elegans Pursh]. Plants 20-80 cm tall, the bulbs 1.5-3 cm long; proximal blades 10-30 cm long, 3-15 mm wide; inflorescences racemose to paniculate, with 1-4 branches at the lower nodes; flowers ascending, 15-20 mm diam; tepals cream-colored to greenish, 7-12 mm long; stamens shorter than the tepals; capsules 1-2 cm long. ●Widespread in the mountains, in clearings, meadows, edges of woods. §

Anticlea moggollonensis (Hess & Sivinski) Zomlefer & Judd [from the Mogollon Mountains] MÖGOLLON DEATH CAMAS [Zigadenus moggollonensis Hess & Sivinski]. Plants 45-85 cm tall, the bulbs 2-3 cm long; proximal blades 25-45 cm long, 10-20 mm wide; inflorescences mostly racemose, sometimes with 1-3 branches at the lower nodes; flowers nodding, 8-20 mm diam; tepals greenish, reddish purple on the margins, blending to yellowish-green in the middle, 12-16 mm long; stamens shorter than the tepals; capsules 1-1.5 cm long. ●Endemic to upper elevations in the Mogollon Mountains of western New Mexico. A. moggollonensis.

Anticlea virescens (Kunth) Rydberg [nearly green] [Anticlea porrifolia (Greene) Rydberg, Helonias virescens Kunth, Zigadenus porrifolius Greene Zigadenus virescens (Kunth) Machride]. Plants 35-80 cm tall, the bulbs 3-5 cm long; proximal blades 25-45 cm long, 3-20 mm wide; inflorescences racemose to paniculate, with 1-4 branches at the lower nodes; flowers 4-8 mm diam, nodding; tepals greenish, 4-6 mm long; stamens shorter than the tepals; capsules 1-2 cm long. ●Widespread on mountain slopes in the coniferous forests at mid- to high elevations.

Schoenocauleon [with rush-like stems] SCHIOENOCAULEON [1].

Perennial, scapose herbs, with bulb-like rhizomes; leaves mostly basal, alternate, simple, grass-like, emerging folded, reduced upwards; inflorescences spike-like to racemose, occasionally with short branches, dense and spike-like; flowers bisexual proximally, staminate distally; tepals 6, leathery to petaloid, distinct, not clawed, the margins entire to faintly toothed; stamens longer than the tepals; fruit a capsule. ●About 24 species, North America, mostly in Mexico. About 24 species, North America, mostly in Mexico.

Schoenocauleon texanum Scheele [from Texas]. Plants 40-100 cm or more tall, the bulbs 2-4.5 cm long and nearly as wide; leaves 15-60 cm long, 2-6 mm wide, shorter than or just surpassing the raceme; racemes condensed, spike-like, 5-30 cm long; flowers greenish-yellowish-whitish, loosely spaced proximally in age; tepals leathery, greenish-yellow, 2-3.4 mm long; stamens about twice the length of the tepals; capsules 1-2 cm long. ●Dry, rocky calcareous sites in the southeastern mountains and foothills. §

Toxicoscordon [poisonous garlic] DEATH CAMAS [2].

Perennial, subscapose herbs, with bulbs or rhizomes; leaves mostly basal, alternate, simple, linear, entire, glabrous, the distal ones reduced and grading into floral bracts, the basal sheathing, with parallel venation; inflorescences racemose to paniculate; flowers bisexual, sometimes stamineate on the panicle branches, actinomorphic; tepals 6, petaloid, often connate basally, with 1 basal rounded nectary gland adaxially; stamens 6; ovary fully superior, the pistil 1 with 3 styles and stigmas; fruit a capsule. ●Our species were particularly in the traditional genus Zigadenus (each tepal with 2 glands), which was long known to be polyphyletic. All our species contain one to numerous alkaloids of the Veratrum-type and are potentially lethal to humans and livestock; the bulbs particularly are to be avoided.

Toxicoscordon paniculatum (Nuttall) Rydberg [panicked] [Helonias paniculata Nuttall, Zigadenus paniculatus (Nuttall) S. Watson]. Plants 20-70 cm tall, the bulbs 2-4 cm long; proximal blades 15-35 cm long, 1-35 mm wide; distal leaves lacking a basal sheathing portion; inflorescences paniculate; flowers 5-10 mm diam; tepals cream-colored, 2-4 mm long, the outer shortly clawed, the inner clawed; gland 1, rounded; stamens 1.5-2 mm longer than the tepals; capsules 1-2 cm long. ●Open rocky hills and grassy slopes at low to mid-elevations in the northwest region.

Toxicoscordon venenosum (S. Watson) Rydberg [very poisonous]. Plants 20-70 cm tall, the bulbs 1-3 cm long; proximal blades 12-50 cm long, 2-10 mm wide; distal leaves with a sheathing basal portion and a free blade portion; inflorescences racemose to paniculate with 1-2 basal branches; flowers 5-10 mm diam; tepals cream-colored, 2-5 mm long, the outer mostly not clawed, the inner clawed; gland 1, rounded; stamens equal to slightly longer than tepals; capsules 1-2 cm long. ●Wooded slopes and open ground in the northwest region. ●Our plants belong to var. gramineum (Rydberg) Brasher [grass-like] Toxicoscordon gramineum Rydberg, Toxicoscordon falcatum Rydberg, Zigadenus falcatus Rydberg, Zigadenus gramineus Rydberg, Zigadenus intermedius Rydberg, Zigadenus venenosus S. Watson var. gramineus (Rydberg) Walsh ex M.E. Peck, Zigadenus venenosus S. Watson var. gramineum (Rydberg) Walsh ex C.L. Hitchcock]; var. venenosum, not known in New Mexico, has no-sheathing distal leaves, entirely racemose inflorescences, and clawed outer tepals. The specific epithet, venenosum, means “very poisonous”, and does not refer to venation (which would be venosus).
**Veratrum** [truly black] WESTERN SKUNK-CABBAGE [1].

Perennial herbs from thick vertical rhizomes and swollen bulbs, the stems erect, simple, hollow; leaves alternate, simple, strongly parallel veined, often plicate, reduced distally to sheaths; inflorescences paniculate; flowers mostly bisexual, rotate to campanulate; tepals distinct to weakly connate basally, petaloid, not clawed, with 1-2 glands at the base adaxially; ovary superior to partly inferior, with 3 styles; fruit a capsule. ♦ About 30 species of the Northern Hemisphere. Most species have a varied concoction of toxic alkaloids, concentrated in the rhizomes (but all parts poisonous).

**Veratrum californicum** Durand [from California] [Veratrum speciosum Rydberg, Veratrum tenuipetalum A. Heller]. Plants 1-2.5 m tall, the stems glabrous proximally, tomentose distally; leaves ovate, to lance-linear distally, 20-40 cm long, 15-25 cm wide, hairy; panicles 30-70 cm long, with stiffly spreading branches; tepals creamy-white, 8-17 mm long, the basal gland V-shaped; capsules 2-3 cm long. ● Moist to wet marshy or seepy ground in the mountains, generally at higher elevations. ♦ Our plants belong to the typical variety, with the panicle bracts seldom exceeding the flowers. New Mexico plants with small flowers have been referred to *V. tenuipetalum* A. Heller. §

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**ORCHIDACEAE** ORCHID FAMILY [14/32/35]

Perennial, terrestrial or epiphytic herbs, sometimes lacking chlorophyll and mycoheterotrophic, the stems often basally thickened to form pseudobulbs, the roots strongly mycorrhizal; leaves alternate or basal, rarely opposite or whorled, simple, entire, frequently somewhat fleshy, sheathing at the base, usually parallel-venined; stipules lacking; flowers strongly zygomorphic, often showy, perfect; sepals 3, green or petal-like; petals 3, the lateral two similar to each other but dissimilar to the central one (labellum or lip); stamens usually 1-2, the pollen sticking together in waxy masses (pollinia); pistil single, inferior, of 3 united carpels, half-twisted; fruit a capsule. ♦ With estimates of about 22,000-28,000 species, this is the largest or second largest plant family in the world, but the 25th largest in New Mexico. Flowers are structurally complex and highly modified for pollination. Important economic plants include *Vanilla planifolia* Andrews, the source of vanilla, and numerous ornamental plants of the nursery trade comprising over 100,000 cultivars and hybrids. The family includes the beginning-of-the-line genus, *Aa*. Orchids can be fully mycotrophic, completely dependent upon host fungi for its food and carbon compounds throughout its life cycle (and lacking photosynthesis), or partially mycotrophic, being primarily photosynthetic, but parasitic only during seed germination and development.


[Key adapted from Coleman 2002]

1 Plants without chlorophyll; leaves reduced to brownish sheaths, green leaves absent
2 Lip without any longitudinal ridges; flowers white (soon discoloring), in dense spicate clusters..................... go to lead 13, below
2 Lip with 1-several longitudinal ridges; flowers not white, or only partly whitish, rather loosely arranged
3 Lip with 5-7 conspicuous longitudinal ridges or crests extending from the base nearly to the tip.......................... Hexalectris
3 Lip with 1-2 short longitudinal ridges at the base, not extending even to mid-length of the lip. Corallorhiza
1 Plants with chlorophyll; normal leaves produced (sometimes withering at flowering time) .......................... Calypso
4 Inflorescence of 1-2 flowers terminating the stem
5 Leaf single per flowering stem, 1-5 cm wide; lip bearded, 1.5-3 cm long .............................................. Calypso
6 Leaf blades 1-2 per flowering stem
10 Leaves 2, opposite, borne near the middle of the stem. Neottia
10 Leaves mostly 1, if 2 then alternate (though the sheaths overlapping) and at the base of the stem Malaxis
9 Leaf blades 3-5 per flowering stem, may be basal only, or withered and nearly gone
11 Leaves mottled, evergreen, mostly in a basal rosette Goodyera
11 Leaves not mottled nor evergreen, mostly cauline
12 Flowers pedicelled, brownish purple, the raceme not twisted; leaves lanceolate to ovate Epipactis
12 Flowers white or whitish, the spike spirally twisted; leaves linear to linear-lanceolate Spiranthus s.l.
13 Spike densely floriferous with more than 10 flowers; lip lacking a reddish blotch at the back, yellowish or whitish Spiranthus
13 Spike sparsely floriferous with 10 flowers or less; lip with a reddish blotch on the upper surface at the back
14 Leaves present during anthesis; blooming late summer Microthelys
14 Leaves absent at anthesis; blooming in May Schiedeella

Calypso [the sea-nymph in Homer’s Odyssey] FAIRY-SLIPPER [1].

Perennial, somewhat succulent herbs, with fleshy roots; stems scapose, from a basal bulb-like corm, with 2 sheathing bracts; leaves basal, solitary, produced in the autumn and withering in the spring, plicate, leathery; flowers solitary on the scape, horizontal to slightly nodding, large and showy; sepals and petals ascending to erect; lip slipper-shaped, with a basal opening and 2 apical horns or projections, the margin dilated and bearded; fruit a capsule.

Calypso bulbosa (Linnæus) Oakes [bulb-like]. Plants 10-20 cm tall; blades elliptic to orbicular, 10-60 cm long, nearly as wide, with 3-7 broadly curving veins; floral bracts 5-25 mm long; flowers pink to purplish red, rarely white; sepals and petals narrowly lanceolate to narrowly oblong, 13-23 mm long; lip 2-3 cm long, with sparse to extensive basal bristles; capsules erect, 2-3 cm long. ◇Rather common in the northern to central mountains above 8,000 ft. ◆Our plants belong to var. americana (R. Brown) Luer [of America] [Calypso americana R. Brown ex Aiton f., Cytherea bulbosa House]. §

Corallorhiza [coral-root] CORAL-ROOT [5].

Perennial herbs, fully or mostly mycotrophic, rootless, leafless, with branching, coral-like rhizomes; stems erect, yellowish, brownish, to purplish, glabrous, with few sheathing bracts; inflorescence a raceme, subtended by closed sheathing bracts; flowers inconspicuous to showy; lip with 2 basal lamellae of the same color as the lip; fruit a capsule. ◇About 11 species, all but 1 in North and Central America.

Corallorhiza maculata (Linnaeus) Oakes [bulb-like]. Plants 10-30 cm tall, the stems brownish, yellowish, pinkish, to purplish; racemes 5-40 cm long, with 6-45 flowers; flowers inconspicuous, tan, yellowish, reddish, purplish, chasmogamous, the perianth open; tepals 5-15 mm long, 3-veined; lip whitish, usually purple-spotted, 4-9 mm long, with 2 lateral lobes or teeth; lamellae 2, basal; column whitish yellow, spotted; capsules 10-24 mm long. ◇Dry, open forests at mid- to high-elevations, commonly in the leaf litter of conifers, aspens, and oaks; widespread throughout the state, probably the most common orchid in New Mexico. ◆We have three rather weak varieties.

Corallorhiza odontorhiza (Willdenow) Poiret [with tooth-like rhizomes] [Corallorhiza odontorhiza Willdenow]. Plants 10-25 cm tall, the stems brownish or purplish; racemes lax, 11-46 cm long; flowers inconspicuous, reddish purple to brownish, the perianth tending to be closed; tepals 3-5 mm long, the dorsal sepal 1-veined; lip whitish, spotted, 3-5 mm long, unlobed; lamellae 2, basal, free; column white proximally, purple distally; capsules 6-8 mm long; flowering late summer. ◇Deciduous and conifer woodlands. ◆Included herein based on a report in Magrath & Feinstein (2002), but specimina are unknown to us; perhaps to be found in the southeastern mountains of Eddy County.
**Corallorhiza striata** Lindley [striped]. Plants 10-40 cm tall; racemes 10-65 cm long, with 2-32 flowers; flowers chasmogamous, the perianth connivent to spreading; tepals salmon reddish purple with darker veins (striped), sometimes more yellowish; lip unlobed, 2-16 mm long, the margins upturned giving a boat-shaped appearance; lamellae less than ⅓ the lip length, partially connate; column yellowish; capsules 10-30 mm long. ●Rather dry, open forests throughout the state, in dry decaying plant matter, also along streams; flowering spring – early summer. ●The dark veins of the tepals are immediately conspicuous. We have two varieties: a Lip 7-16 mm long; sepals and petals open, spreading...var. striata. ●Known from just a few collections. a Lip 2-7 mm long; sepals and petals connivent along the column...var. vreelandii (Rydberg) L.O. Williams [for Frederick King Vreeland (1874-1964), wireless radio inventor] [Corallorhiza striata Lindley var. flavida Todsen, Corallorhiza vreelandii Rydberg]. ●Known from numerous collections, widespread. §

**Corallorhiza trifida** Chatelain [3-cleft]. Plants 10-40 cm tall, the stems reddish purple, yellowish brown, to yellow; racemes 8-35 cm long, with 3-18 flowers; flowers inconspicuous, chasmogamous, yellow-green, the perianth open; sepals and petals 1-veined, 3-8 mm long; lip whitish, often purple-spotted, 3-4 mm long, with 2 small lateral lobes or teeth; lamellae 2, basal, free; column yellow to white, often purplish apically; capsules 7-14 mm long. ●Dry to wet sites in the central cordillera, generally at 9,000-10,500 ft.; few collections. §

**Cypripedium** [Venus’s slipper] LADY’S SLIPPER [1].


**Cypripedium parviflorum** Salisbury [small-flowered]. Plants erect, 30-70 cm tall; leaves 3-5 on stem, the blades broadly elliptic to ob lanceolate, 8-21 cm long; distal-most bract densely silvery-hairy at least when young; flowers mostly solitary; sepals greenish to yellowish, with dark markings and lines, ovate to lanceolate, the dorsal sepal erect, ovate to lanceolate, 2.8-3.5 cm long; lip (pouch) pale to deep yellow, 2.5-5 cm long, with interior reddish markings, the orifice 1-3 cm. ●Mesic openings in the forests, to full shade, fairly widespread but not common. ●Our plants belong to var. pubescens (Willdenow) Knight [hairly] *Cypripedium calceolus* Linnaeus var. pubescens (Willdenow) Corell, *Cypripedium pubescens* Willdenow, *Cypripedium vagum* Cockerell, sometimes treated as a separate species. Populations can be exceedingly variable. §

**Dactylorhiza** [with finger-like roots] FROG ORCHID, ORCHIS [1].


**Dactylorhiza viridis** (Linnaeus) Bateman, Pridgion, & Chase [green] *Coeloglossum bracteatum* (Muhlenberg) Parlato, *Coeloglossum viride* (Linnaeus) Hartman, *Coeloglossum viride* (Linnaeus) Hartman var. virens (Muhlenberg ex Willdenow) Luzer, *Habenaria bracteata* (Muhlenberg) R. Brown, *Habenaria viridis* (Linnaeus) R. Brown var. bracteata (Muhlenberg ex Willdenow) Gray, *Orchis viridis* Muhlenberg ex Willdenow, *Sarypium viride* Linnaeus. Plants 10-50 cm tall (ours, taller elsewhere), the roots usually 2, tuber-like, with smaller roots at the extremities; leaves 3-6 in number along the stem; leaves elliptic proximally, 3-12 cm long, narrowing upwards to bracts; floral bracts to 6 cm long, much exceeding the flowers; flowers greenish with yellow tinges; sepals dark green, 3-8 mm long, forming a hood; petals pale to light green, 3-5 mm long; lip pale green to yellowish, 3-10 mm long, with 2 longer lateral lobes and a shorter central cusp, the spur about 2 mm long. ●Aspen and fir forests at 9,000-10,000 ft. elevations in the northern and western mountains. §

**Epipactis** [ancient Greek name] HELLEBORINE [2].

Perennial herbs, glabrous to puberulent, the roots fibrous from a short rhizome, the stems leafy; leaves cauline, alternate, plicate, sheathing at the base, gradually reduced upwards into floral bracts; inflorescences racemose, the floral bracts foliaceous and often exceeding the flowers; leaves resinate; tepals distinct; sepals concave; petals often shorter than the sepals; lip divided into 2 parts by a medial constriction, the proximal part concave to saccate, the distal part flattened to grooved and often dilated; fruit a capsule. ●About 70 species in the Americas, Asia, and Europe. 1 Lip deeply 3-lobed; lateral sepals 16-24 mm long ......................................................................................... E. gigantea

1 Lip not 3-lobed; lateral sepals 10-13 mm long ......................................................................................... E. helleborine

**Epiactis gigantea** Douglas ex Hooker [giant]. Plants 30-90 cm or more tall, glabrous or nearly so; leaves 4-14 along the stem, lanceolate, elliptic, to ovate, 5-20 cm long; racemes lax, the floral bracts 1-12 cm long; flowers showy; sepals greenish to rose-colored, with dark veins, the lateral 16-24 mm long; petals pinkish to orangish, with dark veins, 13-17 mm long; lip constricted in the middle, 14-20 mm long. ●Wet sites along streams or rocky ground at streamside, at low elevations generally below 7,500 ft. Widespread in scattered locales in the mountains and foothills. §
*Epipactis helleborine* (Linnaeus) Crantz. resembling the genus *Helleborus* [Serapias helleborine Linnaeus]. Plants 30-80 cm or more tall, sparsely to densely pubescent; leaves 3-10 along the stem, lanceolate, elliptic, to orbiculate, 4-18 cm long; racemes commonly 1-sided, the floral bracts 1.5-3 cm long; reduced distally; sepalis greenish, with purplish tinges, the lateral 10-13 mm long; petals pink, purple, or yellowish, 9-11 mm long; lip constricted in the middle, 10-15 mm long, purplish to brownish proximally, pinkish distally. *River and stream banks, cottonwood bosques, along the Rio Grande, Rio Embudo, Rio en Medio, and Pecos River; native to Eurasia and north Africa. This species is considered invasive in many regions, and should be watched along the northern water courses.*

**Goodyera** [for John Goodyer (1592-1664), English botanist] **RATTLESNAKE-PLANTAIN**.

Perennial rhizomatous herbs; stems erect, scapose; leaves evergreen, in basal rosette, petiolate, the blades commonly marked with white or green reticulate sploths; inflorescence an erect spike, the peduncles viscid-hairy, bracteate; flowers resupinate (twisted upside-down), whitish, sessile, viscid-hairy; sepals distinct, subequal; hood formed by dorsal sepal and petals; lip free from the staminal column, the base connate to sac-like; fruit a capsule. ♦About 40-100 species nearly worldwide.

1. Whitish reticulations of the leaves mostly extending from the white midribs outward, the marginal regions usually greenish; leaf blades 2.5-10 cm long; lateral sepals 5-8 mm long; petals pinkish-brown, the sepals and petals apically revolute; sepals 15-17 mm long; petals 15-17 mm long, 6-8 mm wide; lip 14-18 mm long, shallowly 3-lobed, the lateral lobes ⅓ the length of the central; column 6-8 mm long. ♦Shaded sites in rocky canyons of the Guadalupe Mountains, Eddy County.

**Goodyera oblongifolia** Rafinesque [with oblong leaves] **Goodyera decipiens** (Hooker) F.T. Hubbard, *Peramium decipiens* (Hooker) Piper. *Peramium menziesii* (Linleyd Morong). Plants 20-50 cm tall (in flower); leaves all basal, none borne on the scape above the rosette; blades with white sploths only along the midrib, sometimes with fine white lateral veins, narrowly elliptic to ovate, 2.5-10 cm long, the sepals acute; spikes 10-48-flowered, the peduncles 1-4 cm long; flowers greenish to white; lateral sepals 5-8 mm long; petals convinent, the hoods 5-10 mm long, the lips deeply concave, 5-8 mm long; the interior surfaces with 4 rows of glandular papillae. ♦Mixed coniferous and spruce-fir forests, generally 7600-10,000 ft.

**Goodyera repens** (Linnaeus) R. Brown ex Aiton f. [creeping] [Goodyera repens (Linnaeus) R. Brown ex Aiton f. var. ophioides] *Peramium repens* (Fernald) Rydberg, *Satyrium repens* Linnaeus. Plants 9-12 cm tall (in flower); 1-2 leaves borne on the scape above the basal rosette; blades with green white sploths and reticulations mostly extending from the margins inward, the midribs usually not whitish, narrowly to broadly ovate; 1-3 cm long, the apices acute to obtuse; spikes 7-36-flowered, the peduncles 3-18 cm long; flowers white; lateral sepals 3-5 mm long; petals distinct, the hoods 3-6 mm long, the lips narrowly sac-like, 2.5-5 mm long, the interior surfaces with 2 or 4 rows of glandular papillae. ●Shady and moist sites on the forest floor in the mountains, generally 8,000-10,000 ft.

**Hexalectris** [6-crested] **CRESTED-CORAL-ROOT**.

Perennial herbs, lacking leaves and roots, achlorophyllous, with branching rhizomes; stems erect, brownish to reddish to purplish, with sheathing bracts; inflorescence a raceme, comprising the above-ground portion of the plant; flowers resupinate, brownish, reddish, purplish; sepals falcate to lanceolate, the lateral ones free; lip 3-lobed, with 3, 5, or 7 lamellae; fruit a capsule. ●About 10 species of fully mycotrophic plants, photosynthesis entirely absent. Sometimes confused with *Corollorhiza*, but distinguished by the (near) absence of raised crests on the lip in the latter.

1. Lip deeply 3-lobed, the sinus between the 3 lobes 3 mm or more long; ♦About 10 species of *Corollorhiza*.

2. Petals 15-17 mm long; column 9-13 mm long; central lobe of the lip nearly truncate apically. .................. **H. revoluta**

3. Petals 19-22 mm long; column 14-15 mm long; central lobe of the lip acute apically. .................. **H. colemanii**

1. Lip 3-lobed, but not as deeply, the lobes 2 mm or less long

2. Lip less than 10 mm long; column 6-8 mm long. ............................................. **H. nitida**

3. Lip more than 12 mm long; column 11-18 mm long

4. Flowers opening (chasmogamous), the petals and sepals apically revolute; petals 14-23 mm long, 5-9 mm wide .......... **H. spicata**

4. Flowers often remaining closed (cleistogamous), or when open, the petals and sepals not apically revolute; petals 14-16 mm, 4-5 mm wide. .................................................. **H. arizonica**

**Hexalectris arizonica** (S. Watson) Kennedy & L. Watson [of Arizona] [Corollorhiza arizonica S. Watson, *Hexalectris spicata* (Walter) Barnhart var. arizonica (S. Watson) Catling & Engel]. Plants 15-70 cm tall, the stems with 3-5 sheathing bracts; flowers tan to dark brown, with purple ridges and stripes on the lip, cleistogamous to chasmogamous, the sepals and petals usually not apically revolute or recurved; sepals 13-18 mm long; petals 14-16 mm long, 4-5 mm wide; lip 12-15 mm long; column 11-14 mm long; anthers whitish. ●Pine-oak woodlands in the southern mountains and foothills, rare.

●Previous reports of *Hexalectris spicata* belong here.

**Hexalectris colemanii** (Catling) Kennedy & Watson [for Ronald A. Coleman, contemporary student of Orchidaceae] [Hexalectris revoluta Correll var. colemanii Catling]. Plants 40-55 cm tall, the stems pinkish-cream, with 4-6 sheathing bracts; flowers whitish to cream-pink, with brownish or purplish tinges and dark veins; sepals 17-21 mm long; petals 19-22 mm long, 4-5 mm wide, strongly apically revolute; lip 16-20 mm long, the lateral lobes much shorter than the acute central lobe; column 14-15 mm long; ●Juniper-oak woodlands in the boodheel; as yet known from a single recent collection.

**Hexalectris nitida** L.O. Williams [shiny]. Plants 10-30 cm long, with 3-5 sheathing bracts; flowers rose-brown to tan; petals with white and purplish tinges; sepals 7-13 mm long; petals 8-11 mm long, 2-4 mm wide; lip 7-11 mm long, shallowly 3-lobed, the lateral lobes ⅓ the length of the central; column 6-8 mm long. ●Shaded sites in rocky canyons of the Guadalupe Mountains, Eddy County.

**Hexalectris revoluta** Correll [revolute]. Plants 30-50 cm tall, the stems with 3-5 sheathing bracts; flowers tan to pinkish brown, the sepals and petals apically revolute; sepals 15-17 mm long; petals 15-17 mm long, 6-8 mm wide; lip 14-18 mm long,
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deeply 3-lobed, the sinus between the lobes more than 3 mm; column 9-13 mm long. •Questionably reported for New Mexico, but definitely known in the adjacent Guadalupe Mountains National Park in Texas; to be looked for in pine-oak woodlands in Eddy County. •Previous reports of *Hexalectris revoluta* in the state are referred to *H. colemanii*.

*Hexalectris spicata* (Walter) Barnhart [spike-like] [*Arthusa spicata* Walter]. Plants 25-80 cm tall, with 3-5 sheathing bracts; flowers chasmogamous, yellow-tan to purple-brown, with dark veins, the petals weakly to strongly recurved apically; sepals 14-24 mm long; petals 14-23 mm long; 5-9 mm wide; lip 13-20 mm long, the sinus between the lobes less than 2 mm; column 13-18 mm long. •Not yet known definitely from the state; New Mexico reports of this belong to *Hexalectris arizonica*; to be looked for in oak woodlands and mixed conifer forests at low elevations in the dry southeastern mountains.

*Malaxis* var. ADDER'S-MOUTH [3].

Glabrous herbs, with fibrous roots and swollen bulb-like stem bases (pseudobulbs); leaves few, the bases sheathing, the blades lanceolate to ovate; inflorescence spike-like to racemose, sometimes sub-umbrellate; flowers resupinate or not, sessile to pedicellate; sepals free to basally connate; petals spreading to recurved, usually narrower than the sepals; lip not lobed; concave to saccate; column free; fruit a capsule. •About 200 or more species worldwide.


1 Flowers red-purple................................................. M. porphyrea

1 Flowers greenish

2 Flowers appressed to the rachis, sessile or nearly so; lip 3-lobed ............................................................................................................................. M. soulei

2 Flowers not appressed to the rachis, definitely pedicellate; lip unlobed................................................................. M. abieticola

**Malaxis abieticola** Salazar & Arenas [Abies-dwelling] [*Malaxis tenis* (S. Watson) Ames, not Reichenbach f.]. Plants 10-25 cm tall; leaves single, usually near the middle of the stem; blades bright green and glossy, elliptic to broadly ovate, 3-8 cm long, the bases cordate to truncate, the apexes rounded to obtuse; racemes 3-8 cm long; pedicels 7-11 mm long; flowers greenish yellow; sepals 4-6 mm long; petals filiform to linear, falcate, 3-5 mm long; lip 3-4 mm long, the apex long-acuminate. •Damp mossy and grassy places under fir at about 8,000-9,500 ft. in the southern and southwestern mountains; rarely collected.

**Malaxis porphyrea** (Ridley) Kuntze [reddish] [*Archoanthus porphyrea* (Ridley) Wooton & Standley, *Malaxis ehrenbergii* auctores, missapplied, *Microstilis porphyrea* Ridley]. Plants 15-45 cm tall; leaves single, in the lower ⅓ of the stem; blades ovate-lanceolate to orbicular, 3-8 cm long, the apices obtuse to acute; racemes 6-25 cm long; pedicels 3-5 mm long; flowers reddish purple, sometimes with greenish hues; sepals 2-2.5 mm long; petals strongly recurved, linear, about 2 mm long; lip 1.8-2.3 mm long, the apex long-acuminate. •Mixed oak, fir, and pine forests in the mountains throughout the state, often in mossy or grassy wet spots. •Our plants have been called, incorrectly, *M. ehrenbergii* (Reichenbach f.) Kuntze, which is a valid species of central Mexico southward (Todsen 1997). §

**Malaxis soulei** L.O. Williams [for Justus Freeland Soule (1862-1939), professor and Vice President of the University of Wyoming]. [*Archoanthus montana* (Rothrock Greene). Plants 10-60 cm tall; leaves single, at the middle or lower on the stem, the sheathing leaf bases persistent; blades oblanceolate to ovate-elliptic, 3-15 cm long, the apices acute; racemes spike-like, 6-22 cm long; pedicels 1-2 mm long; flowers greenish yellow green; sepals 1.5-3 mm long; petals strongly reflexed, filiform to linear, 1-3 mm long; lip 1.5-3 mm long, the apex apiculate to 3-lobed/toothed. •Dry to rather moist ground and from low to high elevations in the mountains throughout the state, often at meadow edges or on rocky slopes. •The names *Malaxis soulei* and *M. macrostachya* (La Llave & Lexarza) Kuntze have been intermingled, with no clear consensus as to their correct application; we maintain them as separate (Catling & Magrath 2002) pending further clarification. §

**Microthelys** [small female] LADIES-TRESSES [1].

Perennial, acaulescent herbs, from few fleshy roots; leaves basal, 1-3 in number, sometimes present at anthesis, petiolate; blades lanceolate to ovate, the bases acute; inflorescence a spike, with tubular bracts; flowers tubular, curving outward to nodding or reflexed, whitish-greenish, sometimes with orange tinges, subtended by prominent floral bracts; petals erect, recurved near the apex; lip clawed, lobed or unlobed apically, with 2-4 raised calluses; column club-shaped; fruit an ellipsoid capsule. •About 10 species of southwestern United States, Mexico, Central America, and Ecuador.

**Microthelys rubrocallosa** (B.L. Robinson & Greenman) Garay [with a red callus] [*Schediella rubrocallosa* (B.L. Robinson & Greenman) Balogh, *Spiranthes porphyrica* Schlechter, *Spiranthes rubrocallosa* B. L. Robinson & Greenman]. Perennial, from 1-5 tuberous roots, the scales greenish; leaves emerging prior to or with the flowers and withering shortly after anthesis; blades narrowly lanceolate, 3-13 cm long, the apices acute; spike 5-16 cm long, 10-30-flowered; flowers whitish-greenish, about 5 mm long above the ovary, partially hidden within subtending floral bracts, curving away from the rachis; tepals subequal, 4-5 mm long; lip unlobed, hairy adaxially, the apex obtuse, the 2 calluses bright salmon-orange and about 1/3 the length of the lip. •Dry hillsides in the Sacramento Mountains, also Mexico; known from a single population; flowering July-Aug.

**Neottia** [bird's nest] TWAYBLADE [2].

Perennial herbs, the roots slender and fibrous; leaves (in ours) green, mostly 2, paired at mid-stem, glabrous; or leaves (in *Neottia* s.s.) lacking chlorophyll (mycotrophic) and reduced to scales; inflorescences racemose, the peduncle and rachis glandular-hairy to glabrous, the floral bracts inconspicuous; flowers resupinate, various shades of green, yellow, brown, red, or purple; sepals and petals spreading to strongly reflexed; lip prominently 2-forked or lobed; fruit a capsule. •About 65 species, in temperate to arctic regions of the world. Our plants were formerly included in the genus *Listera*, which included the chlorophyll-containing species with two well-developed leaves on the stem, while *Neottia* s.s. comprised the achlorophyllous species. Maintaining this distinction is not without merit, but most recent treatments combine the two genera.

**Neottia denticulata** Kuntze. [1878] [1902] [*Arthusa denticulata* (Schlechter) Todsen]. A waxy, elongated, egg-shaped greenish-yellow flower; the columns about 1.5-2 cm long, the length of the lip. •Dry hillsides and meadows throughout the mountains; collected in the Sinaloa, Sonora and Durango provinces of Mexico; flower October-December. §

**Neottia denticulata** is now usually placed in the genus *Listera*. Neottia denticulata is one of the most showy species of *Neottia*. It has a large, attractive flower that is often seen in the wild. Neottia denticulata is a terrestrial orchid that grows in dry, sunny meadows and hillsides. The plant produces a single, elongated, egg-shaped flower that is greenish-yellow in color. The flower has a long column that is about the length of the lip. The sepals and petals are greenish-yellow and the lip is also greenish-yellow. The flower is often seen in the wild in the Sinaloa, Sonora, and Durango provinces of Mexico. Neottia denticulata is a showy species that is often seen in the wild. It is a terrestrial orchid that grows in dry, sunny meadows and hillsides. The plant produces a single, elongated, egg-shaped flower that is greenish-yellow in color. The flower has a long column that is about the length of the lip. The sepals and petals are greenish-yellow and the lip is also greenish-yellow. The flower is often seen in the wild in the Sinaloa, Sonora, and Durango provinces of Mexico.
### Monocotyledonous Plants - Orchidaceae

#### Neottia borealis (Morong) Szlachetko [northern] [Listera borealis Morong].
Plants 5-25 cm tall; leaves broadly lanceolate, elliptic, to narrowly ovate, 2–6 cm long, the apices obtuse to rounded; floral bracts 1-3 cm long; peduncle and rachis glandular-hairy; flowers pale green, yellowish green, or bluish green, with darker veins; sepals and petals strongly reflexed away from the lip and column; dorsal sepal 4-6 mm long; petals about 5 mm long; lip 4-6 mm wide, cleft ½ or less its length into 2 rounded lobes. ● Damp ground in spruce-fir forests in the northern mountains; known from very few collections.

#### Neottia cordata (Linnaeus) Richard [heart-shaped] [Listera cordata (Linnaeus) R. Brown, Listera cordata (Linnaeus) R. Brown var. nephrophylla (Rydb.) Hultén, Listera nephrophylla Rydberg, Neottia nephrophylla (Rydb.) Szlachetko, Ophrys cordata Linnaeus, Ophrys nephrophylla (Rydb.) Szlachetko].
Plants 3-30 cm tall; leaves mostly ovate-cordate, 2-4 cm long, the apices acutemucronate; floral bracts 1-1.5 cm long; peduncle and rachis slightly glandular-hairy to glabrous; flowers green to yellow-green; sepals and petals spreading but not reflexed; dorsal sepal 2-3 mm long; petals 1-3 mm long; lip 1-2 mm wide, cleft ½ to ⅓ its length into 2 narrow pointed diverging lobes. ● Damp sites in aspen, fir, and pine forests at high elevations in the northern mountains. ● The deeply forked lip of *N. cordata* is diagnostic. Our plants consistently have green flowers aligned with the *nephrophylla* epipheth, and extra-state populations may have green to red flowers aligned with the *cordata* epipheth; this distinction dissolves throughout the range of the species (Coleman 2002). Coleman (2002) calls attention to the fanciful appearance of the lip: the deeply forked and spreading lip resembles legs, and the two horn-like appendages at the base of the lip resemble arms, giving the flower an elf-like appearance.

Perennial, glabrous herbs, the roots fleshy and tuber-like; leaves faded or withering by or during anthesis, basal, the cauline leaves bract-like; inflorescences spicate or racemose; flowers resupinate, white, yellow-green, to green, the lip prolonged backwards into a spur; fruit a capsule. ● About 10 species of temperate regions of North America, including Mexico.

#### Platanthera [wide anthers] BOG-ORCHID [8].
Perennial herbs, the roots slender or tuberous, the stems erect to decumbent-based, glabrous; leaves basal or cauline and gradually reduced upwards to bracts, the bases sheathing; inflorescence a spike (raceme); flowers usually resupinate; sepals free, the dorsal sepall erect or incurved to form a hood, the lateral sepals spreading to reflexed; petals free, entire to fringed or emarginate, the lip unlobed, spurred at the base; fruit a capsule. ● About 200 species, mostly north-temperate. Formerly included in Habenaria, which is restricted to mostly pantropical members. Determination of key floral features are much easier in fresh, unpressed material.

#### Platanthera aquilonis (Sprengel) Rydberg [from Unalaska, the Aleutian Islands] [Habenaria aquilonis (Sprengel) S. Watson, Spiranthes aquilonis Sprengel].
Plants 15-45 cm tall; leaves 2-6 in number, oblanceolate to elliptic, 8-10 cm long; floral bracts 2-16 mm long; flowers green, with a musty odor; sepals 2-4 mm long; petals 2-5 mm long; lip lance-elliptic to broadly ovate, 2-5 mm long, the spur subequal to the lip. ● Wooded canyons in coniferous forests; known as yet only from McKinley County.

#### Platanthera brevifolia
Leaves reduced to bracts along the stem. .................................................................

1. Leaves reduced to bracts along the stem ................................................................. P. brevifolia
2. Leaves well developed
3. Leaves typically single at the base of the plant, obovate, broadly rounded at the apex, 4-15 cm long; lateral petals erect or spreading outward, not much curved inward with the sepal hood ................................................................................... P. obtusata
4. Leaves typically numerous, not as above; lateral petals curved inward with the sepal hood
5. Lip greenish to yellowish, sometimes whitish but with evident and distinct tinges of green, dilated or not at the base; flowers whitish-green, greenish, to yellowish
6. Lip with a small basal protuberance or bump ......................................................... P. limosa
7. Lip without a protuberance or bump
8. Column comparatively large, ½ or more the length of the dorsal sepal; lip linear to lance-linear ................................................. P. dilatata
9. Column comparatively small, less than ½ the length of the dorsal sepal; lip usually broader than lance-linear
10. Spike densely flowered (sometimes lax); flowers distinctly whitish green (sometimes pale yellowish) ......................... P. hyperborea
11. Spike not densely flowered; flowers yellowish green to deep green with purplish tinge
12. Spur 2-3 mm long, sac-like to inflated club-shaped, about ½ or less the length of the lip ......................................................... P. purpurascens
13. Spur 3-7 mm long, cylindrical to narrowly club-shaped, subequal to the lip
14. Lip 3-6 mm long; spur (2)3-5 mm long; anther low, appearing to lie atop the stigma ......................................................... P. aquilonis
15. Lip 5-8 mm long; spur 5-7 mm long; anther high, rising above the stigma .............. P. tescamnis

#### Platanthera aquilonis Sheviak [pertaining to northern regions] [Platanthera hyperborea of NM reports].
Plants 8-60 cm tall; cauline leaves few to several, lanceolate to oblong, 4-20 cm long, gradually reduced to bracts; spikes variable, lax to dense; flowers yellowish green to pale whitish green, not showy; lateral sepals spreading to reflexed; petal margins entire; lip lanceolate to angular-lanceolate, 3-6 mm long, the base not dilated, the spur 2-5 mm long. ● Wet ground along streams and hillside seeps, marshy ground, generally above 8,000 ft in the northern mountains. ● Our plants were long referred to the Icelandic *P. hyperborea* (Linnaeus) Lindley. §

#### Platanthera brevifolia (Greene) Kraenzlin [short-leaved] [Habenaria brevifolia Greene, Habenaria sparsiflora S. Watson var. brevifolia (Greene) Correll, Limnorchis brevifolia (Greene) Rydberg, Platanthera sparsiflora (S. Watson) Schlechter var. brevifolia (Greene) Luer].
Plants 10-50 cm tall; cauline leaves few, quite bract-like, hardly reduced upwards, ovate, 3-6 cm long; spikes variable, lax to dense; flowers green to yellowish green, not showy; lateral sepals mostly reflexed; petal margins entire; lip linear to lanceolate, 6-10 mm long, the spur 9-20 mm long. ● Dry to moist ground in pine-oak woodland and coniferous forests at mid elevations, mostly in the southern and western mountains. §

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Platanthera dilatata (Pursh) Lindley ex Beck [dilated, expanded] [Habenaria dilatata (Pursh) Hooker, Limnorchis boreri (Chamisso) Rydberg, Limnorchis dilatata (Pursh) Rydberg, Orchis dilatata Pursh, Piperia dilatata (Pursh) Szlachetko]. Plants 10-60 cm or more tall, with a spicy aroma; cauline leaves few to several, linear to narrowly oblong, 5-30 cm long, gradually reduced to bracts; spikes variable, lax to dense; flowers white, showy, lateral sepals spreading to reflexed; petal margins entire; lip unlobed, narrowly lanceolate, 4-11 mm long, 2-5 mm wide at the dilated base, the spur subequal to the lip (ours). ●Rowes in the northern mountains; known from scant collections. ●This has recently been placed in the genus Piperia, but we maintain it here until more evidence is available. §

Platanthera huronensis (Nuttall) Lindley [from Lake Huron] [Orchis huronensis Nuttall]. Plants 10-60 cm or more tall; cauline leaves few to several, linear-lanceolate to oblong, 5-25 cm long, gradually reduced to bracts; spikes variable, lax to dense; flowers not showy, whitish green, the corollas often whiter than the calyx; lateral sepals spreading to slightly reflexed; petal margins entire; lip unlobed, narrowly lanceolate, 5-12 mm long, 2-4 mm wide, the base slightly to markedly dilated, the apex abruptly narrowed the spur 4-12 mm long. ●Wet meadows, ditches, and clearings in the northern mountains, above 8,000 ft., often associated with aspen. §

Platanthera limosa Lindley [of muddy ground] [Habenaria limosa (Lindley) Hemsley, Habenaria thurberi A. Gray, Limnorchis thurberi (Gray) Rydberg]. Plants 4-100 cm or more tall; cauline leaves few to several, lanceolate, 9-25 cm long, reduced to bracts upward; spikes variable, lax to dense; flowers greenish, not showy, lateral sepals reflexed to spreading; petal margins entire; lip narrowly oblong to ovate, 3-8 mm long, the spur filiform, 8-25 mm long. ●Wet places in mixed forest at mid-elevations, along streams and hillside seeps with constant moisture. §

Platanthera obtusata (Banks ex Pursh) Lindley [obtuse] [Orchis obtusa Banks ex Pursh]. Plants 6-35 cm tall; leaves mostly single, linear-ob lanceolate to broadly elliptic or obovate, 4-15 cm long; spikes loosely flowered; flowers greenish white to yellowish green, not showy; lateral sepals reflexed; petal margins entire; lip unlobed, narrowly lanceolate, 3-8 mm long, 1-2 mm wide, the spur 3-8 mm long. ●Damp forests of the Pecos Wilderness, Sangre de Cristo Mountains. ●Our plants belong to the typical subspecies; subsp. oligantha (Turczanic) Hulten occurs in Eurasia.

Platanthera purpurascens (Rydb.) Schieviak & Jennings [purplish] [Habenaria neomexicana Tidestrom, Limnorchis purpurascens Rydberg, Platanthera hyperborea (Linnaeus) Lindley var. purpurascens (Rydb.) Luer]. Plants 25-70 cm tall, with a strong musty smell; cauline leaves few to several, lanceolate to oblong-ovate, 6-18 cm long; spikes variable, lax to dense; flowers green to yellowish green, often tinged with blue or red, not showy, strongly scented (semen- or musty-like); lateral sepals spreading to reflexed; petal margins entire; lip unlobed, narrowly lanceolate, 4-8 mm long, the base sometimes dilated, the spur strongly clavate, 2-3 mm long. ●Widespread in moist to damp areas in the mountains above 7,000 ft., commonly along streams, seeps, and wet meadows. §

Platanthera sparsiflora (S. Watson) Schlechter [few-flowered] [Habenaria laxiflora Rydberg, Habenaria sparsiflora S. Watson, Habenaria sparsiflora S. Watson var. laxiflora (Rydb.) Correll, Limnorchis ensifolia Rydberg, Limnorchis sparsiflora (S. Watson) Rydberg, Platanthera hyperborea (Linnaeus) Lindley var. gracilis (Lindley) Luer, Platanthera sparsiflora (S. Watson) Schlechter var. ensifolia (Rydb.) Luer]. Plants 30-60 cm or more tall; cauline leaves few to several, sometimes clustered near the base, linear, oblong, to ovate, 7-25 cm long; spikes variable, lax to dense; flowers green to yellowish green, showy; lateral sepals reflexed (sometimes spreading); petal margins entire; lip narrowly lanceolate to oblong, not dilated basally, 5-11 mm long, the spur longer than the petals; rostellum lobes of column prominent, often strongly divergent (to obscure). ●Wet places in the central and southern mountains, at low to mid-elevations, commonly along seeps and streams in rocky ground. §

Platanthera tesscannis Sheviak & Jennings [desert-river]. Plants 30-120 cm tall; cauline leaves 3-7, linear-lanceolate to elliptic or obovate, 8-28 cm long; spikes variable, lax to dense; flowers green to yellowish green, showy; lateral sepals spreading to reflexed; petal margins entire; lip oblong to somewhat ovate, sometimes narrower, not dilated basally, 5-8 mm long, the spur subequal to the lip; rostellum lobes of the column small and rounded. ●Not definitely known from the state, but to be looked for in the northwest region, canyons, riparian pine-juniper woodlands; known westward in the Great Basin and Colorado Plateau regions. ●The species is sometimes credited for New Mexico from photos (see iNaturalist.org), but its occurrence in the state has not been substantiated. It would most likely be confused with Platanthera sparsiflora, but differs in the size and structure of the column (Sheviak & Jennings 2006).

Schieva [for Christian Julius Wilhelm Schiedea (1798-1836), German physician and botanist] INDIAN-BRAIDS [1].

Perennial herbs from thickened tuberous roots; leaves appearing in the summer after dehiscence of the capsule and withering in the fall, not present at anthesis; inflorescence a few-many-flowered spike, spirally arranged; flowers resupinate; sepal similar, connivent, the dorsal sepal adnate to the back of the column, the lateral sepals adnate to the column foot; petals linear, the lips distinctly clawed, the central petal with a reddish disc; fruit a capsule. ●About 9 species of the Western Hemisphere, only 1 in North America north of Mexico.


Schieva arizonica P.M. Brown [of Arizona] [Schieedea parasitica and Spiranthus parasitica of NM reports]. Perennial herbs to 20 cm tall, with thickened roots to 3 cm long; leaves absent at anthesis, 3-5 in a basal rosette during the summer and fall, oval, 3-6 cm long; scapes greenish yellow to pinkish, slender, with several bracts; flowers 3-14 in number, whitish, rose, or tan, 6-10 mm long; sepal 5-7 mm long; petals 4-5 mm long, the lip 5-8 mm long, reflexed, with a central reddish spot. ●Mixed coniferous deciduous forests at a variety of elevations, often in heavy forest dust in the understory; southern and southwestern mountains. ●This was long-referred to either Schiedea parasitica or Spiranthus parasitica; some use the common name FALLEN LADIES-TRESSES to reflect this past relationship with Spiranthus. Plants of Schiedea arizonica are not parasitic.


Perennial herbs, from fleshy (sometimes tuberous) roots; leaves mostly basal or cauli, reduced above to sheathing bracts, present or absent at flowering time; inflorescence a spike, the flowers spirally arranged; flowers resupinate, white, cream, to yellowish; sepal distinct (ours), connivent with the petals and forming a hood, or free and not forming a hood; lip sessile or short-clawed, partly
Monocotyledonous Plants - Orchidaceae

Spiranthes magnicamporum Sheviak [of the Great Plains] [Spiranthes cernua of NM reports]. Plants 20-50 cm tall, with 2-3 basal leaves and several sheathing cauline bracts, the roots tuberous to 5 cm long, the stems glandular-hairy; leaves linear-lanceolate, to 16 cm long, present or absent at anthesis; flowers white to ivory, slightly nodding; sepals distinct, 5-14 mm long, the lateral wide-spreading; petals 5-13 mm long, the lip with a yellow center, 5-12 mm long, dilated distally. •Moist to wet meadows and clearings in the northern mountains and plains; little collected.

Spiranthes romanzoffiana Chamisso [for Nikolai Petrovich Romanzoff (1754-1826), Chancellor of the Russian Empire] [Ibidium strictum House]. Plants 8-40 cm tall (ours, taller elsewhere), with 3-6 basal leaves and several sheathing cauline bracts, the roots tuberous, to 10 cm long, the stems glabrous; leaves linear-lanceolate, to 18 cm long, present (sometimes absent) at anthesis; flowers white to ivory, tilted upward; sepals and petals connivent and forming a hood; sepals connate basally, 5-12 mm long; petals 6-10 mm long, the lip 5-10 mm long, dilated distally. •Moist to wet meadows, marshy ground, stream banks, and clearings in the northern mountains. §
Monocotyledonous Plants - Orchidaceae

- *Dactylorhiza viridis*
- *Epipactis gigantea*
- *Goodyera oblongifolia*
- *Goodyera repens*
- *Malesia soulei*

**June 25**
Jemez R.

**July 15**
Cowles, San Mig.
Ca.

**July 25**
Sandia Mts.

**August 12**
Black Range
7500'

**August 21**
White Mts.
Sierra Blanca
7400'

Forest floor
Green
Mostly white

Forest floor
Green
 Mostly white

White
Forest

Forest slopes
Purple
Monocotyledonous Plants - Poaceae

1 Plants usually flowering each year, the spikelets present; blades not constricted at the base into a narrow stalk-like portion and

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1 Plants not known to flower in New Mexico, spikelets not produced; blades constricted at the base into a narrow stalk-like portion

2 Spikelets not concealed and not hidden within modified structures, but evident and easily seen, sometimes closely subtended by

2 All or some of the spikelets concealed and hidden from view within modified structures, such as spiny burs, involucres, bony

rachis joints, dense fleshy cobs (ears), or detachable clusters of hard bracts .................................................................KEY A

2 Spikelets not concealed and not hidden within modified structures, but evident and easily seen, sometimes closely subtended by

foliage leaves or covered by hairs

3 One or more bristles (sterile branchlets) borne immediately below the spikelets, the bristles sometimes clustered into a bur or

involucre

4 Spikelets disarticulating singly, leaving the bristles on the plant .................................................................Setaria

4 Spikelets disarticulating with the involucres of bristles, the two falling together ..............................................Pennisetum

POACEAE (GRAMINEAE) GRASS FAMILY

Herbs or less commonly shrubby or even tree-like, the stems usually round and with hollow internodes. Leaves alternate or

basal, simple, differentiated into sheath, ligule, and blade, the sheath margins overlapping or fused. Flowers small, inconspicuous, hidden within an inflorescence of spikelets, which is composed of basal glumes, lemmas, paleas, and

flowers; perianth, if present, modified as tiny lodicules; stamens 1 or 3 (ours); pistil single, superior, of 3 united carpels, the

styles usually 2 and the stigmas feather-like. Fruit a carpyopsis, rarely nut-like or an utricle. About 800 genera and 1200

species. This is easily the single most important plant family for humans, providing what (Triticum), barley (Hordeum), oats

(Avena), sorghum (Sorghum), rice (Oryza), sugarcane (Saccharum), pearl millet (Pennisetum), and corn (Zea). Much recent

work has been done on the evolutionary and phylogenetic relationship among the grasses; see Soreng et al. (2015, 2017) for

current outlines of the classification with references. This treatment includes all grasses known to grow outdoors in New

Mexico, whether cultivated, ornamental, crop, exotic, adventive, or native; species found in the wild are in bold italics, those

known only in cultivation are in simple italics.


1 Plants not known to flower in New Mexico, spikelets not produced; blades constricted at the base into a narrow stalk-like portion with a tuft of stiff bristles on each side: cultivated ornamentals .................................................................Phyllostachys

1 Plants usually flowering each year, the spikelets present; blades not constricted at the base into a narrow stalk-like portion and

without stiff bristles on each side; cultivated or wild grasses

2 All or some of the spikelets concealed and hidden from view within modified structures, such as spiny burs, involucres, bony

rachis joints, dense fleshy cobs (ears), or detachable clusters of hard bracts .................................................................KEY A

2 Spikelets not concealed and not hidden within modified structures, but evident and easily seen, sometimes closely subtended by

foliage leaves or covered by hairs

3 One or more bristles (sterile branchlets) borne immediately below the spikelets, the bristles sometimes clustered into a bur or

involucre

4 Spikelets disarticulating singly, leaving the bristles on the plant .................................................................Setaria

4 Spikelets disarticulating with the involucres of bristles, the two falling together ..............................................Pennisetum

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3 Bristles not borne immediately below the spikelets, a bur or involucre absent
5 Glumes with numerous hooked prickles 1-2 mm long .......................................................... _Tragus_
5 Glumes lacking hooked prickles
6 Lemma with 7-13 awns (rarely 5) .......................................................................................... KEY B
6 Lemma with 1-3 awns or awnless
7 Flowering shoots 2 meters or more tall .................................................................................. KEY C
7 Flowering shoots less than 2 meters tall
8 All or many of the spikelets sessile and borne on the main axis; inflorescence branches absent, the inflorescence a spike, spicate raceme, or dense head-like cluster of spikelets .................................................. KEY D
8 All or most of the spikelets borne on branches, the inflorescence a panicle, or if branches absent then all the spikelets with evident pedicels and few (if any) sessile
9 Andropogoneae Tribe: Glumes mostly hardened (membranous in _Zea_ and _Imperata_), completely enclosing the florets, dorsally compressed; disarticulation below the glumes and nearly always in units consisting of a sessile spikelet with attached rachis joint and pedicel (the pedicelled spikelet present or absent); spikelets borne in pairs, one spikelet sessile or subsessile and one spikelet pedicelled (sometimes the pedicelled spikelet absent, but the pedicel always present); lemmas very thin and translucent, delicate, awned or awnless .............................................. KEY E
9 Combination of features other than above
10 Spikelets with a single floret only ......................................................................................... KEY F
10 Spikelets with at least 2 florets, some may be small and poorly developed (look carefully)
11 Paniceae Tribe: Spikelets with 2 florets, the upper bisexual and usually with a hardened lemma at maturity, the lower male or neuter; lemma of the lower floret similar to the second glume in size and texture; disarticulation below the glumes; spikelets dorsally compressed .................................................. KEY G
11 Combination of features other than above
12 Lemmas with 3 nerves, the nerves usually prominent .......................................................... KEY H
12 Lemmas with 5-many nerves, at least at the base, or the nerves not discernible  ...................... KEY I

KEY A: Spikelets variously concealed
1 Spikelets enclosed in a bur (involucre) of bristles or stiff spines, the bur falling entire
2 Bur of sharp, stiff spines ....................................................................................................... _Cenchrus_
2 Bur of bristles, without spines ............................................................................................... _Pennisetum_
1 Spikelets not enclosed in a bur (involucre) of bristles or spines
3 Plants mat- or sod-forming, with stolons or rhizomes
  4 Sheaths strongly compressed-keeled; spikelets all alike and sunk into one side of a corky or succulent, flattened rachis; cultivated lawn grasses .......................................................... _Stenotaphrum_
  4 Sheaths rounded; spikelets unisexual and different in appearance, the male on spicate, flag-like primary branches raised above the foliage, the female in bony clusters hidden in the foliage; native range grasses, but sometimes also grown as a lawn grass (_B. dactyloides_). .................................................................................................................. _Bouteloua_
3 Plants not mat-forming, without stolons or rhizomes
5 Glumes with numerous hooked prickles 1-2 mm long .......................................................... _Tragus_
5 Glumes lacking hooked prickles
6 Female spikelets borne singly in hard, whitish beads at the ends of long stalks; ornamental or garden grasses only
  6 Female spikelets borne in cobs, or if bead-like then several borne adjacent to each other; cultivated or wild grasses
  7 Spikelets borne in spicate racemes no more than 2 cm long; spikelets paired, the sessile one bisexual, grenade-shaped, and covered with square pits, the pedicelled one male and flattened; rare ............................................................................................................. _Mesotheia_
  7 Spikelets borne in panicles or cobs more than 10 cm long; spikelets all unisexual, the sexes in different part of the same inflorescence or in separate inflorescences on the same plant
  8 Male spikelets borne in a terminal panicle (tassel); female spikelets borne below in a thick axillary spike (cob) and covered by leaf sheaths, the styles (silk) protruding from the tip; cultivated grasses .............................. _Zea_
  8 Male and female spikelets borne together in the same panicle, the male ones papery and in pairs at the terminal portion of the spicate branches, the female ones bony and at the base of the same branches; wild grasses, but probably not extirpated from the state .................................................................................................................. _Tripsacum_

KEY B: Lemma with 7-13 awns
1 Awns plumose, feathery, ± equal in length .............................................................................. _Enneapogon_
1 Awns glabrous to scabrous, not plumose and not equal in length
2 Glumes 1-nerved .................................................................................................................. _Pappophorum_
2 Glumes many-nerved ......................................................................................................... _Cottea_

KEY C: Flowering shoots 2 meters or more tall
1 Grasses cultivated for ornament, landscaping, or as a harvested crop, occasionally escaping around fields or dwellings
2 Corn: male spikelets borne in a terminal panicle (tassel); female spikelets borne on the stem in a thick axillary spike (cob or ear) covered by leaf sheaths, the styles (silk) protruding from the tip .............................................. _Zea_
2 Plants not as above
3 Plants growing in large, thick tussocks with numerous flowering shoots; rhizomes lacking
  4 Blades sharply saw-toothed on the margins; spikelets borne singly on rebranching branches of the inflorescence, with several florets extending beyond thin glumes ............................................................................. _Cortaderia_
  4 Blades scabrous to smooth on the margins; spikelets borne in pairs on spicate branches, with no florets extending beyond the stiff glumes
  5 Panicle branches breaking apart at the nodes (joints) when mature ............................................. _Tripidium_
  5 Panicle branches remaining intact, the spikelets falling separately when mature ...................... _Miscanthus_
1 Grasses wild or weedy, or seeded for range or pasture improvement, but not crop or ornamental plants

2 Main axis of the inflorescence breaking apart at maturity

3 Spikelets not in large tussocks, the shoots single, or if clustered then with strong vigorous rhizomes

4 Awns 1-2 cm long ............................................................................................................. ..............................

5 Disarticulation above the glumes; spikelets awned

6 Racemes 4-8 cm long; awns 5-12 cm long; main axis (or most of it) breaking apart when mature. .......................... ..........................

7 Racemes 4-8 cm long; awns 5-12 cm long; main axis (or most of it) breaking apart when mature .......... ..............................

8 Spikelets awnless, or with awns 1-2 mm long

9 Spikelets subtended by numerous bristles; plants annual (S. magna).................................................. ..............................

10 Inflorescence a spike, no branches developed......................................................................................... ..............................

11 Inflorescence branches numerous and rebranched, not clustered toward the tip of the shoot................. ..............................

12 Inflorescence less congested and somewhat elongate, not at all head-like, the rachis obscured and viewed only with difficulty; fertile plants of alpine or subalpine habitats (Elymus scribneri)........................................... ..............................

13 Inflorescence branches 2-5 in number and mostly not rebranched, clustered toward the tip of the shoot (A. gerardi)...

14 Inflorescence a rebranched panicle, the numerous primary branches always rebranching

15 Inflorescence branches 2-5 spicate, unbranched primary branches clustered at the tip of the shoot, sometimes a few of the branches rebranching (A. gerardi) ................................................................. ..............................

16 Outer bracts of the spikelet (glumes) membranous, thin and flexible, not hardened; upper floret hardened at maturity; spikelets awnless.............................................................................................................. ..............................

17 Spikelets somewhat shiny, glabrous or slightly pubescent, the hairs pressed against the spikelet; awn early-deciduous................................................................................................................................. ..............................

18 Panicles with unbranched spicate branches ............................................................................................... ..............................

19 Spikelets with a single floret (S. arenicola & S. rigidus).................................................................................. ..............................

20 Glumes unequal in length; rachilla glabrous; lemma long-hairy ................................................................. ..............................

21 Glumes nearly equal in length; rachilla glabrous; lemma long-hairy ................................................................. ..............................

22 Inflorescence a spike, spicate raceme, or dense head-like cluster, all or many of the spikelets sessile on the main axis, branches absent from the inflorescence.

23 Spikelets borne in pairs of one sessile and one pedicelled (sometimes only the pedicel present); glumes mostly enclosing the spikelet, the florets mostly not visible (members of the Andropogoneae tribe)

24 Spikelets awned, the awns at least 5 mm long

25 Awns 1-2 cm long ................................................................................................................................. ..............................

26 Racemes 4-8 cm long; awns 5-12 cm long; main axis (or most of it) breaking apart when mature .............. ..............................

27 Racemes less than 3 cm long, glabrous or only sparsely pubescent; plants annual ........................................ ..............................

28 Spikelets borne other than above; glumes may be longer than, but not enclosing the spikelet, the florets usually visible (Triticeae tribe)

29 Spikelets mostly 1 or 2 at each node of the main axis, if 3 then not otherwise as above; spikelets with 2 to many florets

30 Spikelets mostly 1 at each node of the main axis

31 Plants annual

32 Plants perennial

1 Inflorescence very dense, almost head-like, the rachis obscured and viewed only with difficulty; fertile plants of alpine or subalpine habitats (Elymus scribneri) .............................................................. ..............................

2 Inflorescence less congested and somewhat elongate, not at all head-like, the rachis easily observed; sterile hybrid plants of low-elevation or mid-montane habitats
Monocotyledonous Plants - Poaceae

13 Awns of the lemma 4-17 mm long, usually erect; rachis internodes 2.5-6(7) mm long; these are *Elymus elymoides* × *E. trachycaulus* hybrids [Elymus saundersii Vasey, Agropyron saundersii (Vasey) A.S. Hitchc.].

13 Awns of the lemma (14)18-37 mm long, spreading to recurved downward; rachis internodes mostly 7-10 mm long...these are *Elymus elymoides* × *E. spicata* hybrids [Elynotogia saxiscola (Scribn. & Smith) Barkw. & Dewey, *Elymus saxicola* Scribn. & Smith].

8 Spikelets mostly 2 at each node of the main axis
14 Glumes 3-7 mm long; anthers 4-5 mm long ................................................................. Psathyrostachys
14 Glumes 12-100 mm long; anthers, when present, about 2 mm long
15 Glumes 12-24 mm long; sterile hybrid plants...these are *Elymus trachycaulus* × *Hordeum jubatum* hybrids [Elyhordeum macounii (Vasey) Barkw. & Dewey, *Elymus macounii* Vasey].
15 Glumes 25-100 mm long; fertile plants.......................................................... Elymus

2 Main axis of the inflorescence remaining intact
16 Plants strongly rhizomatous or stoloniferous perennials
17 Wild range grasses, not cultivated in lawns; spikelets falling in clusters of three................................................................. Hilaria
17 Lawn grasses, occasionally escaping in weedy ground in residential areas; spikelets not falling in clusters of three
18 Plants mostly stoloniferous; blades fleshy and somewhat succulent; spikelets borne on one side of a flattened, succulent main axis ........................................................................................................ Stenotaphrum
18 Plants mostly rhizomatous; blades thin and membranous, not at all succulent; spikelets variously disposed on short pedicels around the thin, non-succulent main axis .......................................................... Zoysia
16 Plants tufted annuals or perennials, not stoloniferous or rhizomatous
19 Plants cultivated lawn grasses or weedy in lawns
20 Spikelets pointed at the tip and arranged on one side of a thickened rachis ................................................................. Stenotaphrum
20 Spikelets blunt at the tip and arranged on both sides of the rachis ................................................................................... Sclerochloa
19 Plants of various habitats, but never cultivated or weedy in lawns
21 First glume with 2 or 3 awns; lower stems angled or flattened somewhat.......................................................... Muhlenbergia
21 First glume with a single awn or awnless; lower stems rounded
22 Awns 4-6 cm long................................................................. Trachypogon
22 Awns, if present, less than 2 cm long
23 Ligules hairy; sheaths prominently inflated; blades widely spreading to reflexed; inflorescence dense and head-like or spike-like; the base often included in the sheath; much-branched annuals (S. alopecuroides & S. schoenoides) ................................................................. Sporobolus
23 Plants not as above in all respects
24 Spikelets in pedunculate clusters of three, usually hanging downward, and falling together.............. Aegopogon
24 Spikelets not so arranged
25 Glumes awnless; lemma awned (use a lens) .......................................................................................... Alopecurus
25 Glumes awned
26 Glumes strongly flattened laterally, ciliate on the keeled midnerve .................................................. Phleum
26 Glumes rounded on the back, not keeled, not ciliate on the midnerve but may be pubescent elsewhere.......................................................................................... Polypogon
28 Plants not as above in every characteristic
30 Lemmas with 3 awns .......................................................................................................................... Aristida
30 Lemmas with one awn or awnless
31 Spikelets with one floret only
32 Plants annual; leaves with prominent, claw-like auricles 2-6 mm long; awns 50-160 mm long.............. Hordeum
32 Plants perennial; leaves without auricles, or occasionally with small rounded auricles about 1 mm long; awns 1-4 mm
33 Spikelets strongly compressed; glumes flattened, keeled on the midnerve, completely enclosing the floret .......................................................... Phleum
33 Spikelets not strongly compressed; glumes rounded on the back, only slightly keeled, not completely enclosing the floret.......................................................... Muhlenbergia
31 Spikelets with more than one floret, some may be poorly developed, rudimentary, or vestigial
34 Spikelets in dense, sessile, head-like clusters that are mostly surpassed by and nestled within the foliage...Munroa
34 Spikelets not in dense, head-like clusters, or if so then elevated well above the foliage
35 Lemmas with 3 conspicuous nerves
36 Lemmas conspicuously pubescent; spikelets with several well-developed florets; blades white-margined... Erioneuron
36 Lemmas glabrous or scabrous; spikelets with one well-developed floret and 1-3 rudimentary above it: blades not white-margined................................................................. Bouteloua
35 Lemmas with 1 or 5-several nerves
Monocotyledonous Plants - Poaceae

37 Plants low annuals; inflorescence not a true spike, but the branches very short with 1-3 spikelets borne on short pedicels nearly on the main axis; lemmas about 2 mm long, the glumes mostly shorter .......................................................... Catapodium

37 Plants, inflorescence, lemmas, and glumes not as above
38 Spikelets 2 or more per node of the rachis
39 Rhizomes present, evident, creeping ................................................................. Leymus
39 Rhizomes absent, occasionally short rhizomes developed but the plants still forming dense clumps
40 Glumes absent or reduced to 1 or 2 minute bristles; spikelets horizontally spreading or ascending at maturity (E. hystrix) .................................................. Elymus
40 Glumes present; spikelets rarely horizontally spreading
41 Glumes 2-10 cm long ....................................................................................... Elymus
41 Glumes shorter than 1.5 cm
42 Glumes 2- to 5-nerved; anthers 1.5-3 mm long................................................ Elymus
42 Glumes 1-nerved; anthers 3-5 mm long........................................................... Psathyrostachys
38 Spikelets mostly 1 per node of the rachis
43 Spikelets placed edge-wise to the rachis, the first glume absent on all but the terminal spikelets ....
................................................................................................................................. Lolium
43 Spikelets placed flat-wise to the rachis; both glumes present on all spikelets
44 Plants annual
45 Spikes very short, 0.6-2 cm long; plants usually less than 30 cm tall
46 Inflorescence exserted from the sheath at maturity; glumes and lemmas awn-tipped;
blades with small auricles .................................................................................. Eremopyrum
46 Inflorescence often partially enclosed in the upper sheath; glumes and lemmas blunt-
tipped; blades lacking auricles ........................................................................ Sclerochloa
45 Spikes longer, mostly 5-15 cm long; plants usually much more than 30 cm tall
47 Glumes narrow, linear, 1-nerved; spikelets with 2 florets ................................. Secale
47 Glumes broad, oblong to ovate, 3- to several-nerved; spikelets mostly with 3-5 florets
48 Nerves of the lemma converging at the apex; plants commonly glaucous........
............................................................................................................................... × Triticosecale
48 Nerves of the lemma ± parallel, not converging at the apex; plants commonly green and not glaucous .................................................. Triticum
44 Plants perennial
49 Spikelets borne in pairs of one pedicelled and one nearly sessile; glumes awnless; lemmas awned, the awns 4-6 cm long .................................................. Trachypogon
49 Spikelets not as above
50 Glumes linear, needle-like, 1-nerved (occasionally broader at the base and 3-nerved). .
............................................................................................................................. Leymus
50 Glumes lanceolate or broader, usually 3- to 7-nerved
51 Spikelets spreading away from the rachis, placed very close together on the main axis; rachis internodes between the spikelets 0.3-3 mm long in the middle of the spike................................................................................................................................ Agropyron
51 Spikelets mostly pressed against the rachis, or curving outward toward the tip of the spikelet; rachis internodes between the spikelets 4-25 mm long
52 Glumes acuminate, asymmetrical to curved and somewhat sickle-shaped, gradually tapering to an awn-tip; blades somewhat rigid and prominently ridged above; plants rhizomatous, commonly bluish (P. smithii) ..............................................................
................................................................................................................................. go to Pascopyrum
52 Glumes various, blunt to acuminate, symmetrical, not curving, not gradually tapering to an awn-tip; blades often lax, not prominently ridged above; plants tufted to rhizomatous, not commonly bluish .............. Elymus

KEY E: Andropogoneae Tribe
1 Spikelets all unisexual, the male and female spikelets conspicuously different in form and borne either separately in the same inflorescence or in separate inflorescences on the same plant; plants monoecious
2 Female spikelets borne singly in hard, whitish beads at the end of long stalks; domesticated grasses......................................................... Coix
2 Female spikelets in cobs, or if bead-like then not borne singly at the end of long stalks but adjacent to other bony spikelets; wild or domesticated grasses
3 Male spikelets borne in a terminal panicle (tassel); female spikelets in a separate inflorescence and borne below in a thick axillary spike (cob) and covered by leaf sheaths, the styles (silks) protruding from the tip; domesticated grasses .................................. Zea
3 Male and female spikelets borne together in the same panicle, the male ones papery and in pairs at the terminal portions of the spike branches, the female spikelets bony and at the base of the same branches; wild grasses ................................................. Tripsacum
1 Spikelets unisexual or bisexual but usually not conspicuously different in form, borne in pairs and not separated one from the other; plants not monoecious
4 Each inflorescence a panicle with branches (occasionally a few inflorescences with a single branch), with or without inflated sheaths subtending the inflorescence (spathes)
5 Spikelets all similar in appearance and size
6 Pedicels without a spikelet borne at the tip
7 Flowering shoots mostly with one or a few large, terminal panicles 10 cm or more long .........................................Sorghastrum
7 Flowering shoots with numerous small panicles clustered together, each less than 3 cm long and each with a subtending spathe .................................................................Andropogon
6 Pedicels with a spikelet borne at the tip
8 Pedicels and rachis segments (rachis joints) with a central longitudinal groove or membrane, flattened in cross-section ..................................................................................................Bothriochloa
9 Panicles narrow and spike-like, with soft silky hairs, 1-3 cm wide and 8-18 cm long, the branches scarcely noticeable at arm’s length .................................................................Imperata
9 Panicles not as above, usually wider and/or shorter or the branches obvious at arm’s length
10 Panicles with 2-5 primary branches ..................................................................................................................Andropogon
10 Panicles with more than 10 branches
11 Hairs at the bases of the spikelets much shorter than the spikelets, less than 1 mm long; plants grown for crops or adventive in weedy ground ..................................................Sorghum
11 Hairs at the bases of the spikelets nearly equaling or longer than the spikelets, 4-12 mm long; plants grown for ornament
12 Panicle branches breaking apart at the nodes (joints) when mature ....................................................................Tripodium
12 Panicle branches remaining intact, the spikelets falling separately when mature ...........................................Miscanthus
5 Spikelets not all similar, the pedicelled ones often smaller in size or different in appearance when compared to the sessile ones
13 Pedicels and rachis segments (rachis joints) with a central groove or membrane running lengthwise, flattened in cross section ..................................................................................................Bothriochloa
13 Pedicels and rachis segments without a central groove or membrane, nearly round in cross section, at least at the apex
14 Inflorescence with numerous (more than 5) branches; sessile spikelets ovoid to nearly globose ..........................................................Sorghum
14 Inflorescence with 2-5 nearly digitate branches; sessile spikelets lanceolate (A. gerardi) ...........................................Andropogon
4 Each inflorescence a single unbranched spikelet raceme without branches, subtended by a somewhat inflated bladeless sheath (spathe), the flowering shoot usually bearing numerous such inflorescences
15 Spikelets awned, or with awns 1-2 mm long
16 Racemes less than 3 cm long, glabrous or only sparsely pubescent ........................................................................Mnesithea
16 Racemes more than 4 cm long, densely woolly-pubescent ..................................................................................Elionurus
15 Spikelets awned, the awns at least 5 mm long
17 Awns 0.5-2 cm long ..................................................................................................................................................Schizachyrium
17 Awns 4-12 cm long
18 Racemes 4-8 cm long; awns 5-12 cm long; the main axis breaking apart at maturity, at least most of it ..........Heteropogon
18 Racemes 10-18 cm long; awns 4-6 cm long; the main axis persistent .................................................................Trachypogon

KEY F: Spikelets with a single floret.
1 Glumes absent; leaf blades strongly saw-toothed on the edges ....................................................................................Leersia
1 Glumes present, at least one; leaf blades smooth to slightly saw-toothed on the edges
2 Glumes and lemmas awnless
3 Inflorescence a panicle of evident, unbranched, spikelet primary branches
4 Panicle branches all attached at the tip of the main axis .................................................................Cynodon
4 Panicle branches attached along the length of the main axis, not only at the tip
5 Glumes equal in length or nearly so; spikelets nearly round in outline ..........................................................Beckmannia
5 Glumes unequal, the first glume shorter than the second; spikelets lanceolate in outline
6 Spikelets widely spaced, rarely overlapping, appearing embedded in the branches; blades spirally twisted (M. paniculata) ........................................................................................................Muhlenbergia
6 Spikelets very closely spaced, overlapping, not at all appearing embedded in the branches; blades not spirally twisted .........................................................................................Spartina

3 Inflorescence a panicle of rebranched branches, or dense and spike-like
7 Disarticulation below the glumes
8 Ligules hairy; sheaths prominently inflated; blades widely spreading to reflexed; inflorescence dense and head-like or spike-like, the base often included in the sheath; much-branched annuals (S. alopecuroideus & S. schoenoides). Sporobolus
8 Plants not as above in all respects
9 Spikelets nearly round in outline, the glumes somewhat inflated or puffy-looking ...........................................Beckmannia
9 Spikelets mostly lanceolate in outline, the glumes not at all inflated or puffy-looking
10 Glumes softly pubescent on the midnerves; inflorescence dense and spike-like, rarely lobed .........................Alopecurus
10 Glumes glabrous to scabrous, not softly pubescent; inflorescence usually lobed at least below ..................Polypogon
7 Disarticulation above the glumes
11 Lemma hardened at maturity, enclosing the palea and flower
12 Lemma with 1 or 2 slender bracts, bristles, or scales at the base of the floret, these sometimes pubescent and often difficult to see without dissecting carefully .................................................................Phalaris
12 Lemma without any bracts, bristles, or scales at the base of the floret
13 Florets dorsally compressed; lemma margins not overlapping, the palea exposed, at least in part ........Piptatheropsis
13 Florets terete; lemma margins slightly overlapping, the palea hidden ..........................................................Oryzopsis
11 Lemma remaining thin and flexible, not hardened, not enclosing the palea
14 Lemma with a single nerve; ligule a ring of hairs
15 Rare turf grasses planted for lawns; first glume absent, the second glume enclosing the floret .........................Zoysia
15 Mostly common grasses of numerous habitats, but never lawn grasses .........................................................Sporobolus

Monocotyledonous Plants - Poaceae
14 Lemma with 3 or more nerves; ligule a membrane

16 Sheath margins fused together for half their length or more

16 Sheath margins overlapping most of their length

17 Palea about as long as the lemma; body of the glumes (not including awn tips) shorter than the lemma; lemma mostly 3-nerved

17 Palea half or less as long as the lemma; body of the glumes longer than the lemma; lemma obscurely nerved

18 Rachilla prolonged beyond the palea as a short bristle to 0.6 mm long

18 Rachilla not prolonged beyond the palea

2 Glumes and/or lemmas awned

19 Inflorescence a panicle of several evident, unbranched, spicate, primary branches

20 Spikelets nearly round in outline, the glumes somewhat inflated

20 Spikelets lanceolate in outline, the glumes not at all inflated

21 Panicle branches all less than 2 cm long

21 Panicle branches mostly longer than 2 cm long

19 Inflorescence a panicle of rebranched branches, or a raceme, or in some the pedicels and branches poorly developed and the inflorescence spike-like

22 Lemma hard at maturity, usually enclosing or clasping the palea and flower, mostly with a well-developed and pointed callus

23 Ligule a ring of hairs; lemma terminating in three awns, the two lateral awns occasionally shortened and inconspicuous

23 Ligule a membrane; lemma terminating in a single awn, this may be deciduous

24 Palea hardened, longitudinally grooved and slightly longer than the lemma, protruding from between the lemma margins as a small point; lemma margins involute, fitting into the grooves of the palea

24 Palea usually membranous, not grooved, not or only slightly overlapping, the palea, not protruding as a small point; lemma margins flat

25 Lemma margins strongly overlapping; palea less than 1/3 the length of the lemma, glabrous, lacking veins

25 Lemma margins not or only slightly overlapping; palea 1/3 to equalling the length of the lemma, always pubescent when short, sometimes glabrous when longer, 2-veined

26 Awns 6-20 cm long or more; glumes longer than 1.8 cm

27 Membranous ligules of lower leaves densely ciliate, with hairs 0.3-1 mm long

27 Membranous ligules of lower leaves glabrous or at most minutely ciliate

26 Awns 0.5-7.5 cm long, if longer than 6 cm then the glumes 1-1.5 cm long

28 Palea pubescent, the apex flat, the veins terminating below the apex; lemma coriaceous at maturity but not strongly indurate

29 Glumes without evident nerves, the apices rounded to acute; plants alpine, growing on mossy hummocks in wet ground

29 Glumes with 1-5 evident nerves and/or the apices attenuate; plants growing in various habitats, but rarely as above

30 Plants with neither woody nor bamboo-like culms 3-6 mm thick, with mostly 2-3 nodes

30 Plants with ± woody, bamboo-like culms 3-6 mm thick below, with 3-13 nodes

31 Florets dorsally compressed; lemma margins not overlapping, the palea exposed, at least in part

31 Florets terete; lemma margins slightly overlapping, the palea hidden

22 Lemma not hard (somewhat so in Apera but then the rachilla prolonged beyond the palea), not enclosing the flower and palea; mostly without a well-developed callus

32 Inflorescence spike-like or head-like, the branches absent or highly shortened

33 First glume 2-nerved with 2 or 3 awns; lower stems angular or flattened somewhat

33 First glume 1-nerved with a single awn or awnless; lower stems rounded

34 Glumes plumose; spikelets in dense ovoid heads, rarely any more than 2 times longer than wide; plants annual with markedly pubescent sheaths and blades, grown for ornament and dried bouquets, rarely escaping

34 Plants not as above in all respects

35 Glumes awned; lemma awned

35 Glumes awnless

36 Glumes strongly flattened laterally, ciliate on the keeled midnerve

36 Glumes rounded, not keeled, not ciliate on the midnerve, but may be pubescent on the body

32 Inflorescence a panicle with evident branches

37 Disarticulation below the glumes

38 First glume with 2 or 3 awns; spikelets falling in pairs

38 First glume with a single awn or awnless
39 Spikelets nearly circular in outline; glumes and lemma awnless (glumes with a tiny point, but not awned) ................................................................. Beckmannia

39 Spikelets elongate, not circular in outline; glume and/or lemma awned

40 Glumes awnless; lemma awned
41 Panicle loose, the branches at least 5 cm long and drooping at maturity ................................................. Cinna
41 Panicle cylindrical, dense, the branches very short................................................................................. Alopecurus

40 Glumes awned
42 Glumes strongly flattened laterally, ciliate on the keeled midnerve ................................................. Phleum
42 Glumes rounded, not keeled, not ciliate on the midnerve, but may be pubescent on the body ..................................................... Polypogon

37 Disarticulation above the glumes
43 Glumes strongly flattened laterally, ciliate on the keeled midnerve ................................................. Phleum
43 Glumes rounded, not keeled, not ciliate on the midnerve
44 Lemma awned from the back, at about the middle or below
45 Floret with a tuft of hairs at the base; rachilla prolonged beyond the palea as a slender bristle............. Calamagrostis
45 Floret without a tuft of hairs at the base; rachilla not prolonged beyond the palea.......................................................... Agrostis

46 Lemma from the apex or just below
46 Rachilla prolonged beyond the palea as a slender bristle; plants annual ................................................. Apera
46 Rachilla not prolonged beyond the palea; plants annual or perennial ................................................. Muhlenbergia

KEY G: Paniceae Tribe.

1 Spikelets subtended by one or more bristles or enclosed in an involucre of spines or bristles
2 Spikelets subtended by one to several bristles, these remaining on the plant when the spikelets fall
2 Spikelets enclosed in a bowl-like cluster (bur or involucre) of bristles or flattened spines, these falling with the spikelets and not remaining on the plant
3 Bur of sharp spines, sometimes also with a whorl of bristles
3 Bur of bristles, without spines

4 Inflorescence spike-like, the spikelets embedded in the side of a somewhat corky rachis ................................................. Stenotaphrum

4 Inflorescence a panicle, the spikelets not at all embedded in the rachis
5 Spikelets covered with long, silky, reddish hairs 2-4 mm long ................................................................. Melinis
5 Spikelets glabrous or pubescent, but any hairs never as above
6 First glume usually less than 0.5 mm long, absent or vestigial
7 Inflorescence an open rebranched panicle, the spikelets on long pedicels .................................................. Leptoloma
7 Inflorescence a panicle of unbranched branches, the spikelets sessile or short-pedicelled
8 Spikelets with a small cup-like structure at the base (the first glume); lemma of upper floret awn-tipped .......... Eriochloa
8 Spikelets without a cup-like structure at the base; lemma of upper floret not awn-tipped
9 Spikelets rounded on one side and flattened on the other, orbicular to ovate in outline; margins of the lemma of the upper floret firm and hard when mature, the apex rounded .................................................. Paspalum
9 Spikelets not rounded and flattened as above, lanceolate in outline; margins of the lemma of the upper floret thin and translucent when mature, the apex acute to acuminate
10 Spikelets glabrous or with short, stiff hairs; plants annual ................................................................. Digitaria
10 Spikelets silky-pubescent with long, white hair; plants perennial
11 Panicles with 3 or more nodes, the branches not subdigitate; plants known in the wild, relatively common
12 Panicles with only 1-2 nodes, the branches subdigitate; plants not known in the wild (D. eriantha) ...... Digitaria

6 First glume usually more than 0.5 mm long, well-developed, evident
12 Ligule absent, the ligular region glabrous; plants annual ................................................................. Echinochloa
12 Ligule present, the ligular region often pubescent; plants annual or perennial
13 Lemma of the upper floret with a stiff bristle projecting from the otherwise blunt apex ................................................. Urochloa
13 Lemma of the upper floret without a bristle, the apex rounded to acute
14 Plants stoloniferous perennials ................................................................................................. Hopia
14 Plants tufted annuals or perennials
15 Inflorescence a panicle of simple or nearly simple spicate branches; spikelets nearly sessile; back of fertile lemma and second glume turned toward the branch axis; plants annual ................................................. Urochloa
15 Inflorescence an open rebranched panicle; spikelets often pedicellated; back of fertile lemma and second glume turned away from the branch axis; plants annual or perennial
16 Palea of the lower floret inflated, enlarged, ovate, forcing the spikelet to gape open; rare or extirpated plants not known in NM since 1895 .................................................. Steinthesis
16 Palea of the lower floret not inflated as above, the spikelet closed (except open somewhat during anthesis); including many common grasses
17 Sheaths keeled; lemmas of fertile florets finely roughened-rugose, dull; bases of culms mostly thickened into bulb-like corrs ................................................. Zuloagaea
17 Sheaths rounded; lemmas of fertile florets smooth and shiny; bases of culms never thickened into bulb-like corrs
Monocotyledonous Plants - Poaceae

18 Plants perennial, with two distinct growth phases: during the cool season producing a basal rosette of short broad blades and terminal panicles; during the warm season producing much-branched lateral shoots with small axillary panicles; palea of lower floret vestigial.......


KEY II: Lemmas 3-nerved; florets more than one.

1 Some spikelets (female ones) with long awns 5 cm or more long; plants stoloniferous, monococious or dioecious, with awnless male spikelets ......................................................... Scleropogon

1 All spikelets with awns less than 1 cm long or awnless; plants stoloniferous or tufted, unisexual in Bouteloua dactyloides or bisexual

2 Spikelets in dense, sessile, head-like clusters closely subtended and mostly surpassed by the leaves

3 Disarticulation below the glumes, the spikelets in bony clusters and falling together; plants strongly stoloniferous perennial (B. dactyloides) ................................................. Bouteloua

3 Disarticulation above the glumes, the spikelets not falling in bony clusters; plants annual or perennial, stoloniferous or tufted

4 Plants annual; blades mostly flat (M. squarrosa) ............................................................ M. squarrosa

4 Plants perennial; blades mostly rolled and needle-like

5 Plants tufted, lacking stolons; lemmas with 3 ciliate awns from the nerves.............................................. Blepharidachne

5 Plants producing short stolons; lemmas with a single awn, the lateral nerves extending into lobes (M. pulchella) ... Munroa

2 Spikelets not in dense, sessile, head-like clusters, and/or elevated well above the leaves

6 Inflorescence a panicle of definite and obvious spicate or racemose unbranched primary branches

7 Spikelets all male, 2-flowered with orange-red anthers; lemmas awnless (B. dactyloides) ........................................... Bouteloua

7 Combination of features otherwise

8 Panicle branches all digitate or in whorls near the apex of the main axis

9 Spikelets with 2–several well-developed, bisexual florets

10 Second glume and some lemmas short-awned or mucronate; rachis projecting as a stiff point beyond the terminal spikelet ................................................................. Dactyloctenium

10 Second glume and lemmas awnless; rachis not projecting beyond the terminal spikelet ............................................. Eleusine

9 Spikelets with 1 well-developed, bisexual floret and 1–4 rudimentary and mostly neuter florets above it

11 Spikelets awnless; the upper rudimentary floret single and represented by a minute scale ........................................ Cynodon

11 Spikelets awned (awnless or mucronate in Chloris submutica); the upper rudimentary florets 1–4 in number and obvious

12 Lemma of the lower floret with 3 awns 8–12 mm long ........................................................................ Leptochloa

12 Lemma of the lower floret with a single awn or awnless ........................................................................ Chloris

8 Panicle branches distributed all along the main axis and most not in whorls, or with a single branch only

13 Spikelets with a single fertile, well-developed floret and with 1–3 smaller, rudimentary florets above ............ Bouteloua

13 Spikelets with usually 3–many fertile, well-developed florets

14 Axils of primary panicle branches with tufts of long hairs; spikelets mostly few and widely spaced on each branch . ................................................................. Eragrostis

14 Axils of primary panicle branches glabrous; spikelets mostly numerous and usually crowded on each branch .......................... Disakisperma

15 Plants perennial......................................................................................................................... Diplachne

15 Plants annual

16 Ligules 2–8 mm long, attenuate, not lacerate except by tearing ......................................................... Diplachne

16 Ligules 1–3 mm long, truncate to rounded, often cros or lacerate......................................................... Dinebra

6 Inflorescence a raceme, or a panicle of rebranched primary branches

17 Sheaths margins fused together for ½ their length or more

18 Spikelets less than 5 mm long ................................................................................................. Catabrosa

18 Spikelets usually more than 10 mm long .................................................................................. Bromus

17 Sheath margins overlapping for most of their length

19 Lemmas pubescent on the nerves or at the base (except Tridens albescens), the midnerves usually exserted as an awn or short point (except Poa)

20 Ligules membranous; lemma midnerves not exserted as a small point............................................. Poa

20 Ligules a ring of hairs, or if membranous (Triplasiella eragrostoides) then the lemma midnerves exserted as a small point

21 Plants strongly rhizomatous; lemma nerves glabrous .............................................................. Redfieldia

21 Plants lacking rhizomes; lemma nerves pubescent (except Tridens albescens)

22 Palea densely long-ciliate on the upper half; plants annual ................................................................. Triplasis

22 Palea not long-ciliate on the upper half; plants perennial

23 Blades with white margins ........................................................................................................ Erioneuron

23 Blades not white-margined

24 Panicles open, loose, the branches spreading to drooping

25 Lemmas 2–3 mm long, only the midnerves projecting as a short point .............................................. Triplasiella

25 Lemmas 3–5 mm long, the midnerva and lateral nerves projecting as short points (T. flavus) ......

... ............................................................................................................................................ Tridens

24 Panicles narrow, contracted, the branches erect

26 Nerves of the lemma plainly pubescent ..................................................................................... Tridentopsis
26 Nerves of the lemma glabrous or pubescent only at the base (T. albenscens) .................... Tridens

19 Lemmas glabrous on the nerves and at the base, awnless or awned from the back or from a deeply cleft apex

27 Ligule a membrane

28 Spikelets on long pedicels mostly much longer than the spikelets; plants spreading from stolons or rhizomes.....

......................................................................................................................................................... Muhlenbergia

28 Spikelets sessile or nearly so, the pedicels much shorter than the spikelets; plants tufted

29 Lemmas conspicuously awned from the back, the awns 3-6 mm long (K. spicata, K. vaseyi) ............ Koeleria

29 Lemmas awnless or with an awn to 2 mm long

30 Second glume broadened below the middle; lemmas commonly short-awned, the awn 0-2 mm long;
palea colored, at least on the nerves ................................................................. Graphephorum

30 Second glume broadened above the middle; lemmas completely awnless; palea colorless, scarious,
white (K. macrantha) ............................................................................................................ Koeleria

27 Ligule a ring of hairs

31 Panicles dense, congested, spike-like, usually light greenish or whitish; lemmas notched at the apex with a
minute point; plants perennial (T. albenscens) ................................................................. Tridens

31 Panicles usually open, loose, often olive or dark colored; lemmas lacking a minute notch and point; plants
annual or perennial

32 Plants with extensive creeping rhizomes; blades very stiff and sharp-pointed........................................ Kalinia

32 Plants lacking rhizomes or with short knotty rhizomes only; blades usually rather lax, not sharp-pointed...

......................................................................................................................................................... Eragrostis

KEY I: Lemmas with 5-many nerves; florets more than one.

Glumes and lemmas stiff-ciliate on the midnerves and keels; spikelets arranged in dense, one-sided clusters at the branch tips; sheath margins fused together ................................................................. Dactylis

Glumes and lemmas glabrous or variously pubescent but not ciliate on the midnerves and keels; spikelets not so arranged; sheath margins fused or overlapping

2 Sheath margins fused together 3/4 or more their length

3 Callus of the floret with a prominent tuft of stiff hairs (otherwise glabrous) and lemmas prominently awned.............. Schizachne

3 Callus of the floret lacking a tuft of hairs and/or lemmas awnless

4 Nerves of the lemma 7 in number, nearly parallel, not converging at the truncate or rounded apex .................. Glyceria

4 Nerves of the lemma 3-11 in number, converging at the obtuse to acute apex, if parallel then less than 7 in number

5 Spikelets awned, or if awnless then longer than 15 mm; palea and grain strongly adherent to each other when mature ....

......................................................................................................................................................... Bromus

5 Spikelets awnless and shorter than 15 mm; palea and grain free from each other when mature

6 Spikelets on mostly racemose unbranched primary branches, hanging like flags away from the axis; upper florets
empty, inrolled and represented by a club-shaped rudiment.............................................................. Melica

6 Spikelets variously arranged, but mostly on rebranched primary branches; upper florets usually not empty nor as above .

......................................................................................................................................................... Poa

2 Sheath margins free from each other, overlapping, or fused only at the lower 1/3 or less

7 Disarticulation below the glumes

8 Florets 2 per spikelet, the upper with a short hooked awn, the lower awnless ...................................................... Holcus

8 Florets 2-several per spikelet, all either awnless or awned, but the awn never short and hooked...................... Sphenopholis

7 Disarticulation above the glumes

9 Spikelets (glumes and/or lemmas) awned

10 Inflorescence a panicle of unbranched, spicate primary branches all clustered toward the apex of the stalk; plants annual,
......................................................................................................................................................... Choris

10 Inflorescence a panicle, but the main branches rebranched or the spikelets on obvious pedicels; plants annual or perennial

11 Florets 3 per spikelet, the lower two florets sterile, silky with brownish hairs, and awned, the upper floret fertile, 
glabrous, awnless, hidden within the sterile florets and appearing as the hardened grain .................. Anthoxanthum

11 Florets not as above

12 Florets dissimilar, some awned, some awnless

13 Glumes large, more than 15 mm long ................................................................................................. Avena

13 Glumes small, less than 12 mm long

14 Plants perennial, robust, to 1 m or more tall; mountain plants...................................................... Arrhenatherum

14 Plants annual, delicate, to 30 cm or so tall; disturbed ground ............................................................. Aira

12 All florets alike and awned

15 Glumes not extending beyond the lowermost floret

16 Spikelets 2(4)-flowered; awn arising from the back of the lemma or from a deeply cleft apex ........ Koeleria

16 Spikelets mostly 3- to many-flowered; awn arising from an entire apex

17 Plants annual ......................................................................................................................... Vulpia

17 Plants perennial; flowers with 3 stamens

18 Auricles present; blades mostly wider than 3 mm, flat when fresh .............................................. Schedonorus

18 Auricles absent; blades mostly narrower than 3 mm, rolled and somewhat stiff (but see F. sororia)............ Festuca

15 Glumes, at least the second, equal to or surpassing the lowermost floret

19 Lemmas awned from the back or base

20 Spikelets not large, the glumes 2-8 mm long
Monocotyledonous Plants - Poaceae

21 Awn of the lemma attached above the middle; lemmas 4-9 mm long (sometimes slightly shorter). ................................................................. Koeleria

21 Awn of the lemma attached below the middle; lemmas 1.5-4 mm long (sometimes slightly longer) ................................................................. Deschampsia

20 Spikelets large, the glumes 10-30 mm long

22 Plants annual; glumes 18-30 mm long ................................................................. Avena

22 Plants perennial; glumes 10-15 mm long

23 Panicles 2-5 cm long; blades rolled, usually pubescent ........................................ Helictotrichon

23 Panicles 5-15 cm long; blades flat or folded, mostly glabrous ................................... Avenula

19 Lemmas awned from an entire or cleft apex, if cleft the awn arising from the sinus at the tip of the midnerve, or lemmas awnless

24 Awns of the lemma minute and nearly obsolete, scarcely visible .................................. Schismus

24 Awns of the lemma well-developed, easily visible

25 Spikelets mostly 2-3-flowered, 3.5-6.5 mm long; rachilla extending beyond the uppermost floret ................................................................. Koeleria

25 Spikelets 3- to 7-flowered, 6-15 mm long; rachilla not extending beyond the uppermost floret................................................................. Danthonia

9 Spikelets (glumes and lemmas) awnless or at most with an awn tip no more than 1 mm long

26 Glumes mostly longer than 2 cm and longer than the florets ................................................................. Schismus

26 Glumes shorter than 2 cm and/or shorter than the florets

27 Spikelets appearing 1-flowered, but the large fertile floret subtended by 1 or 2 smaller scales or bristles representing rudimentary florets, these often appressed to the fertile floret and not immediately apparent .................................. Phalaris

27 Spikelets not as above

28 Glumes and lemmas at maturity stiff, firm, greenish to straw-colored; leaves distichous, the lower ones bladeless as the stems grade into rhizomes; lemmas 7- to 11-nerved, the nerves obscure; plants strongly rhizomatous, dioecious perennials of alkaline areas and flood plains ........................................ Distichlis

28 Glumes and lemmas pliable, thin, often greenish to purplish (stiff in the annual Catapodium); leaves not distichous, the lower ones usually with well-developed blades; lemmas generally 5- to 7-nerved (9-nerved in the annual Schismus); plants annual or perennial, of various habitats

29 Glumes and lemmas spreading at right angles to the rachilla, inflated and papery; florets and spikelets about as wide as long; spikelets on long capillary pedicels, resembling the rattles of a rattlesnake ................................ Briza

29 Glumes, lemmas, florets, and spikelets not all as above

30 First glume 5- to 7-nerved; blades thread-like; small tufted annuals of sandy desert areas .................................. Schismus

30 First glume 1- to 3-nerved; blades thread-like to much broader; annuals and perennials of various habitats

31 Glumes, at least the second, equaling or surpassing the lowermost floret

32 Florets 3 in number, the lower (outer) 2 as large as the upper (middle) one but male, their margins prominently ciliate, the upper (middle) floret fertile, somewhat hardened, and pubescent at the tip ........................................ Hierochloe

32 Florets not as above

33 Second glume broadened below the middle; lemmas commonly short-awned, tiny but visible; palea colored, at least on the nerves ........................................... Graphephorum

33 Second glume broadened above the middle; lemmas completely awnless; palea colorless, scariosus, white ................................................................. Koeleria

31 Glumes, at least one but usually both, not extending beyond the lowermost floret

34 Lemmas awned or narrowing at the apex to an awn-tip

35 Auricles present; blades mostly wider than 3 mm, flat when fresh ................................ Schedonorus

35 Auricles absent; blades mostly narrower than 3 mm, rolled and somewhat stiff (but see F. sororia) ................................................................. Festuca

34 Lemmas awnless, often blunt

36 Second glume broadened above the middle; palea colorless, scariosus, white; pedicels puberulent ................................................................. Koeleria

36 Second glume, palea, and pedicels not all as above

37 Inflorescence scarcely branched, the spikelets on short stout pedicels ± on the main axis; plants annual ................................................................. Catapodium

37 Inflorescence noticeably branched, the spikelets not borne as above; plants annual or perennial

38 Plants rhizomatous and dioecious; glumes hyaline and translucent .................................. Leucopoa

38 Plants not rhizomatous and dioecious and with translucent glumes

39 Sheath margins fused at least at the base; nerves of the lemma converging toward the acute apex; base of lemma with or without a tuft of cobwebby hair ........................................ Poa

39 Sheath margins overlapping at the base; nerves of the lemma ± parallel, not converging toward the truncate apex; base of lemma never with a tuft of cobwebby hairs
40 Nerves of the lemma conspicuous; plants with creeping rhizomes; blades mostly flat, 4-15 mm wide; plants of freshwater habitats...........Torreyocha

40 Nerves of the lemma obscure; plants tufted, lacking rhizomes; blades rolled, or if flat then 1-3(4) mm wide; plants of usually alkaline or saline habitats.

Aegilops [a name used by Theophrastus for a kind of wild oat] GOATGRASS [1].

Tufted annuals; sheaths open; auricles present, ciliate; ligules membranous; blades flat; inflorescence a jointed spike with segments that break apart in maturity, with 1 spikelet per node; spikelets with 2-7 florets, the distal ones sterile; glumes ovate, several-nerved, sometimes indurate, awned or awnless; lemmas rounded, mostly awned; anthers 3.

*Agilops ciliaris* Host [cylindrical] JOINTED GOATGRASS [Triticum ciliaris (Host) Cesiati], Annual, 15-50 cm tall, erect to decumbent at the base, usually highly branched basally; sheaths with hyaline margins; spikes 3-12 cm long, about 3 mm wide; spikelets with 3-5 florets, the lower 2-3 sterile; glumes of upper spikelets with awns 3-6 cm long. A troublesome weed of crop fields and roadsides, along railroads, disturbed ground; widely distributed throughout the state and expected in every county; native to the Mediterranean region and central Asia. *JOINTED GOATGRASS* hybridizes with wheat, *Triticum aestivum*, and is sometimes placed in that genus.

Aegopogon [goat-beard, alluding to the cluster of awns] [1].

Tufted annuals and perennials; sheaths open; auricles absent; ligules membranous; inflorescence raceme-like, the spikelets borne on delicate pedicels that join at the base to form a cluster of 3 spikelets, the cluster falling entire; spikelets with 1 floret, the lateral spikelets highly reduced to well-developed, staminate or sterile, the central spikelet well-developed and fertile; glumes shorter than the florets; lemmas 3-nerved, awned; anthers 3. Peterson et al. (2010) recently demonstrated the phylogenetic affinity of *Aegopogon* within *Muhlenbergia*, and recommended its submergence into that genus. We do not dispute the validity of their argument, but choose to maintain *Aegopogon* as a paraphyletic genus because of its distinctive morphology.

*Aegopogon tenellus* (A.P. de Candolle) Trinius [tender, delicate, or soft] FRAGILE-GRASS [Aegopogon cenchrifolius Humboldt & Bonpland ex Wildenow var. abortivus Fournier, *Aegopogon tenellus* (A.P. de Candolle) Trinius var. abortivus (Fournier) Beetle, Lamarkcia tenella A.P. de Candolle, *Muhlenbergia geminiflora* (Kunth) P.M. Peterson], Tufted annual, 2-25 cm tall; blades flat, 1-2 mm wide; racemose panicles 2-6 cm long; pedicels of the lateral spikelets 1.1-3.3 mm long, those of the central spikelets 0.3-0.6 mm long; glumes 1-2 mm long, fan-shaped, with short awns; lemmas 2.5-3.2 mm long, with a central awn 3-8 mm long. Known only from desert plains and foothills of the boodheel region, in shaded canyons and beneath shrubs and trees, sometimes roadsides. A former congeneric awnless species has been referred to *var. abortivus* (Fournier) Beetle, but these are found mixed in the same inflorescence with awned spikelets. When classed in *Muhlenbergia*, our plants take the name *M. geminiflora*, as the epithet *tenella* is previously occupied by *M. tenella* (Kunth) Trinius.

Agropyron [wild wheat] WHEATGRASS [2].

Tufted perennials; sheaths overlapping; auricles present; ligules membranous; inflorescence a spike with very short internodes between the spikelets; spikelets single per node, longer than the internodes, diverging sharply from the main axis, several-flowered; disarticulation above the glumes, between the florets; glumes shorter than the florets, keeled on the midnerve; lemmas 5-7-nerved; anthers 3. Most species previously found in *Agropyron* are treated in the genera Elymus or *Eremopryon* herein, but also in the genera Pascopyrum, *Pseudoroeperania*, and *Thinopyrum* in other works; the remaining species of *Agropyron* are native to Eurasia, but have been introduced throughout much of the world’s rangelands.

Agropyron cristatum (Linnaeus) Gaertner [crested] CRESTED WHEATGRASS [Agropyron cristatum (Linnaeus) Gaertner subsp. pectiniforme (Bieberstein) Tzvelev, *Agropyron desertorum* (Fischer ex Link) Schultz], Tufted, but occasionally producing short rhizomes, 25-85 cm or more tall; spikes 2-15 cm long, 0.5-2.5 cm wide, sometimes tapering distally; glumes 3-6 mm long with awns 1-3 mm long; lemmas 5-9 mm long with awns 1-6 mm long. Widely introduced for rangeland rehabilitation (so-called) and soil stabilization, except in the southern desert, native to Asia. Includes the cultivars Fairway, Parkway, Ruff, and Standard. §

*Agropyron fragile* (Roth) P. Candargy [fragile] SIBERIAN WHEATGRASS [Agropyron cristatum (Linnaeus) Gaertner subsp. fragile (Roth) P. Candargy] Live with a spicule of Siberian wheatgrass (Wildenow) Beauv., *Triticum fragile* Roth. Tufted, never rhizomatous, 30-70 cm or more tall; spikes 8-15 cm long, 0.5-1.3 cm wide; glumes 3-5 mm long with awns 1-3 mm long; lemmas 5-9 mm long, awnless. Old fields, roadsides, known as yet only from a few scattered counties; native to Asia.

*Agrostis* [field or pasture] BENTGRASS [8].

Perennial, sometimes with rhizomes or stolons; sheaths open; auricles absent; ligules membranous; inflorescence a rebranching panicle; spikelets 1-flowered; glumes exceeding the floret, awnless or rarely with a short awn; lemmas 3-5-nerved, unawned or awned; paleas minute to as long as the lemma; anthers 1 or 3.

1 Palea well-developed, 0.5-2 mm long, ½ to 3/4 the length of the lemma
2 Panicle dense, compact, interrupted; spikelets usually disarticulating below the glumes (P. viridis) .........................  go to Polypogon
2 Panicle open or closed but not dense or compact; spikelets disarticulating above the glumes
3 Plants 3-20 cm tall; anthers 0.5-0.7 mm long; rachilla prolonged beyond the floret; alpine and subalpine meadows and boggy
   ground (P. humilis) ........................................................................................................  go to Podagrostis
3 Plants taller, mostly 40 or more cm tall; anthers 0.8-1.4 mm long; rachilla not prolonged beyond the floret; occurring in a wide
   variety of habitats, and common at lower elevations
   4 Panicles open during anthesis but contracted thereafter and when mature, mostly 1-1.5 cm broad, the branches erect-
      apressed; plants often stoloniferous and decumbent at the base, if short rhizomes developed then these bearing no more
      than 3 scale leaves.................................................. A. stolonifera
   4 Panicles open both during and after anthesis, more than 1.5 cm broad, the branches ascending to widely spreading; plants
      with well developed rhizomes bearing more than 3 scale leaves, not stoloniferous, erect at the base ............... A. gigantea
1 Palea obsolete or a small scale less than 0.4 mm long, as much as ½ the length of the lemma
5 Panicle narrow, contracted, several times longer than broad, at least some of the branches spikelet-bearing to the base
6 Stems slender, generally not much more than 20 cm tall; blades mostly not more than 1 mm wide......................... A. variabilis
6 Stems usually stout; mostly much more than 20 cm tall; blades mostly 2-10 mm wide................................. A. exarata
5 Panicle open to diffuse, often less than 3 times longer than broad, the branches naked at the base
7 Lemmas with a slender, flexuous awn; plants annual; anther 1 ................................................................. ........ A. perennans
7 Lemmas awnless or with a straight awn; plants perennial, though they may appear annual; anthers 3
8 Cauline leaves well-developed, the basal ones often withered by anthesis; blades 2-5 mm wide, flat, 6-20 cm long.................... A. stolonifera
8 Cauline leaves weakly developed, the basal ones usually persistent or at least not withered; blades 1-2 mm wide, rolled to
   flat, 1-14 cm long
8 Cauline leaves strongly reduced, the basal ones usually only persistent; blades 1-2 mm wide, rolled to flat, 1-14 cm long
9 Lower panicle branches 1-4 cm long; panicle not detaching at maturity; blades 1-7 cm long......................... A. idahoensis
9 Lower panicle branches 4-12 cm long; panicle often detaching at the base at maturity; blades 4-14 cm long.................. A. scabra

Agrostis exarata Trin. [narrowed, alluding to the grooves between the nerves]. Perennial, 20-80 cm tall, sometimes
decumbent-based or short-rhizomatous; blades flat when fresh, 2-7 mm wide; panicles narrow, contracted, 8-28 cm
long, 1-4 cm wide; spikelets 1.5-3.5 mm long; lemmas unawned (ours); paleas less than 0.5 mm long. ● Along stream banks and in
moist woods of the southern desert mountains, uncommon; known only from a few collections in Hidalgo County.

Agrostis exarata [furrowed, alluding to the grooves between the nerves]. Perennial, 20-80 cm tall; leaves mostly basal; panicles
narrow and diffuse when mature, the branches ultimately widely spreading or drooping and rebranched beyond midlength; spikelets
1.5-2 mm long; lemmas with a flexuous awn 3-10 mm long; paleas absent or minute. ● Along stream banks and in
moist woods of the southern desert mountains, uncommon; known only from a few collections in Hidalgo County.

*Agrostis gigantea Roth [gigantic]. REDTOP [Agrostis alba of numerous authors]. Plants perennial, 20-100 or more cm tall,
with short to rather long (20 cm) rhizomes; leaves mostly cauline; blades 3-8 mm wide; panicles 10-25 cm long, 1-12
cm wide, open both during and after anthesis, some branches spikelet-bearing to the base; spikelets green to purple,
1.7-3.2 mm long; lemmas awnless (rarely with a short awn); paleas about half the length of the lemma. ● Moist
pastures, ditches, stream banks, meadows, very widespread and expected in all the counties; native to Europe. ● Similar
to Agrostis stolonifera, and both are called redhead, differing most conspicuously in the always open panicle; this species seems to be
far more common in New Mexico.

*Agrostis idahoensis Nash [from Idaho]. [Agrostis bakeri Rydb.]. Perennial, 8-40 cm tall; leaves mostly basal; panicles
3-13 cm long, 1-6 cm wide, open and diffuse, the branches spreading and rebranching above the middle; spikelets 1.5-
2.5 mm long; lemmas awnless; paleas less than 0.2 mm long. ● Wet meadows, seeps, and moist ground at high elevations in
the northern mountains; there are few collections from New Mexico. ● This is a catch-all name for intermediates (presumably
due to hybridization) between Agrostis scabra and Agrostis variabilis, and could be merged with the former.

Agrostis perennans (Walter) Tuckerman [perennial]. [Cornucopiae perennans Walter]. Perennial, 20-80 cm tall; leaves
mostly cauline with flat blades 2-5 mm wide; panicles 10-25 cm long, to 11 cm wide, the branches ascending to spreading,
rebranching at or below the middle; spikelets 1.8-3.2 mm long; lemmas awnless (rarely awned to 2 mm); paleas absent or to 0.1 mm long. ● Stream banks, moist meadows, shady roadsides; not common; northern and western
mountains. ● Well-developed cauline leaves with broad, flat blades are distinctive. Most plants called this belong to
Agrostis scabra, but there are a few authentic specimens, both old (1897) and recent (1986).

Agrostis scabra Willdenow [rough]. [Agrostis hiemalis sensu Wooton & Standley]. Perennial, 10-80 cm tall; leaves mostly
basal with rolled blades; panicles 10-40 cm long, to 20 cm wide, the branches spreading when mature and rebranching
above the middle; spikelets 1.8-3 mm long; lemmas awnless or with an awn to 2 mm; paleas less than 0.2 mm long. ● Meadows, grassy slopes, rocky ground, roadsides, foothills to high mountains throughout the western ¾ of
the state. ● Agrostis scabra and the more eastern A. hyemalis (Walter) Britton, Sterns, & Poggenburg (often spelled
hiemalis) have been confused in New Mexico, especially in early reports. In A. hyemalis, the branches rebranch only in the distal ¼,
the pedicles are shorter (to 3.5 mm long), the lemmas are smaller (0.8-1.2 mm), and the anthers are smaller (0.2-0.5 mm). Currently, no
verified plants taller, mostly 40 or more cm tall from the state. ●

*Agrostis stolonifera Linnaeus [bearing stolons]. REDTOP [Agrostis alba of numerous authors, Agrostis palustris Hudson].
Perennial, mostly 30-60 cm tall, with stolons 5-50 cm or more long; blades flat, 2-6 mm wide; panicles narrow and
contracted when mature, open during anthesis, mostly 5-16 cm long and 1-4 cm wide, the branches spikelet-bearing to
the base; spikelets greenish to purplish, 1.5-3 mm long; lemmas awnless (rarely with a short awn); paleas about half the
length of the lemma. ● Moist pastures, ditches, stream banks, meadows, widespread; native to Europe. ● Similar to
Agrostis gigantea, and both have been called REDTOP, differing most conspicuously in the narrow panicle in maturity; this species seems to be far less common in New Mexico.

§

Agrostis variabilis Rydberg [variable, different]. Perennial, 5-20(25) cm tall, mostly tufted or rarely with short rhizomes to 2 cm long; leaves mostly basal in dense tufts; blades 0.5-1.5(2) mm wide; panicles 2-6 cm long, 0.5-1.5 cm wide, narrow and dense, the branches spikelet-bearing to the base; spikelets greenish purple, 1.8-2.5 mm long; lemmas awnless, rarely with a short awn; paleas tiny, about 0.2 mm long. §Perennial, subalpine and alpine slopes, uncommon in the northern mountains. ● A small, infrequent species that is similar to Podagrostis humilis (not yet known from New Mexico), but differing in its tiny palea and the rachilla not prolonged (the palea large and rachilla prolonged in P. humilis).

Aira [an old Greek name for some weedy grass] HAIRGRASS [1].

Tufted annuals; sheaths open; auricles absent; ligules membranous; distal blades highly reduced; inflorescence an open or narrow panicle with capillary branches; spikelets with 2 florets, both usually awned; disarticulation above the glumes and beneath the pair of florets; glumes longer than the florets, awnless; lemmas bifid at the apex, awned from the back below midlength; anthers 3. ● Several species are grown as ornamental plants for their delicate panicles.


* Aira caryophyllea Linnaeus [resembling the genus Caryophyllus] SILVER-HAIRGRASS. Tufted annual, 5-45 cm tall; ligules 1-8 mm long; panicle 1-14 cm long, open, nearly as wide; pedicels many-times longer than the spikelets; spikelets 1.7-3.5 mm long; lemma awns 2.1-3.9, protruding past the glumes and visible. ● Found once in New Mexico in 1998; weakly adventive in ornamental plantings in Las Cruces, not likely persisting; native to Europe. ● Our plants belong to var. capillaris (Mertens & W.D.J. Koch) Mutel [hair-like] [Aira elegans Willdenow ex Kunth, Aira elegantissima Schur].

Alopecurus [foxtail] FOXTAIL [5].

Annual or perennial, usually tufted; sheaths overlapping; auricles absent; ligules membranous; inflorescence a spike-like panicle, the branches much reduced; disarticulation below the glumes; spikelets 1-flowered; glumes equaling or longer than the floret, 3-veined, ciliate on the midnerve; lemmas 3-5-nerved, awned from the back just above the base; paleas absent or very small; anthers 3. ● Other grasses are also commonly called foxtail: Bromus madritensis, Hordeum jubatum, Setaria italicu, and Setaria magna.
Monocotyledonous Plants - Poaceae

1 Spikelets 5–6 mm long
2 Glumes conspicuously ciliate on the keel--------------------------------------------- A. pratinusis
2 Glumes glabrous to scabrous on the keel -------------------------------------------- A. myosuroides

1 Spikelets 2–4 mm long
3 Awn slightly exerted beyond the glumes, scarcely visible without magnification......................... A. aequalis
3 Awn well-exserted beyond the lemma, easily visible without magnification
4 Plants annual; anthers 0.3–0.5 mm long................................................................. A. carolinianus
4 Plants perennial; anthers 1.2–2 mm long............................................................... A. geniculatus

**Alopecurus aequalis** Sobolewsky [equal, referring to the glumes] [Alopecurus aristinatus Michauds]. Perennial, 10–70 cm tall, the culms erect to decumbent; upper sheaths not inflated; glumes 1.8–3.5 mm long; lemma awns 0.7–3 mm long, slightly exceeding the glumes and scarcely visible without magnification; anthers golden yellow to orange when mature. Ponds, ditches, wet ground; widespread in the state from low to high elevations. §

**Alopecurus carolinianus** Walter [from the Carolinas]. Annual, 5–50 cm tall, the culms erect to decumbent; upper sheaths not inflated; glumes 2.3–3 mm long; lemma awns 3.6–5 mm long, extending beyond the glumes. Moist ground, ditches, irrigated ground, fields; uncommon in the southwestern region of the state, with additional records northward, and perhaps elsewhere.

**Alopecurus geniculatus** Linnaeus [bent like a knee]. Perennial, 15–60 cm tall, the lower shoots decumbent and often rooting at the nodes; upper sheaths somewhat inflated; glumes 2.3–5 mm long; lemma awns 3.5–6 mm long, extending beyond the glumes. Moist or wet ground, stream and canal banks, irrigated ground; uncommon, mostly in the western region of the state; native to Europe.

**Alopecurus myosuroides** Hudson [resembling Myosurus] [Alopecurus agrestis Linnaeus]. Annual, 30–80 cm tall; upper sheaths somewhat inflated; glumes 4.5–7.5 mm long; lemma awns 7–12 mm long, extending beyond the glumes; native to Europe. Known only from a single collection in the late 1800s from a farm in Las Cruces.

**Alopecurus pratensis** Linnaeus [of meadows]. Perennial with short rhizomes, 30–100 cm tall; upper sheaths not or scarcely inflated; glumes 4–6 mm long; lemma awns 5–10 mm long, extending beyond the glumes. Moist woods and meadows, often in the mountains; introduced for erosion control and reseeding; native to Europe.

**Andropogon** [male beard, alluding to the usually hairy staminate spikelets] BLUESTEM [2]

Perennial, tufted or rhizomatous; sheaths overlapping; ligules membranous, sometimes also ciliate; inflorescence a terminal or axillary panicle of 2–several branches; primary branches (the rame) composed of repeating units of sessile and pedicelled spikelets, these units breaking apart at maturity and becoming the dispersal unit; sessile spikelets bisexual and fertile, awned, the 2 glumes enclosing the florets; pedicelled spikelets well-developed and staminate to reduced to a single glume and empty. Formerly a very large and unwieldy genus, Andropogon has fittingly been segregated into more meaningful and phylogenetic genera, including Bothriochloa, Capillipedium, Dichanthium, Heteropogon, Ischaemum, Schizachyrium, and Sorgghum, among others.

**Andropogon aequalis** Wipff & Shaw [of the desert] BUSHY BLUESTEM [Andropogon glomeratus (Walter) Britton, Sterns, & Poggenburg var. scabriflum Campbell]. Tufted, 80–150 cm tall; shoots highly branched in the distal half; sheaths scabrous; panicles axillary, partially enclosed in inflated terminal sheaths; sessile spikelets 3–4 mm long; pedicels densely ciliate; pedicelled spikelets absent. Seasonally wet places, seeps and springs in the desert foothills. This species has potential as a landscape ornamental and for dried arrangements. Formerly considered a variety of the eastern Andropogon glomeratus.

**Andropogon gerardi** Vitman [for Louis Gérard (1733–1819), French physician-botanist] BIG BLUESTEM. Perennial, 1–3 m tall; rhizomes, when present, with internodes less than 2 cm long; panicles mostly terminal, with 2–6 rames, often purplish; sessile spikelets 5–12 mm long, with awns 0–20 mm long; pedicelled spikelets 3.5–12 mm long, about the same size and shape as the sessile spikelets; anthers 3. Prairies, plains, sand dunes, wooded slopes and forests. An excellent native forage grass; included in many seed mixes, and may have been established in some mountain sites from seeding after fires. We have two subspecies, which intergrade freely when sympatric:

- Awn of sessile spikelet 0.8–2 mm long; rhizomes absent or well-developed; ligules 2.4–5.5 mm long; hairs of the rame internodes 3.7–6.6 mm long...subsp. **hallii** (Hackel)

Wipff [Andropogon chrysocoma Nash, Andropogon gerardii Vitman var. paucipilius (Nash) Fernald, Andropogon hallii Hackel, Andropogon hallii Hackel var. matusis Hackel]. Mostly on the eastern plains, but scattered populations elsewhere. §

- Awn of sessile spikelet 8–20 mm long; rhizomes absent or well-developed; ligules 0.5–2.5 mm long; hairs of the rame internodes 2.2–4.2 mm long...subsp. **gerardi** [Andropogon furcatus Mühlenberg]. Found essentially throughout the state in a variety of communities, but generally absent from the arid desert areas. §

**Anthoxanthum** [yellow flower, alluding to the inflorescence] [1].

Tufted annuals and perennials; sheaths open; auricles present to absent; ligules membranous; inflorescence a narrow, sometimes spike-like, poorly developed panicle; spikelets 3-flowered, the 2 lower (lateral) ones awned and sterile, the upper (central) one smaller, awnless, and fertile; disarticulation above the glumes, the florets falling together; glumes strongly unequal, the first about ½ as long as the second; sterile florets shorter than both glumes, awned from the back; fertile floret shorter than the sterile ones and obscured by them, awnless; palea 1-nerved. Some authors now merge the genera Anthoxanthum and Hierochloë (which see), so that the New Mexico species of Hierochloë are brought into Anthoxanthum as *A. nitens* (Weber) Schouten & Veldkamp.

**Andropogon eremicus** Wipff & Shaw [of the desert]

**A. carolinianus** Walter [from the Carolinas]. Annual, 30–80 cm tall; upper sheaths not or scarcely inflated; glumes 4.5–7.5 mm long; lemma awns 7–12 mm long, extending beyond the glumes. Moist or wet ground, stream and canal banks, irrigated ground; uncommon, mostly in the western region of the state; native to Europe.

**Andropogon gerardii** Vitman [for Louis Gérard (1733–1819), French physician-botanist] BIG BLUESTEM. Perennial, 1–3 m tall; rhizomes, when present, with internodes less than 2 cm long; panicles mostly terminal, with 2–6 rames, often purplish; sessile spikelets 5–12 mm long, with awns 0–20 mm long; pedicelled spikelets 3.5–12 mm long, about the same size and shape as the sessile spikelets; anthers 3. Prairies, plains, sand dunes, wooded slopes and forests. An excellent native forage grass; included in many seed mixes, and may have been established in some mountain sites from seeding after fires. We have two subspecies, which intergrade freely when sympatric:

- Awn of sessile spikelet 0.8–2 mm long; rhizomes well-developed; ligules 2.4–5.5 mm long; hairs of the rame internodes 3.7–6.6 mm long...subsp. **hallii** (Hackel)

Wipff [Andropogon chrysocoma Nash, Andropogon gerardii Vitman var. paucipilius (Nash) Fernald, Andropogon hallii Hackel, Andropogon hallii Hackel var. matusis Hackel]. Mostly on the eastern plains, but scattered populations elsewhere. §

- Awn of sessile spikelet 8–20 mm long; rhizomes absent or well-developed; ligules 0.5–2.5 mm long; hairs of the rame internodes 2.2–4.2 mm long...subsp. **gerardi** [Andropogon furcatus Mühlenberg]. Found essentially throughout the state in a variety of communities, but generally absent from the arid desert areas. §
Apera

[not maimed, apparently alluding to the presence of the long awn] [1].

Tufted annuals; sheaths open; auricles absent; ligules membranous; inflorescence a narrow or open panicle; spikelets with 1 floret; glumes subequal; rachilla prolonged as a bristle, rarely with a vestigial floret; disarticulation above the glumes and below the floret; lemmas firm, obscurely 5-nerved, awned from just below the apices; paleas subequal to the lemmas; anthers 3.

Aristida

Annual or perennial, tufted (ours); sheaths overlapping; auricles absent; ligules a ring of hairs or a tiny long-ciliate membrane; inflorescence a panicle, sometimes weakly developed and raceme-like; spikelets 1-flowered; disarticulation above the glumes; glumes equal to strongly unequal, 1-3-nerved, thin; lemmas 3-nerved, convolute around the palea and flower, indurate at maturity, usually with 3 awns extending from the rachis but the lateral awns sometimes reduced or absent; callus with a tuft of short stiff hairs; palea shorter than the lemma; anthers 3(1).

A. interrupta

[interrupted, not continuous] SILKY-BENT [Agrostis interrupta Linnaeus]. Tufted annual, 10-70 cm tall; sheaths often purplish; ligules 1.5-5 mm long; panicles narrow, 3-20 cm long, 1-3 cm wide, somewhat interrupted below; spikelets 2-3 mm long; glumes somewhat unequal, the lower 1-nerved, the upper 3-nerved; rachilla extended beyond the floret 0.2-0.6 mm; lemmas 1.5-2.5 mm long, slightly involute, the awn 4-16 mm long.

Disturbed moist sites; known only from a few collections in the central region of the state; native to Europe.

A. pansa

[not maimed, apparently alluding to the presence of the long awn] [1].

This mimics some species of Agrostis in having firm lemmas, always developed paleas that are nearly the size of the lemmas, a prolonged rachilla, and a well-developed awn.

Agrostis

Tufted perennial, 25-60 cm or more tall; panicles 4-14 cm long, the branches short; pedicels pubescent; spikelets 8-10 mm long; glumes unequal, the lower 3-4 mm long, the upper 8-10 mm long; awn of first lemma 2-4 mm long; awn of second lemma 4-9 mm long, equaling or only slightly exceeding the upper glume; upper fertile floret 1-2.5 mm long and awnless.

*Anthoxanthum odoratum* Linnaeus [fragrant, sweet-smelling] SWEET VERNALGRASS. Tufted perennial, 25-60 cm or more tall; panicles 4-14 cm long, the branches short; pedicels pubescent; spikelets 8-10 mm long; glumes unequal, the lower 3-4 mm long, the upper 8-10 mm long; awn of first lemma 2-4 mm long; awn of second lemma 4-9 mm long, equaling or only slightly exceeding the upper glume; upper fertile floret 1-2.5 mm long and awnless.

1 Plants annual

2 Awns mostly 1-2 cm long; glumes mostly 5-12 mm long

3 Lateral awns shortened, rarely shorter than 3 mm

4 First glume noticebly shorter than the second; inflorescence narrow, contracted, the branches erect (wrightii forma brownii) .............. A. adscensionis

5 First glume equal to or longer than the second; inflorescence open, the branches spreading from axillary swellings at maturity

6 Primary panicle branches somewhat capillary and curving or drooping under the weight of the spikelets but without axillary swellings; awns mostly (2)3-8 cm long .......................................................... A. portulacea

7 Glumes equal or nearly so; blades usually flat and curling like wood shavings in age; base of blade glabrous (do not confuse with ligule hairs) ....................................................... A. schiedea

8 Primary panicle branches stiffly divaricate to ascending from axillary swellings; awns mostly 1-2.5 cm long

9 Anthers 0.8-1 mm long

10 Plants more than 25 cm tall; secondary branchlets present and usually well-developed; primary branches 5-13 cm long; apex of lemma strongly twisted 4 or more turns ............................................. A. divaricata

11 Glumes strongly unequal, the first about 1/2 to 3/4 the length of the second (var. perplexa) ................................................. A. purpurea

12 Base of blades with scattered, soft, weak hairs 1.5-3 mm long on the upper surface or margin (var. gentilis) ................. A. ternipes

13 Blades flat, loosely curling like wood shavings in age; summit of lemma conspicuously twisted...A. schiedea

14 Blades rolled, straight to arcuate but not curling; summit of lemma not or only slightly twisted .......... A. pansa
**Aristida adscensionis** Link ex Naudin [from Ascension Island in the South Atlantic]  
*SIX-WEEKS THREEAWN* [Aristida bromoides Humboldt, Bonpland, & Kunth]. Plants annual, mostly 10-50 cm tall, sometimes shorter or taller, usually highly branched and often geniculate; sheaths shorter than the internodes; blades flat to involute; panicles 5-18 cm long, the branches sparsely flowered and lacking axillary glumes; glumes 1-nerved, unequal, the lower about half the length of the floret; lemmas 6-9 mm long; awns 7-20 mm long, the lateral slightly shorter, not disarticulating. ♦ Waste ground, disturbed sites, road sides, sparsely vegetated ground; throughout the state and expected in every county. ♦ Plants can be extremely variable in size, depending on moisture. §

**Aristida arizonica** Vasey [from Arizona]  
*Tufted perennial*, 30-80 cm or more tall, unbranched above the base; leaves mostly basal; blades usually flat, 1-3 mm wide, curling like wood shavings in age; panicles 10-25 cm long, 1-3 cm wide, the primary branches appressed and lacking pulvini; glumes subequal, the lower one slightly shorter, 1-2-nerved; lemmas 12-18 mm long; awns mostly equal, 20-35 mm long. ♦ Somewhat dry mountain slopes and forest clearings at medium elevations, especially associated with ponderosa pine forests; widespread in the mountainous regions of the state. ♦ Many specimens of *A. purpurea* var. nealei have been misidentified as *A. arizonica*; habitat and the curling blades and larger, thicker, more robust spikelet parts of *A. arizonica* serve to distinguish the two.

**Aristida divaricata** Humboldt & Bonpland ex Willdenow [spreading]  
*POVERTY THREEAWN*. Plants perennial, 25-70 cm tall, not or sparingly branched; sheaths longer than the internodes, glabrous except at the summit, the collars densely pilose; blades flat to loosely rolled; panicle open, 10-30 cm long and nearly as wide, the branches 5-13 cm long, stiffly spreading to divaricate from axillary pulvini; spikelets infrequently with pulvini; glumes subequal, 1-nerved, 8-12 mm long; floret subequal to the glumes, the terminal 2-3 mm with 4 or more twists at maturity; awns 8-20 mm long, the central erect to curving, the lateral slightly to much shorter. ♦ Dry plains and foothills nearly throughout the state. ♦ Similar to *Aristida havardii*, but that species has shorter primary branches, usually no secondary branches, and more frequently pulvinate spikelets.

**Aristida havardii** Vasey [Aristida barbata Fournier]. Plants perennial, 15-40 cm tall; unbranched; sheaths longer than the internodes, glabrous except for the summit, the collars densely pilose; blades flat to loosely rolled; panicle open, 6-18 cm long and somewhat less wide, the branches 2-6 cm long, stiffly divaricate to reflexed from axillary pulvini; spikelets usually with axillary pulvini; glumes subequal, 1-nerved, 8-12 mm long; floret subequal to the glumes, the terminal 2-3 mm straight or with 1-2 twists at maturity; awns 8-20 mm long, the lateral mostly thinner and shorter than the central. ♦ Dry plains and foothills, nearly throughout the state except for the northern tier of counties. ♦ Plants usually have several stems and tend to grow in short, pale, hemispheric tufts, like a basketball partially sunken into the ground. Similar to *Aristida divaricata*, but that species has longer primary branches, usually with secondary branches, and less frequently pulvinate spikelets.

* Aristida oligantha* Michaux [few-flowered]  
*OLDFIELD THREEAWN*. Plants annual, 20-45 cm tall, geniculate at the base, branching at the nodes; sheaths shorter than the internodes; blades flat or loosely rolled; inflorescence spike- or raceme-like, the spikelets borne on very short pedicels on the main axis, branches rarely developed; pulvini at the base, branching at the nodes; sheaths shorter than the central. ♦ Disturbed areas and old fields; an uncommon immigrant from the eastward plains known from a few scattered counties, and considered exotic in New Mexico. ♦ Easily identified by the annual branching habit, nearly sessile spikelets, large glumes, and long awns.

**Aristida pansa** Wooton & Standley [expanded, open]. Plants perennial, 20-60 cm tall, unbranched above the base; collars densely pilose with cobwebby hairs that are often arrayed downward; panicles 10-20 mm long, the primary branches stiffly spreading to spreading from axillary pulvini; spikelets usually with axillary pulvini; glumes subequal, 1-nerved, 6-12 mm long, subequal. ♦ Dry, sandy plains and meadows, mostly southern regions. ♦ We have two forms in New Mexico, a third occurs in Mexico, all based on pulvinus expression:

* Aristida pansa* var. **contracta** Allred & Valdes-R. ♦ Not yet known from New Mexico.

* Aristida pansa* var. **apart** [Aristida divisa I.M. Johnston, Aristida pansa Wooton & Standley var. divisa (I.M. Johnston) Beetle].

* Aristida pansa* var. **pansa** Allred & Valdes-R. [confused, perplexing]. ♦ Scattered locales throughout the state. ♦ Because of the axillary pulvinus in the panicule, this taxon was long confused with *Aristida purpurea*, which differs in having cobwebby hairs at the collar, equal glumes, and shorter awns.

**Aristida purpurea** Nuttall [purple].  
*PURPLE THREEAWN*. Densely tufted perennial, 10-100 cm tall, usually unbranched above the base; leaves basal or caudine; collar hairs straight, not cobwebby; ligules less than 0.5 mm long; blades mostly involute, usually glabrous; panicles sparingly branched, sometimes raceme-like, with or without axillary glumes; glumes mostly unequal, the lower shorter than the upper, 1-nerved, the lower 4-12 mm long, the upper 7-25 mm long; lemmas 6-16 mm long; awns usually subequal, but sometimes the lateral ones reduced. ♦ Dry plains, slopes, foothills, sandy sites, disturbed ground; throughout the state in all counties. ♦ There are 6 varieties in New Mexico, all widespread and none distinguished by habitat or distribution, and all of them intergrading with one or more other varieties:

* Aristida purpurea* var. **purpurea** [Aristida microntha Nash, Aristida purpurea Nuttall var. laxiflora Merrill, Aristida roemeriana Schlee]. ♦ Throughout the state. ♦ The delicate and generally drooping pedicels and spikelets, waving in even a slight breeze, give value to this as an ornamental grass. Plants with small spikelets from the eastern plains and eastward were referred to *Aristida roemeriana*, but they intergrade completely with the more typical form.

* Aristida purpurea* var. **longiseta** (Steudel) Vasey [long-awned]  
*RED THREEAWN* [Aristida longiseta Steudel, Aristida longiseta Steudel var. rariflora Hitchcock, Aristida...
**Arrhenatherum**

- **Arrhenatherum bulbosum** (Willdenow) Spenner. Perennial, 0.5-1 m tall or more, often with bulbous bases; ligules 1.5-3 mm long; panicles 7-30 cm long, spreading before and during anthesis, then contracted; spikelets 7-11 mm long; glumes 3-nerved; florets 8-12 mm long, pilose, smooth to tuberculate-scabrous; awns of lower lemma 10-20 mm long; awn of upper lemma absent or to 5 mm long.

**Aristida ternipes** Cavanilles [three-footed, referring to the awns] SPIDERGRASS. Tufted perennial, 25-60 cm tall, the stems mostly unbranched above the base; leaves basal and cauline, the sheaths mostly flat, coiled or curling at maturity; panicles open, 1-30 cm long and nearly as wide, the primary branches stiffly spreading from axillary pulvini; glumes mostly 1-nerved, subequal or more commonly the upper somewhat shorter; floret 10-15 mm long, the beak twisted; awns strongly unequal, the central 5-12 mm long, the lateral 0-3 mm long; spikelets with 2-4 florets, 10-15 mm long; glumes and between the florets; glumes large, longer than the florets, 3-5-nerved; lemmas pilose, 3-7-nerved, awnless or shortly awned; hairs 4-9 mm long; paleas shorter than the lemmas.

**Arundo**

- **Arundo donax** Linnaeus GIANT REED. Culms to 10 m tall from vigorous, stout rhizomes; leaves dichotomous; sheaths open; ligules membranous, sometime ciliate; inflorescence a sparsely rebranching panicle; spikelets with 2 florets, the lower staminate, the upper fertile; disarticulation above the glumes, the florets falling together; glumes unequal; lower lemma 3-7-nerved,awned from below the middle; upper floret 7-nerved, usually congested; glumes subequal, 9-15 mm long, 1-nerved; lemmas 9-15 mm long, smooth to tuberculate-scabrous; awns 0.5-1.5 mm tall or more, often with bulbous bases; ligules 1-3 mm long; panicles 7-30 cm long, spreading before and during anthesis, then contracted; spikelets 7-11 mm long; lower glumes 4-7 mm long, the upper about 3 mm longer; lemmas mostly 6-10 mm long; awn of lower lemma 20-40 mm long; awn of upper lemma absent or to 5 mm long. Introduced for hay and forage, found escaped in moist, shady places in the mountains. Native to Europe. Plants producing bulbous bases have been called var. *bulbosum*. §

**Aristida**

- **Aristida arenaria** Steudel var. *robusta* Merrill. [throughout the state. This was called DODG TOWN GRASS in earlier years, when prairie dogs were prevalent on the western range and this grass rapidly invaded the bare ground around their colonies. §

**Arrhenatherum**

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**Arundo**

- **Arundo donax** Linnaeus GIANT REED. Culms to 10 m tall from vigorous, stout rhizomes; leaves dichotomous; sheaths open; ligules a ciliate membrane; blades flat or folded; panicles large, plumose, silvery to purplish; spikelets with few to several florets; rachilla glabrous; disarticulation above the glumes and the florets; glumes large; perianth 3-5-nerved; lemmas pilose, 3-7-nerved, awnless or shortly awn-tipped; anthers 3.  3 About 5 species, native to Europe and Asia.

**Arrhenatherum**

- **Arrhenatherum elatius** (Linnaeus) Beauvouis ex J. & K. Presl [taller] OATGRASS. [Arrhenatherum elatius (Linnaeus) Beauvouis ex J. & K. Presl var. *bulbosum* (Wildk) Spamer]. Perennial, 0.5-1.5 m tall or more, often with bulbous bases; ligules 1-3 mm long; panicles 7-30 cm long, spreading before and during anthesis, then contracted; spikelets 7-11 mm long; lower glumes 4-7 mm long, the upper about 3 mm longer; lemmas mostly 6-10 mm long; awn of lower lemma 20-40 mm long; awn of upper lemma absent or to 5 mm long. Introduced for hay and forage, found escaped in moist, shady places in the mountains. Native to Europe. §

**Arundo**

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Monocotyledonous Plants - Poaceae

Andropogon gerardii subsp. gerardii

± 2-3 branches
divergent awns, med.-length
8-10 mm, twisted + bent near base
hairs grayish to off-white, 1-2 mm
no hairy brush at tip of spikelets

Andropogon gerardii subsp. hallii

± 2-5 branches
straight short inconspicuous awns, to 5 mm, or absent
hairs short, 1-3 mm, tan to brown hairy brush at tip of spikelet

Aristida adscensionis
Aristida purpurea var. longiseta

Aristida tenuipes var. gentilis
**Avena** [the classical Latin name for oats]. OATS [3].

Plants annual (ours) or perennial; sheaths overlapping, the basal often pilose and the distal glabrous; auricles absent; ligules a membrane; blades usually flat; inflorescence a panicle, sometimes weakly developed; disarticulation above the glumes, above or below the florets; spikelets with few to several florets, ± laterally compressed, the rachilla not prolonged; glumes 3- to 11-nerved, papery, usually surpassing the florets; lemmas usually indurate and enclosing the grain at maturity, 5- to 9-nerved, often strigose, the apex bifid into teeth; awns absent or single off the back of the lemma, twisted below, 1-geniculate; paleas shorter than the lemma; anthers 3; caryopsis longitudinally grooved, terete, hairy. • The genus contains about 29 species, native to temperate regions of Europe, North Africa, and central Asia, many now spread throughout the world as an important crop.


1 Teeth at apex of lemma very thin, elongate, needle-like; pedicels capillary........................................................................... *A. barbata*

2 Teeth at apex of lemma acute but not elongate and needle-like; pedicels slender but not capillary

2 Awns usually absent or short and straight; florets not disarticulating and remaining on the plant, or falling together, when broken apart mechanically a portion of the rachilla remaining attached to the glabrous callus............................................................................... *A. sativa*

2 Awns usually well developed and bent abruptly; florets separating and falling separately, leaving a circular scar or “sucker-mouth” at the bearded callus ........................................................................................................................................ *A. fatua*

* **Avena barbata** Pott ex Link [bearded] SLENDER OATS. Plants annual, 60-100 cm or more tall; blades glabrous to variously hairy; panicles open, 15-40 cm long, 6-12 cm wide; spikelets with 2-3 florets, each floret falling separately; glumes 15-30 mm long, 7-9-nerved; lemmas 15-26 mm long, densely strigose below, the apices with needle-like teeth 2-4 mm long; awns 30-45 mm long, arising about midlength. • A weed in fields and along roads; a few collections from Doña Ana County; native to Eurasia. • The long needle-like teeth at the apex of the lemma are diagnostic.
**Avena fatua** Linnaeus [foolish, of no worth] WILD OATS. Plants annual, 10-120 cm tall or more; blades mostly glabrous; panicles open, 8-35 cm long, 5-18 cm wide, the branches nodding; spikelets with mostly 2 florets, each floret falling separately; glumes 18-30 mm long, 9-11-nerved; lemmas 14-22 mm long, densely striose below, the apices bifid with teeth to 1.5 mm long; awns 22-40 mm long, arising in the middle of the lemma. ● Weed in grain fields and along roads; widespread in the state; native to Eurasia. ● Similar to and forming hybrids with the cultivated *Avena sativa*; some botanists treat these as conspecific. Its easy dispersal and rampant in the fields no doubt helped to bolster the euphemism 'sowing wild oats' for youthful excess. Awns are sensitive to moisture and humidity, and sometimes will wiggle about in the hand when breathed on. Soft stems of young plants are used by children (of whatever age) to make nooses for catching lizards.

**Avena sativa** Linnaeus [cultivated] CULTIVATED OATS (*Avena fatua* Linnaeus var. *sativa* (Linnaeus) Haussknecht). Plants annual, 40-150 or more cm tall; blades mostly glabrous; panicles 10-40 cm long, 5-15 cm wide, the branches nodding; spikelets mostly with 2 florets, the florets falling together; glumes 20-32 mm long, 9-11-nerved; lemmas 14-18 mm long, usually glabrous but sometimes striose, the apices bifid with teeth to 0.5 mm long; awns often absent, 15-30 mm long when developed, arising in the middle of the lemma. ● Commonly cultivated, sometimes escaping along the fields; widespread in the state; native to Eurasia. ● Similar to and forming hybrids with the weedy *Avena fatua*; some botanists treat these as conspecific, with cultivated oats being recognized as *A. fatua* var. *sativa*. A conspicuous cultivar frequently grown (in the U.S.) as a crop is 'naked oats,' with up to 7 florets, membranous glumes, and grains that fall out of the crop. Fields of cultivated oats were much more common in former years, when oats supplied feed for draft horses. Well-known in the little ditty: 'Mares eat oats, an' do eat oats, an' little lambs eat ivy; A kid'll eat ivy too, wouldn't you?'

*Avenula* [little oats] OATGRASS [1]. Tufted or sometimes stoloniferous perennials; sheaths open or closed; auricles absent; ligules membranous; blades not ribbed; inflorescences weakly developed panicles, raceme-like, many branches bearing a single spikelet; spikelets with 2-7 florets; disarticulation above the glumes and between the florets; glumes nearly as large as the spikelet, 1-3-nerved; rachillas glabrous on the side adjacent to the paleas; lemmas 5-7-nerved, awned from about midlength; awns geniculate, twisted below the bend; anthers 3. ● Formerly included in *Helicaitrichon*, this monotypic genus is distinguished by features of the ligules, blades, rachillas, lodicules, embryos, and root anatomy (Romero-Zarco 2011).

*Avenula hookeri* (Scribn.) Holub [for Joseph Dalton Hooker (1817-1911), eminent British botanist and plant collector] [Avenula hookeri Scribn, *Helictotrichon hookeri* (Scribn) Henr.]. Tufted perennial, 10-75 cm tall; sheaths open; ligules 3-7 mm long; blades flat or folded; panicles 5-15 cm long, 1.2-5 cm wide; spikelets 16-12 mm long; lower glume 9-13 mm long; lemmas 10-12 mm long; awns 10-17 mm long. ● Alpine and subalpine slopes and ledges. Known only from a single 1923 collection in Taos County, but expected to still be in the state and to be looked for in high elevations scraggly habitats.


*Beckmannia syzigachne* (Steud.) Fernald [joined scales, referring to the glumes]. Tufted annual, 30-120 cm tall; sheaths glabrous; ligules 5-11 mm long, acute; blades glabrous; panicles 8-28 cm long, the 1-2 cm long, with few secondary branchlets; spikelets 2-3 mm long, with 1 floret (sometimes 2); lemma 2.5-3.5 mm long; palea about as long as the lemma. ● Along irrigation ditches, marshes, floodplains, riverbanks, and sloughs in the northern plains and mountains.

*Our plants belong to subsp. baicaulensis* (N.I. Kusnezow) T. Koyama & Kawano [from Lake Baikal, Russian Federation] [Beckmannia erectiformis (Linnaeus) Host]. This is an important grass for waterfowl.

*Blepharidachne* [eyeshad-scale, alluding to the ciliate lemmas] [1]. Tufted perennials, often nearly mat-forming; sheaths open; auricles absent; ligules a ring of hairs or absent; inflorescence a compact panicle; spikelets with 4 florets, the lower 2 sterile or staminate, the 3rd fertile, the terminal one rudimentary and 3-awned; disarticulation above the glumes, all the florets falling as a unit; lemmas 3-nerved, plicate across the base and on the margin, 3-lobed; anthers 2-3. ● About 4 species, all of the New World.

*Blepharidachne bigelovii* (S. Watson) Hackel DESERTGRASS [Eremochloa bigelovii S. Watson]. Tufted perennials from a knotty base, 6-20 cm tall, the stems branching from the base; basal sheaths shorter than the internodes; ligules to 0.3 mm long; blades rolled, 1-2 cm long, less than 1 mm wide, the lower blades deciduous from the sheath; panicles 1.5-3 cm long, sometimes partially enclosed in the subtending sheaths; spikelets; glumes subequal, shorter than the florets, 5-6 mm long, 1-nerved, awnless or nearly so; fertile 3rd lemma 5-6 mm long, 3-nerved and 3-lobed, awned to 3 mm; palea of fertile 3rd floret slightly longer than the lemma; anthers 2. ● Limestone knolls and ledges in Doña Ana and Eddy counties, uncommon.

*Plants of DESERTGRASS have the initial appearance of Munroa pulchella, but that species is often shorter, produces short stolons, the blades are white-margined, and the lemmas have a single awn.*

*Blepharonoeuron...go to* Muhlenbergia tricholepis

*Bothriochloa* [pitted grass, alluding to the pit in some glumes] BLUESTEM [7]. Plants tufted (ours) perennials; sheaths open; auricles absent; ligules membranous, sometimes with a ciliate fringe; blades usually flat when mature; inflorescence a terminal panicle of several branches; primary branches unbranched, composed of repeating units of sessile and pedicelled spikelets, these breaking apart at maturity and becoming the dispersal unit; internode and pedicels with a longitudinal membranous area (native species) or a longitudinal groove (exotic species); sessile spikelets awned, relatively large and fertile, the pedicelled spikelets awnless, staminate or sterile and often much smaller. ● Species of Bothriochloa were formerly in the genus Andropogon. Seedheads contain flavanols and other aromatic oils, and chewing or smelling the seedhead is reputed to give a

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strong blueberry taste. Three common native species sort roughly as follows: *B. barbinodis* in the more arid habitats of the southern deserts; *B. torreyana* in more mesic habitats of the plains and prairies; and *B. springfieldii* in the upland foothills and mountain slopes.

*Bothriochloa reevesii* (Gould) Gould has been reported for the state, but the specimen in question is referred to *B. springfieldii*.

1 Pedicelled spikelets much shorter and narrower than the sessile ones

2 Sessile spikelets more than 5 mm long........................................................................................................... *B. wrightii*

2 Sessile spikelets less than 5 mm long

3 Panicle axis longer than the branches................................................................................................................. *B. bladhii*

3 Panicle axis shorter than the branches................................................................................................................. *B. ischaemum*

4 Sessile spikelets much shorter and narrower than the sessile ones

4 Sessile spikelets more than 4.5 mm long; awns less than 18 mm long

5 Panicle reddish; hairs subtending the sessile spikelet about ¼ the length of the spikelet, sparse, not at all obscuring the spikelet...

5 Panicle silvery; hairs subtending the sessile spikelets at least ½ the length of the spikelet or longer, copious, at least somewhat obscuring the spikelets .................................................................................................................................................... *B. torreyana*

4 Sessile spikelets more than 4.5 mm long; awns more than 18 mm long

6 Panicle axis mostly less than 5 cm long, with 2-8 branches; racemes and pedicels densely white long-pubescent; nodes densely white long-pubescent with spreading hairs........................................................................................................... *B. springfieldii*

6 Panicle axis 5-15 cm long, usually with numerous branches; racemes and pedicels long-pubescent but with off-white hairs; nodes bearded with stiff tan or off-white hairs

7 Panicles of the larger shoots 14-25 cm long; stems stout, stiffly erect, little-branched above the base, 1.2-2.5 m tall, bluish-glaucous below the nodes; nodes bearded with spreading hairs 3-6 mm long............................................................................................................................... *B. alta*

7 Panicle mostly 7-13 cm long; stems tending to be bent at the base and much-branched in age, mostly 1.2 m or less tall, not bluish-glaucous below the nodes; nodes bearded with appressed hairs less than 3 mm long.................................................................................................................................................... *B. barbinodis*

*Bothriochloa alta* (Hitchcock) Henrard [tall] [*Andropogon alta* Hitchcock]. Plants perennial, 1.2-2.5 m tall or more, little branched, glaucous below the nodes, the nodes hirsute with stiff hairs 2-6 mm long; panicles 14-25 cm long; sessile spikelets 4.5-6 mm long, the first glume short-hairy, pitted or not; awns 18-22 mm long; pedicelled spikelets 3.8-4.4 mm long; 2n=120. ♦Plains in the southern region, uncommon, usually along roadways and ditches where extra water accumulates. ♦Plants have the initial aspect of overly large, robust *Bothriochloa barbinodis*, and can also be confused with *Leptochloa crinita* from a passing car.

*Bothriochloa barbinodis* (Lagasca) Herter [with beaded nodes] CANE BLUESTEM [*Amphilophis barbinodis* (Lagasca) Nash, *Andropogon barbinodis* Lagasca, *Andropogon perforatus* Fourr., *Andropogon saccharoides* Swartz var. *barbinodis* (Lagasca) Hackel]. Plants perennial, 60-120 cm tall, often branched in age, the nodes hirsute with commonly appressed hairs less than 3 mm long; panicles 5-8(20) cm long; sessile spikelets 4.5-7.3 mm long, the first glume short-hairy, pitted or not; awns 20-35 mm long; pedicelled spikelets 3-4 mm long; 2n=120, 220. ♦Arid plains and grasslands, commonly along roadsides. ♦*Andropogon argenteus* A.P. de Candolle is often incorrectly considered a synonym of *Bothriochloa barbinodis* or *B. torreyana*; the argenteus entity has pedicelled spikelets as long as the sessile ones, and not so reduced in length as in the other two. *Andropogon argenteus* is most similar to (and perhaps conspecific with) *Andropogon herterianus* Steudel of Chile; neither of these names have combinations in *Bothriochloa*, where they belong. Homemade darts can be made from CANE BLUESTEM by inserting cactus spines into a short section of the peduncle, leaving the seedhead for the fletching. §

*Bothriochloa bladhii* (Retzius) S.T. Blake [for Peter Johan Bladh (1746-1816), Finnish naturalist and industrialist] AUSTRALIAN BLUESTEM [*Andropogon bladhii* Retzius, *Bothriochloa caucasia* (Trinius) C.E. Hubbard, *Bothriochloa intermedia* (R. Brown) A. Camus]. Plants perennial, 50-100 cm or more tall, the nodes glabrous or hairy; foliage greenish; panicles 5-15(20) cm long, reddish when mature, the axis longer than the branches, which spread from the main axis from axillary pulvini; the lower branches rebranched; sessile spikelets 3-5 mm long, the first glume mostly glabrous, a bit present or absent; awns 10-17 mm long; pedicelled spikelets about same size and shape as sessile ones to half as large, staminate or sterile; 2n=40, 60, 80. ♦Introduced for range restoration, stabilization of roadsides, and erosion control; scattered localities in the state; native to Asia and Africa, notwithstanding its common name. ♦Australian bluestem hybridizes and intergrades with other Asian species of *Bothriochloa*, including *B. ischaemum*, and some plants may be difficult to identify.

*Bothriochloa ischaemum* (Linnaeus) Keng [resembling Ischaemum] YELLOW BLUESTEM [*Amphilophis ischaemum* (Linnaeus) Nash, *Andropogon ischaemum* Linnaeus, *Andropogon ischaemum* Linnaeus var. *songaricus* Ruprecht ex Fischer & C.A. Meyer, *Bothriochloa ischaemum* (Linnaeus) Keng var. *songarica* (Ruprecht ex Fischer & Meyer) Celerier & Harlan]. Plants perennial, 30-85 cm tall, sometimes nearly stoloniferous from geniculate bases, the nodes glabrous or short hairy; foliage greenish; panicles 5-15 cm long, fan-shaped, reddish, the branches longer than the main axis and with axillary pulvini; sessile spikelets 3.5-4.5 mm long, the first glume hairy, not pitted; awns 9-17 mm long; pedicelled spikelets about as long as the sessile, but narrower; 2n=40, 50, 60. ♦Introduced for improving dry-land pastures and roadside stabilization, escaping along roadways; native to southern Europe and Asia. ♦Yellow bluestem intergrades with *Bothriochloa bladhii*, and some plants may be difficult to distinguish.

*Bothriochloa springfieldii* (Gould) Parodi [for Harry Wayne Springield (1920-2013), range scientist and ecologist] [*Andropogon springfieldii* Gould]. Plants perennial, 30-80 cm tall, little branched, the nodes with conspicuous horizontal white hairs 3-7 mm long; panicles 4-9 cm long, the branches longer than the main axis; sessile spikelets 5.5-8.5 mm long, the first glume densely hairy on the lower half; sometimes pitted; awns 18-26 mm long; 2n=120. ♦Rocky to sandy slopes and plains, in grasslands and woodlands. ♦Easily told in the field by the long white horizontal hairs at the nodes and the short panicles with very white long hairs and long awns, the erect panicle branches disarticulate beginning at the tip, leaving spreading tufts of hairs. This is perhaps our most spectacular bluestem, with its very white hairs of panicles and nodes; a good choice for a native garden. §
Bothriochloa torreyana (Steudel) Scrivanti & Anton [for John Torrey (1796-1873), distinguished American botanist, mentor to Asa Gray] SILVER BLUESTEM [Amphilophis saccharoides auctores non (Swartz) Nash, Andropogon saccharoides auctores non Swartz, Andropogon torreyana Steudel, Bothriochloa saccharoides of numerous authors, Bothriochloa lagaroides (A.P. de Candolle) Herter subsp. torreyana (Steudel) Allred & Gouldi] = Bouteloua americana Scirventi] = Plants perennial, 35-100 cm or more tall, the nodes glabrous or short-hairy; panicles 4-12 cm long, silvery white, lacking pulvin; sessile spikelets 2.5-4.5 mm long, the first glume glabrous to short hairy, lacking a pit; awns 8-16 mm long; 2n=60.  • Well-drained soils of grasslands, river valleys, roadsides, watered lawns, and cemeteries. • SILVER BLUESTEM long went by the name *Bothriochloa saccharoides*, a more southern subtropical species that differs in having pilose leaves, a narrow central groove in the rame axis, and pulvin in the panicles. The original collection of *B. torreyana* was made during the 1830 Long expedition, from “the Canadian River,” which could have been in New Mexico, Oklahoma, or Texas. Recently Scrivanti et al. (2013) created the enigmatic *Bothriochloa saccharoides* (Swartz) Rydberg subsp. *americana* Scrivanti for plants with pilose nodes, a wide rachis groove, sessile spikelets 3-6 mm long, awns 1-2 mm long, and pedicellate spikelets 2-2.4 mm long. The type of subspecies *americana* is very typical *B. torreyana*, including being a hexaploid (2n=60); she cites no other specimens, but the description would include members of *B. barbinodis* as well, which she did not include in her study. §

Bothriochloa wattii (Hackell) Henrad [for Charles Wright (1811-1885), outstanding American botanical collector] *Amphilophis wattii* (Hackell) Nash, *Andropogon wattii* Hackell. Plants perennial, 45-70 cm tall; nodes glabrous or hirsute; foliage glaucous; panicles 5-6 cm long, fan-shaped, the axis mostly shorter than the branches; sessile spikelets 5.5-7 mm long; first glume glabrous, usually lacking a pit; awns 10-15 mm long; pedicelled spikelets staminate, nearly as long as the sessile one; 2n=120.  • Perhaps extirpated, but to be looked for in rocky, grassy foothills of the piñon zone in the southwestern mountains.  • First discovered in 1851 by Charles Wright of the U.S.—Mexico boundary survey. Wright’s notes indicated that it was found in “pine hills from the Mimbres to the Cobre, large patches with scattered culms.” The only other (and latest) collection from New Mexico was in 1904 near Hillsboro. The glaucous leaves, glabrous sessile spikelets, and large pedicellate spikelets are distinctive.

**Bouteloua** [for Claudio Bouteloua Agras (1774-1842) and Esteban Bouteloua Agras (1776-1813), Spanish agriculturalists and gardeners] GRAMA [16].

Plants annual to perennial, tufted to rhizomatous or stoloniferous; sheaths open; auricles absent; ligules hairy, membranous, or a combination; inflorescence a panicle of 1-many spicate primary branches; disarticulation below the branch or above the glumes and the florets falling together; spikelets with a single fertile floret and 1-2 smaller staminate or sterile florets above; glumes mostly unequal, 1-nerved; lemmas 3-nerved and usually 3-awned.  • A New World genus of perhaps 40 species or so. Some have proposed that species with disarticulation above the glumes be segregated into the genus *Chondrurus*, but studies by Columbus (1993, 1999) and others show this to be without strong underpinning. We also follow Columbus (1999) in bringing the monotypic genus *Buchloë* into *Bouteloua*; the staminate inflorescence of the former illustrates its relationship to the latter. *Bouteloua chondroides* (Kunth) Bentham ex S. Watson and B. rosulosa Vassey have been reported for the state, but no validating specimens are yet known.

1 Stem internodes (not the sheaths) wooly-pubescent ..................................  *B. eriopoda*  
1 Stem internodes glabrous (distal internodes of *B. breviseta* with a chalky-whitish bloom)  
2 Plants unisexual, dioecious, stoloniferous, forming low mats often less than 10 cm tall ........................................  *B. dactyloides*  
2 Plants bisexual, tufted or shortly rhizomatous, usually taller  
3 Inflorescence branches deciduous at maturity; spikelets 1-6 per branch  
4 Branches of the inflorescence 15-80 per stem, or if less than 15 then the branches (including the spikelets) less than 1 cm long  
5 Leaf blades 1-2(2.5) mm broad; plants not rhizomatous; anthers purple ..........................................................  *B. warnockii*  
5 Leaf blades mostly more than 2.5 mm broad; plants with or without rhizomes; anthers red, orange, or yellow ...........................................  *B. curtipendula*  
4 Branches of the inflorescence 1-13 per stem or if more than 13 then the branches (including the spikelets) 1.5 cm or more long  
6 Plants annual ..............................................................................................................................................  *B. aristidoides*  
6 Plants perennial  
7 Glumes and often the lemmas densely pubescent, the hairs not confined to the midnerves  
8 Inflorescence axis 3-6 cm long; spikelet clusters (including awns) mostly less than 1 cm long ..................................  *B. rigidiseta*  
8 Inflorescence axis 7-10 cm long; spikelet clusters mostly more than 1 cm long ..................................................  *B. cladens*  
7 Glumes and lemmas glabrous, or scabrous to ciliate on the midnerves only  
9 Middle inflorescence branches with 12-20 spikelets; lemma of lower floret 4-6 mm long ...........................................  *B. repens*  
9 Middle inflorescence branches with 4-16 spikelets; lemma of lower floret 4.5-8 mm long  
10 Shoots from hard, stout, rhizomatous bases, the stems thus appearing ± in linear progression and close together; basal sheaths mostly flattened, ribbon-like; middle branches mostly 2-3 cm long (excluding awns) ...  *B. radicosa*  
10 Shoots solitary or several together in somewhat concentric tufts or from weak rhizomes; basal sheaths little flattened, somewhat keeled and not ribbon-like; middle branches mostly 0.7-2 cm long (excluding awns) ...........................................  *B. repens*  
3 Inflorescence branches and glumes persistent on the plant; spikelets usually 20-60 per branch  
11 Inflorescence reduced to a single branch  
12 Plants annual ...........................................  *B. simplex*  
12 Plants perennial  
13 Primary inflorescence branch extending well beyond the attachment of the terminal spikelet .................  *B. hirsuta*
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Bouteloua aristidoides (Kunth) Griseb. [resembling the genus Aristida] NEEDLE GRAMA. Plants annual, tufted, 4-45 cm tall or more; blade margins usually with bulbous-based hairs at the base; panicles 2-12 cm long, with 4-15 branches densely pubescent basally, the entire branch somewhat resembling an Aristida spikelet; disarticulation at the base of the branch; spikelets appressed to the branch; lemmas and paleas of distal spikelets short-awned. • Alluvial plains and uplands, dry mesas, disturbed rangelands. We have two varieties.

- a Panicle branches with 2-4 spikelets, mostly 1.6 cm or less long to the tip of the terminal spikelet; rachis extended 6-10 mm beyond the point of attachment of the terminal spikelet...var. aristidoides [Bouteloua gracilis Vasey, Dinebra aristidoides Kunth]. Common, with a wide distribution.
- a Panicle branches with 6-10 spikelets, 1.5-3.5 cm long; rachis extended 2.5(7) mm beyond the point of attachment of the terminal spikelet...var. arizonica

Bouteloua breviseta Vasey [short-awned] GYP GRAMA [Chondrosum brevisetum (Vasey) Clayton]. Tufted or rhizomatous perennials to 40 cm tall, somewhat bushy, the culms with 4-5 or more nodes and slightly woody-based, distal portion of the lower internodes with a chalky bloom; panicles 2-4 cm long, with 1-3 branches, each branch ending in a bristle-like spikelet; disarticulation above the glumes; hairs on glumes not bulbous-based; lemmas 3-awned; anthers yellow and red. • Alluvial flats and slopes, plains, rocky slopes, washes, dry woodlands, roadsides, fields, often disturbed ground; found throughout the state and expected in the few counties not recorded. • As with many annual grasses, size varies with available moisture. We have two intergrading varieties.

- a Plants annual; culms usually decumbent and geniculate, occasionally rooting at the lower nodes; panicle branches mostly 10-18 in number...var. barbata
  - Throughout the state.
  - a Plants short-lived perennial; culms erect from the base; panicle branches 15-30 in number...var. rothrockii (Vasey) Gould [for Joseph Trimble Rothrock (1839-1922), American botanist-western explorer] ROTHROCK'S GRAMA [Bouteloua rothrockii Vasey]. Known only from Dona Ana and Hidalgo counties; expected in the surrounding counties.

Bouteloua curtipendula (Michaux) Torrey [with short, hanging branches] SIDE OATS GRAMA [Atheropogon curtipendulus Fourr.]. Tufted to rhizomatous perennials mostly 20-70 cm tall; blades mostly wider than 7.5 mm; panicles 14-30 cm long, with 15-80 often long hanging branches; disarticulation at the base of the branch; spikelets appressed; lemmas awnless to awned; anthers red, orange, yellow, or purple. • Prairies, grasslands, woodlands, forest openings, usually on well-drained soils; throughout the state. • This is an excellent forage grass that withstands grazing well. It is highly variable, largely due to its apomictic mode of reproduction. Regarding the author citation, some maintain that the correct combination is (Michaux) Gray, concluding correctly that Torrey's 1848 combination (in Emory) was provisional and invalid, but they overlook Torrey's valid combination in 1853 (in Marcy), which preceded that of Gray in 1856. [This is the stuff dreams are made of!]

- a Plants tufted, without rhizomes...var. caespitosa Gould & Kapadia (tufted). • Scattered locales, presumably less common than the next.
- a Plants with short rhizomes from the bases of the clumps...var. curtipendula • Widespread throughout the state.

Bouteloua dactyloides (Nuttall) J.T. Columbus [finger-like] BUFFALOGRASS [Buchloe dactyloides (Nuttall) Engelmann, Bulbis dactyloides (Nuttall) Rafinesque, Sesleria dactyloides Nuttall]. Dioecious (sometimes monocious), stoloniferous perennials 1-30 cm tall, the pistillate shoots much shorter than the staminate; leaves sparingly pilose in the ligule region; stamineae paniculate usually exceeding the foliage, with 1-3 branches, disarticulation above the glumes, the spikelets crowdedly pectinate and pubescent, with prominent red to orange anthers; pistillate inflorescence partially hidden in leaf sheaths, the branches bur-like with 3-5 enclosed spikelets, disarticulation at the base of the bur. • Plains, prairies, and grasslands nearby throughout the state except for the central corridor. • BUFFALOGRASS provides valuable forage and thrives under heavy grazing. It is also finding favor as an ornamental or lawn plant in xeriscape landscaping. It is similar in vegetative appearance to the stoloniferous Hilaria belangeri, but that species has noticeably pilose nodes. Studies by Columbus (1999) have shown the intertwined phylogenetic relationship of Bouteloua and Buchloe, with Buchloe nested solidly within a broader Bouteloua variation pattern; one recognizes the relationship when comparing the stamineae panicules of Buchloe with the inflorescences of Bouteloua.

Bouteloua eludens Griffiths [evading] SANTA RITA GRAMA. Tufted perennials 20-60 cm tall; panicles 6-10 cm long, with 10-16 pubescent branches, the axis extended beyond the last spikelet; disarticulation at the base of the branch; glumes and lemmas densely hairy between the veins; lemmas 3-lobed. • Dry, rocky slopes and desert grasslands; known from a single collection in Hidalgo County. The similar Bouteloua chondrosioides is known from southeastern Arizona, and might reasonably be expected in the booteel region. The two may be told by the following features:

- a Inflorescence 14-30 cm long, mostly with 15-30 branches; branches with 2-6 spikelets...B. eludens
- a Inflorescence 2.5-6 cm long, mostly with 3-8 branches; branches with 8-12 spikelets...B. chondrosioides (Kunth) Bentham ex S. Watson
**Bouteloua eriopoda** (Torrey) Torrey ([wooly-footed, alluding to hairs at the base of the plant] BLACK GRAMA [*Chondrosum eriopodum* Torrey]. Plants perennial, regularly producing long stolons, sometimes also with short rhizomes; sheaths glabrous and about half as long as the wooly-hairy internodes; panicles 2-16 cm long with 2-8 branches, a tuft of woolly hairs at the base of the branch; disarticulation above the glumes; spikelet hairs not bulbous-based; lemmas mostly with a single awn, the lateral awns absent or very short; anthers yellow to orange. ♦ Desert grasslands, dry plains, and rocky slopes throughout the state. ● In New Mexico, only black grama and *Hilaria rigida* (exotic and known only from a single site in Dona Ana County) have wooly internodes. In the early reports of New Mexico vegetation, at least four different grasses were called black grama: *Bouteloua eriopoda, B. hirsuta, Muhlenbergia porteri,* and *Hilaria mutica.* §

**Bouteloua gracilis** (Wildenow ex Kunth) Lagasca ex Griffiths [slender, graceful] BLUE GRAMA [*"Bouteloua gracilis" Lagasca nom. nud., Bouteloua oligostachya (Nuttall) Torrey ex A. Gray, Chondrosum gracile Wildenow ex Kunth]. Densely tufted perennials, 20-70 cm tall, sometimes with short rhizomes from the base; blades with bulbous-based hairs near the ligule; panicles 2-10 cm long, with 1-5 branches, the rachis bearing spikelets to the end; disarticulation above the glumes; spikelets densely crowded on the rachis, pectinate, with 1 fertile and 1 reduced floret; lower lemmas lobed and mostly awned; anthers yellow or purple. ● Plains, rocky slopes, woodlands, forest openings. ● Very similar to *Bouteloua hirsuta,* but that species has a prominent extension of the rachis beyond the terminal spikelet. This is the state grass of New Mexico, and is found in every county of the state, from 4,000 to over 10,000 ft. It is undoubtedly the most valuable forage grass in the state, and BLUE GRAMA plants provide excellent forage for livestock. It was called WHITE GRAMA in the early days of the territory, but it mostly appears neither white nor blue. Some Native Americans used the seeds to make flour for breads and mush. Plants are increasingly being used in xeriscaping.

**Bouteloua hirsuta** Lagasca [hairy or bristly] HAIRY GRAMA [*Chondrosum foenum Torrey, Chondrosum hirsutum* (Lagasca) Kunth]. Tufted perennials 15-60 cm tall; blades with bulbous-based hairs near the ligule; panicles 1-18 cm long, with 1-4 branches, the rachis of the branch extending beyond the terminal spikelet as a slender bristle; disarticulation above the glumes; spikelets densely crowded on the rachis, pectinate, with 1 fertile and 1-2 reduced florets; lower lemma lobed and awned; anthers yellow or cream. ● Plains, rocky slopes, woodlands; widespread. ● Very similar to *Bouteloua gracilis,* but differing most noticeably by the extension of the branch rachis beyond the terminal spikelet in *B. hirsuta.* §

**Bouteloua parryi** (Fournier) Griffiths [for Charles Christopher Parry (1823-1890), American botanist explorer of the West] PARRY’S GRAMA [*Chondrosum parryi* Fournier]. Tufted annuals, 20-55 cm tall; sheaths with tufts of long hairs at the sides of the collar; blades with bulbous-based hairs on both surfaces; panicles 3-10 cm long, with 4-8 branches, the rachis prolonged into a terminal bristle; disarticulation above the glumes; spikelets densely crowded on the branch, pectinate, with 1 fertile floret and 1-2 reduced florets; glumes with bulbous-based hairs; lower lemmas hairy, awned; anthers yellow. ● Dry rocky slopes in the southern regions.

**Bouteloua radiosa** (Fournier) Griffiths [well-rooted] PURPLE GRAMA [*Atheropogon radicosus* Fournier]. Tufted-rhizomatous perennials from hard knotty bases, 40-70 cm tall; basal sheaths flattened and ribbon-like; panicles 10-15 cm long, with 7-12 branches each bearing 8-10 spikelets, the middle branches 2-3 cm long (excluding awns); disarticulation at the base of the branch; spikelets appressed, with 1 fertile and 1 reduced floret; glumes glabrous; lemmas 3-lobed, 3-awned. ● Dry rocky slopes, desert grasslands and woodlands; uncommon.

**Bouteloua repens** (Kunth) Scriber & Merrill [creeping] SLENDER GRAMA [*Atheropogon filiformis* Fournier, *Bouteloua filiformis* (Fournier) Griffiths, *Dinebra repens* Kunth]. Tufted perennials, 15-65 cm tall, geniculate-based; panicles 4-14 cm long, with 6-12 branches (sometimes fewer), the rachis prolonged beyond the terminal spikelet; disarticulation at the base of the branch; spikelets appressed, with 1 fertile and 1 reduced floret; lemma mostly glabrous, 3-awned; anthers usually orange or yellow. ● Semi-arid rangelands and woodlands in the southwestern region, not common.

**Bouteloua rigidiseta** (Steudel) A.S. Hitchcock [with stiff bristles] TEXAS GRAMA [*Aegopogon rigidisetus* Steudel]. Tufted slender perennials, 10-40 cm tall, unbranched; panicles 3-6 cm long, with 6-8 branches, the rachis prolonged beyond the terminal spikelet; disarticulation at the base of the branch; spikelets appressed-spreading, with 1 fertile and 1-2 reduced florets; glumes and lemmas sparsely hairy on the nerves only; lemmas 3-awned. ● Shin-oak mottes on the eastern plains; known from a few recent collections in Roosevelt County.

**Bouteloua simplex** Lagasca [single] MAT GRAMA [*Bouteloua procumbens* (Durand) Griffiths, *Chondrosum simplex* (Lagasca) Kunth]. Tufted annuals, the culms decumbent, 3-18(26) cm long; panicles usually with a single branch 1-3 cm long, rarely with 2-3 branches, the rachis not prolonged beyond the terminal spikelet; disarticulation above the glumes; spikelets densely crowded, pectinate; glumes glabrous; lemmas hairy on the nerves, 3-awned. ● Dry rocky plains, mesas, hills, and disturbed ground in the mountains, nearly throughout the state. ● *MAT GRAMA* seems to have a liking for rocky or gravely sites.

**Bouteloua trifida** Thurber ex S. Watson [3-clft] RED GRAMA [*Bouteloua trifida* Thurber ex S. Watson var. burkii (Scriber ex S. Watson) Vasey ex L.H. Dewey, *Chondrosum trifidum* (Thurber ex S. Watson) Clayton]. Tufted perennials, older plants sometimes with short rhizomes, 8-35 cm tall; panicles 3-10 cm long, with 2-7 branches, the rachis not prolonged beyond the spikelets; spikelets reddish, with 1 fertile and 1 reduced floret; glumes glabrous, 3-awned; anthers yellow. ● Calearious, rocky slopes in the southern desert grasslands, infrequently collected.

**Bouteloua warnockii** Gould & Kapadia [for Barton Holland Warnock (1911-1998), revered West Texas botanist]. Tufted perennials with rhizomes, 20-40 cm tall; blades narrow, 1 -2(2.5) mm wide, involute when dry; panicles 8-20 cm long, with 9-20 or more branches, the rachis prolonged beyond the terminal spikelet; disarticulation at the base of the branch; spikelets appressed, somewhat greenish; glumes and lemmas mostly glabrous; lemma 3-awned; anthers dark purple. ● Dry plains on limestone in desert grasslands, on ledges and outcrops, often on gypsum; uncommon in the southern regions. ● Similar to *Bouteloua curtipendula,* but distinguished by the strictly caespitose habit, narrow blades, and purple anthers.

Brachia...go to *Urochloa*
Monocotyledonous Plants - Poaceae

**Bothriochloa barbinodis**
- Sandy Mts. Sept 15
- Many branches, fanned at top.
- Pedicelled spikelet reduced.
- Showy collar of white hairs.
- Axis of inflorescence short.
- Spikelets appear pale green, operas borne in white ter.
- Dense, long white-hairy.
- Las Cruces Oct. 15

**Bothriochloa springfieldii**
- Pedicelled spikelet much reduced.
- Xeri Park, Albuquerque Sept 15
- 1-2 panicle branches arising from a central axis 4-7 cm long, not widely fanned at top.
- Siliqua with abundant white hairs, to 9 mm awns less than 18 mm.

**Bothriochloa Torreyana**

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**Boucleous barbata**

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Monocotyledonous Plants - Poaceae
Briza [nodding] QUAKING GRASS [2].

Plants annual (ours) or perennial, tufted; sheaths open; auricles absent; ligules membranous; blades flat; inflorescence an open panicle; the branches capillary; spikelets erect to drooping, with several florets, awnless, the glumes and lemmas spreading from the rachilla; disarticulation above the glumes and between the florets; lemmas inflated, about as wide as long, with rounded backs, with several indistinct nerves; anthers 3. ♦ About 5 species of Eurasia and northern Africa. The inflated, awnless spikelets are distinctive. Plants are grown for ornament and bouquets, and are exotic in New Mexico.


1 Spikelets 10-20 mm long; panicles bearing fewer than 10 spikelets .................................................................................... B. maxima
1 Spikelets 2-5 mm long; panicles bearing numerous (more than 20) spikelets .................................................... B. minor

*B. maxima* Linnaeus [very large]. Plants 25-75 cm tall; sheaths often less than ½ as long as the internodes; panicles 4-10 cm long, 2-6 cm wide; spikelets 10-20 mm long, with several florets; lemmas 7-9 mm long, glabrous proximally, becoming villous distally; anthers 1-1.8 mm long. ♦ Weakly adventive; found recently in Union County; native to the Mediterranean region. ♦ Plants are grown for ornament and bouquets because of the spectacular seedheads.

*B. minor* Linnaeus [smaller]. Plants 10-70 cm tall; sheaths ½ to ¾ the length of the internodes; panicles 4-15 cm long, 3-11 cm wide; spikelets 2-5 mm long, with several florets; lemmas 1.5-2.5 mm long, mostly glabrous; anthers about 0.5 mm long. ♦ Weakly adventive; collected from Las Cruces, but not likely persisting; native to the Mediterranean region. ♦ The spikelets and its parts are much smaller than the other species (particularly *B. maxima*), hence, it’s name. Seedheads are used in dried bouquets.
**Bromus** [food, also an ancient name for oats] **BROME** [16].

Plants annual, biennial, or perennial, tufted to rhizomatous; sheaths fused to near the top, often pubescent; auricles present or absent; ligules membranous; inflorescence a panicle, sometimes raceme-like; spikelets with several florets; disarticulation above the glumes and between the florets; lemmas several-nerved, awned or awnless; paleae ciliate on the nerves, adnate to the grain; anthers 3. This is a large and diverse genus, from which segregate genera have been created (*Anisantha, Bromopsis, Ceratochloa*). We have chosen to retain the genus in its large, inclusive sense, but we record the relevant synonyms and alternative classifications. The works of Pavlick & Anderton (2007) and Saarela et al. (2014) are particularly helpful, but the genus remains a vexing group in New Mexico in need of further study. All the perennials but one are native, and all the annuals but one are exotic. *Bromus pungens* Linnaeus has been reported for the state, but no validating specimens are known.


1 Plants perennial

2 *Rhizomes present*

3 Culm nodes usually glabrous; leaves (blades and sheaths) usually glabrous; lemmas mostly glabrous or scabrous; awns 0-3 mm long; seeded or disturbed sites, widespread................................................................. *B. inermis*

3 Culm nodes often pubescent; leaves pubescent; awns 1-6 mm long; native plant communities, uncommon in the northern mountains ................................................................. *B. pumilusculus*

2 *Rhizomes absent*

4 Spikelets strongly flattened, the lemmas v-shaped in cross-section; second (upper) glume 5- to 9-nerved

5 Lemma awns 0-2.5 mm long................................................................. *B. catharticus*

5 Lemma awns 3-15 mm long (rarely as short as 2 mm)................................................................. *B. carinatus*

4 Spikelets not strongly flattened, but ± terete, the lemmas rounded on the back in cross-section; second (upper) glume 3-nerved

6 First glume 3-nerved

7 Glumes mostly glabrous; leaf blades often glaucous ................................................................. *B. frondosus*

7 Glumes mostly pubescent; leaf blades not glaucous

8 Pedicels puberulent; blades of the upper half of the shoot erect, the midrib not narrowed below the collar; auricles absent................................................................. *B. porteri*

8 Pedicels glabrous; all blades mostly lax or spreading, the midrib mostly narrowed below the collar; auricles frequently present on the lower leaves................................................................. *B. anomalus*

6 First glume (1-2)-nerved

9 Sheaths densely lanate, the hairs spreading from the sheath but becoming matted at the tips................................................................. *B. lanatipes*

9 Sheaths glabrous to lightly pilose or hirtellous, if pubescent then not becoming matted

10 Midrib of the culm leaves abruptly narrowed below the collar; anthers 2-4 mm long; lemmas pubescent across the back as well as on the margins................................................................. *B. anomalus*

10 Midrib of the culm leaves not narrowed below the collar; anthers 1-2.7 mm long; lemmas pubescent across the back, pubescent on the margins

11 Anthers 1-1.4 mm long; upper glumes 7-8 mm long; backs of all lemmas glabrous................................................................. *B. ciliatus*

11 Anthers 1.6-2.7 mm long; upper glumes 9-11 mm long; backs of the upper lemmas in a spikelet with appressed hairs, the backs of the lower lemmas glabrous................................................................. *B. richardsonii*

1 Plants annual

12 Lemma awns 0-2.5 mm long

13 Lemma lanceolate, broadest at the base, 9-14 mm long; anthers about 3-4 mm long................................................................. *B. catharticus*

13 Lemma inflated, broadest at the middle, 7-9 mm long; anthers 1 mm long or less................................................................. *B. briziformis*

12 Lemma awns longer than 3 mm

14 First glumes mostly 3- to 5-nerved or more

15 Spikelets strongly flattened, the lemmas v-shaped in cross-section................................................................. *B. carinatus*

15 Spikelets not strongly flattened, but ± terete, the lemmas rounded on the back in cross-section................................................................. *B. squarrosus*

14 First glumes mostly 1-nerved (sometimes 3-nerved) in *B. diandrus*

16 Panicle dense, compact, ovoid; panicle branches stout, erect, and mostly much shorter than 2 cm................................................................. *B. madritensis*

16 Panicle loose, open, elongate; panicle branches often spreading or drooping, and mostly much longer than 2 cm

17 Anwns mostly 3-6 cm long; lemmas 20-35 mm long................................................................. *B. diandrus*

17 Anwns mostly 1-3 cm long; lemmas 9-20 mm long

18 Primary panicle branches mostly with 1 (3) spikelets; awns 15-30 mm long; lemmas 14-20 mm long................................................................. *B. sterilis*

18 Primary panicle branches mostly with more than 3 spikelets, at least on mature shoots; awns 10-18 mm long; lemmas 9-12 mm long................................................................. *B. tectorum*

**Bromus anomalus** Ruprecht ex Fournier [abnormal] **MEXICAN BROME** (*Bromopsis anomalus* (Ruprecht ex Fournier) Holub). Tufted perennials, 40-90 cm tall; nodes glabrous to hairy; sheaths glabrous or pilose, the midrib of the culm leaves abruptly narrowed just below the collar; auricles usually present on the lower leaves; blades 2-4 mm wide; panicles 10-20 cm long, open, the branches spreading, often drooping; glumes usually pubescent, sometimes glabrous, the lowermostly 1-nerved, the upper 3-nerved; lemmas rounded, the back and margin pubescent; awns 1-3(5) mm long; anthers

**Monocotyledonous Plants - Poaceae**

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Monocotyledonous Plants - Poaceae

2-4 mm long. ●Mountain scrub, oak & piñon/juniper woodlands, ponderosa parklands, aspen groves, and mountain meadows, often growing with Bromus ciliatus and B. richardsonii, mid- to high elevations. ●This intergrades with the two previously-named species and with B. frondosus, and identification of some specimens can be vexing; it may be less common than thought. Seeds of some species are used by Tarahumara people in Mexico to begin fermentation in making a corn drink called tesquino (Saarela et al. 2014).

*Bromus briziformis* Fischer & Meyer [resembling the genus Briza] RATTLESNAKE CHESS. Tufted annuals, 20-60 cm tall; sheaths densely pilose-hispid, the hairs retrorse; auricles absent; blades 2-4 mm wide, pilose; panicles 5-15 cm long, open, the branches spreading to reflexed; spikelets laterally flattened; lemmas 5-8 mm wide, obovate, inflated; awns 0-3 mm long; anthers 0.7-1 mm long. ●Woody, dry sites; native to Europe. ●Known only from an old (1913) collection from Santa Fe County, more common northwestern in the Intermountain region.

*Bromus carinatus* Hooker & Arnott [keeled] [Bromus arizonicus (Shear) Siebblins, Bromus carinatus Hooker & Arnott var. arizonicus Shear, Bromus carinatus Hooker & Arnott var. californicus Shear, Bromus carinatus Hooker & Arnott var. marginatus (Nees) Barkworth & Anderton, Bromus marginatus Nees ex Steudel, Bromus marginatus Nees ex Steudel var. seminudus Shear, Bromus polyanthus Scribn.]. Tufted annuals, 20-60 cm tall; nodes glabrous to hairy; sheaths glabrous to densely pilose; auricles absent (present?); blades 2-10 mm wide, glabrous to hairy, flat to rolled; panicles 8-40 cm long, the branches stiffly ascending to divergent; glumes glabrous to pubescent, with several nerves; lemmas keeled on the back, glabrous to pubescent; awns 3-15 mm long; anthers 0.4-6 mm long. ●Mountain slopes and forest clearings, widespread. ●This species has gone by the common name CALIFORNIA BROME, but a better name would be MIXED-UP BROME. In attempts to make sense of the bewildering variation, the following weak phases have been recognized, sometimes treated as varieties or even separate species, but intergradation is common in New Mexico. Recently, the entire complex has been merged with Bromus stenchenus (Brainerd et al. 2016); for now, we leave it under the more well-known name, *Bromus carinatus*. §

- a Anthers 0.4-0.5 mm long; plants annual; upper glume as long as the lower lemma...the *arizonicus* phase.
- b Anthers 1-6 mm long; plants annual to perennial; upper glume shorter than the lower lemma

- a Awns usually more than 7 mm long...the *carinatus* phase.
- b Awns usually less than 7 mm long

- c Plants mostly pubescent throughout...the *marginatus* phase.
- d Plants mostly glabrous, at least in the spikelets...the *frondosus* phase. ●Recent work (Barkworth et al. 2006) suggests that this could be treated at the specific level, as *Bromus polyanthus* Scribn., but New Mexico populations are unconvincing.

*Bromus catharticus* Vahl [purgative] RESCUEGRASS [Bromus unioloides Kunth, Bromus willdenovii Kunth, Ceratochloa cathartica (Vahl) Herter]. Annuals or short-lived perennials, 30-100 or more cm tall; nodes glabrous; sheaths densely pilose; auricles absent; blades 3-10 mm wide, glabrous; panicles 10-25 cm long, the branches ascending to spreading; glumes mostly glabrous; lemmas strongly keeled, usually glabrous; awns 0-3 mm long; anthers less than 1 mm long in cleistogamous florets, 2-4 mm in chasmogamous florets. ●Widespread in the state in disturbed ground, lawns, weedy sites, and roadsides; native to South America. ●This species was widely introduced in the United States for forage; MATUA GRASS is a popular cultivar for irrigated pastures. §

*Bromus ciliatus* Linnaeus [fringed] FRINGED BROME [Bromopsis ciliata (Linnaeus) Holub, Bromus canadensis Michaux]. Tufted perennials, 40-120 or more cm tall; upper nodes mostly pubescent; sheaths glabrous or pilose, the midrib of the culm leaves not abruptly narrowed just below the collar; auricles mostly absent; blades 3-9 mm wide, the upper mostly pilose adaxially; panicles 6-18 cm long, the branches spreading to somewhat drooping; glumes glabrous, the lower mostly 1-nerved, the upper 3-nerved, 7-8 mm long; lemmas rounded, the back glabrous, the margins ciliate; awns 3-5 mm long; anthers 1.4 mm long. ●Common and widespread in ponderosa, mixed conifer, spruce/fir forests, and mountain meadows, but also extending to lower elevations. ●This intergrades with *B. anomalus* and *B. richardsonii*, and New Mexico specimens cannot always be told apart, despite the assertions of some recent studies. §

*Bromus diandrus* Roth [having two stamens] RIPGUT BROME [Anisantha diandra (Roth) Tutin, Anisantha rigida (Roth) Hyland, Bromus diandrus Roth var. rigida (Roth) Saless, Bromus rigidus Roth]. Tufted annuals, 20-80 cm tall or more, the culms puberulent below the panicle; sheaths pilose; auricles absent; blades 1-9 mm wide, pilose on both surfaces; panicles 12-25 cm long, the branches ascending to spreading and with only 1-2 spikelets; lemmas rounded on the back; awns 30-65 mm long; anthers 0.5-1 mm long. ●Dry, disturbed ground in scattered locales, but most common in the southern counties; native to Europe. ●Heavy infestations of this grass on pastureland can be harmful to animals if the florets become embedded around the mouth or in the underbelly, as they will work themselves through the coat and skin and damage underlying tissue. Bromus rigidus has sometimes been segregated as a variety or subspecies based primarily on whether the spikelets are held erect on short pedicles (rigidus) or drooping on long pedicles (diandrus), but the distinction is trivial.

*Bromus frondosus* (Shear) Wooton & Standley [full of leaves, leafy] DROOPING BROME [Bromopsis frondosa (Shear) Holub, Bromus porteri (Cooley) Nash var. frondosa Shear]. Tufted perennials, 45-100 cm tall; nodes usually glabrous; sheaths mostly glabrous, sometimes pilose, the midrib often abruptly narrowed just below the collar; auricles absent; blades 3-6 mm wide, usually glabrous; panicles 10-20 cm long, the branches ascending to drooping; glumes glabrous, 3-nerved; lemmas rounded, the back glabrous to pubescent, the margins hairy; awns 2-4 mm long; anthers 1.5-3.5 mm long.

- a Semi-desert mountain scrub and riparian areas, oak and piñon/juniper woodlands, upwards to ponderosa forests, mostly below 8100 ft in New Mexico. ●This species has been confused most frequently with *Bromus anomalus* and *B. ciliatus*, which differ in the features in the key, as well as being mostly higher elevation species. The type is from Mangas Springs, Grant County. §

*Bromus inermis* Leysser [unarmed, awnless] SMOOTH BROME [Bromopsis inermis (Leysser) Holub]. Rhizomatous perennials, 50-130 cm tall; nodes glabrous; sheaths usually glabrous; auricles sometimes present; blades 5-15 mm wide, glabrous, flat; panicles 10-20 cm long, the branches mostly ascending; glumes glabrous; lemmas rounded on the back, usually glabrous; awns 0-3 mm long; anthers 3.5-6 mm long. ●Pastures, mountain slopes, roadside swales and slopes; throughout the state; native to Eurasia. ●Commonly planted in forests and fields for so-called improvement, but quite aggressive and spreading easily by the rhizomes. This is the exotic counterpart to our native *Bromus pumilus*.
**Bromus lanatipes** (Shear) Rydberg [wooly-footed] WOOLY BROME [Bromopsis lanatipes (Shear) Holub, Bromus anomalus Ruprecht ex Fournier var. lanatipes (Shear) Hitchcock, Bromus porteri (Coulter) Nash var. lanatipes Shear]. Tufted perennials, 35-90 cm tall; nodes pubescent to occasionally hairy; lower sheaths densely pilose to woolly, the hairs spreading from the sheath but becoming matted at the tips, becoming pilose to glabrous upwards, the midrib sometimes abruptly narrowed just below the collar; auricles absent; blades 3-7 mm wide, glabrous; panicles 5-15 cm long, the branches erect to ascending; glumes to sparsely pubescent; 3-nerved; lemmas rounded, pubescent or occasionally glabrous, the margins hairy; awns 2-4 mm long; anthers 1.8-4 mm long. ●Semi-desert riparian areas and mountain brush, oak and pinyon-juniper woodlands and plains, most plants growing between 6500 and 7600 ft (but extending beyond). ●The sheath pubescent is distinctive, with the hairs spreading from the sheath and then becoming matted at the tips. §

*Bromus madritensis* Linnaeus [of Madrid] RED BROME [Anisantha rubens (Linnaeus) Nevski, Bromus madritensis Linnaeus subsp. rubens (Linnaeus) Husnot, Bromus rubens Linnaeus]. Tufted annuals, 15-50 cm or more tall; sheaths pilose to glabrous; auricles absent; blades 1-5 mm wide, pubescent to glabrous, flat; panicles 3-12 cm long, dense and compact, reddish, the branches erect and mostly shorter than 2 cm long; spikelets pubescent; awns 12-23 mm long; anthers 0.5-1 mm long. ●Weedy, dry, disturbed ground, roadsides, old fields; native to Europe. ●*Bromus rubens* is sometimes recognized as a separate species, based on the length and visibility of the panicle branches; we find the distinctions unpersuasive. §

*Bromus porteri* (Coulter) Nash [for Thomas Conrad Porter (1822-1901), American poet, clergyman, classicist, and naturalist] NODDING BROME [Bromus kalmii Gray var. porteri Coulter, Bromopsis porteri (Coulter) Holub]. Tufted perennials, 50-100 cm tall; sheaths glabrous; nodes pubescent; sheaths mostly pilose to pubescent, rarely glabrous, the lower and upper mostly 3-nerved; auricles absent; blades 2-5 mm wide, noticeably erect rather than spreading or drooping; panicles 7-20 cm long, the branches spreading, often drooping; pedicels puberulent; glumes usually pubescent, rarely glabrous, the lower and upper mostly 3-nerved; lemmas rounded, the back and margin pubescent; awns 1-3 mm long; anthers mostly 2-3 mm long. ●Ponderosa and spruce/fir forests, aspen groves, often at high elevations. ●The erect blades are quite distinctive in the field. §

*Bromus pumellianus* Scribner [for Raphael Pumpelly (1837-1923), American geologist and explorer] [Bromopsis pumellianus (Scribner) Holub, Bromus inermis Leysser var. pumellianus (Hooker) Wagon]. Rhizomatous perennials (rarely tufted), 50-130 cm tall; nodes glabrous to pubescent; sheaths mosty pilose to villous, sometimes glabrous; auricles sometimes present on lower leaves; blades 3-9 mm wide, mostly hairy; flat; panicles 10-24 cm long, the branches erect to ascending; glumes glabrous to hairy; lemmas rounded on the back, variously hairy; awns 0-7 mm long; anthers 3.5-7 mm long. ●Uncommon in the forests of the northern mountains. ●This is the native counterpart to *Bromus inermis*, and differs mainly in having pubescent nodes, sheaths, blades, and lemmas. *Bromus richardsonii* Link [for John Richardson (1787-1865), Scottish naturalist, naval surgeon] RICHARDSON’S BROME [Bromopsis mucroglumis (Wagon) Holub, Bromus mucroglumis Wagon]. Tufted perennials, 40-110 cm or more tall; upper nodes usually glabrous; sheaths glabrous to pilose, the midrib not abruptly narrowed just below the collar; auricles absent; blades 3-10 mm wide, glabrous adaxially; panicles 10-20 cm long, the branches spreading to somewhat drooping; glumes mostly glabrous, the lower mostly 1-nerved, the upper 3-nerved, 9-11 mm long; lemmas rounded, the backs of the lower lemmas glabrous, those of the upper lemmas appressed-hairy, the margins ciliate; awns 3-5 mm long; anthers 1.6-2.7 mm long. ●Ponderosa, mixed conifer, spruce/fir forests, and mountain meadows. ●This intergrades with *B. anomalus* and *B. ciliatus* especially, and New Mexico specimens cannot always be told apart. It is perhaps more widespread than indicated on the map, but more southern specimens are difficult to tell from *B. ciliatus*; further study is needed of New Mexico populations. The placement of *B. mucroglumis* Wagon is problematic, as the type specimen is incomplete, but it appears to belong either here or with *B. lanatipes*. §

*Bromus squarrosum* Linnaeus [projecting outward and downward] [Bromus arenarius Linnaeus var. japonicus (Houttunyn) Fiori, Bromus commutatus Schrad., Bromus hordeaceus Linnaeus, Bromus hordeaceus Linnaeus var. glabrescens (Cosson & Germain) Shear, Bromus hordeaceus Linnaeus subsp. mollis (Lloyd) Maiz & Weiller, Bromus japonicus Houttunyn, Bromus japonicus Houttunyn var. porrectus Hackel, Bromus mollis Linnaeus, Bromus molliformis Lloyd, Bromus racemosus Linnaeus, Bromus secalinus Linnaeus]. Tufted annuals, 20-100 cm or more tall; nodes glabrous to densely hairy; sheaths glabrous to pilose, sometimes retrorsely so; auricles absent; blades 1-6 mm wide, pilose above, sometimes glabrous, flat; panicles 4-30 cm long, open, the branches ascending, spreading, to drooping, often with a single spikelet; spikelets laterally flattened, but not keeled, the rachilla visible or not; the lower nodes pubescent, sheaths, blades, and lemmas.●Weedy sites, disturbed ground, roadsides; widespread throughout the state; native to Europe. ●Variation in this species is immense and bewildering, and numerous segregate species (including as synonyms herein) have been named, but the segregate taxa are weakly defined by intergrading features, and confident identification of many plants in this group is impossible. Nonetheless, we offer a guide to the following well-known phases:

a. Lemmas smooth, without protruding or raised nerves when dry; panicles usually dense...the hordeaceus phase.

b. Lemmas smooth, without protruding or raised nerves when dry; panicles usually open

c. Lower sheaths glabrous or with sparse stiff hairs less than 0.6 mm long; rachilla mostly visible at maturity...the secalinus phase.

d. Lower sheaths densely pilose with long soft hairs to 1.2 mm long; rachilla mostly remaining obscured at maturity...the racemosus phase.

*Bromus sterilis* Linnaeus [unfruitful, barren] POVERTY BROME [Anisantha sterilis (Linnaeus) Nevski]. Tufted annuals, 30-80 cm or more tall; sheaths densely pilose; auricles absent; blades 1-6 mm wide, pilose on both surfaces; panicles 10-20 cm long, open, the branches mostly drooping and with 1-2(3) spikelets; lemmas 14-20 mm long, rounded on the back; awns 15-30 mm long; anthers 1-1.5 mm long. ●Dry, disturbed ground, a few scattered locales in the state but not common; native to Europe. ●Similar to *Bromus tectorum*, and perhaps more common than thought; distinguished by the features in the key.
*Bromus tectorum* Linnaeus [of rooftops] CHEATGRASS *Anisantha tectorum* (Linnaeus) Nevski. Tufted annuals, 10-90 cm tall, the culm puberulent below the panicle; sheaths densely pilose, the upper sometimes glabrous; auricles absent; blades 1-6 mm wide, pilose on both surfaces; panicles 5-20 cm long, open, the branches drooping and at least some with 4 or more spikelets; lemmas 9-12 mm long, usually pubescent; awns 10-18 mm long; anthers 0.5-1 mm long.

- Dry, disturbed ground, nearly throughout the state, sometimes an indicator of formerly abused rangelands; native to Europe. Plants have a tendency to turn reddish as they mature. This is a noxious plant that is nearly impossible to eradicate once it becomes established. It has recently been found at 9,800 ft in the Sandia Mts (Bernalillo County).

*Buchloe...go to Bouteloua*
Monocotyledous Plants - Poaceae

Bromus ciliatus

July 30
Sandia Mts.

Bromus inermis

May 8
Rockhound S.R.
Spring Canyon
Bromus madritensis

Bromus lamatipes

Sacramento Mts.
July 24

Bromus inermis

panicle erect, narrow
with many short, crowded, ascending branches
spikelet narrow, oval
or roundish in cross sec.
glume 1: 1 vein
glume 2: 3 veins
lemma: 7-9 veins
almost no hairs on awns

sheath hair tips matted

Monterey Mts.
Aug 19

Bromus inermis

perish

weed of early Spring

1st glume

palea
2nd glume

lemma of 1st floret
Calamagrostis [reed grass] REEDGRASS [4].

Plants perennial, tufted to commonly rhizomatous; sheaths open; auricles absent; ligules membranous; blades flat to involute; inflorescence a panicle, the primary branches rebranched; spikelets mostly 1-flowered, small, the rachilla prolonged beyond the palea and mostly hairy; disarticulation above the glumes; glumes mostly surpassing the floret, 1- to 3-nerved; lemma mostly 3-nerved, the apex toothed; awns arising from the back of the lemma, from the base to near the tip, often obscure; paleas well-developed; anthers 3.

These are grasses of cool, mostly mountainous habitats in New Mexico. The species boundaries are sometimes blurry and identification can be difficult; this is attributed to hybridization, polyploidy, and asexual reproduction. Calamagrostis ×acutiflora has become a rather common ornamental in cooler regions of the state. The generic boundaries have been recently redrawn, with the recognition of several segregate genera, none of which occur in New Mexico (Peterson et al. 2019).


1 Plants cultivated ornamentals, not known in the wild................................................................................................. C. ×acutiflora

1 Plants native wild grasses, not known in cultivation

2 Awns exserted well beyond the glumes, easily visible, 4.5-8 mm long; blades usually densely hairy on the upper surface .................. C. purpurascens

2 Awns scarcely if at all exserted beyond the glumes, less than 4.5 mm long; blades glabrous or sparsely hairy
3 Pedicels glabrous or nearly so; panicles contracted, 1-2(3) cm wide..........................C. scopulorum
3 Pedicels evidently scabrous; panicles contracted to open
4 Glumes oblong, the apex abruptly acute and not drawn out to an awn tip; blades 1-4 mm wide, usually rolled and stiffly ascending; lemma hairs ½ to ⅓ as long as the lemma.............................C. stricta
4 Glumes lance-ovate, the apex of especially the first drawn out to an awn tip; blades 3-10 mm wide, mostly flat and lax; lemma hairs ½ to as long as the lemma..............................................C. canadensis

*Calamagrostis ×acutiflora (Schrad.) A.P de Candolle cultivar ‘Karl Foerster’ [with pointed flowers or spikelets] FEATHER REEDGRASS. Densely tufted perennials, with short rhizomes at the base, 1-1.8 m tall or more; panicles 15-30 cm long, 1-2 cm wide, greenish purple in anthesis, becoming straw-colored; spikelets 4-5 mm long; floret much shorter than the glumes; awns about 3.5 mm long, attached near the base of the lemma, exerted and distinguished from the long callus hairs. ●Not known in this, the wind is an attractive ornamental grass that is being planted more and more in the state; native to Europe. The pale panicles show an attractive contrast to the green foliage.

Calamagrostis canadensis (Michaux) Beauvois [of Canada] [Arundo canadensis Michaux, Calamagrostis scribneri Beal]. Loosely tufted perennials with moderate rhizomes, 50-100 cm or more tall; blades 3-10 mm wide, mostly flat and lax, the upper surface scabrous; panicles 8-20 cm long, 2-6 cm wide, open when mature, purplish to greenish; spikelets 2-5 mm long; glumes lance-ovate, the apex especially of the lower glume drawn out to an awn tip; rachilla 0.5-1.5 mm long, with hairs 1.5-3.2 mm long; lemma transcurrent on the upper ⅔, the callus hairs ½ to longer than the lemma; awns 1-3 mm long, attached in the lower ⅓ of the lemma, difficult to observe. ●Wet meadows, seeps, marshy ground and other wet sites in the northern mountains, above 8000 ft. ●In the past, Calamagrostis scribneri has been recognized based on sheath and collar pubescence and length of callus hairs, but the distinctions are untenable and the name is submerged herein.

Calamagrostis purpurascens R. Brown [becoming purplish]. Tufted perennials with short rhizomes, 30-80 cm tall; blades flat to involute, stiff, the upper surface densely hairy; panicles 4-14 cm long, 1-2.5 cm wide, purplish; spikelets 4.5-7 mm long; rachilla 1-2 cm long; awns 2-2.5 mm long, easily seen, attached in the lower ⅓ of the lemma; bent and stouter. ●Open rocky slopes, meadows, and alpine plains at high elevations (above 11,000 ft) in the Sangre de Cristos Mountains; currently known only from Taos County. ●Plants of other species have been called this in New Mexico, but the hairy blades, narrow purplish panicles, and exerted stiff awns serve to identify this species.

Calamagrostis scopulorum Jones [of rocky places, of the Rocky Mountains]. Loosely cespitose perennials with short rhizomes, 40-90 cm tall; blades flat, pale bluish green, the upper surface glabrous or sparsely hairy; panicles 6-16 cm long, 1-3 cm wide, pale to straw-colored when mature; spikelets 4-6 mm long; rachilla 1-2 mm long, with hairs 1.5-2.5 mm long; awns 1-2 mm long, attached in the upper half of the lemma and lying against the lemma, not exerted, straight, easily overlooked. ●Known in the state from a single collection in San Juan County, at about 6000 ft, along a seep in a hanging garden of a pinyon-juniper community; earlier reports from other counties were in error. ●Narrow, straw-colored panicles and obscure delicate awns attached in the upper half of the lemma serve to distinguish this species.

Calamagrostis stricta (Timm) Koeler [narrow]. Tufted perennials with short rhizomes, 30-90 cm or more tall; blades mostly 1-4 mm wide, usually rolled ed and not lax, the upper surface scabrous; panicles 4-20 cm long, 1-3 cm wide, narrow, purplish to pale green; spikelets 2-4.5 mm long; glumes oblong, the apex abruptly acute and not drawn out to an awn tip; rachilla 0.5-1.5 mm long, with hairs 1.5-3.2 mm long; lemma membranous on the upper ⅔, the callus hairs ½ to as long as the lemma; awns 1.5-2.5 mm long, attached in the lower ⅓ of the lemma. ●Stream banks, wet meadows, seeps, and marshy or wet ground in the mountains, above 7500 ft, often in rather open clearings on mesic mountain slopes. ●Our plants belong to subsp. inexpansa (Gray) C.W. Greene [not spreading or expanded] [Calamagrostis inexpansa Gray, Calamagrostis neglecta of numerous authors].

Calamovilfa… go to Sporobolus arenicola and S. rigidus

Catabrosa [devoured] [3].

Tuffed perennials, sometimes stoloniferous, usually decumbent-based and rooting at the nodes; sheaths closed to near the summit; auricles absent; ligules membranous; blades flat; inflorescence an open rebranching panicle; spikelets with 1(2)3 florets; rachilla prolonged; disarticulation above the glumes and beneath the florets; glumes much shorter than the florets, awnless; lemma prominently 3-nerved, the apex erose and truncate, awnless; anthers 3.

Catabrosa aquatica (Linnaeus) Beauvois [found in water] BROOKGRASS [Aira aquatica Linnaeus, Catabrosa aquatica (Linnaeus) Beauvois var. uniflora S.F. Gray]. Tufted to stoloniferous perennials, 10-60 cm tall; sheaths glabrous; ligules 1-8 mm long; panicles 3-28 cm long, 2-10 cm wide; spikelets 1.5-4 mm long; lemma 2-3 mm long. ●Quiet stream banks in the northern mountains, known only from Colfax County; a report from Mora County (Arundo 24078; BRY) was in error. ●The foliage of BROOKGRASS is succulent and very palatable to livestock, perhaps contributing to its rarity in the state. Both one- and two-flowered plants from the western Unites States have been referred to var. uniflora, and the distinction between this and the typical form is tenous at best, and disregarded herein.

Catapodium [underfoot] [1].

Tufted annuals; sheaths open; auricles absent; ligules membranous; inflorescence an open rebranching panicle, sometimes racemose; spikelets several-flowered, awnless; disarticulation above the glumes and between the florets; rachillas not prolonged, puberulent; glumes shorter than the florets; lemma 3-nerved, awnless; paleas subequal to the lemma; anthers 3. ●A small genus of about 4 species of Eurasia and North Africa.


*Catapodium rigidum (Linnaeus) C.E. Hubbard ex Dony [stiff, rigid] RIGID-FESCUE [Desmazeria rigidá (Linnaeus) Tutin, Scleropoa rigidá (Linnaeus) Grisebach, Poa rigidá Linnaeus]. Tufted annuals, the culms up to 60 cm long, but usually much shorter, often procumbent; sheaths glabrous, the margins membranous; ligules 1.5-4 mm long; panicles 2-18 cm long, the branches spreading to divaricate; spikelets 4-10 mm long; glumes glabrous, keeled; lemmas 2-3 mm long, rounded on the back, obtuse to mucronate. ●Weakly adventive from horticultural plantings in the southern region, but likely to appear almost anywhere in the state; native to Europe. Plants have the aspect of six-weeks fescue (Vulpia octoflora), but are more coarse and thickened. We follow Soreng et al. (2015) in maintaining Catapodium as a genus separate from Desmazeria.
Monocotyledonous Plants - Poaceae

Cenchrus [a kind of millet] SANDBUR [3].

Tufted annuals and perennials, the culms often geniculate or decumbent; sheaths open; auricles absent; ligules a ciliate membrane; inflorescence of highly reduced branches clustered into a fascicle or bud, the buds racemose on the main axis; burs of many stiff, spiny, partially fused bristles surrounding and mostly concealing the enclosed spikelets; disarticulation at the base of the bur; spikelets awnless, with 2 florets, the lower usually sterile, the upper fertile; lower glume short, 1-nerved; upper glume and lower lemma subequal, 3- to 9-nerved; upper floret becoming indurate, flattened on one side, enclosing the grain. ♦ The sandburrs can be pernicious pests because of the spiny burs, and can inflict painful wounds. Chemisquy et al. (2010) argue with some justification for the merger of Cenchrus and Pennisetum (within Cenchrus) in order to uphold monophyly, but we allow a paraphyletic Pennisetum, and maintain the obvious and practical morphological distinctions among Setaria, Pennisetum, and Cenchrus as follows: a) bristles subpending the spikelets but not fused and remaining on the plant at disarticulation = Setaria; b) bristles fused at least basally to form a disarticulating bur but not spine = Pennisetum; c) bristles fused to form a disarticulating bur and some or all of the bristles spine = Cenchr us.


1 Burs with more than one whorl of flattened spines subtended by 1–several whorls of bristles .............................................. ................................. C. echinatus

1 Lemma of the lower floret with a single awn or awnless

| 3 Upper floret inflated-spheroidal, bowl-shaped, about 1 mm wide ............................................................... ............... C. cucullata |
| 3 Upper floret not inflated, less than 0.5 mm wide |
| 4 Florets with a short awn 0.5-2 mm long.............................................................. “C. subdolichochostachya” |

4 Florets awnless or with a short mucro to 0.5 mm ............................................................... ................................. C. submutica

5 Panicle branches typically in several whorls along an axis 2 cm or more long ................................................................. C. verticillata

6 Tip of lower lemma with a tuft of spreading hairs to 2 mm long; plants annual ......................................................... “C. virgata”

7 Tip of lower lemma with short, appressed hairs; plants perennial ................................................................. “C. subdolichochostachya”
**Chloris cucullata** Bischoff  [hooded]. Tufted perennials, 15-60 cm tall; blades glabrous; panicle branches 10-20 in mostly 1-3 whorls, 2-5 cm long; disarticulation below the glumes and the spikelets falling entire, or above the glumes and the florets falling together; spikelets with 1 fertile and 1 sterile floret; glumes 1-nerved, hyaline; sterile (upper) floret inflated, spherical, about as wide as long, with and awn 0-1.5 mm long. •Plains and grasslands, roadsides, disturbed ground of the eastern plains, with a disjunct collection from the BUFFALOGRASS plains of Hidalgo County. •Plants are known to hybridize with *Chloris verticillata* (Anderson 1974), and one may expect to find plants with intermediate or confusing features.

“**Chloris subdolichostachya**” C. Mueller  [with longish spikes]  [*Chloris alba* Presl var. *aristulata* Torrey, *Chloris brevispica* Nash]. Plants referred to this name are hybrid derivatives involving *Chloris andropogonoides* Fournier (not in New Mexico), *C. cucullata*, and *C. verticillata*, not accurately assignable to a biologic species, and will have features of all three parents: perennial, panicle branches digitate or in very close whorls, and slightly inflated florets with short awns.

**Chloris submutica** Kunth  [nearly awnless]. Plants perennial, mostly cespitose but occasionally with short stolons, 30-75 cm tall; blades sometime s with long basal hairs; panicle branches 5-17 in 1-3 closely spaced whorls, to 7 cm long, ascending to reflexed when mature; spikelets with 1 fertile and 1 sterile floret; disarticulation above the glumes; florets awnless or with a short macro. •Infrequent adventive from Mexico, occasionally found in disturbed ground, lawns, and fields in the southern region. •Though native to Mexico and southward, this is considered exotic in New Mexico; known sporadically from Doña Ana and Otero counties.

**Chloris verticillata** Nuttall  [whorled]. Tufted perennials, 15-40 cm tall; blades with basal hairs, otherwise glabrous; panicle branches 10-16 in mostly 2-5 whorls, 5-15 cm long; disarticulation at the base of the panicle and concomitantly above the glumes, releasing the florets and the panicle rolls and bounces across terrain; spikelets with 1 fertile and 1 sterile floret; florets with awns 3-9 mm long. •Plains and grasslands, roadsides, widespread throughout much of the state, and expected in the other counties. •Plants are known to hybridize with *Chloris cucullata* (Anderson 1974), and one may expect to find plants with intermediate or confusing features. §

**Chloris virgata** Swartz  [twiggy, with straight stems or branches]  [*Chloris elegans* Kunth]. Tufted annuals, sometimes with stolons, 10-80 cm or more tall; blades with long hairs near the base; panicle branches 4-20 in a single terminal whorl, 5-10 cm long; spikelets with 1 fertile and 1-2 sterile florets; disarticulation above the glumes, the florets falling together; lower (fertile) floret with a conspicuous tuft of long hairs at the apex; first and second florets with awns 3-15 mm long; third floret when present greatly reduced, awnless. •Disturbed fields, roadsides, and waste areas throughout the state. •Sometimes considered exotic in some situations, as plants easily spread from native habitats and ranges. §

**Cinna**  [an ancient Greek name used by Theophrastus]  WOODREED [1].

Tufted, sometimes rhizomatous, perennials; sheaths open; auricles absent; ligules thin-membranous; blades flat; inflorescence a panicle, the branches ascending to spreading; disarticulation below the glumes; spikelets with 1(2) florets; rachillas usually prolonged as a bristle or stub; glumes subequal to the floret, awn-tipped; lemmas 3-5-nerved, short-awned; anthers 1-2. •Only 4 species, widespread in the Americas and northern Eurasia.
Monocotyledons - Poaceae

Monocotyledonous Plants - Poaceae have become weedy and invasive in California. Sometimes confused with 184 species, Asia and Australia.

Shoots of Bermudagrass grow in a pattern of 2-3 short internodes alternating with a long internode, giving the appearance of several leaves clustered together on the culm. There are numerous tufted perennials, sometimes with short rhizomes, the internodes hollow, the nodes glabrous; sterile spikelets, with 1-5 florets, the rachilla extending beyond the terminal floret, the lemmas 5-nerved and awned to awnless; anthers 3. About 10 species native to the warm temperate and tropical regions of the Old World, but spreading worldwide.

Cynodon [dog tooth]. Tufted, rhizomatous, or stoloniferous perennials; leaves glabrous; auricles absent; ligules a ring of hairs or membranous; inflorescence a panicle of spike-like, digitate branches; spikelets with 1(3) florets, only the lowermost fertile; rachilla usually prolonged, sometimes with a vestigial floret; disarticulation above the glumes; lengths shorter than the floret; lemmas 3-nerved, keeled, awnless to mucronate; paleas subequal to the lemmas; anthers 3. About 10 species native to the warm temperate and tropical regions of the Old World, but spreading worldwide.

Cynosurus [doughtail]. DOG’S-TAIL GRASS. Tufted annuals or perennials; leaves glabrous; auricles absent; ligules a ring of hairs or membranous; inflorescence a dense spike-like or head-like panicle; spikelets dimorphic and paired, the sterile lower one obscuring the fertile upper one; disarticulation above the glumes, the florets falling together; florets several, reduced to linear lemmas, awnless or awned; fertile spikelets with 1-5 florets, the rachilla extending beyond the terminal floret, the lemmas 5-nerved and awned to awnless; anthers 3. About 8-9 species of Eurasia and North Africa, adventive in many other parts of the world.

Mostly tufted perennials, sometimes with short rhizomes, the internodes hollow, the nodes glabrous; sheaths closed, the margins fused together at least ½ their length, mostly longer than the internodes; auricles absent; ligules membranous; inflorescence a panicle, the spreading branches with dense one-sided clusters of spikelets distally; spikelets several-flowered, ciliate on the keels;
**Dactylolimonium**  [a comb-like finger] [1].

Tufted, stoloniferous, to rhizomatous annuals and perennials; sheaths open; auricles absent; ligules membranous to ciliate; inflorescence a panicle of few to several digitate spicate primary branches, the branch axis extending beyond the spikelets to a point, the spikelets 2-rowed on the abaxial sides of the branches; spikelets with several florets, reduced distally; disarticulation above the glumes, the florets falling together; glumes 1-nerved, shorter than the adjacent lemmas, the upper glumes with a curved awn; lemmas 3-nerved, keeled; anthers 3. Yellow.

**Dactylolimonium** *aggregatum* (Linnaeus) Willdenow  [from Egypt] CROWFOOTGRASS  [Cynodon aggregatus Linnaeus].

Tufted annual, 10-40 cm tall, the culms geniculate-based; sheaths with bulbous-based hairs distally; ligules to 1.5 mm long, ciliolate; blades 2-10 mm wide, with bulbous-based hairs, especially proximally; panicle branches mostly 2-6 in number, 2-6 cm long; spikelets 3-5 mm long; glumes with curved awns 1.5-2.5 mm long; lemmas ovate, with curved awns 0.5-1 mm long, the paleas about as long. An infrequent weed of cultivated fields, moist waste places, and lawns in the southern region; native to Africa. The straight hairs on the margins of the blades and collars and the flattened short-awned spikelets are distinctive.

**Danthonia**  [for Etienne Danthoine (1739-1794), French botanist-pharmacist] DANTHONIA, OATGRASS [3].

Tufted perennials; sheaths open; auricles absent; ligules of hairs; inflorescence a weakly developed panicle, raceme, or a single spikelet; spikelets several-flowered; disarticulation above the glumes and between the florets; glumes subequal, usually exceeding the florets or nearly so, 1- to 7-nerved; lemmas 7- to 11-nerved, the apex with 2 aristate lobes, paleas slightly shorter than the lemmas. About 12 species native to Africa and Australia.

**Dactylolimonium** *glomerata* Linnaeus  [clustered into heads] ORCHARDGRASS. Tufted perennial with abundant foliage, 75-150 cm or more tall; ligules conspicuous, 3-11 mm long; blades 4-10 mm wide; inflorescence a somewhat pyramidal panicle, 4-20 cm long, the distal branches ascending to appressed; spikelets 5-8 mm long, subsessile; lemmas 4-8 mm long; paleas slightly shorter than the lemma. Widely introduced for meadow and pasture improvement and found throughout the state; native to Europe. The species includes diploid and tetraploid populations, from which numerous infraspecific, but tenuous, entities have been named. §

1 Pedicels and branches puberulent................................................................. D. parryi

1 Pedicels glabrous

2 Panicle branches widely spreading (chasmogamous form, at anthesis)................................................................. D. spicata

2 Panicle branches erect-appressed

3 Older blades green to pale green but not prominently straw-colored, ± straight or only arcuate, not markedly curly or coiling; lemmas 2.5-5 mm long; callus of middle florets about as long as wide................................................................................................. D. spicata

3 Older blades prominently straw-colored and markedly curly or coiling; lemmas 6-8 mm long; callus of middle florets longer than wide................................................................................................. D. intermedia

**Danthonia intermedia** Vasey  [intermediate (resembling Danthonia sericea)]. Shoots 20-70 cm tall, the culms not breaking at the nodes; sheaths usually glabrous; uppermost blades erect or only slightly diverging from the culm at maturity; panicles with several spikelets, the branches/pedicels erect and appressed; spikelets 11-18 mm long, usually greenish to purplish tinged; lemma teeth 1.5-2.5 mm long; awns 6-8 mm long; cleistogamous spikelets rarely produced. Forest meadows and clearings at high elevations in the northern mountains. Greenish plants with ± erect or only curving old blades help to distinguish this species.

**Danthonia parryi** Scribner  [for Charles Christopher Parry (1823-1890), notable collector of western plants]. Shoots in well-developed tussocks, 30-100 cm tall, the culms not breaking at the nodes; sheaths glabrous or sparsely pubescent; lower blades breaking at the collar, leaving clumps of basal sheaths; uppermost blades erect or only slightly diverging from the culm at maturity; panicles with few to many spikelets, sometimes racemose, the branches/pedicels ascending to spreading and puberulent; spikelets 16-24 mm long, commonly straw-colored when mature; lemma teeth 2.5-8 mm long; awns 12-15 mm long; cleistogamous spikelets perhaps produced in the lower sheaths. Coniferous forests, mountain meadows and grasslands, mostly in the northern mountains. This species is distinguished by its tussocky growth, bleached basal sheaths without blades, and large spikelets on often spreading pubescent pedicels. Florists are mostly sterile, and we assume reproduction is by cleistogamous spikelets in the lower sheaths. §

**Danthonia spicata** (Linnaeus) Beauv. ex Roemer & J.A. Schultz  [spike-like] [Avena spicata Linnaeus]. Shoots 10-65 cm tall, breaking at the nodes when mature; sheaths pilose to glabrous; blades usually straw-colored and curled or coiled when mature (sometimes nearly straight in shade plants); panicles with few to numerous spikelets, the branches/pedicels appressed to ascending, or spreading in anthesis of the chasmogamous form; spikelets 7-15 mm long, greenish to straw-colored; lemma teeth 0.5-2 mm long; awns 5-8 mm long. Dry sandy mineral soil in ponderosa pine forests of the northern and western mountains. Pale plants with prominently curly or coiling old blades help to distinguish this species. Narrow panicles with erect branches/pedicels tend to be cleistogamous, self-pollinating in the sheath before elongation, while open panicles with spreading branches/pedicels tend to be chasmogamous, cross-pollinating after elongation from the sheath.

Plants annual to perennial; leaves tending to be basal; sheaths open; auricles absent; ligules membranous; inflorescence a panicle; spikelets mostly 2-flowered; disarticulation above the glumes, the florets falling together; glumes exceeding the lower floret; lemma 5- to 7-nerved, the apex toothed, awned from the lower back; rachilla prolonged beyond the palea; anthers 3.


1 Plants perennial; blades 1-5 mm wide; panicle loose and open at maturity, the branches spreading ........................................ D. cespitosa

1 Plants annual; blades 0.5-1.5 mm wide; panicle narrow at maturity, the branches mostly erect................................. D. danthonioides

Deschampsia cespitosa (Linnaeus) Beauvois [tufted] [Aira cespitosa Linnaeus, Deschampsia alpica (Rydberg)]. Perennial, 35-100 cm or more tall; panicles 10-30 cm long, 5-25 cm wide, the branches flexuous; spikelets 3-7 mm long, sometimes with 1 or 3 florets; lemmas purplish proximally, pale distally; awns 1-8 mm long, straight to bent, often exceeding the glumes slightly; anthers 1-3 mm long. Widespread in moist mountain meadows, bogs, grasslands, and forest openings at medium to high elevations. Our material belongs to variety (or subspecies) cespitosa. Linnaeus used the spelling “cespitosa” in his original description. Bicolored lemmas give the panicles a “salt-and-pepper” appearance. §

Deschampsia danthonioides (Trinius) Munro in Bentham [resembling Danthonia] [Aira danthonioides (Trinius)]. Annual, 10-50 cm tall; panicles 5-20 cm long, 2-8 cm wide, the branches rather straight; spikelets 4-9 mm long; lemmas pale green to purplish but not bicolored; awns 4-9 mm long, strongly geniculate; anthers 0.3-0.5 mm long. An infrequent weed of moist waste places; known from Grant and Torrance counties; native to the western United States and Mexico.
Dichanthelium [two plumes, an allusion to the two flowering periods] ROSETTEGRASS [4].

Tufted (ours) perennials, producing a winter rosette of broad basal leaves often sharply different than the narrow cauline leaves; sheaths open; auricles absent; ligules mostly a ciliate membrane or ring of hairs, often with a second ring of hairs (pseudoligule) adjacent on the blade that is nearly indistinguishable; inflorescence a terminal (spring) or axillary (summer-fall) panicle; spikelets dorsally compressed, with 2 florets, the lower staminate or sterile, the upper fertile and indurate; disarticulation below the glume; lower glume shorter than the spikelet; upper glume as long as the spikelet, 5- to 11-nerved; lower lemma similar to the upper glume; upper floret forming a hard seed case, the lemma rounded, shiny, and clasping the flat palea; anthers 3. ♦ Members of Dichanthelium were all formerly included in a large and unwieldy Panicum, but their segregation into Dichanthelium is supported by a suite of morphological, anatomical, physiological, and molecular features. They are conspicuous by producing simple flowering shoots with terminal panicles in the spring or early summer, and highly branched flowering shoots with numerous axillary panicles in the summer and fall. Many species are highly variable.

1 Basal leaf blades usually well-differentiated from those of the lower cauline leaves, spreading, forming a rosette; culms usually helleri glume absent to no more than ¼ the length of the spikelet; upper glume short to subequal to the spikelet; lower lemma pubescent; membranous, sometimes with a ciliate fringe; inflorescence a panicle, not detaching at maturity, the terminal panicles in the spring or early summer, and highly branched flowering shoots with numerous axillary panicles in the summer and fall. Many species are highly variable.

1 Basal leaf blades similar in shape to those of the lower cauline leaves, usually erect to ascending; culms branching from near the base in the fall, with 2-4 leaves, only the upper 2-4 internodes elongated; spikelets 2.4-3.4 mm long

2 Panicles 1-2 cm wide, narrow with pressed spikelets; upper cauline leaves 10-20 cm long, distinctly longer than those below

3 Spikelets 1.4-2 mm long; upper glume lacking an orange or purplish spot at the base

3 Spikelets 2.7-3.5 mm long; upper glume with an orange or purplish spot at the base

Dichanthelium acuminatum (Swartz) Gould & Clark [having a tapering point] [Dichanthelium lindheimeri (Nash) Gould, Panicum acuminatum Swartz, Panicum fasciculatum (Torrey) F.T.Hubbard, Panicum texanum Ashe, Panicum lanuginosum Elliott, Panicum lanuginosum Elliot var. lindheimeri (Nash) Fernald, Panicum lindheimeri Nash, Panicum tennessseense Ashe]. Plants 20-75 cm or more tall; basal rosettes differentiated; sheaths shorter than the internodes, glabrous to densely pubescent; blades usually densely pubescent; spikelets 1.4-2.1 mm long, pubescent; lower glume obtuse to acute; lower floret sterile; upper glume lacking an orange or purplish spot at the base. ♦ Moist woodlands, stream banks, and shaded canyons in a few scattered locales; reports from San Juan County are undocumented. ♦ Basal rosettes, pubescent foliage, and small pubescent spikelets allow recognition of the complex. The complex is highly variable and numerous species, varieties, or subspecies have been named. Thomas (2015) argues for the recognition of several of these segregates at the species level:

1. Adaxial row of ligule hairs less than 1.5 mm long.
   - D. oligosanthes
   - D. perlongum

2. Adaxial row of ligule hairs 1.7 mm or more long.
   - D. acuminatum

3. Sheaths of upper spring culms glabrous or glabrate (ignore marginal hairs).
   - D. lindheimeri

4. Sheaths of upper spring culms pubescent.
   - D. acuminatum

5. Marginal cilia on spring blades less than 20 in number, extending from base of blade to halfway up the blade.
   - D. acuminatum

6. Marginal cilia on spring blades 20 in number or present only at the base of the blade.
   - D. lanuginosum

Dichanthelium oligosanthes (Schultes) Gould [with few or small flowers]. Plants 20-75 cm tall; basal rosettes differentiated; sheaths shorter than the internodes, glabrous to pubescent; blades glabrate to pubescent, 6-15 mm wide; spikelets 2.7-3.5 mm long, usually glabrous; lower glume acute; upper glume with a prominent orange or purplish spot at the base. ♦ Moist shaded woodlands and canyon bottoms, from a few scattered locales. ♦ Our plants belong to var. scribnerianum (Nash) Gould [for Frank Lamson Scribner (1851-1938), renowned American agrostologist] [Panicum helleri Nash, Panicum oligosanthes Schultes, Panicum oligosanthes Schultes var. scribnerianum (Nash) Fernald, Panicum scribnerianum Nash]; var. oligosanthes, from the eastern half of the United States, has larger pubescent spikelets (3.4-4.2 mm) and narrower blades (4-9 mm).

Dichanthelium perlongum (Nash) Freckmann [very long, referring to the peduncle] [Dichanthelium linearifolium of NM authors, Panicum perlongum Nash]. Plants 10-50 cm tall; basal rosettes weakly developed; sheaths longer than the internodes, pilose; blades pubescent; spikelets 2.6-3.4 mm long, finely pubescent; lower glume broadly ovate. ♦ Moist shaded woodlands and canyon bottoms, from a few scattered locales. ♦ Some consider Dichanthelium perlongum to be conspecific with D. linearifolium, with which it occasionally hybridizes; if the taxa are merged, the latter name has priority.

Dichanthelium wilcoxianum (Vasey) Freckmann [for Timothy Erastus Wilcox (1840-1932), U.S. Army surgeon] [Dichanthelium oligosanthes (Schultes) Gould var. wilcoxianum (Vasey) Gould & Clark, Panicum wilcoxianum Vasey]. Plants 15-35 cm tall; basal rosettes poorly developed; sheaths mostly longer than the internodes, hirsute; blades stiffly erect, sparingly pilose; spikelets 2.4-3.2 mm long, finely pubescent; lower glume triangular. ♦ Moist open grassland clearings in the western mountains; known only from Catron County.

Digitaria [fingers] CRAIRGRASS [3].

Tufted or stoloniferous annuals to perennials, the culms often rooting at the lower nodes; sheaths open; auricles absent; ligules membranous, sometimes with a ciliate fringe; inflorescence a panicle of spicate, digitate branches, not detaching at maturity, the spikelets appressed in 2 rows along one side of the branches; spikelets, awnless, glabrous to pubescent, 2-flowered, the lower floret staminate to sterile, the upper floret fertile, the rachilla not elongated between the two glumes; disarticulation below the glumes; lower glume absent to no more than ¼ the length of the spikelet; upper glume short to subequal to the spikelet; lower lemma pubescent; upper lemma clasping the palea and forming a seed case, this membranous to somewhat cartilaginous but not indurate, pale- to dark-colored; anthers 3. ♦ We treat Digitaria in a more narrow sense than previous, with the segregation of Leptoloma and Trichachne, until further resolution of the classification. The panicles of the annual species resemble those of Bermuda grass. The name 'crabgrass' derives not from any resemblance to the crustacean, but its allusion to foul or sour (as in crab apple or a crabby person), that is, an undesirable grass in the lawn. "Texas crabgrass" is not a grass at all, but a party dip made from spinach, butter, onion, crabmeat, and parmesan cheese.
Monocotyledonous Plants - Poaceae

Dinebra

moist, disturbed ground, and generally does not invade dense turf as easily as gardens, scattered locales, but expected elsewhere; native to Eurasia.

- 1 Spikelets on long pedicels; inflorescence an open, rebranching panicle
- 2 Spikelets sessile or short pedicelled; inflorescence a panicle of unbranched spicate or racemose branches
- 3 Panicles with 3 or more nodes, the branches not subdigitate
- 4 Blades with prominent, stiff, bulbous-based hairs on both surfaces; lower lemma scabrous on the lateral nerves (use 10x or higher magnification)
- 5 Spikelets 2.8-4.1 mm long, born in 2s at the middle portion of the branch; lower glume 0.2-0.8 mm long

*Digitaria ischaemum* (Schreber) Schreber ex Muhlenberg [resembling Ischaemum] SMOOTH CRABGRASS [Panicum ischaemum Schreber]. Tufted annual, the culms 20-60 cm long, decumbent and rooting at the nodes; sheaths glabrous or sparsely pubescent; blades mostly glabrous except toward the base; panicle branches 2-10 in number, digitate or in 1-2 whorls below the apex, 2-20 cm long; spikelets 2.8-4.1 mm long; lower glume vestigial, at most 0.3 mm long; upper glume ½ to nearly as long as the spikelet, short-hairy; upper floret 2.5-4 mm long, glabrous. Weed of moist waste places in the southern region; native to Asia.

*Digitaria eriantha* Steudel [having wooly flowers] PANGOLA GRASS. Tufted, rhizomatous, or stoloniferous perennial, 35-100 cm tall or more; basal sheaths glabrous to densely pubescent, the hairs 4-6 mm long; blades 3-6 mm wide; panicle branches 3-15 in number, subdigitate; spikelets 4.5-8 mm long; upper glume and lower lemma wooly-hairy.

- Introduced for experimental planting in Quay County at the Tucumcari Research Station, New Mexico State University, but not known to escape; native Africa.

This species is widely used as a forage or pasture grass in warm regions of the world; it is native to Africa.

*Digitaria sanguinalis* (Linnaeus) Scopoli [pertaining to blood] Hairy Crabgrass [Panicum sanguinale Linnaeus, Syntheris sanguinale (Linnaeus) Dulac]. Tufted annual, the culms 20-60 cm long, decumbent and rooting at the nodes; sheaths glabrous or sparsely pubescent; blades mostly glabrous except toward the base; panicle branches 2-7 in number, subdigitate, 6-17 cm long; axillary panicles present in lower sheaths; spikelets 1.7-2.3 mm long; lower glume vestigial, at most a nerveless membranous rim; upper glume ½ to as long as the spikelet; upper floret 2.3-2.4 mm long. Weed of lawns and gardens, scattered locales, but expected elsewhere; native to Eurasia. This species seems to invade the dense turf of lawns more easily than *Digitaria sanguinalis*, the more common crabgrass in the state.

- 1 Spikelets 1.7-2.3 mm long, borne in 3s at the middle portion of the branch; lower glume absent or a nerveless membranous rim less than 0.3 mm long.
- 2 Spikelets glabrous or with short, stiff hairs; plants annual
- 3 Panicles with only 1-2 nodes, the branches subdigitate
- 4 Blades usually with prominent, stiff, bulbous-based hairs on both surfaces; lower lemma scabrous on the lateral nerves (use 10x or higher magnification)
- 5 Spikelets 1.7-2.3 mm long, borne in 3s at the middle portion of the branch; lower glume absent or a nerveless membranous rim less than 0.3 mm long...

*Digitaria ciliaris* (Retzius) Koeler [fringed hair]. SOUTHERN CRABGRASS [Panicum ciliaris Retzian]. Tufted annual, sometimes longer lived, 10-60 cm or more long; sheaths with bulbous-based hairs; blades mostly glabrous except toward the base; panicle branches 2-10 in number, digitate or in 1-2 whorls below the apex, 2-20 cm long; spikelets 2.8-4.1 mm long; lower glume vestigial, at most 0.3 mm long; upper glume ½ to nearly as long as the spikelet, short-hairy; upper floret 2.5-4 mm long, glabrous. Weed of moist waste places in the southern region; native to Asia.

*Digitaria brachiata* (Linnaeus) W. Steudel [having wooly flowers] PANGOLA GRASS. Tufted, rhizomatous, or stoloniferous perennial, 35-100 cm tall or more; basal sheaths glabrous to densely pubescent, the hairs 4-6 mm long; blades 3-6 mm wide; panicle branches 3-15 in number, subdigitate; spikelets 4.5-8 mm long; upper glume and lower lemma wooly-hairy.

- Introduced for experimental planting in Quay County at the Tucumcari Research Station, New Mexico State University, but not known to escape; native Africa. This species is widely used as a forage or pasture grass in warm regions of the world; it is native to Africa.

*Digitaria brachiata* (Linnaeus) W. Steudel [having wooly flowers] PANGOLA GRASS. Tufted, rhizomatous, or stoloniferous perennial, 35-100 cm tall or more; basal sheaths glabrous to densely pubescent, the hairs 4-6 mm long; blades 3-6 mm wide; panicle branches 3-15 in number, subdigitate; spikelets 4.5-8 mm long; upper glume and lower lemma wooly-hairy.

- Introduced for experimental planting in Quay County at the Tucumcari Research Station, New Mexico State University, but not known to escape; native Africa. This species is widely used as a forage or pasture grass in warm regions of the world; it is native to Africa.

*Digitaria brachiata* (Linnaeus) W. Steudel [having wooly flowers] PANGOLA GRASS. Tufted, rhizomatous, or stoloniferous perennial, 35-100 cm tall or more; basal sheaths glabrous to densely pubescent, the hairs 4-6 mm long; blades 3-6 mm wide; panicle branches 3-15 in number, subdigitate; spikelets 4.5-8 mm long; upper glume and lower lemma wooly-hairy.

- Introduced for experimental planting in Quay County at the Tucumcari Research Station, New Mexico State University, but not known to escape; native Africa. This species is widely used as a forage or pasture grass in warm regions of the world; it is native to Africa.

*Digitaria brachiata* (Linnaeus) W. Steudel [having wooly flowers] PANGOLA GRASS. Tufted, rhizomatous, or stoloniferous perennial, 35-100 cm tall or more; basal sheaths glabrous to densely pubescent, the hairs 4-6 mm long; blades 3-6 mm wide; panicle branches 3-15 in number, subdigitate; spikelets 4.5-8 mm long; upper glume and lower lemma wooly-hairy.

- Introduced for experimental planting in Quay County at the Tucumcari Research Station, New Mexico State University, but not known to escape; native Africa. This species is widely used as a forage or pasture grass in warm regions of the world; it is native to Africa.

*Digitaria brachiata* (Linnaeus) W. Steudel [having wooly flowers] PANGOLA GRASS. Tufted, rhizomatous, or stoloniferous perennial, 35-100 cm tall or more; basal sheaths glabrous to densely pubescent, the hairs 4-6 mm long; blades 3-6 mm wide; panicle branches 3-15 in number, subdigitate; spikelets 4.5-8 mm long; upper glume and lower lemma wooly-hairy.

- Introduced for experimental planting in Quay County at the Tucumcari Research Station, New Mexico State University, but not known to escape; native Africa. This species is widely used as a forage or pasture grass in warm regions of the world; it is native to Africa.

*Digitaria brachiata* (Linnaeus) W. Steudel [having wooly flowers] PANGOLA GRASS. Tufted, rhizomatous, or stoloniferous perennial, 35-100 cm tall or more; basal sheaths glabrous to densely pubescent, the hairs 4-6 mm long; blades 3-6 mm wide; panicle branches 3-15 in number, subdigitate; spikelets 4.5-8 mm long; upper glume and lower lemma wooly-hairy.

- Introduced for experimental planting in Quay County at the Tucumcari Research Station, New Mexico State University, but not known to escape; native Africa. This species is widely used as a forage or pasture grass in warm regions of the world; it is native to Africa.
**Distichlis** (Poaceae: Chloridoideae: Cynodonteae). Taxon 64:445-467. doi: 10.3897/taxon.64.445

**Diplochne fuscua** (Linnaeus) Beauv. ex Roemer & J.A. Schultes [dark]. Tufted annuals, sometimes longer lived, 10-100 cm tall or more; sheaths open, glabrous; auricles absent; ligules an attenuate membrane, lacerate at maturity; blades glabrous, 2-7 mm wide; inflorescence a panicle of spicate branches, 10-80 cm or more long; branches numerous, arranged along the main axis, ascending to spreading to 22 cm wide; spikelets several-flowered, to 12 mm long, awned to awnless; disarticulation above the glumes and between the florets; glumes 1-nerved; lemmas 3-nerved, hairy on the nerves, awned or awnless; anthers 3. \*With 4 species, Africa, Asia, and the Americas. This is a segregate genus from the traditional *Leptochloa*, which has been dismembered into the additional genera *Dinebra*, *Diplochne*, and *Disakisperma.*

**Disakisperma** [seeds with 2 teeth] SPRANGLETOP [1].

Tufted perennials, rarely stoloniferous, 30-200 cm tall, typically erect, the nodes glabrous; sheaths open; auricles absent; ligules membranous, ciliate apically; leaf blades lax; inflorescence a panicle of several unilateral spicate branches; cleistogamous spikelets commonly produced in the basal sheaths; spikelets several-flowered, awnless; disarticulation above the glumes and between the florets; glumes 1-nerved; lemmas 3-nerved; anthers 3. \*With 4 species, Africa, Asia, and the Americas. This is a segregate genus from the traditional *Leptochloa*, which has been dismembered into the additional genera *Dinebra*, *Diplochne*, and *Disakisperma.*

**Disakisperma duhium** (Kunth) Peterson & Snow [uncertain] GREEN SPRANGLETOP [Chloris dubia Kunth, Disakisperma mexicana Steudel, Leptochloa dubia (Kunth) Nees]. Perennials, 50-110 cm tall; sheaths sparsely pilose; ligules typically 1-1.5 mm long, truncate; blades to 35 cm long, 2-8 mm wide, flat (drying involute), the midrib prominent; panicle branches 5-15 cm long, alternate along the main axis (infrequently subdigitate); glumes 2-6 mm long; lemmas 3-5 mm long, the green lateral nerves usually prominent against the pale body, pubescent, the apices blunt, notched; paleas subequal to the lemmas; anthers 1-1.6 mm long; caryopses 1.5-2.3 mm long, to 1 mm wide. \*Widespread throughout the state on plains, slopes, bajadas, ravines, roadsides, often shady sites. \*Leaves are often dusted with salt crystals, which are exuded in solution through salt glands.

**Disakisperma dubium** (Kunth) Peterson & Snow [seeds with 2 teeth] SPRANGLETOP [1].

Tufted perennials, rarely stoloniferous, 30-200 cm tall, typically erect, the nodes glabrous; sheaths open; auricles absent; ligules membranous, ciliate apically; leaf blades lax; inflorescence a panicle of several unilateral spicate branches; cleistogamous spikelets commonly produced in the basal sheaths; spikelets several-flowered, awnless; disarticulation above the glumes and between the florets; glumes 1-nerved; lemmas 3-nerved, hairy on the nerves, awned or awnless; anthers 3. \*With 4 species, Africa, Asia, and the Americas. This is a segregate genus from the traditional *Leptochloa*, which has been dismembered into the additional genera *Dinebra*, *Diplochne*, and *Disakisperma.*

**Diplochne fuscua** (Linnaeus) Beauv. ex Roemer & J.A. Schultes [dark]. Tufted annuals, sometimes longer lived, 10-100 cm tall or more; sheaths open, glabrous; auricles absent; ligules an attenuate membrane, lacerate at maturity; blades glabrous, 2-7 mm wide; inflorescence a panicle of spicate branches, 10-80 cm or more long; branches numerous, arranged along the main axis, ascending to spreading to 22 cm wide; spikelets several-flowered, to 12 mm long, awned to awnless; disarticulation above the glumes and between the florets; glumes 1-nerved; lemmas 3-nerved, hairy on the nerves, awned or awnless; anthers 3. \*With 4 species, Africa, Asia, and the Americas. This is a segregate genus from the traditional *Leptochloa*, which has been dismembered into the additional genera *Dinebra*, *Diplochne*, and *Disakisperma.*

**Distichlis** [two-ranked] SALTGRASS [1].

Rhizomatous or stoloniferous, usually unisexual, perennials; leaves strongly distichous, glabrous; sheaths open; auricles absent; ligules a short membrane; blades stiff; inflorescence a weakly developed panicle, sometimes racemose; spikelets several-flowered, awnless; disarticulation of pistillate spikelets above the glumes and between the florets, the staminate spikelets usually not disarticulating; glumes 3- to 7-nerved; lemmas thick, 9- to 11-nerved; anthers 3. \*About 10 species of the Americas and Australia.
Echinochloa [spiny grass] BARNYARDGRASS [4].

Tufted annuals (ours); sheaths open; auricles absent; ligules absent (ours) or of hairs; blades flat; inflorescence a panicle of spicate branches; disarticulation below the glumes, the spikelets falling entire; spikelets plano-convex, with 2 florets, the lower staminate or sterile, the upper fertile; lower glume much shorter than the spikelet; upper glume similar in size and texture to the lower lemma; upper floret indurate, the lemma clasping the palea; anthers 3. ♦About 35 or so species of warm temperate to tropical regions. Some of the species are grown as cereal grains, and known as millet (see comment under Panicum miliaceum).


1 Palea of lower floret absent or vestigial, much less than half as long as the lemma ................................................. E. cruspavonis

1 Palea of lower floret well-developed, nearly as long as the lemma

2 Hairs of the panicule branches and spikelets not bulbous-based; panicule branches simple, usually 2(3) cm or less long; spikelets awnless, 2-3 mm long, arranged in four rows on the branch ................................................................. E. colona

2 Hairs of the panicule branches and/or spikelets bulbous-based; panicule branches usually rebranched, the lower branches usually more than 2 cm long; spikelets awnless or awned, 2.8-4 mm long (excluding the awns), mostly arranged in two rows on the panicule branch

3 Shiny apical portion of the fertile lemma obtuse or broadly acute, with a line of minute hairs, the tip sharply differentiated and withering; hairs of the panicule branches, at least some, longer than 3 mm...................................................... E. crusgalli

3 Shiny apical portion of the fertile lemma narrowly acute to acuminate, without a line of minute hairs, with a gradual transition to a membranous, stiff tip; hairs of the panicule branches absent to rarely longer than 3 mm.......................................................... E. muricata

*Echinochloa colona* (Linnaeus) Link [cultivated] JUNGLE-RICE [Echinochloa colona (Linnaeus) Link subsp. zonalis (Gussone) Wooton & Standley, Panicum colonum Linnaeus]. Erect to decumbent annual, rooting from the lower nodes, the culms 10-70 cm long; blades often with purplish bars; panicles glabrous to hispid but lacking bulbous-based hairs; branches simple, less than 3 cm long; spikelets 2-3.5 mm long, in 4 rows, awnless; fertile floret 2.5-3 mm long. ●Moist disturbed ground, lawns, gardens, in the southern regions; native to tropical Asia. ●The specific epithet is sometimes rendered colonum, but the adjective should be declined as colona. Plants with conspicuous purplish cross-bars on the leaves have been given the epithet zonalis Gussone, recognized at various ranks.
Echinochloa crus-galli (Linnaeus) Beauvois [cock's-spur]  BARNYARDGRASS  Echinochloa crus-galli (Linnaeus) Beauvois var. mitis (Pursh) Peterman, Echinochloa crus-galli (Linnaeus) Beauvois var. zeylanensis (Kunth) Hitchcock, Echinochloa zeylanensis (Kunth) Schultes, Panicum crus-galli (Linnaeus). Decumbent to stiff erect annual, 30-100 cm or more tall; panicles with bulbous-based hairs to 5 mm long; branches 2-10 cm long, usually reduced; spikelets 2.5-4 mm long, awnless or with awns to 5 cm long; fertile floret 2.5-5.5 mm long. • Wet, warm swales, around ground pools; throughout the state; native to Eurasia. • Also known as BARNYARD MILLET, the seeds being used for grain.

Echinochloa crus-pavonis (Kunth) Schultes [leg of a peacock]  Annual or short-lived perennial, 30-100 cm or more tall; panicles with bulbous-based hairs; branches 4-12 cm long, usually rebranched with shorter 2nd branches; spikelets 2.5-3.5 mm, awnless or with curved awns to 10 mm, often a palea absent or vestigial. • Marshy ground and wet disturbed places, uncommon in a few scattered localities. • Our plants belong to var. macra (Wiegand) Gould [meagre, lean]  [Echinochloa zeylanensis (Kunth) Schultes var. macra Wiegand].

Echinochloa muricata (Beauvois) Fernald [with sharp points]  AMERICAN BARNYARDGRASS. Annual, 75-160 cm tall; panicles with bulbous-based hairs less than 5 mm long, or absent; branches 2-8 cm long; usually reduced; spikelets 2.5-5 mm long, usually with bulbous-based hairs, awnless or with awns to 16 mm long. • Moist to wet swales and seeps, disturbed ground, roadways. • We have two varieties. §
   a spikelets less than 3.5 mm long to base of awn or awn tip of lemma of lower floret; lemma of lower floret usually with an awn 6 mm or more long, infrequently all spikelets awnless…var. muricata [Setaria muricata Beauvois]. • Rather uncommon, in scattered localities in the state.
   a spikelets less than 3.5 mm long to base of awn or awn tip of lemma of lower floret; lemma of lower floret awnless or with an awn to 6(10) mm long…var. microstachya Wiegand [small-spiked]. • Widespread in the state.

Echinochloa crus-pavonis, Echinochloa muricata

Elusine  [from the city of Elusius in Greece] 1

Tufted annuals or perennials; sheaths open; auricles absent; ligules membranous, ciliate; inflorescence a panicle of many spike-like branches; spikelets several-flowered, laterally compressed; disarticulation above the glumes and between the florets; lemmas 3-nerved; anthers 3. • About 10 species of Asia, Africa, and South America.

Elymus  [an ancient Greek name]  WHEATGRASS, WILDBRYE 17

Tufted to rhizomatous perennials (rarely annual); sheaths open; auricles absent; ligules a ciliate membrane or entire hairs; inflorescence spike-like, unbranched, composed of repeating pairs of sessile and pedicelled spikelets; disarticulation below the spikelet pair, the two falling together; spikelets awnless, the sessile fertile, the pedicelled staminate. • About 15 species of warm temperate to tropical areas of the world. Sometimes spelled Elymurus.

Elionurus  (Pursh) Peterman, & G. Davié. 1898. (1865) Proposal to conserve the name Elionurus (Poaceae, Andropogoneae) with that spelling. Taxon 47(3):737-738.

Elionurus barbicalum  Hackel [bearded stem]. Tufted perennial, 40-80 cm tall, densely hirsute beneath the nodes; blades mostly involute, to 30 cm long, densely pilose on upper surface; inflorescence 5-10 cm long, the axis villous; spikelets densely villous, the sessile 4.5-8 mm long. • Rocky, grassy slopes and foothills in the boot heel region, uncommon.

Elymus  [an ancient Greek name]  WHEATGRASS, WILDBRYE

Tufted to rhizomatous, sometimes stoloniferous, perennials; sheaths open; auricles often developed; ligules membranous, sometimes ciliate; inflorescence a spike, with 1-5 spikelets per node; spikelets 1- several-flowered, awned to awnless; disarticulation various, from above the glumes and between the florets to below the spikelet and in the rachis; glumes 2, sometimes highly reduced; lemmas usually 5- to 7-nerved; anthers 3. • With perhaps 160 species in the present configuration. The classification and circumscription of this and related genera of the Triticeae Tribe is provocative and frequently changing; genomic analysis is the currently favored criterion, but even that has difficulty aligning with all the variation. We maintain Elymus in a more inclusive sense than is currently popular, and include here species that others might place (or have been placed) with reasonable justification in Agropyron, Lophopyrum, Pseudoroegneria, Sitanion, or Thinopyrum. Other species formerly classed in Elymus may be found in Leymus herein.

Elymus arenarius sensu lato, and

Elymus aristatus

Elymus arenarius

Elymus arenarius

Elymus arenarius

Elymus arenarius
6 Spikelets 3-7 cm long, very dense, the lowermost internodes 3-7 mm long; plants 15-45 cm tall, the bases usually decumbent to prostrate; mid-culm nodes mostly 0.5-1.5 mm wide; glumes 1- to 3(5)-nerved.................................................. E. scribneri
6 Spikelets 7-20 cm long, not especially dense, the lowermost internodes 8-15 mm long; plants 30-70 cm tall, the bases usually erect; mid-culm nodes mostly 1.5-2.5 mm wide; glumes (3)5- to 7-nerved.................................................. E. ×bakeri

2 Spikelets (glumes and lemmas) awnless or nearly so, any awns usually less than 5 mm long
7 Glumes blunt, nearly truncate, thick and very firm; spikelets awnless; sheaths typically ciliate on at least one margin
8 Plants with evident, long-creeping rhizomes.................................................. E. hispidus
8 Plants densely tufted, lacking evident rhizomes.................................................. E. ponticus
7 Glumes acute to acuminate, thin and membranous to stiff, but not thick; spikelets awned or awnless; sheaths rarely ciliate
9 Anthers 1-2 mm long
10 Glumes 1- to 2(3)-nerved; rachis tending to break apart at maturity; sterile hybrid plants...these are E. trachycaulus × E. elymoides hybrids, occurring where the two parents grow together.
10 Glumes (3)5-nerved; rachis remaining intact; fertile to sterile plants
11 Plants mostly with rhizomes.................................................................................. E. ×pseudorepens
11 Plants tufted............................................................................................................. E. trachycaulus
9 Anthers 4-16 mm long
12 Plants with evident, long-creeping rhizomes
13 Glumes acuminate, asymmetrical to curved and somewhat sickle-shaped, gradually tapering to an awn-tip; blades somewhat rigid and prominently ridged above (P. smithii)............................................................... Pascopyrum
13 Glumes acute to acuminate, symmetrical, not gradually tapering to an awn-tip; blades often lax, not prominently ridged above
14 Blades flat, mostly 5-15 mm wide, dark green, often with a circular constriction toward the tip; anthers (3)4-7 mm long.................................................. E. repens
14 Blades rolled or less than 4 mm wide when flat, usually glaucous, lacking a circular constriction toward the tip; anthers 3-5 mm long.................................................. E. lanceolatus
12 Plants lacking evident rhizomes, occasionally rhizomes weakly developed and short
15 Spike 15-30 cm long, often nodding; blades 4-6 mm wide......................................... E. arizonicus
15 Spike 8-15 cm long, usually erect; blades 1-2 mm wide............................................. E. spicatus

1 Spikelets 2 or more at each node of the rachis
16 Rachis fragile and breaking apart at maturity
17 Glumes 1 mm or more in width and conspicuously hardened.................................. E. virginicus
17 Glumes less than 1 mm in width, flexible and not hard
18 Lemma awns 4-17 mm long; rachis internodes 1.5-2.5 mm long...these are Elymus elymoides × E. trachycaulus hybrids [Elymus ×saundersii Vasey, Agropyron ×saundersii (Vasey) A.S. Hitchcock].
18 Lemma awns 20-80 mm long; rachis internodes mostly 5-12 mm long.......................... E. elymoides
16 Rachis persistent, not breaking apart at maturity
19 Glumes absent or reduced to one or two minute bristles; spikelets horizontally spreading or ascending at maturity...E. hystricx
19 Glumes present and well-developed
20 Glumes nearly subulate, 1- to 2-nerved
21 Sheaths villose; glumes short pilose............................................................................. E. villosus
21 Sheaths mostly glabrous; glumes glabrous
22 Glumes 1-3 cm long, indurate on the lower portion.................................................. E. interruptus
22 Glumes 4-15 cm long, rarely slightly shorter, only slightly hardened if at all..................... E. elymoides
20 Glumes narrowly lanceolate and broadened above the base, mostly conspicuously 3- to 7-nerved
23 Glumes firm and hardened on at least the lower portion, the bottom bowed out slightly; lemmas 6-9 mm long.............................. E. virginicus
23 Glumes not hardened nor bowed out at the base; lemmas 8-14 mm long
24 At maturity, the spikes erect and the awns erect-pressed; glumes mostly less than 20 mm long, commonly overlapping at the base and obscuring the florets; lemmas glabrous to scabrous................................. E. glaucus
24 At maturity, the spikes usually nodding or curved and the awns spreading outward; glumes 20 mm or more long, commonly separate at the base, the florets easily visible; lemmas scabrous to short-hairy (rarely glabrous)................................................. E. canadensis

Elymus arizonicus (Scrubiner & Smith) Gould [of Arizona] [Agropyron arizonicum Scribner & Smith, Agropyron spicatum (Pursh.) Scribner & Smith var. arizonicum (Scrubiner & Smith) Jones, Elytrigia arizonicum (Scribner & Smith) Dewey, Pseudoroegneria arizonica (Scrubiner & Smith) Löve]. Tufted perennial, 45-85 cm tall; auricles present; blades 4-6 mm wide; spikes 1-2.5 cm long, usually nodding in age, with 1 spikelet per node; spikelets with 4-6 florets, disarticulating above the glumes and between the florets; glumes 3-nerved; lemmas 8-15 mm long, with awns 10-25 mm long; anthers 3-5 mm long. ● Dry rocky slopes of the southern and western mountains. §

Elymus ×bakeri (E. Nelson) Löve [for Charles Fuller Baker (1872-1927), entomologist and Colorado botanist] [Agropyron bakeri E. Nelson, Elymus trachycaulus (Link) Gould subsp. bakeri (E. Nelson) A. Löve]. Tufted perennials, 25-50 cm tall; auricles usually present; spikes 8-15(20) cm long, not especially dense, straight to somewhat drooping; glume awns to 8 mm long, straight to curving; lemma awns 10-35 mm long, curved to divergent. ● These are sterile hybrids and perhaps partially fertile hybrid derivatives between Elymus trachycaulus and several other species, including E. scribneri, E. elymoides, and E. canadensis, and the features of such plants are diverse and reflect the parentage. High elevation populations (generally above 9,000 ft) have been called Elymus bakeri, which serves as a catch-all name for the entire group. Reports of E. bakeri from Doña Ana County are misidentifications of E. arizonicus (Scribner & Smith) Gould.

Loosely tufted perennial, mostly 50-150 cm or more tall; auricles present; spikes 8-30 cm long, with 2(3) spikelets per node; usually nodding; disarticulation above the glumes; glumes narrow, 3- to 5-nerved, with awns 10-25 mm long; lemmas variously hairy to glabrous, with divergent awns 10-45 mm long. ● Stream banks, ditch banks, flood plains, moist sandy soil; throughout the state. ● Intraspecific taxa have been named (see synonymy) based on widely variable spikelet features; we deem them unworthy of recognition. *Elymus canadensis* hybridizes with *Elymus virginicus*, *E. elymoides*, *E. spicatus*, and *E. trachycaulus*, among others. §

**Elymus elymoides** (Rafinesque) Swezey [resembling *Elymus*] SQUIRRELTAIL. Tufted perennial, 15-70 cm tall, the stems erect to geniculate-based, the nodes mostly concealed by the sheaths; sheaths glabrous to densely villous; auricles to about 1 mm long; blades 2-6 mm wide, glabrous to villous; spikes 5-20 cm long, erect to bent sharply over, with 2-3 spikelets per node; spikelets mostly with 2-5 florets; disarticulation in the rachis of the spike, then each floret falling; glumes 2-13 cm long, 1-3-nerved, the awns sometimes split; lemmas 6-12 mm long, glabrous to hairy, the awns 2-12 cm long, flattened and grooved. ● SQUIRRELTAIL is often mistaken for *Hordeum jubatum*, which has more slender awns without a central groove and three spikelets per node. This is a poor ecological competitor and only becomes abundant on rocky or sandy soil where other vegetation is scant. The variation of this wide-spread species is extensive and sometimes baffling, no doubt in part due to the extensive hybridization with several other species. We recognize two subspecies in the state: §

a. Lowermost flore of one or both spikelets at the node sterile and modified to a subulate or lanceolate awn, giving the appearance of an extra glume segment...subsp. elymoides [Situation elymoides Rafinesques, Situm hystricyst (Nuttall) J. S. Smith in part]. ● Plains and graney slopes; known with certainty only from Colfax County, but extant elsewhere.

b. Lowermost flore of each spikelet well developed and fertile, not appearing as an extra glume segment...subsp. brevifolius [Elymus brevifolius (J.G. Smith) M.E. Jones, *Elymus longifolius* (J.G. Smith) Gould, *Situm brevifolius* J.G. Smith, *Situm caepitatum* J.G. Smith, *Situm hystricyst* (Nuttall) J.S. Smith in part, *Situm longifolium* J.G. Smith, *Situm musc* J.G. Smith, *Situm pubiflorum* J.G. Smith, *Situm rigojum* sensu Wkses]. ● Plains, grasslands, woodlands, clearings in forests, road-sided, meadows, and hayfields. This is the common 90% SQUIRRELTAIL in New Mexico, and forms hybrids with several other species. Particularly common in the southern mountains are putative hybrids with *Elymus canadensis*, characterized by spikes that drop sharply down from the base of the main axis.

**Elymus glaucus** Buckley [bluish]. Tufted perennial, sometimes weakly rhizomatous, 30-100 cm or more tall; auricles usually present; spikes 5-20 cm long, mostly erect, with usually 2 spikelets per node; disarticulation above the glumes and between the florets; glumes 3- to 5-nerved, slightly united and overlapping at the base, obscuring the florets, thin and flat, not indurate, with awns 0-6 mm long; lemmas 9-15 mm long, with erect to flexuous awns 1-30 mm long; anthers 1.5-3.5 mm long. ● Open woods, aspen groves, edges of mountain meadows, never achieving very thick stands; in all the mountain ranges, but much more common in the north.

**Elymus hispidus** (Opiz) Melderis [spiny, shaggy, rough]. Rhizomatous perennial, often somewhat glaucous, 50-100 cm or more tall; auricles present; blade margins whitish, thicker than the midnerves; spikes 10-20 cm long, with 1 spikelet per node; spikelets 11-18 mm long, awnless or rarely with short awns from the lemmas; glumes about ½ the spikelet length, blunt, thick and rigid, the midnerves longer than the lateral nerves, offset acute to mucronate; lemmas 7-10 mm long, acute; anthers 5-7 mm long. ● Introduced for range revegetation and erosion control, widespread in the forests and foothills; native to Eurasia. ● Spikelets are very similar to *Elymus ponticus*, which has exactly truncate glumes, and lacks rhizomes. When treated in *Elymus*, the epithet intermedius cannot be used for this species (being taken by the earlier *E. intermedius* Bieberstein). We have two weak subspecies, probably better treated as forma: §


b. Spikelets pubescent...subsp. barbulatus (Schur) Melderis PUBESCENT WHEATGRASS [Agropyron barbulatum Schar, *A. trichophorum* (Link) Richter, *Elymus hispidus* (Opiz) Melderis var. rathenius (Grisebach) Dom, *Elymus trichophorum* (Link) Nevski]. ● This is sometimes treated as a separate species, but it scarcely qualifies to be recognized as a subspecies.

**Elymus hystricyst Linnaeus [like a porcupine] BOTTLEBRUSH-GRASS [Hystrix patula Moench]. Tufted perennial, 50-120 cm or more tall; auricles present; blades glossy green; spikes 8-20 cm long, with 2 spikelets per node; spikelets diverging at nearly right angles from the main axis; disarticulation above the glumes and between the florets; glumes 3- to 5-nerved, slightly united and overlapping at the base, obscuring the florets, thin and flat, not indurate, with awns 0-6 mm long; lemmas 9-15 mm long, with erect to flexuous awns 1-30 mm long; anthers 1.5-3.5 mm long. ● Open woods, aspen groves, edges of mountain meadows, never achieving very thick stands; in all the mountain ranges, but much more common in the north.

**Elymus interruptus** Buckley [not continuous, interrupted] *Elymus canadensis* Linnaeus var. interruptus (Buckley) Church. Tufted perennial, 50-100 cm tall; auricles present or absent; spikes 5-20 cm long, with 2 spikelets per node; spikelets ascending to divergent; disarticulation above the glumes and between the florets; glumes subulate, 1-2 nerved, 10-30 mm long; lemmas 7-10 mm long, with awns 15-22 mm long; anthers 2-4.5 mm long. ● Moist canyons and woodland s in rich soil; known from a single collection at Kingston, Sierra County, in the early 1900s, and an unsubstantiated report from Otero County; likely no longer present in the state.

**Elymus lanceolatus** (Scribn. & Smith) Gould [lance-shaped] *Agropyron dasystachyum* (Hooker) Scribn. (not *Elymus dasystachyum* Triniss ex Ledeboar), *Agropyron dasystachyum* (Hooker) Scribn. var. riparium (Scribn. & B. B.) Bowden, *Agropyron lanceolatum Scribn. & Smith*, *Agropyron riparium Scribn. & Smith*, *Elymus riparius* (Scribn. & B. B.) Gould, *Elytrigia dasystachytra* (Hooker) Nevski. Rhizomatous perennial, 25-100 cm or more tall; leaves often mostly basal; auricles usually present; blades usually rolled; spikes 5-25 cm long, usually with 1 spikelet per node; spikelets appressed, nearly awnless; glumes shorter than the adjacent lemma; lemmas 7-12 mm long, acute to awned to 2 mm; anthers 3-6 mm long. ● Used in reseeding mixes for land reclamation, but not commonly encountered elsewhere in New Mexico. Intraspecific taxa have been named based on spikelet investiture, and some of these have been propagated as cultivars for reseeding (“thickspike” and “streamside” wheatgrass); none are judged worthy of formal taxonomic recognition. §

long, with 1 spikelet per node; spikelets glabrous, awnless; glumes about \( \frac{1}{2} \) the length of the spikelet, thick and firm, nearly truncate, the midnerv about same length as lateral nerves; lemmas 9-12 mm long. ● Introduced for range revegetation, pasture improvement, and erosion control, widespread in the forests and foothills; native to Eurasia. ● Spikelets are similar to *Elymus hispidus*, which has glumes with a tiny awn-tip or point projecting from the nerve, but is also rhizomatous. We include here *Elymus elongatus* (Host) Runemark, which differs in blade and pubescence features. Though the names have long been confused, *E. elongatus* s.s. is not known from the United States. §

*Elymus × pseudorepens* (Scribner & Smith) Barkworth & Dewey [false repens] FALSE QUACKGRASS *[Agropyron pseudorepens* Scribner & Smith]*. Mostly rhizomatous perennial, sometimes nearly caespitose, 30-90 cm or more tall; auricles present or absent; spikes 6-14 cm long, with 1 spikelet per node; glumes shorter than or equaling the adjacent lemma, 5- to 9-nerved, slightly curved, sometimes short-awned; lemmas 7-15 mm long, mucronate or awned to 3 mm; anthers 1-2 mm long. ● Mountain slopes, grasslands, roadsides, generally below 9000 ft; very common in the southern mountains. ● This name has been applied to hybrid plants between *Elymus trachycaulus × Elymus lanceolatus* or *Elymus repens*. We recognize it herein because it is one of the common grasses of our mountains.

*Elymus repens* (Linnaeus) Gould [creeping] QUACKGRASS *[Agropyron repens* (Linnaeus) Beauvois, *Elytrigia repens* (Linnaeus) Nevski, *Triticum repens* Linnaeus]*. Strongly rhizomatous perennial, 50-100 cm tall; auricles present; spikes 5-15 cm long, with 1 spikelet per node; spikelets appressed to ascending; disarticulation above the glumes and between the florets; glumes about \( \frac{1}{2} \) the length of the spikelet, several-nerved, awnless or awned to 3 mm; lemmas 8-12 mm long, glabrous, awnless or awned to 6 mm; anthers 4-7 mm long. ● Aggressive weed of moist disturbed ground, gardens, and flower beds; found many scattered locales in the state but much less commonly encountered than its derivative, *Elymus × pseudorepens*; native to Europe.

*Elymus scribneri* (Vasey) M.E. Jones [for Frank Lamson-Scribner (1851-1938), renowned American agrostologist] *[Agropyron scribneri* Scribner & Smith]*. Tufted perennial, the culms prostrate to erect, 15-40 cm long; auricles usually present; spikes 3-9 cm long, very dense, mostly with 1 spikelet per node; disarticulation below the spikelets in the rachis, the florets also eventually falling; spikelets appressed to ascending; glumes 4-8 mm long, 1- to 3(-5)-nerved, with a divergent awn 12-30 mm long; lemmas 7-10 mm long, with divergent awns 15-30 mm long; anthers 1-1.5 mm long. ● Rocky slopes at high elevations, mostly above 9,000 ft in the central chain of mountains. ● *Elymus scribneri* may be a derivative of hybridization between *E. trachycaulus* and *E. elymoides*.

*Elymus smithii* go to Paspalum.

*Elymus spicatus* (Parsh) Gould [spike-like] BLUEBUNCH WHEATGRASS *[Agropyron inerme* Scribner & Smith]* Rydberg, *Agropyron spicatum* (Parsh) Scribner & Smith, *Agropyron spicatum* (Parsh) Scribner & Smith var. *inerme* (Scribner & Smith) A. Heller, *Elytrigia spicata* (Parsh) Dewey, *Festuca spicata* Parsh, *Pseudoegneria spicata* (Parsh) Löve). Tufted perennial, sometimes with short rhizomes, 30-100 cm tall; auricles present; blades involute when dry; spikes 8-15 cm long, with 1 spikelet per node; spikelets scarcely if at all overlapping, appressed to slightly divergent; disarticulation above the glumes and between the florets; glumes about \( \frac{1}{2} \) the length of the spikelet; lemmas 5-nerved, awnless (*inerme* phase) to awned, the awns straight to divergent to 25 mm long; anthers 4-8 mm long. ● Sagebrush flats, piñon-juniper foothills, and dry slopes in the western half of the state. ● This species is often placed in either *Pseudoegneria* or *Elytrigia*, but is just as much at home in *Elymus* as in those segregate genera. Awnless or nearly awnless forms have been assigned the *inerme* epithet at some rank.

*Elymus trachycaulus* (Link) Gould [rough-stemmed] SLENDER WHEATGRASS. Tufted perennial, sometimes producing weak rhizomes, 30-130 cm tall; auricles absent or present; blades mostly flat when fresh, 2-6 mm wide; spikes mostly 8-20 cm long, with mostly 1 spikelet per node; spikelets well-spaced to strongly overlapping; disarticulation above the glumes and between the florets; glumes subequal, nearly as long as the spikelet, green to purplish, the nerves prominent, awned or awnless; lemmas 6-13 mm long, awned to awnless; anthers 1-3 mm long. ● Mountain slopes, meadows, roadsides, from foothills to alpine, nearly throughout the state. ● This species hybridizes with *Elymus canadensis*, *E. glaucus*, *E. lanceolatus*, *E. elymoides*, *E. scribneri*, and *Hordeum jubatum*, and we find a corresponding array of variation in populations. Numerous subspecies or varieties have been named, but the features upon which they are based seem to segregate independently in our New Mexico populations and their formal recognition is fragile. The following, however, are conspicuous: §

b Glumes mostly 3-nerved; spikelets strongly overlapping, the rachis internodes 4-5 mm long; 9,000-12,000 ft elevation... subsp. *violaceus* (Hornemann) A. & D. Löve [Agropyron latiglumis* (Scribner & Smith) Rydberg, *Agropyron violaceum* (Hornemann) Lange, *Elymus alaskanus* (Scribner & Merrill) A. Löve subsp. *latiglumis* (Scribner & J.G. Smith) A. Löve, *Triticum violaceum* Hornemann].


*Elymus villosus* Muhlenberg ex Wildenow [shaggy-haired]. Tufted perennial, 40-100 cm or more tall; sheaths villous to pilose; auricles present; spikes 4-12 cm long, with usually 2 spikelets per node; spikelets 7-12 mm long, overlapping; disarticulation above the glumes and between the florets; glumes awn-like, hirsute, 12-25 mm long; lemmas 5-9 mm long, usually villous, with awns to 30 mm long; anthers 1.5-3 mm long; native to central United States. ● Known only from a few roadside collections in Union County.

*Elymus virginicus* Linnaeus [of Virginia] *[Elymus virginicus* Linnaeus var. *glabriflorus* (Vasey) Bush, *Elymus virginicus* Linnaeus var. *submuticus* Hooker]. Tufted perennial, 30-120 cm tall; foliage mostly glabrous; auricles absent to present; spikes 4-16 cm long, with 2 spikelets per node; disarticulation in the rachis, or below the glumes and the rachis remaining intact; glumes 3- to 5-nerved, the basal portion nearly terete, indurate, and bowed out, gradually narrowing into a straight awn 3-12 mm long; lemmas 6-10 mm long, glabrous to villous, with straight awns 8-20 mm long; anthers 2-4 mm long. ● Moist woods, bottomlands, roadsides, in scattered locales, not common. ● Plants resemble *Elymus canadensis*, which differs most conspicuously by having divergent awns, disarticulation that leaves the glumes on the rachis, and glume bases that are not terete- or indurate- nor bowed out.
Enneapogon [nine-awned] PAPPUSGRASS [1].

Tufted annuals and perennials; sheaths open; auricles absent; ligules a ring of hairs; inflorescence a weakly developed panicle; spikelets with 3-6 florets, often only the lowermost fertile, the upper progressively reduced; disarticulation above the glumes, the florets falling together; glumes subequal, multi-nerved; lemmas 9-nerved, the nerves extended into 9 plumose awns; anthers 3. • About 24 species in warm-temperate to tropical regions worldwide; sometimes called BOTTLE-WASHERS.

Enneapogon desvauxii Desvaux ex Beauvois [for Nicaise Auguste Desvaux (1784-1856), French botanist] [Pappophorum wrightii S. Watson]. Tufted perennial, 20-45 cm tall; nodes hairy; sheaths shorter than the internodes, hairy; panicles 2-10 cm long, mostly less than 2 cm wide, lead-colored; glumes 3-5 mm long; lower lemma 1.5-2 mm long, prominently nerved; awns 3-4 mm long. • Plains and alluvial hills in desert or arid grasslands. • Cleistogamous spikelets with reduced awns are usually found in the lower sheaths.

Eragrostis [obscure origin, perhaps literally love grass, from Latin eros and agrostis, but other possibilities exist] LOVEGRASS [18].

Plants annual to perennial, tufted, rhizomatous, or stoloniferous; sheaths open; auricles absent; ligules usually a ciliate membrane; inflorescence a panicle; spikelet with several florets; disarticulation generally above the glumes, the grain and lemma falling, the palea remaining on the rachilla; lemmas 3-nerved, awnless; anthers 2-3. • A large, worldwide genus of 400 or so species. Eragrostis cilianensis (Linnaeus) R. Brown and E. hogens Nees have been reported from the state, but no validating specimens have been located.
Monocotyledonous Plants - Poaceae

1 Plants annual
2 Plants with stolons, rooting at the nodes and forming mats .................................................. E. hypnoides
2 Plants lacking stolons, not forming mats
3 Lemma keel (midnerve) with tiny crater-like glands toward the apex; mature spikelets 2-4 mm wide; lemmas with prominent green nerves contrasting sharply with the otherwise whitish body .................................................. E. ciliaris
3 Lemma keel lacking crater-like glands (occasionally present E. minor); mature spikelets less than 2.5 mm wide; lemmas generally colored otherwise
4 Mature grains with a groove on the side opposite the embryo
5 Spikelets with 5-15 florets; rather common and widespread in the state .................................. E. mexicana
5 Spikelets with 3-6 florets; rare or now absent ........................................................................... E. frankii
4 Mature grains lacking a groove (slightly flattened in E. barrelieri)
6 Pedicles with a glabrous ring toward the tip ................................................................................ E. minor
6 Pedicles lacking a glabrous ring
7 Mature panicles 0.5-2 cm wide; spikelets light yellowish, occasionally purplish .................. E. lutescens
7 Mature panicles 2-15 cm wide; spikelets generally darkish
8 Spikelets with 3-6 florets; rare or now absent ......................................................................... E. frankii
8 Spikelets, at least many of them, with 7-20 florets
9 Culms with prominent glandular rings below the nodes ......................................................... E. barrelieri
9 Culms with prominent glandular rings below the nodes, but sometimes with a few glandular pits
10 Panicle branches usually solitary at the lowest 2 nodes; spikelets 1.2-2.5 mm wide ............ E. pectinacea
10 Panicle branches usually paired or whorled at the lowest 2 nodes; spikelets 0.6-1.4 mm wide .......... E. pilosa

1 Plants perennial
11 Plants with extensive creeping rhizomes; blades very stiff and sharp-pointed (K. obtusiflora) ...................... go to Kalinia
11 Plants lacking rhizomes or with short knotty rhizome only; blades usually rather lax, not sharp-pointed
12 Spikelets 3-10 mm wide, disarticulating below the glumes at maturity and the spikelets falling entire ............ E. superba
12 Spikelets 1-5 mm wide, disarticulating above the glumes at maturity
13 Spikelets sessile and borne on divergent unbranched primary branches .................................. E. sessilispa
13 Spikelets pedicelled, at least shortly so, and/or the primary panicle branches rebranched
14 Lateral (not the terminal) pedicels 2 mm or less long
15 Mature spikelets 3-5 mm wide and arranged in overlapping clusters ........................................... E. secundiflora
15 Mature spikelets less than 3 mm wide and not arranged in overlapping clusters
16 Panicle branches gummy, stout, and stiffly spreading .......................................................... E. curtipedicellata
16 Panicle branches not gummy and stiff, but at least somewhat lax or drooping
17 Basal sheaths glabrous on the back; culms usually geniculate-based; lemmas mostly less than 1.8 mm long .......... E. lehmanniana
17 Basal sheaths villous on the back; culms usually erect at the base; lemmas mostly more than 2 mm long ....... E. curvula

14 Lateral (not the terminal) pedicels longer than 2 mm
18 Mature spikelets 3-5 mm wide and arranged in dense, overlapping clusters ...................... E. secundiflora
18 Mature spikelets less than 3 mm wide and not arranged in dense, overlapping clusters
19 Paleas conspicuously ciliate; lateral nerves of lemma prominent; panicle breaking away when mature and tumbling before the wind ................................................................. E. spectabilis
19 Paleas smooth or minutely ciliate; lateral nerves of lemma prominent or obscure; panicle usually not breaking away
20 New basal shoots breaking through the base of the sheaths (extravaginal); stem bases knotty ....... E. palmeri
20 New basal shoots not breaking through the base of the sheath, but emerging out of the top or off to the side; stem bases not knotty
21 Mature lemmas mostly shorter than 2.2 mm ............................................................................ E. intermedia
21 Mature lemmas mostly longer than 2.2 mm, usually more than 2.4 mm
22 Grains squarrish; lemmas reddish, acuminate with smooth tips; basal nodes and internodes crowded ................................................................. E. trichodes
22 Grains elongate to elliptic; lemmas greenish, acute with usually fringed tips; basal nodes and internodes not crowded ................................................................. E. erosa

*Eragrostis barrelieri* Daveau [for Jacques Barrelier (1606-1693), French medical botanist] MEDITERRANEAN LOVEGRASS. Tufted annual, 10-60 cm tall, with a yellowish ring of glabrous tissue below the nodes; panicles open, with pulvini in the axils, 4-20 cm long, 2-10 cm wide, the axils glabrous; spikelets 1-2.2 mm wide, diverging from the branches, lacking glands, with 7-15 florets; disarticulation leaving the paleas on the rachilla but the glumes falling; lemmas 1.4-1.8 mm long; grain not grooved. • Disturbed sites, flower beds, roadsides, common and widespread, essentially throughout the state; native to the Mediterranean region. §

*Eragrostis ciliaris* (Allioni) Vignolo-Lutati ex Janchen [from the Ciliani Estate, Italy] STINKGRASS [Eragrostis megastachya (Koeler) Link, Poa ciliaris Allioni]. Tufted annual, 15-60 cm tall, sometimes with crater-like glands below the nodes and on the sheath; panicles 5-16 cm long, 2-8 cm wide, with pulvini in most axes; spikelets often with numerous florets, 2-4 mm wide, greenish lead-colored to whitish; disarticulation leaving the only the rachilla; lemmas with glands on the keels, membranous; between the conspicuous nerves; paleas prominently ciliate on the keels; grain not grooved. • Disturbed and weedy ground, widespread; native to Europe. • Consumption of STINKGRASS in large amounts may be toxic to grazing animals, especially horses. An early English name in New Mexico was CANDY GRASS, on account of its sweet odor. A concoction prepared from this plant was thought to act as a love potion, hence the name love grass. §
**Eragrostis curtipedicellata** Buckley [short-stalked] **GUMMY LOVEGRASS.** Tufted perennial, much of the plant viscid-sticky, sometimes with short knotty rhizomes, 20-65 cm tall; panicles 18-35 cm long, nearly as wide, with 2º branches from the divergent 1º branches; spikelets 1-1.5 mm wide; disarticulation leaving the glumes, but not the rachilla; lemmas glandless; grains not grooved. ● Sandy or clayey plains and grasslands on the eastern plains; reports of a disjunct population from the **BUFFALOGRASS** prairie of Hidalgo County are unsubstantiated, but not unexpected.

**Eragrostis curvula** (Schrader) Nees var. **conferta** Stapf, **Poa curvula** Schrader. Tufted perennial, the culms usually erect basally, 50-100 cm or more tall; ligules 0.6-1.3 mm long; blades to 65 cm long and forming fountain-like arrays; panicles 16-40 cm long, about ½ as wide, hairy to glabrous in the axis; spikelets appressed, 4-9 mm long, 1-2 mm wide, lead-colored; disarticulation leaving the paleae on the rachilla but the glumes falling; lemmas 1.8-3 mm long, the nerves somewhat obscure; grain grooved or not. ● Widespread throughout the state, from plains and prairies to foothills and mid-elevations in the mountains, often along roadsides. ● Plants were introduced from Africa for range land restoration and erosion control, but populations spread quickly along roads and disturbed ground. This includes what has been called **BOER LOVEGRASS**, a distinctive selection with short blades and straw-colored panicles [often segregated as **Eragrostis chloromelas** Steudel or **Eragrostis curvula** (Schrader) Nees var. **conferta** Stapf], but which intergrades quite completely in its native habitats in Africa.

**Eragrostis eosa** Scribner [with jagged tips]. Tufted perennial, 70-110 cm tall, lacking glands; panicles 25-45 cm long, 10-30 cm wide, hairy to glabrous in the axis; spikelets appressed to divergent, 1-3 mm wide; disarticulation leaving the paleas on the rachilla but the glumes falling; lemmas 2.4-3 mm long, greenish, the lateral nerves obscure; grains grooved, 0.8-1.6 mm long. ● Rocky limestone hills and mountain slopes, often in piton-juniper areas, widespread, but more common in the southern regions. ● Resembles **Eragrostis palmeri** S. Watson, but that species has knotty bases with extraginal branching, has shorter lemmas (2-2.6 mm), and has shorter grains (0.6-0.8 mm), and is much less common.

**Eragrostis frankii** C.A. Meyer ex Steudel [for Joseph C. Frank (1782-1835), German botanical collector]. Tufted annual, 10-50 cm tall, often with glandular pits below the nodes, on the sheaths, and on the panicle branches; panicles less than ½ the length of the plant, 2-12 cm wide, glabrous in the axis; spikelets 1-2 mm wide, with 3-6 florets, lead-colored to reddish; disarticulation leaving the paleas on the rachilla, the glumes falling; lemmas 1.1-1.5 mm long, the lateral nerves obscure; grains flat or shallowly grooved. ● Disturbed ground, moist weedy sites; native to central and eastern United States; known only from an 1847 collection by Augustus Fendler at Santa Fe; probably no longer present in the state.

**Eragrostis hypnoides** (Lamarck) Britton, Sterns, & Poggenburg [moss-like] [Poa hypnoides Lamarck]. Stoloniferous annual, forming loose mats, 5-20 cm tall; sheaths short-to-filose on the margins and collars; panicles weakly developed, 1-4 cm long, mostly open; spikelets 1-1.5 mm wide, greenish-yellow to purplish, with 12-35 florets; disarticulation leaving the paleas and the rachilla, the glumes falling; lemmas 1.4-2 mm long; grains somewhat translucent, not grooved; anthers 2, 0.2-0.3 mm long. ● Sand and mud bars along slow-moving streams and lakeshores; uncommon, in scattered locales. ● Formerly confused with **Eragrostis reptans** (Michaux) Nees, which has unisexual spikelets (the plants being monoecious) and 3 large anthers 1.4-2.2 mm long. Oddly, New Mexico plants of **E. hypnoides** are often found with rattlesnakes nearby.

**Eragrostis intermedia** A.S. Hitchcock [intermediate or similar] **PLAINS LOVEGRASS.** Tufted perennial, 30-90 cm or more tall; sheaths lightly hairy on the margins and at the apex; panicles 15-40 cm long, 10-30 cm wide, glabrous or hairy in the axis; spikelets 1-1.8 mm wide, with 5-11 florets; disarticulation leaving the paleas on the rachilla but the glumes falling; lemmas 1.6-2.2 mm long, the lateral nerves obscure; grains strongly grooved. ● Sandy or rocky plains, prairies, mountain slopes, disturbed ground, widespread. ● Our plants belong to var. **intermedia.** Similar to **E. lugens** Nees, which is sometimes reported for the state, but which has narrower spikelets, shorter lemmas, and cyropaxes lacking a groove.

**Eragrostis lehmanniana** Nees [for Johann Georg Christian Lehmann (1792-1860), German botanist] **LEHMANN LOVEGRASS.** Tufted perennial, 30-80 cm tall, the bases geniculate, sometimes rooting at the nodes and forming surprisingly long stolons; sheaths mostly glabrous basally; ligules 0.3-0.5 mm long; blades to 12 cm long; panicles 7-18 cm long, about ½ as wide, glabrous in the axis; spikelets generally spreading from the branch (sometimes only slightly), 5-14 mm long, 0.8-1.2 mm wide, lead- to straw-colored; disarticulation leaving the paleas on the rachilla but the glumes falling; lemmas 1.5-1.7 mm long, the nerves obscure; grains sometimes with a shallow groove. ● Introduced from Africa for range land rehabilitation and roadside erosion control, widespread, especially common in the southern regions. ● Populations are remarkably uniform and form dense stands along roadsides, noticeable by the geniculate bases, yellow-green foliage, and straw-colored panicles of similar height. In recent years, with milder winters, we have seen this grass spread in the southern counties, venturing from the roadsides into surrounding range land. It is a noxious invader in southeastern Arizona.

**Eragrostis lutescens** Scribner [yellowish]. Tufted annual, 6-25 cm tall, with glandular pits (but not rings) below the nodes; sheaths and leaf bases with scattered glandular pits; panicles 4-15 cm long, 0.5-2 cm wide, the main axis and branches with glandular pits; spikelets 1.2-2.2 mm wide, pale yellowish (sometimes purple-mottled), glabrous or hairy in the axis; disarticulation leaving the paleas on the rachilla but the glumes falling; lemmas straw-colored with greenish nerves, lacking glands; grains without a groove. ● Sandy, moist soil, uncommon with a few scattered localities, mostly southern.

**Eragrostis mexicana** (Hornemann) Link [of Mexico] [Eragrostis limhata Foemmer, Eragrostis neomexicana Vassey, Poa mexicana Hornemann]. Tufted annual, 10-95(110) cm tall, the culms sometimes with a glandular ring below the nodes; sheaths sometimes with glandular pits; panicles 10-40 cm long, 4-18 cm wide, glabrous in the axis; spikelets 0.7-2.4 mm wide, with 5-12 florets, grey-green to purplish green; disarticulation leaving the paleas on the rachilla but the glumes falling; lemmas 2.2-3.4 mm long, the lateral nerves evident; grains mostly deeply grooved. ● Roadsides, moist disturbed sites in a variety of habitats, often gravelly or rocky sites, widespread. ● Our plants belong to var. **mexicana.**

**Eragrostis minor** Host [smaller] [Eragrostis poaeoides P. Beauvius ex Roemer & Schultes]. Tufted annual, 10-45 cm tall, sometimes with a glandular ring below the nodes; sheaths sometimes glandular on the midnerves; blade margins sometimes with crater-like glands; panicles 4-20 cm long, contracted to open, to 8 cm wide, sometimes with glandular pits or glandular rings, glabrous or hairy in the axis; pedicels usually with a glandular ring in the distal half; spikelets 1.1-2.2 mm wide, with 7-20 florets; disarticulation leaving the
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Eragrostis palmeri S. Watson [for Edward Palmer (1829-1911), British botanist and ethnologist]. Tufted perennial with knotty bases, the axillary sheaths breaking through the base of the sheath (exuvial), rhizomes lacking, 50-100 cm tall, lack glands short-villous to glabrous; paleas 1.2-4.0 cm long; 4-20 cm wide; glabrous to sparingly hairy in the axils; spikelets appressed to divergent, 1-2 mm wide; disarticulation leaving the paleas on the rachilla but the glumes falling; lemma 1.2-2.6 mm long, the lateral nerves obscure to conspicuous; grains grooved, 0.6-0.8 mm long.

- Rocky plains and mountain slopes, uncommon in the southeastern mountains. *Resembles Eragrostis eosa Scribn, but that species lacks knotty bases with evaginal branching, has shorter lemmas (2.4-3 mm), and has longer grains (0.8-1.6 mm), and is more commonly encountered.

Eragrostis pectinacea (Michaux) Nees [comb-like] CAROLINA LOVEGRASS. Tufted annual, lacking glands, 10-65 cm tall; paleas 5-25 cm long, 3-12 cm wide, usually open, the axis glabrous or sparingly hairy; spikelets 1.2-2.5 mm wide, with 6-20 florets; disarticulation leaving the paleas on the rachilla but the glumes falling; lemma 1.2-2.2 mm long, the lateral nerves obvious; grains not grooved.

- Roadsides, fields, alkali flats, sandy plains, disturbed ground, widespread.

- We have two varieties: §
  - Pedicels mostly appressed to the panicle branches, rarely diverging...var. pectinacea [Eragrostis diffusa Buckley. Eragrostis pusihii Schrader]. Throughout the state, expected in every county.
  - Pedicels mostly breaking away from the panicle branches, rarely diverging...var. miserrima (Fournier) J. Reeder [wretched] [Eragrostis arida Hitchcock, Eragrostis pusihii Schrader var. miserrima Fournier, Eragrostis nepenthanthos Schultes]. Mostly in the southwestern half of the state. *This can be confused with Eragrostis barcellieri D'aveau, but that species has conspicuous glandular rings below the nodes

Eragrostis pilosa (Linnaeus) P. Beauvios [hairy] [Poa pilosa Linnaeus]. Tufted annual, 8-50 cm tall; sheaths sometimes with glabrous nodes; blades sometimes with glands along the midnerve; paleas 4-20 cm long; 2-15 cm wide, the branches paired or whorled at the lower 2 nodes, the axis glabrous to hairy; spikelets 0.6-1.4 mm wide, with 5-15 florets; disarticulation leaving the paleas on the rachilla but the glumes falling, and then the paleas eventually falling; lemma 1.2-2.2 mm long, the lateral nerves obscure; grains not grooved.

- Roadsides, disturbed ground, gardens, fields; native to Eurasia. Reported by various workers for the state, but authentic specimens are as yet unknown; included here for comparison.

Eragrostis secundiflora Presl [with flowers on one side] RED LOVEGRASS. Tufted perennial, lacking glands, 30-75 cm tall; paleas 5-30 cm long, about ½ as wide, the branches appressed to ascending, the axis nearly glabrous; spikelets 2.5-5.5 mm wide, strongly flattened, reddish or somewhat straw-colored, with 10-45 florets; disarticulation dropping the florets and rachilla before the glumes; lemma 2.6 mm long, the lateral nerves conspicuous; grains not grooved.

- Sandy grasslands and prairies, roadsides, mostly on the eastern plains. Our plants belong to subs. oxylepis (Torrey) S.D. Koch [sharp-scaled] [Eragrostis beyrichii J.G. Smith, Eragrostis oxylepis (Torrey) Torrey, Eragrostis secundiflora Presl var. caputata (Fournier) Beetle, Poa oxylepis Torrey].

Eragrostis sessilisgaca Buckley [with sessile spikelets] TUMBLE LOVEGRASS [Acamptocladus sessilisgaca (Buckley) Nash]. Tufted perennial, lacking glands, 30-90 cm tall; panicles 20-60 cm long, about ½ as wide; branches saccate, unbranched, widely spaced, with hairy axils; spikelets sessile or nearly so on the primary branches, widely spaced and not overlapping, 1.4-3 mm wide, with 3-12 florets; disarticulation leaving the glumes, the florets falling, the panicle also breaking away and tumbling before the wind; lemma 3.5 mm long, indurate; grains not grooved.

- Sandy hills and prairies on the eastern plains.

Eragrostis spectabilis (Pursh) Steudel [spectacular, notable] PURPLE LOVEGRASS [Poa spectabilis Pursh]. Tufted perennial, 30-75 cm tall, with short knotty rhizomes; sheaths hairy on the margins; blades glabrous to pilose; panicles 20-50 cm long, 15-35 cm wide, hairy in the axils; spikelets 1-2 mm wide, spreading or appressed, reddish purple; disarticulation leaving the glumes, the florets falling; lemma 1.2-2.5 mm long, the lateral nerves obvious; grains grooved between 2 ridges.

- Sandy soil, in the northeastern grasslands. Plants are quite beautiful, and becoming available in the nursery trade.

Eragrostis superba Peyritsch [excellent, magnificent] WILMAN’S LOVEGRASS. Tufted perennial, lacking glands, 45-95 cm tall; sheaths hairy on the margins; panicles 10-30 cm long, 1-6 cm wide, glabrous in the axils; spikelets 3-10 mm long, strongly flattened, straw-colored to greenish or reddish; disarticulation below the glumes, the spikelets falling entire; lemma 3.5 mm long, papery to leathery, the green lateral nerves conspicuous; grains not grooved. Introduced in seeding trials and for erosion control in southern regions, uncommon; native to Africa. The English name commemorates Miss Maria Wilman (1867-1957), a superb South African botanist, geologist, archeologist, and museum curator. Populations seeded on White Sands Missile Range (Sierra County) in 1993 are no longer extant.

Eragrostis trichodes (Nuttall) Wood [hair-like] SAND LOVEGRASS [Poa trichodes Nutall]. Tufted perennial, lacking glands, 30-120 cm tall; sheaths sometimes hairy along the margins; blades sometimes pilose; panicles 30-80 cm long, 10-30 cm wide, glabrous to hairy in the axils; spikelets diverging, 1.5-3.6 mm wide, with 4-18 florets; disarticulation leaving the paleas on the rachilla but the glumes falling; lemma 2.2-3.5 mm long, the lateral nerves obvious; grains grooved.

- Sandy prairies and open woodlands, mostly in the northeastern quarter of the state.

Eremopyrum [desert wheat] [1].

Tufted annual, the culms geniculate-based; sheaths open. auricles present; ligules a truncate membrane; blades flat, short; inflorescence a spike, with 1 spikelet per node, the spikelets crowded and overlapping; disarticulation below the glumes, the rachis shattering, or above the glumes and between the florets; spikelets with 2-5 florets; glumes shorter than the spikelets; lemma 5-nerved; anthers 3. ◦ Eurasian and North African genus of about 4 species.


- *Eremopyrum triticeum* (Gaertner) Nevsivski [resembling wheat] ANNUAL WHEATGRASS [Aegropyron triticeum Gaertner]. Tufted annual, 5-30 cm tall; spikes 1-3 cm long; disarticulation above the glumes and between the florets, the rachis remaining; spikelets with 2-3 florets; glumes 1-nerved, awn-tipped; lemma 5-7.5 mm long, the lowermost hairy. Dry plains in the Four Corners region; native to Eurasia, India.
**Eriochloa** [wooly grass] CUPGRASS [3].

Mostly tufted annuals and perennials; sheaths open; auricles absent; ligules a ciliate membrane; inflorescence a panicle with spike-like branches, lacking bristles; spikelets with 2 florets, the lower sterile, the upper fertile, awned to awnless; disarticulation below the glumes (below the cup); lower glume reduced to a cup-like structure; upper and lower lemma similar in shape and texture; upper floret indurate, the lemma clasping the palea and forming a seed case; anthers 3. About 35 species of Eurasia, Africa, Australia, and the Americas. The cup-like structure formed by the lower glume is distinctive.


1 Spikelets solitary in the middle of the branches .......................................................... *E. contracta*

1 Spikelets in pairs in the middle of the branches

2 Adaxial blade surface velvety-hairy; lower paleas 1-4 mm long .................................................. *E. lemmonii*

2 Adaxial blade surface glabrous to sparsely pilose; lower paleas absent............................................. *E. acuminata*

**Eriochloa acuminata** (Presl) Kunth [with a tapering point]. Tufted annual, 30-100 cm or more long; sheaths sometimes inflated; blades sparsely pilose; panicles 7-16 cm long, the branches 5-20 in number, 1-5 cm long, with spikelets in unequally pedicellate pairs in the middle of the branch, solitary distally; spikelets 3.8-6 mm long; upper glume awnless to awned to 1.2 mm; lower palea absent; upper floret awn-tipped 0.1-0.3 mm. Disturbed moist ground, rocky slopes, in the southern half of the state. We have two varieties:

a Spikelets 4-6 mm long, long-acuminate or tapering to a short awn...*var. acuminata* [Eriochloa gracilis (Fournier) A.S. Hitchcock, *Piptatherum acuminatum* Presl]

a Spikelets less than 4 mm long, obtuse to acute...*var. minor* (Vasey) R.B. Shaw [smaller] [Eriochloa gracilis (Fournier) A.S. Hitchcock var. minor (Vasey) Hitchcock, *Eriochloa polystachya* sensu W&S, *Eriochloa punctata* (Linnaeus) Desvaux ex W. Hamilton var. minor Vasey].

**Eriochloa contracta** A.S. Hitchcock [contracted]. Tufted annual, 20-80 cm or more long; blades sparsely to densely pubescent on both surfaces; panicles 6-20 cm long, the branches 10-28 in number, 1.5-5 cm long, with solitary spikelets in the middle of the branch, sometimes paired proximally; spikelets 3-5 mm long; upper glume acuminate to awned to 1 mm; lower palea absent; upper floret awned 0.4-1.1 mm. Loamy soil of prairies and swales in the south-central and south-eastern regions of the state.
**Eriochloa lemmonii** Vasey & Scribner [for John Gill Lemmon (1832-1908), California botanist]. Tufted annual, 20-80 cm long; blades velutinous on the upper surface; panicles 5-15 cm long, with 2-10 branches 1-4 cm long, with spikelets in unequally pedicellate pairs in the middle of the branch, solitary distally; spikelets 3-5 mm long; upper glume acute, awnless; lower palea 1-4 mm long; upper floret rounded to acute, sometimes mucronate, awnless. • Rocky, grassy slopes in the booth heel region, with a few outliers.

**Eriocoma** [woody hair] NEEDLEGRASS [9].

Perennial, ours mostly cespitose; sheaths open; auricles absent; ligules membranous; inflorescence a panicle; spikelets 1-flowered; disarticulation above the glumes longer than the floret, 1-3-nerved or sometimes more; florets terete, usually fusiform; the lemma convolute around the palea and flower but the margins only slightly overlapping, awned from the tip with a single awn; anthers 3. • Our 27 species of *Eriocoma* were formerly recognized in the genera *Achnatherum*, *Oryzopsis*, and *Stipa*. We accept the reorganizations of Peterson et al. (2019) and Romaschenko et al. (2012), that moves the Western Hemispheric species of a polyphyletic *Achnatherum* to the monophyletic North American genera *Eriocoma* and *Pseudoeriocoma*. *Eriocoma pinetorum* (M.E. Jones) Romaschenko has been reported for the state, but without documentation and no specimens are known.

1. Lemma densely covered with long hairs; awn short, 3-5 mm long, quickly deciduous; panicule widely spreading at maturity, with dichotomous branches................................................................. *E. hymenoides*

1. Lemma glabrous or covered with short appressed hairs; awn longer than 6 mm, persistent or deciduous; panicule with ascending branches

2. Basal segment of the once-geniculate awn plumose with long hairs 3-8 mm long ...................................................... go to *Pappostipa*

2. Basal segment of the awn glabrous or with hairs less than 2 mm long

3. Awn ± readily deciduous; blades 1-2 mm wide................................................................. *E. × bloomeri*

3. Awn persistent; blades various

4. Lower segment of the awn (not the lemma tip) with hairs 1-2 mm long ................................................................. *E. curvifolia*

4. Lower segment of the awn (not the lemma tip) scabrous or with hairs less than 1 mm long

5. Awns 3-7.5 cm long, obscurely bent, the terminal segment flexuous or curving

6. Ligule minute, less than 1 mm long, hardly visible; panicule narrow, contracted, the main axis obscured............... *E. arida*

6. Ligule 1-2 mm long, evident; panicule open when mature, the branches spreading, the main axis visible .................................................................

................................................................. go to *Pseudoeriocoma*

5. Awns 1-3 cm long, usually plainly bent, the terminal segment ± straight

7. Palea approximately ½ the length of the lemma

8. Hairs at the tip of the palea about the same length as those below; mature stems 60-180 cm tall, 2-6 mm in diameter; blades 4-10 mm wide................................................................. *E. robusta*

8. Hairs at the tip of the palea longer than those below; mature stems 25-80 cm tall, 1-2 mm in diameter; blades 1-2 mm wide ................................................................. *E. lettermanii*

7. Palea ½ to ⅔ the length of the lemma

9. Hairs at the lemma tip 2.5-3 mm long; callus with a pointed extension................................................................. *E. scribneri*

9. Hairs at the lemma tip 1.2-2.2 mm long; callus blunt, without a pointed extension

10. Apical lemma hairs erect; lemma lobes 0.5-1.2 mm long; florets widest about midthickness............... *E. lobata*

10. Apical lemma hairs descending to divergent; lemma lobes 0.2-0.5 mm long; florets widest below midthickness

11. Awns mostly 2-3 cm long; blades 3-7 mm wide ................................................................. *E. nelsonii*

11. Awns mostly 1-2 cm long; blades 2-3 mm wide ................................................................. *E. perplexa*

**Eriocoma arida** (M.E. Jones) Romaschenko [dry, growing in dry places] *Achnatherum aridum* (M.E. Jones) Barkworth, *Stipa arida* M.E. Jones, *Stipa mormonum* Mees. Perennial, 30-80 cm tall; blades flat when fresh, 1-3 mm wide; panicles 5-17 cm long, 1-2 cm wide, the bases often enclosed in the subtending sheath at anthesis; glumes subequal to unequal, the lower 8-14 mm long, the upper 1-5 mm shorter; florets 4-6.5 mm long; awns 4-8 cm long, obscurely one-geniculate, the terminal segment flexuous. • Desert scrub vegetation of the Four Corners region; only recently (2000) found in New Mexico and not well-collected in the state. • The long awns, tiny ligule, and a contracted panicle often partially hidden in the subtending sheath are distinctive features.

**Eriocoma × bloomeri** (Bolander) Romaschenko [for Hiram Green Bloomer (1819-1874), an early San Francisco botanist] *Achnatherum × bloomeri* (Bolander) Barkworth, *Oryzopsis bloomeri* (Bolander) Ricker, *Stipa bloomeri* Bolander, *Stiporyzopsis bloomeri* (Bolander) B.L. Johnson. • Not definitely recorded for New Mexico, but to be expected in the Four Corners area. • This is a catch-all name for hybrids between *Eriocoma hymenoides* and various other species of *Eriocoma*, generally with the readily deciduous awns of *E. hymenoides* and the longer, narrow florets and wider blades of the other parent.

**Eriocoma curvifolia** (Swallen) Romaschenko [with a curved leaf] *Achnatherum curvifolium* (Swallen) Barkworth, *Stipa curvifolia* Swallen. Perennial, 25-60 cm tall; basal sheaths puberulent, sometimes tormentose at the base; blades folded to involute, minutely puberulent, moderately to strongly curved in age; panicles 7-11 cm long; glumes subequal, 3-nerved, 10-14 mm long; florets 6-8 mm long; awns 20-50 cm long, mostly one-geniculate, the first segment with hairs 1-2 mm long. • Crevices and rocky ledges and cliffs, limestone substrate, sometimes in well-developed soil; uncommon in the southern desertic mountains and foothills; also known from adjacent Texas and Chihuahua; flowering April to mid-June. • Though relatively uncommon and scattered, populations of this grass are generally not threatened by development or grazing, and this species is not considered endangered or threatened.
Monocotyledous Plants - Poaceae

**Eriocoma hymenoides** (Roemer & J.A. Schultes) Rydberg [membrane-like] **INDIAN RICEGRASS** [Achnatherum hymenoides (Roemer & J.A. Schultes) Barkworth, Eriocoma cuspidata Nuttall, Oryzopsis hymenoides (Roemer & Schultes) Ricker ex Piper, Stipa hymenoides Roemer & Schultes]. Perennial, 20-50 cm tall or more; blades convolute, to 1 mm wide; panicles of dichotomous branching, to 20 cm long and 15 cm wide; spikelets on long divergent pedicles; glumes subequal, 5-7 mm long; florets fusiform, 4-6 mm long; awns 3-6 mm long, straight, early-deciduous. Sandy plains and dunes, in nearly every county of the state. The open, dichotomously branching panicle with long pedicles is unique among our species of *Eriocoma*. **INDIAN RICEGRASS** hybridizes with several species of *Eriocoma*, *Pappostipa*, and *Nassella*; these are referred to as *E.* *bloomeri* (Bolander) Romaschenko, and are reported to all be sterile. This is an attractive grass with potential as an ornamental, especially in the more arid regions in the state. The seedhead has the same branching pattern as chicken-wire.

**E. nelsonii** (Scribner) Romaschenko [for Aven Nelson (1859-1952), teacher and eminent Wyoming botanist] [*Achnatherum nelsonii* (Scribner) Barkworth, *Stipa nelsonii* Scribner]. Perennial, 40 to 100 cm or more tall; blades flat when fresh, 3-7 mm wide (sometimes less); panicles to 30 cm long and 2 cm wide; glumes subequal, the lower slightly longer, 6-12 mm long; florets fusiform, 4-7 mm long; awns 18-30 mm long, twice-geniculate. Infrequent and only recently accurately reported (2006) in mixed conifer forests in the northern mountains; meadows and clearings in the forest; flowering spring to early summer.

**E. perplexa** (Hoge & Barkworth) Rosens, [confused, obscure, or perplexing] [*Achnatherum perplexum* Hoge & Barkworth, *Stipa columbiana* of NM reports, *Stipa minor* of NM reports, *Stipa nelsonii* of NM reports, *Stipa perplexa* (Hoge & Barkworth) J. Wipt & S.D. Jones]. Perennial, 35-85 cm tall; blades flat when fresh, 1-3 cm wide; panicles to 25 cm long and 2 cm wide; glumes unequal, 1-3-nerved, the lower 10-12 mm long, the upper 2-3 mm shorter; florets fusiform, 5-8 mm long; apical lemma lobes 0.5-1.2 mm long; awns 10-20 mm long, once- to twice-geniculate. Rocky hills and woodlands, most common in the semi-arid southern regions, but extending northward to the Colorado state line; flowering summer to fall. This can be difficult to distinguish from *Achnatherum perplexum*, and we must rely on the long lemma lobes and sometimes 3-nerved glumes of *A. lobatum* for accurate determination.

**E. lettermanii** (Vasey) Romaschenko [for George Washington Letterman (1841-1913), Missouri school-teacher and reclusive botanist] [*Achnatherum lettermanii* (Vasey) Barkworth, *Stipa lettermanii* Vasey]. Perennial, 25-80(90) cm tall; collars of the flag leaves glabrous; blades rolled to flat when fresh, 1-2 mm wide; panicles 7-20 cm long, to 1 cm wide; glumes subequal, 6-10 mm long; florets fusiform, 4-6 mm long; paleas ¾ to nearly as long as the lemma; awns 12-25 mm long, twice-geniculate. Sagebrush flats and hills, dry mountain meadows and clearings, from sagebrush to subalpine communities; widespread in the mountains of the state, but not common. Similar to the equally infrequent *E. nelsonii* and the more common *E. perplexa*, but those species have broader blades and shorter paleas less than ⅔ the length of the lemma.

**E. robusta** (Vasey) Romaschenko [robust] **SLEEPYGRASS** [*Achnatherum robustum* (Vasey) Barkworth, *Stipa robusta* Vasey, S. vaseyi Scribner, *Stipa viridula* Trinian var. robusta Vasey]. Perennial, (60)80-180 cm tall or more; collars hairy, those of the flag leaves densely so; blades flat when fresh, 4-10 mm wide; panicles 15-30 cm long, 1-3.5 cm wide; glumes subequal, 9-12 mm long; florets fusiform, 6-9 mm long; the apical hairs to 1.5 mm long; paleas 2/3-¾ as long as the lemma; awns 20-35 mm long, twice-geniculate. Mountain grasslands, clearings, and dry slopes in the pitoen of ponderosa pine communities; flowering late summer to fall. The species is aptly named: it has been confused with *Eriocoma nelsonii*, from which it differs in having narrower blades, unequal glumes, and shorter awns; nearly all the reports of *E. nelsonii* in New Mexico refer to this species. The type is from Bernalillo County.

**E. scribneri** (Vasey) Romaschenko [for Frank Lamson-Scribner (1851-1938), renowned agrostologist] [*Achnatherum scribneri* (Vasey) Barkworth, *Stipa scribneri* Vasey]. Cespitose perennials 30-90 cm tall; blades flat or rolled when fresh, 2-4 mm wide; panicles to 24 cm long and 1 cm wide; glumes strongly unequal, the lower 10-17 mm long and often curving outward, the upper 2-4 cm shorter; florets fusiform, 10-15 mm long, the sharp callus extension to 1.5 mm long, with apical hairs 2-3 mm long; awns 14-25 mm long, mostly once-geniculate. Dry rocky hills and woodlands, widespread in the state to ponderosa pine communities. The usually curving glumes, long sharp callus, and long hairs at the tip of the lemma help to distinguish this sometimes confusing species.

**Erioneuron** [woolly nerve] **TRIDENS, WOOLLYGRASS** [3]. Tufted or stoloniferous perennials; leaves mostly basal; sheaths open; auricles absent; ligules a ring of hairs; blade margins white, cartilaginous; inflorescence a panicule, sometimes raceme-like; spikelets several-flowered; disarticulation above the glumes and between the florets; lemma 3-nerved, the nerves strongly hairy; awned or awnless; anthers 1 or 3. A few species of southern North America and southern South America. Species of *Erioneuron* were formerly treated in the genus *Tridens*.

1 Spikelets arranged in leafy clusters borne down among the pungent, spine-tipped blades; plants often stoloniferous and shorter than 1 cm. **M. pusilla** (Nutt.) Swallen 
2 Tip of lemma acute or with a notch 0.5 mm or less deep; both glumes shorter than the lowermost floret. **E. pilosum**
3 Spikelets of vigorous plants 10-15 mm long, usually silvery or only slightly purple-tipped; lemma copiously pubescent at the base; lateral lemma nerves not extended into a mucro. **E. nealleyi**
4 Spikelets seldom longer than 10 mm, usually purplish-tinted or brownish-purple; lemma with some hairs but not copiously pubescent at the base; lateral lemma nerves extended into a mucro to 1 mm long. **E. avenacea**
Erioneuron avenaceum (Kunth) Tateoka [oat-like] *Erioneuron avenaceum* (Kunth) Tateoka var. *grandiflorum* (Vasey) Gould, *Erioneuron grandiflorum* (Vasey) Tateoka, *Triodia avenacea* (Kunth) Hitchcock, *Triodia grandiflora* (Vasey) Wooton & Standley, *Triodia avenacea* Kunth, *Triodia grandiflora* Vasey). Tufted or infrequently stoloniferous perennial, 7–40 cm tall; blades sparsely pilose; panicles 2–10 cm long; spikelets 6–10 mm long, with 4–20 florets; upper glume equalizing or surpassing the lower floret; lemmas 4–7 mm long, the lobes 1–2 mm long, with awns 2–4 mm long; anthers 3. Limestone hills and rocky outcrops in the southcentral region. Our material belongs to var. *avenaceum*.

Erioneuron nealleyi (Vasey) Tateoka [for Greenleaf Citlley Nealley (1846–1896), USDA plant collector] *Erioneuron avenaceum* (Kunth) Tateoka var. *nealleyi* (Vasey) Gould, *Triodia nealleyi* (Vasey) Wooton & Standley, *Triodia nealleyi* Vasey). Tufted perennial, 15–65 cm tall; blades pilose to villous; panicles 5–10 long, compact; upper glumes surpassing the lower floret; lemmas 4–6 mm long, the lobes 1.5–2.5 mm long, with awns 1–3.5 mm long; anther 1. Limestone hills and rocky outcrops in the southcentral region.

Festuca [pasture or food] FESCUE [12]. Tufted perennials, with or without rhizomes in addition, rarely stoloniferous; sheaths open to closed to about ¾ their length, sometimes to near the top; auricles absent; ligules membranous, often ciliate; blades flat to variously folded or rolled; inflorescence a panicle, sometimes raceme-like; spikelets with few to several florets; disarticulation above the glumes and between the florets; glumes usually surpassed by the florets, 1–3-nerved; lemmas 5–7-nerved, awned or awnless; anthers 3. A large genus of perhaps more than 500 species, in temperate to arctic regions of the world. Annual fescues, which generally have only a single anther, are treated in *Vulpia*. The classification of *Festuca* and related groups is problematic and controversial, with proposals ranging from having a single large inclusive genus (*Festuca*) that is entirely monophyletic but includes several genera traditionally recognized by many, all the way to having many small tightly circumscribed genera, many of those recognizing the genera *Festuca*, *Leucopoa*, *Lolium*, *Schodanora*, and *Vulpia*.

1. Blades mostly wider than 3 mm, usually at least somewhat lax and flat when fresh

2. Spikelets 2–4-flowered, 8–11 mm long; auricles absent; panicle branches spreading, at least below ......................... F. sororia

3. Spikelets (4)–5– to 9-flowered, 10–17 mm long; small auricles usually developed; panicle branches usually ascending ................................................................. go to *Schodanora*

4. Blades mostly less than 3 mm wide, usually rolled and somewhat stiff

5. Glumes (both) equaling or exceeding the upper florets; lemma awns 0–1.3 mm long ............................................. F. hallii

6. Glumes distinctly shorter than the upper florets; lemma awns various

7. Ligules 2.5–5(9) mm long; lemma awns 0–0.3 mm long; nodes usually visible and conspicuous; plants generally more than 50 cm tall ............................................... F. rubra

8. Ligules less than 2 cm long; lemma awns usually more than 0.5 mm long, occasionally shorter; nodes often not visible nor conspicuous; plant height various

9. Plants usually with short rhizomes, the shoots often loosely tufted; basal sheaths reddish and rapidly separating into thread-like fibers (the whitish veins)

10. Anthers 1.8–4.5 mm long; ovary apices glabrous ................................................................. F. rubra

11. Anthers 0.6–1.4 mm long; ovary apices densely pubescent ......................................................................................... F. earlei

12. Plants lacking rhizomes, the shoots loosely to densely tufted; basal sheaths usually not reddish nor separating into thread-like fibers (sometimes thus separating in *F. calligera*)

13. Anthers 2–4 mm long (sometimes shorter in *F. trachyphylla*)

14. Blades, especially the older ones, strongly laterally compressed, thickened and stiff, 0.5–1 mm wide ...... *F. trachyphylla*

15. Blades, even the older ones, at least somewhat terete, not thickened, but thread-like, 0.2–0.4 mm wide

16. Peduncle and lower panicle branches densely scabrous; old basal sheaths conspicuous at the base of the clump, generally 4–12 cm long (rarely shorter); body of larger lemmas 5–9 mm long, the awn 0.5–2.5 mm long; ovary apex pubescent ................................................................. F. arizonica

17. Peduncle and lower branches glabrous or nearly so; old basal sheaths conspicuous or not at the base of the clump, 1–3 cm long; body of larger lemmas 3.5–5.5 mm long, the awn 1–7 mm long; ovary and grain apex glabrous or with a few sparse hairs

18. Body of larger lemmas 3.5–5.5 mm long, the awn 1–2.5 mm long; lower glume 2.5–3.5 mm long; ovary apex with a few sparse hairs at maturity (glabrous when very young); grain 2–3 mm long ................................................. *F. calligera*
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10 Body of larger lemmas (4.5-5.5 mm long, the awn 2-7 mm long; lower glume 3.5-4.5 mm long; ovary apex glabrous at maturity and when very young; grain 4-5 mm long)..............................F. idahoensis

7 Anthers 0.4-1.7 mm long, rarely longer

11 Plants found only as ornamentals and border plants (in New Mexico), never in native habitats; foliage markedly bluish-glaucous in dense hemispheric tufts; ovary and grain apex densely pubescent...........................................F. glauca

11 Plants not growing as ornamental landscape plants, planted infrequently as a pasture grass, common in native mountain habitats; growth form various, but usually not in dense hemispheric tufts; foliage somewhat glaucous to green; ovary and grain apex glabrous or pubescent

12 Plants 3-10 cm tall

13 Lemma body 2-3 mm long, with an awn 0.5-1.5 mm long; spikelets with 2, occasionally 3, florets; panicle branches at lowest node usually 2-3; ovary and grain apex pubescent........................................F. minutiflora

13 Lemma body 3-5.5 mm long, with an awn 2-3.6 mm long; spikelets with 3-4 florets, occasionally only 2; panicle branches at lowest node 1; ovary and grain apex glabrous..............................F. brachyphylla

12 Plants over 10 cm tall, usually 15-50 cm tall

14 Basal sheaths reddish and splitting into thread-like fibers (the whitish veins) in age; ovary and grain apex pubescent..........................................................F. earlei

14 Basal sheaths mostly straw-colored to brownish, not splitting into thread-like fibers in age (occasionally so in F. brachyphylla); ovary and grain apex glabrous

15 Blades soft, striate from the veins showing, somewhat wrinkled in drying, with little or no sclerenchyma tissue; spikelets and foliage greenish; culms usually less than twice the height of the leaves; anthers 0.5-1.3 mm long; rachilla internodes of middle florets 0.6-0.8 mm long ......................F. brachyphylla

15 Blades stiff, terete or sulcate, not striate nor wrinkled, the veins generally not visible because of a build-up of sclerenchyma tissue; spikelets and foliage often glaucous; culms usually twice the height or more of the leaves; anthers 1-1.7 mm long (rarely longer); rachilla internodes of middle florets 0.9-1.1 mm long ....

.............................................................................F. saximontana

**Festuca arizonica** Vasey [of Arizona] ARIZONA FESCUE [Festuca ovina Linnaeus var. arizonica Hackel]. Densely tufted perennial, without rhizomes, 40-100 cm or more tall; sheaths persistent, more than 3 cm long; ligules 0.5-2 mm long; peduncle densely scabrous or pubescent below the panicle; panicles 6-20 cm long; lemmas 5.5-9 mm long; awns 0.5-3 mm long; anthers 2-4 mm long; ovary apices densely pubescent. ●High mountain grasslands throughout the mountain regions of the state; our most common fescue. ▲Confused with the much less common Festuca idahoensis, q.v. This and the other fine-leaved fescues come out of a large and unwieldy Festuca ovina Linnaeus, which is now restricted to European plants.

**Festuca brachyphylla** J.A. Schultz ex J.A. & J.H. Schultz [short-leaved]. Densely or loosely tufted perennial, 5-40 cm tall; sheaths persistent or sometimes splitting into thread-like fibers; ligules 0.1-0.4 mm long; panicle 2-5 cm long, narrow; lemmas 3.5-4.5 mm long; awns 1-3 mm long; anthers 0.5-1 mm long; ovary apices glabrous. ●Alpine grasslands in the northern mountains. ▲Our plants belong to subs. coloradensis Frederiksen [of Colorado] [Festuca ovina var. brachyphylla & Festuca ovina var. brevifolia of NM reports]. §

**Festuca calligera** Piper [beauty-bearing]. Densely tufted perennial, without rhizomes, 15-50 cm tall; sheaths persistent (rarely splitting in age); ligules 0.3-0.5(1) mm long; panicles 3-15 cm long; lemmas 4-6 mm long; awns 1.2-5 mm long; anthers 2.2-3.5 mm long; ovary apices sparsely pubescent. ●Relatively rare, mostly in the southcentral mountains (but extending north to Colorado), and usually growing with Arizona fescue. ▲This and the other fine-leaved fescues come out of a large and unwieldy Festuca ovina Linnaeus, which is now restricted to European plants.

**Festuca earlei** Rydberg [for Franklin Sumner Earle (1856-1929), American mycologist]. Loosely tufted perennial, often with short rhizomes, 15-45 cm tall; sheaths closed about 1/2 their length, separating into fibers; ligules 0.1-0.6 mm long; panicles 3-8 cm long; lemmas 3.4-5.5 mm long; awns mostly 1-1.5 mm long; anthers 0.6-1.4 mm long; ovary apices densely pubescent. ●Subalpine and alpine meadows, grassy slopes at medium to high elevations. ▲Must be taken to observe the short rhizomatous shoots, often absent in herbarium specimens. Similar to Festuca rubra, which is distinguished by its glabrous ovary apices and longer anthers.

**“Festuca glauca”** BLUE FESCUE. Perennial; introduced from Europe as an ornamental landscape plant, ideal for borders and accents, with numerous cultivars; not known outside of cultivation. ▲We use this provisional name for several species that have been used in the nursery trade; they are all characterized by dense rounded clumps with markedly bluish foliage and narrow blades. They have gone most commonly by the name *F. brachyphylla*; with numerous cultivars; not known outside of cultivation.

**Festuca hallicus** (Vasey) Piper [for Elihu Hall (1822-1882), American plant collector from Illinois] [Melica hallicus Vasey]. Densely tufted perennial, with short rhizomes, 20-85 cm tall; sheaths open for 1/2 or more their length, not separating into fibers, persistent; ligules 0.3-0.6 mm long; blades usually folded, to about 1.5 mm across, rarely flat to 3 mm wide; peduncles glabrous to sparsely scabrous; panicles 6-16 cm long, with 1-2 branches per node, the branches erect to stiffly spreading; glumes as long as the spikelet, exceeding the florets, 7-10 mm long; lemmas 5.5-9 mm long; awns absent to 1.3 mm long; anthers 4-6 mm long; ovary apices sparsely pubescent. ●High-elevation meadows and forest glades in the northern mountains; known from a single recent collection, Taos County, at 10,200 ft. ▲Distinctive by the narrow, rolled, blades long, glumes, and nearly awnless florets. Its occurrence in the northern mountains is probably more common than indicated by the collections, being overlooked among similar narrow-leaved Festuca species.

**Festuca idahoensis** Elmer [of Idaho] DAHO FESCUE [Festuca ovina Linnaeus var. ingrami Hackel ex Beal]. Densely tufted perennial, without rhizomes, 25-85 cm tall; sheaths persistent, less than 4 cm long; ligules 0.2-0.6 mm long; peduncle mostly glabrous, occasionally somewhat scabrous; panicles 5-16 cm long; lemmas 4.5-5.5 mm long; awns 2-7 mm long, occasionally shorter; anthers 2.5-4.5 mm long; ovary apices glabrous. ●Mountain grasslands of the central (mostly northern) cordillera, not common. ▲Not nearly so common as Festuca arizonica, with which it is easily
confused, but distinguished in New Mexico by the mostly smooth pedsuncles, often shorter shoots, shorter sheaths, mostly shorter lemmas, and glabrous ovary apices of *F. idahoensis*. Much of what has been called *F. idahoensis* in recent years belongs to *F. trachyphylla*. This and the other fine-leaved fescues come out of a large and unwieldy *Festuca ovina* Linnaeus, which is now restricted to European plants.

**Festuca minitiflora** Rydberg [small-flowered] *Festuca ovina* Linnaeus var. minitiflora (Rydberg) J.T. Howell. Loosely or densely tufted perennial, without rhizomes, mostly 3-10 cm tall in our populations; sheaths persistent; ligules 0.1-0.3 mm long; panicles 1-5.5 cm long; spikelets with 2-3 florets; lemmas 2.3-3.5 mm long; awns 0.5-1.5 mm long; anthers 0.5-1.2 mm long; ovary apices sparsely hairy, rarely glabrous. ●Alpine grasslands in the northern mountains. ●Similar to *Festuca brachyphylla*, but distinguished by the key features.

**Festuca rubra** Linnaeus [red]. Loosely or somewhat tufted perennial, with short rhizomes, 10-50 cm tall; sheaths (especially the vegetative ones) closed about ¾ their length, rapidly separating into thread-like fibers (the whitish veins); ligules 0.1-0.5 mm long; panicles 3-25 cm long; lemmas 4.9 mm long; awns 0.5-4.5 mm long; anthers 2-4.5 mm long; ovary glabrous. ●High mountain grasslands and open clearings, sometimes found in lawns. ●Sheaths splitting into thread-like segments is a feature shared with *Festuca calligera* (rarely), and *F. earlei*. Plants in the wild seem to belong to subsp. *rubra*. lawn and turf mixtures might also include subsp. *commutata* Gaudin (CHEWING’S FESCUE, after George Chewings, who produced seed in New Zealand beginning in the late 1800s).

**Festuca saximontana** Rydberg [rocky mountain] *Festuca ovina* Linnaeus var. saximontana (Hackel) Krajina. Densely to loosely tufted perennial, without rhizomes, 50-100 cm or more tall; nodes visible and conspicuous; sheaths persistent, rarely splitting; blades stiff, the veins usually not visible; ligules 0.1-0.5 mm long; panicles 3-12 cm long; lemmas 3.5 mm long; awns 1-2.5 mm long; anthers 1-2.2 mm long; ovary glabrous. ●Mountain grasslands and forest clearings, mostly in the northern mountains, but also known from Grant County. ●Included by some as a variety of the similar *Festuca brachyphylla*, which differs in the features in the key.

**Festuca sororia** Piper [a sister, closely related]. Loosely tufted perennial, without rhizomes, 60-120 cm tall; sheaths splitting into thread-like fibers in age; ligules 0.3-1.5 mm long; blades flat, 3-6 mm or more wide; panicles 10-25 cm long, the branches lax and spreading below; spikelets 2-4(5)-flowered; lemmas 5-8 mm long; awns awnless or with awns to 2 mm long; anthers 1.5-2.5 mm long; ovary apices hairy. ●Moist, shaded slopes and stream banks in the mountains.

**Festuca thurberi** Vasey [for George Thurber (1821-1890), American botanist and naturalist] THURBER’S FESCUE. Densely tufted perennial, without rhizomes, 50-100 cm or more tall; nodes visible and conspicuous; sheaths persistent; ligules 2-9 mm long; panicles 10-17 cm long, the branches loosely arranged; lemmas 6-10 mm long, awnless; anthers 3-4.5 mm long; ovary apices densely hairy. ●High mountain grasslands in the central cordillera. ●Plants are conspicuous by their large tufts, exposed nodes, long ligules, and awnless spikelets. §

*Festuca trachyphylla* (Hackell) Krajina [rough-leaved] HARD FESCUE *Festuca brevipila* Tracy, *Festuca ovina* Linnaeus var. duriaucula of many authors, not Linnaeus, *Festuca ovina* Linnaeus subvar. *trachyphylla* Hackell. Densely tufted perennial, without rhizomes, 15-75 cm tall; ligules 0.1-0.5 mm long; blades strongly folded, thickened and stiff, 0.5-1 mm wide (folded); panicles 3-15 cm long; lemmas 3.8-6 mm long; awns 0.5-3 mm long; anthers 2-3.4 mm long; ovary apices glabrous. ●Introduced for reseeding, erosion control, and range land restoration; grassy slopes of the northern mountains; native to Europe. ●Easily confused with the much less common *Festuca idahoensis*, but the thickened, stiff blades of *Festuca trachyphylla* are quite distinctive.

**Glyceria** [sweet] MANNAGRASS [12].


**Panicularia nervata** (Willdenow) Kuntze var. elata (Nash ex Rydberg) M.E. Jones. Tufted perennial, 75-150 cm tall; culms 2.5-8 mm thick, spongy in the mid-stem leaves; nodes visible and conspicuous; sheaths persistent, rarely splitting; blades 0.5-1 mm wide (folded); ligules 0.1-0.5 mm long; panicles 2.5-7.5 cm long; spikelets 2-4(5)-flowered; lemmas 5-8 mm long; awns awnless or with awns to 2 mm long; anthers 1.5-2.5 mm long; ovary apices glabrous. ●High mountain grasslands and open clearings, sometimes found in lawns. ●Sheaths splitting into thread-like segments is a feature shared with *Festuca calligera* (rarely), and *F. earlei*. Plants in the wild seem to belong to subsp. *rubra*. lawn and turf mixtures might also include subsp. *commutata* Gaudin (CHEWING’S FESCUE, after George Chewings, who produced seed in New Zealand beginning in the late 1800s).

**Glyceria borealis** (Willdenow) Kuntze var. elata (Nash ex Rydberg) Piper. Perennial, 75-150 cm tall; culms 2.5-8 mm thick, spongy in the internodes, decumbent and rooting at the nodes; blades 6-15 mm wide, lacking papillae but scabrous; panicles 15-30 cm long; spikelets 3-6 mm long; Caitlan 1.5-3 mm wide; lemmas 1.7-2.2 mm long, the apices prow-shaped; anthers 2, 0.5-0.8 mm long. ●Mountains and ponds in the northern mountains. ●Floating blades have non-wettable upper surface because of the papillae.

**Glyceria elata** (Nash ex Rydberg) M.E. Jones [elevated, tall] *Panicularia nervata* (Wilddenow) Kuntze var. elata (Nash ex Rydberg) Piper. Perennial, 75-150 cm tall; culms 2.5-8 mm thick, spongy in the internodes, decumbent and rooting at the lower nodes; blades 6-15 mm wide, lacking papillae but scabrous; panicles 15-30 cm long; spikelets 3-6 mm long, flattened, 1.5-3 mm wide; lemmas 1.7-2.2 mm long, the apices prow-shaped; anthers 2, 0.5-0.8 mm long. ●Mountains and ponds in the northern mountains. ●Floating blades have non-wettable upper surface because of the papillae.
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**Glyceria grandis** S. Watson [large, great] [Panicularia grandis (S. Watson) Nash]. Perennial, 50-150 cm or more tall; culms 8-12 mm thick, erect to decumbent and rooting at the nodes; blades 5-15 mm wide, lacking papillae; panicles 16-40 cm long; spikelets 3.2-10 mm long, flattened, 2-3 mm wide; lemmas 1.8-3 mm long, the apices flat or nearly so, not prow-shaped; anthers 3, 0.5-1.2 mm long. ● Marshes, swammy ground, irrigation banks, and springs in the foothills and mid-elevations in the mountains.

**Glyceria striata** (Lamarck) A.S. Hitchcock [striped] [Glyceria nervata Trininius, Glyceria striata (Lamarck) A.S. Hitchcock var. striata (Schrenk) Fremdall, Panicularia nervosa (Wildenow) Kunze, Poa striata Lamarck]. Perennial, 20-80 cm tall, sometimes taller; culms 1.5-3.5 mm thick, not or slightly spongy, only sometimes rooting at the nodes; blades 2-6 mm wide, lacking papillae but scabrous; panicles 6-25 cm long; spikelets 1.8-4 mm long, flattened, 1.2-3 mm wide; lemmas 1.2-2 mm long, the apices prow-shaped; anthers 2, 0.2-0.6 mm long. ● Marshes, springs, wet ground, stream-banks, in the mountains. ♦ This is the most common species of Glyceria in the state. See comment under G. elata. Plants are palatable, and may produce cyanide, but stock poisonings are rare.

**Graphephorum** produce cyanide, but stock poisonings are rare.

**Gymnopogon** [naked beard] [0].


**Helictotrichon** [twisted hair] OATGRASS [1].

Tufted perennials; sheaths open; auricles absent; ligules membranous, short, about as long as wide; blades rolled, the adaxial surface ribbed; inflorescence a weakly developed panicle, raceme-like; spikelets with 2-5 florets; disarticulation above the glumes and between the florets; glumes nearly as large as the spikelet, 1-3-nerved; rachillas pilose on all sides, lemmas 3-5-nerved, awned from about midlength; awns geniculate, twisted below; anthers 3 ♦. Traditionally, the genus *Avenula* has been included in *Helictotrichon*, but the two are distinguished by features of the ligules, blades, rachillas, lodicules, embryos, and root anatomy (see Romero-Zarco 2011).

**Helictotrichon montiorum** (Schrenk) Henrard [for Julius Sterling Morton (1832-1902), U.S. Secretary of Agriculture for President Grover Cleveland] [[Avena montiorum] Scribner]. Tufted perennial, 20-50 cm tall; blades 1.2-2 mm wide, rolled or folded, 2-5(8) cm long; spikelets 4-8 mm long, mostly with 2 florets; glumes subequal and exceeding the lower floret; rachillas 1.5-2 mm long, with hairs to 1 mm; lowermost lemmas 4-6.5 mm long, obscurely bifid with broad points but not setaceous teeth, awnless or an awn coming from the sinus to 2 mm long. ● Marshy ground around seeps and springs at high elevations in the northern mountains.

**Hesperostipa** [western Stipa] NEEDLE-AND-THREAD [3].

Tufted perennials, lacking rhizomes; sheaths open; auricles absent; ligules membranous, sometimes ciliate; inflorescence a panicle; spikelets with 1-5 florets; disarticulation above the glumes, the floret falling; glumes large, nearly equaling or exceeding the body of the lemma; lemmas indurate at maturity, the margins overlapping, the distal portion fused into a crown, awned; awns twice-geniculate; pales equal to the lemma, indurate at the apex; anthers 3. ● Species of *Hesperostipa*, strictly North American, were formerly recognized in the genus *Stipa*, now strictly Eurasian.

**Trisetum** [needles and thread] OATGRASS [1].


**Hesperostipa comata** (Trinius & Ruprecht) Barkworth [long-haired]. Tufted perennial, 25-100 cm or more tall; margins of lower sheaths not ciliate; ligules 1-7 mm long, the lower ones usually thin and lacerate; panicles 10-30 cm long; glumes 16-35, the upper glume slightly shorter than the lower; florets 7-13 mm long, the lemmas evenly white hairy; awns 6-22 cm long, any hairs shorter than 1 mm long. ●Plains, prairies, woodland clearings. ●We have two subspecies, both widespread in the state:

a Terminal segment of the awn curling to flexuous; lower panicle branches usually included in the sheath; lower cauline nodes usually hidden in the sheaths…subsp. *comata* [Stipa comata Trinius & Ruprecht].

a Terminal segment of the awn straight; lower panicle branches mostly exerted from the sheath; lower cauline nodes usually exposed…subsp. *intermedia* (Scribner & Tweedy) Barkworth [between] [Stipa comata Trinius & Ruprecht var. *intermedia* Scribner & Tweedy, Stipa tweedyi Scribner].

**Hesperostipa neomexicana** (Thurber) Barkworth [of New Mexico] NEW MEXICO FEATHERGRASS [Stipa neomexicana (Thurber ex Coulter) Scribner, Stipa pennata Linnaeus var. neomexicana Thurber ex Coulter]. Tufted perennial, 40-100 cm tall; sheaths not ciliate; ligules 0.5-3 mm long; panicles 10-30 cm long; glumes 30-60 mm long, subequal; florets 15-18 mm long; awns 12-22 cm long, hairs on the terminal segment (1)2-3 mm long. ●Plains, grassy hills, rocky slopes, usually on limestone, throughout the state. §

**Hesperostipa spartea** (Trinius) Barkworth [a rope or cord] [Stipa spartea Trinius]. Tufted perennial, 45-100 cm or more tall; margins of lower sheaths usually ciliate; ligules 0.3-7.5 mm long, the lower ones thick and not lacerate; panicles 10-25 cm long; glumes 22-45 mm long, subequal; florets 15-25 mm long, the lemmas with brownish hairs on the margins and in lines proximally, glabrous distally; awns 9-19 cm long, any hairs less than 1 mm long. ●Plains and prairies, scattered localities in the northern region.
**Heteropogon** [different awns] TANGLEHEAD [1].

Tufted annual or perennials; sheaths open, keeled; auricles absent; ligules membranous, sometimes ciliate; inflorescence a single raceme (rake), composed of repeating pairs of sessile and pedicelled spikelets; disarticulation in the raceme, the spikelet pairs falling together; sessile spikelets of the upper portion of the raceme fertile, fusiform, long-awned, the hairy glumes concealing the florets; pedicelled spikelets sterile or staminate, flattened, awnless. ♦ About 5-6 species, mainly in tropical and subtropical regions.

1 Plants perennial; glumes of the upper pedicelled spikelets lacking glandular pits .......................................................... H. contortus

**Heteropogon** contortus (Linnaeus) Beauvois ex Roemer & J.A. Schultes [contorted] [Andropogon contortus Linnaeus].

Tufted perennial, 20-100 cm or more tall; blades flat or folded, blunt, 2-7 mm wide; racemes 3-7 cm long; awned sessile spikelets 5-10 mm long, with awns 6-10 cm long; pedicelled spikelets 6-10 mm long, lacking glandular pits. ● Desert hills in the southwestern region. ♦ This is a native species, its seeds being found in ancient packrat middens in the Southwest.

**Heteropogon** melanocarpus (Elliott) Bentham [black-fruited] [Andropogon melanocarpus Elliott]. Tufted annual, 50-200 cm tall; sheaths with glandular pits along the keel; blades usually folded, 3-12 mm wide; racemes 3-7 cm long; awned sessile spikelets 10-14 mm long, with awns 10-15 cm long; awnless pedicelled spikelets 16-21 mm long, the midnerves glandular-pitted. ● This occurs in adjacent Arizona, and perhaps may be found in the bootheel region; it is a tall rank weedy annual with pits or glandular depressions on the first glumes of the staminate spikelets.

**Hierochloe** [holy grass] SWEETGRASS [1].

Tufted or rhizomatous perennials; sheaths open; auricles absent; ligules membranous, sometimes ciliate; inflorescence a panicles, the branches sometimes poorly developed; spikelets with 3(4) florets, the lower two staminate and appearing on either side of the upper one, the upper (central) one fertile, sometimes a terminal smaller sterile floret present at the tip; disarticulation above the glumes, the florets falling together; glumes nearly concealing the spikelets, 3-awned, thin, papery; staminate (lateral) florets large, hairy along the margins, awnless; fertile (central) floret smaller, nearly glabrous, awnless; palea 3-awned. ● About 35 species of temperate to subarctic regions. **Hierochloe** is sometimes merged into **Anthoxanthum**, but the two are adequately distinct in North America, and we maintain them in the traditional sense.

**Hierochloe odorata** (Linnaeus) Beauv. - Loosely tufted perennial, 10-75 cm tall, with elongate rhizomes; panicles 3-12 cm long, 1.5-7 cm wide; spikelets 3-7 mm long, tawny colored; glumes subequal, exceeding the florets; stamineate florets 3.5-5 mm long, sometimes with an awn to 0.5 mm long; fertile florets 2.5-4 mm long. *Wet high mountain meadows and subalpine to alpine slopes, flowering very early; native to Europe. The native Hierochloe hirta (Schrank) Borbas is not yet known from New Mexico, but occurs in Colorado and northward; it has often been circumscribed to include H. odorata. It may be told from H. odorata as follows:

- a Longest hairs on the distal portion of the bisexual/fertile floret mostly less than 0.5 mm long, longer hairs, if present concentrated near the midvein. **H. odorata**

**Hilaria** [for Auguste François César Prouv'anc'ant de Saint-Hilaire (1779-1855), French botanist] [5].

Annuals and perennials, tufted, rhizomatous, or stoloniferous; sheaths open; auricles absent; ligules membranous, often ciliolate; inflorescence functionally a spike, with 3 spikelets per node, the cluster sitting on a ledge-like indentation on the zig-zag rachis; disarticulation at the base of the spikelet cluster, which falls entire; lateral spikelets of the cluster with 1-4 staminate or sterile florets, the glumes deeply lobed and short-awned; central spikelet of the cluster with a single fertile floret, the glumes lobed and awnless. *Rhizomatous members of this group have been treated in the genus Pleuraphis, which is set off by several features, but recent detailed studies (see Columbus & Smith [2010] for a summary) show the advisability and practicality of returning to an all-encompassing Hilaria.*

1 GLUMES THICKENED, INDURATE, AND FUSED AT THE BASE; PLANTS STOLONIFEROUS AND NOT RHIZOMATOUS AND RARELY TALLER THAN 30 CM


1 GLUMES PAPERY OR MEMBRANOUS THROUGHOUT, NOT FUSED AT THE BASE; PLANTS USUALLY RHIZOMATOUS AND RARELY SHORTER THAN 30 CM

3 LOWER CAULINE INTERNODES GLABROUS

4 GLUMES OF THE LATERAL SPIKELETS FAN-SHAPED, THE AINS NOT EXCEEDING THE APICAL LOBES; CAULINE NODES SHORT-HAIRY, SOMETIMES GLABROUS .............................................................................................................................................................................. **H. mutica**

4 GLUMES OF THE LATERAL SPIKELETS LANCEOLATE OR PARALLEL-SIDED, THE AINS NOT EXCEEDING THE APICAL LOBES; CAULINE NODES LONG-HAIRY OR GLABROUS .............................................................................................................................................................................. **H. jamesii**

**Hilaria belangeri** (Steudel) Nash [Charles Paulus Bélanger (1805-1881), French botanist] CURLY MESQUITE [Anthephora belangeri Steudel, *Hilaria texana* Nash, *Hilaria cenchroides* Kunth]. Tufted perennial, 5-35 cm tall, usually with stolons; blades sparsely pilose on the adaxial surface with bulbous-based hairs; spikes 2-4 cm long; lateral spikelets with 2-3 staminate florets or 1 sterile floret, the glumes indurate and fused at the base, eglandular or the bases spotted with a few dark glands, the awns from below midlength. **Desert hills and rocky slopes in the southern mountains. This species was inadvertently named for Bélanger by Steudel, instead of after Jean Louis Berlandier, who collected the plant in Mexico. Plants lacking stolons have been called var. *longifolia* (Vasey) Hitchcock, and are supposedly present in southern New Mexico, but collections are unknown.**

**Hilaria jamesii** (Torrey) Bentham [for Edwin P. James (1797-1861), American botanist and naturalist] GALLETA [Pleuraphis jameesi (Torrey)]. Loosely tufted perennial, with strong rhizomes and sometimes stolons, 25-65 cm tall; spikes 2-6 cm long; spikelet cluster 6-8 mm long; lateral spikelets with 3 staminate florets, the glumes lanceolate or parallel-sided with dorsal awns exceeding the apices. **Plains and foothills; widespread, but mostly in the northern half of the state.**

This is the northern equivalent of TOBOSA. The origin of the common name, which means cookie or biscuit in Spanish, is obscure, but perhaps refers to its use as forage by livestock. **§**

**Hilaria mutica** (Buckley) Bentham [cut off] TOBOSA [Pleuraphis mutica Buckley]. Loosely tufted perennial, with often strong rhizomes, 30-60 cm tall; spikes 4-8 cm long; spikelet cluster 5-8 mm long; lateral spikelets with 1-2 stamineate florets, the glumes fan-shaped with dorsal awns not exceeding the apices. **Plants and gravelly hillsides, mostly in the southern half of the state.**

**TOBOSA** is one of our important range grasses of the southern plains, swales, and playas, but it becomes increasingly unpalatable with maturity. This and *Hilaria jamesii* are essentially indistinguishable by vegetative means, and were both confusingly called BLACK GRAMA in the early days in the Southwest. **§**

**Hilaria rigida** (Thurber) Bentham ex Scribn [rigid] BIG GALLETA [Pleuraphis rigida Thurber]. Tufted perennial, sometimes rhizomatous, 40-200 cm or more tall, much branched and becoming shrubby; lower internodes tomentose; spikes 4-12 cm long; spikelet cluster 6-12 mm long; lateral spikelets with 2-4 florets, the lower ones stamineate, the upper sterile, the glumes lanceolate or parallel-sided with dorsal awns exceeding the apices. **Introduced from California and Arizona for range reseeding trials, without success, but a few plants remain in the test plots of the College Ranch of New Mexico State University.**

**Hilaria swallenii** Cory [for Jason Richard Swallen (1903-1991), American agrostologist of distinction]. Loosely tufted perennial, 10-35 cm tall, with stolons; blades mostly glabrous but also sparsely pilose; spikes 1-4 cm long; lateral spikelets with 2 florets, the lower sterile and the upper stamineate, the glumes indurate and fused at the base, evenly spotted with dark glands, the awns from above midlength. **Desert hills and rocky slopes in the southwestern desert mountains; apparently less common than *Hilaria belangeri.*

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Holcus [a kind of grain] VELVETGRASS [1].

Tufted or rhizomatous perennials or annuals; sheaths open; auricles absent; ligules membranous, ciliate; inflorescence a panicle; spikelets with 2(3) florets, the lowermost fertile, the upper staminate or sterile; rachilla curved below the lower floret; disarticulation below the glumes; glumes equaling or exceeding the florets, keeled; lemmas 3-5-nerved, the lower awnless, the upper awned; anthers 3.

*Holcus lanatus* Linnaeus [wooly]. Tufted perennial, lacking rhizomes, 35-100 cm tall; lower internodes densely pilose; sheaths densely pubescent; blades 5-10 mm wide, densely soft-hairy; panicles 3-20 cm long, the branches and pedicels hairy; spikelets 3-6 mm long; glumes ciliate on the midnerve, the upper awn tipped; upper lemma with a hooked awn 1-2 mm long. ♦ Adventive in cool, moist, waste places; native to Europe. ♦ The foliage has a distinctive gray-hairy look, giving a field of VELVETGRASS a fog-like appearance.

Hopia [for the Hopi Tribe of Native Americans] VINE MESQUITE [1].

Rhizomatous and stoloniferous perennials; sheaths open; auricles absent; ligules membranous; inflorescence a panicle with spike-like branches; spikelets with 2 florets, the lower staminate, the upper fertile; lower glume ¾ to nearly equaling the spikelet length; upper glume and lower lemma similar in size and appearance; lower palea developed; upper floret becoming indurate, smooth, forming a seedcase. ♦ *Hopia* is a monotypic genus segregated from *Panicum*, based on a suite of morphological, anatomical, chromosomal, and molecular evidence.


*Hopia obtusa* (Kunth) Zuloaga & Morrone [*Panicum obtusum* Kunth]. Stoloniferous perennial sometimes also with short rhizomes, 20-80 cm tall, the long stolons with conspicuously hairy nodes; lower sheaths pilose; ligules 0.2-2 mm long; panicles 5-15 cm long, the branches 2-6 in number; spikelets shaped like a rugby ball, 2.8-4.5 mm long, awnless. ♦ Usually heavy soils of swales, playas, flats, and low spots; sometimes planted to control soil erosion, throughout the state. §
Hordeum [ancient Latin name for barley] BARLEY [6].

Tufted annuals or perennials; sheaths open; auricles present or absent; ligules membranous; inflorescence a spike (spicate raceme) with 3 spikelets per node, the central sessile and fertile, the lateral pedicelled and usually staminate or sterile (fertile in cultivated forms); disarticulation below the spikelets and in the rachis, the 3 spikelets falling together with the rachis internode (above the glumes in cultivated forms); spikelets with a single floret; glumes awn-like; lemmas awned or awnless; anthers 3. About 40 or so species in the temperate regions of Africa, Eurasia, and the Americas. Species with a disarticulating main axis (all of ours except the annual cultivated species) are placed in the genus Cistion by some, but we maintain the genus in the more inclusive sense.


1 Rachis persistent, not breaking apart when mature; plants annual.................................H. vulgar

2 Rachis breaking apart when mature; plants annual or perennial

2 Glumes of the central spikelet without ciliate margins, at most scabrous; auricles usually lacking or weakly developed and less than 0.5 mm long

3 Plant perennial

4 Glumes of the central spikelet flattened near the base ..................................................H. arizonicum

5 Glumes of the central spikelet terete throughout, not flattened near the base

6 Glumes 7-20 mm long; awns of the lemmas 5-10(20) mm long ......................................H. brachyantherum

5 Glumes 20-150 mm long; awns of the lemmas 10-70 mm long........................................H. jubatum

3 Plants annual

6 Glumes bent outward at the base, strongly divergent when mature

7 Glumes of the central spikelets terete, not flattened near the base, 20-150 mm long........H. pubillum

7 Glumes of the central spikelets flattened near the base, 11-28 mm long............................H. arizonicum

6 Glumes erect at the base, ascending to only slightly divergent when mature

8 Glumes of lateral spikelets prominently flattened near the base; ligules 0.2-0.8 mm long ................H. pusillum

8 Glumes of lateral spikelets terete to slightly flattened near the base; ligules 0.6-1.8 mm long ..........H. arizonicum

**Hordeum arizonicum** Covas [of Arizona] [Cistion arizonicum (Covas) Löve]. Tufted annual to sometimes a short-lived perennial, 20-70 cm tall; auricles absent; ligules 0.6-1.8 mm long; spikes 5-12 cm long, 6-10 mm wide; glumes 11-28 mm long, flattened near the base; lemmas of the central spikelet 5-10 mm long.

- Moist mountain slopes and grassy hills, from mid- to high elevations. 
- Stabilized hybrids with Hordeum jubatum go under the name H. jubatum subsp. jubatum, q.v., below.

**Hordeum jubatum** Linnaeus [mane-like] FOXTAIL BARLEY. Tufted perennial, sometimes appearing annual, 20-80 cm tall; auricles absent; spikes 3-15 cm long; glumes 15-85 mm long, divergent, sometimes strongly so; lemmas of the central spikelet 4-8.5 mm long. 

- Moist ditches, meadows, roadsides, disturbed ground, throughout the state.
- Stabilized hybrids between Hordeum jubatum and H. brachyantherum are recognized as a subspecies of H. jubatum, as follows, and occur within the range of H. brachyantherum. §

- Glumes of the central spikelets (including awns) 30 mm or more long; lemma of central spikelet (including awn) 30 mm or more long...subsp. jubatum

- Glumes of the central spikelets (including awns) 20-30 mm long; lemma of central spikelet (including awn) 20-40 mm long...subsp. intermedium Bowden [between] [Hordeum caespitosum Scribn, Hordeum jubatum Linnaeus var. caespitosum (Scribn) Hitchcock].

- *Hordeum murinum* Linnaeus [mouse-like] MOUSE BARLEY [Cistion murinum (Linnaeus) Löve]. Loosely tufted annual, 3-100 cm or more tall; ligules 1-4 mm long; auricles well developed, 1-8 mm long; spikes 3-8 cm long, 7-16 mm wide; glumes 10-25 mm long, with distinct ciliate margins; lemmas of the central spikelet 8-14 mm long, with awns to 40 mm long. 

- Weedy ground; native to Eurasia. 

- The epithet murinum (neuter adjective from murinos, meaning mouse-like or mouse-colored) derives from mus, a mouse, and not murus, a wall; the confusion has led to its being called 'wall barley' (of walls would be rendered muralis). Appropriately, a game of "mousy-mousy" can be played by picking a spike, holding it upside down within a partly closed fist, and wiggling the fingers slightly to make the "mouse" crawl to the top and escape. We have two subspecies: §

- *Hordeum murinum* Linnaeus var. pubescens A.S. Hitchcock. Loosely tufted annual, 10-40 cm tall; auricles absent; ligules 0.2-0.8 mm long; spikes 2-9 cm long, 3-7 mm wide; glumes erect ascending, not divergent, 8-18 mm long; lemmas of central spikelet 5-8.5 mm long, with awns to 10 mm. 

- Waste places, nearly throughout the state. §

Baum, B.R. 1983. Morphometric re...subsp. jubatum, q.v., below.

Hordeum jubatum Linnaeus [mane-like] FOXTAIL BARLEY. Tufted perennial, sometimes appearing annual, 20-80 cm tall; auricles absent; spikes 3-15 cm long; glumes 15-85 mm long, divergent, sometimes strongly so; lemmas of the central spikelet 4-8.5 mm long. 

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- Waste places, nearly throughout the state. §

About 40 or so species in the temperate regions of Africa, Eurasia, and the Americas. Species with a disarticulating main axis (all of ours except the annual cultivated species) are placed in the genus Cistion by some, but we maintain the genus in the more inclusive sense.
Monocotyledonous Plants - Poaceae

*Hordeum vulgare* Linnaeus [common] BARLEY [Hordeum distichon Linnaeus, Hordeum triticiatum (Schlechtendal) Wendoorth]. Loosely tufted annual, to 150 cm tall; auricles to 1-6 mm long; spikes 5-10 cm long, 8-20 mm wide, the rachis usually persistent; central and lateral spikelets sessile when both are fertile, the lateral spikelets pedicelled when sterile; glumes 10-30 mm long, flattened near the base; lemmas of central spikelet 6-12 mm long, awned to awnless.

-Introduced barley crop also used for erosion control along roads, adventive along fields and roadsides; expected sporadically in any of the counties; native to Eurasia. **Barley is considered to be the first cereal grass to be domesticated, with 9,000 year old artifacts from Syria and Iraq. More than half of the barley grown in the United States is used as feed for livestock, and a quarter of the harvest is used in brewing of beer and whiskey. We have three cultivated races one might encounter:**

  a) Awns suppressed or variously deformed, commonly 3-cleft...the *triticeatum* phase **BEARDLESS BARLEY.**
  b) Lateral spikelets sessile, fertile, well-developed, and prominently awned...the *vulgare* phase **SIX-ROW BARLEY.**
  c) Lateral spikelets pedicelled, sterile, much smaller in size, and nearly awnless...the *distichon* Phase **TWO-ROW BARLEY.**

For the novice, especially without a hand lens, barley (*Hordeum vulgare*), rye (*Secale cereale*), and wheat (*Triticum aestivum*) may be difficult to distinguish. These features may be helpful: a) barley and rye have narrow, needle-like glumes; wheat has broad glumes.

- barley has three spikelets per node; rye and wheat have a single spikelet per node. Unfortunately, the hybrid between rye and wheat may take over a flower garden.

**Imperata** [for Ferrante Imperato (1550-1625), apothecary and naturalist of Naples] SATINTAIL [1].

<table>
<thead>
<tr>
<th>Species</th>
<th>Characteristics</th>
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<tbody>
<tr>
<td><em>Imperata brevifolia</em></td>
<td>Strongly rhizomatous perennial, 50-120 cm tall; panicles 16-34 cm long; callus hairs 8-12 mm long; spikelets 2.7-4 mm long; anthers 1.3-2.3 mm long. In New Mexico, known only from Doña Ana County along the Rio Grande floodplain; last found in 1939.</td>
</tr>
<tr>
<td><em>Imperata cylindrica</em> (Linnaeus) Beauvois var. <em>koenigii</em> (Retzius) T. Durand &amp; Schinz</td>
<td>Japanese Bloodgrass 'RED BARON.' Strongly rhizomatous perennial, 30-150 cm or more tall; panicles 6-25 cm or more long; callus hairs 9-16 mm long; spikelets 2.5-5.5 mm long; anthers 2.4-4.4 mm long. Cultivated as an ornamental landscape plant but not known to escape to the wild in New Mexico; native to Asia, India, Australia, Africa. Plants are aggressive from strong rhizomes and can completely take over a flower garden.</td>
</tr>
<tr>
<td><em>Kalinia obtusiflora</em> (Fournier) H.L. Bell &amp; Columbus</td>
<td>Rhizomatous and stoloniferous perennial; sheaths open; auricles absent; ligules membranous, ciliate; inflorescence a panicle; spikelets 5-10 florets; disarticulation above the glumes and between the florets, leaving the glumes; lemmas 3-nerved (sometimes 4 or 5), awnless; anthers 3; grains with a shallow groove. Formerly included as an anomalous member of <em>Eragrostis</em>; easily told by the rhizomes and puncturing blades.</td>
</tr>
</tbody>
</table>

**Kalinia** [alkali] ALKALI LOVEGRASS [1].

- About 10 species of tropical to subtropical regions.

1 Spikelets 3-4 mm long; foliage green; stem 1; native grass of floodplains. *Kalinia brevifolia*.

1 Spikelets 3-4 mm long; foliage reddish at least in age; stem 2; exotic grasses in cultivation as an ornamental landscape plant but not known to escape to the wild in New Mexico; native to Asia, India, Australia, Africa. *Kalinia obtusiflora*.

2 Spikelets 4.5 mm long. *Kalinia obtusiflora* var. *koenigii*. 

3 Spikelets 4-5 mm long; foliage reddish at least in age; stem 3; native grass of floodplains. *Kalinia obtusiflora* var. *leptocladia* (Retz.) T. Durand & Schinz.

4 Spikelets 5-6 mm long; foliage reddish at least in age; stem 4; native grass of floodplains. *Kalinia obtusiflora* var. *spicata* (Retz.) T. Durand & Schinz.

**Jarava**...go to *Pappostipa*

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3 Spikelets 4-5 mm long; foliage reddish at least in age; stem 3; native grass of floodplains. *Kalinia obtusiflora* var. *leptocladia* (Retz.) T. Durand & Schinz.

4 Spikelets 5-6 mm long; foliage reddish at least in age; stem 4; native grass of floodplains. *Kalinia obtusiflora* var. *spicata* (Retz.) T. Durand & Schinz.

5 Spikelets 5.5-6 mm long; foliage reddish at least in age; stem 5; native grass of floodplains. *Kalinia obtusiflora* var. *myosura* (Retz.) T. Durand & Schinz.
Trisetum canescens

Koeleria [for Georg Ludwig Koeler (1765-1807), German physician & botanist] [3].

Tufted, sometimes rhizomatous or stoloniferous, perennials or annuals; sheaths open, glabrous to pubescent; auricles absent; ligules membranous; blades flat to variously folded or rolled; inflorescence a panicle, often dense and spike-like, the rachis and branches velvety pubescent (ours) to glabrous; spikelets with 2-4 florets, awned to awnless; disarticulation above the glumes and between the florets, the rachilla usually prolonged above the uppermost floret; glumes slightly shorter to exceeding the lemmas, the first 1-nerved, the second 1-3-nerved; lemmas thin, (3)-(5)-(nerv-7)ed, the apices with 2-4 short awns or setae, the body with scarious margins, the awn (when present) dorsal; paleas not tightly enclosed by the lemmas; anthers 3. ♦About 60 or so species throughout the world. ♦We include here two species formerly included within Triquetum, which remains a genus of 1-2 species native to Europe and Asia.


1 Florets awnless:.............................................................................................................. ..................................................

K. macrantha

Lagurus

2 Panicles 3-10 cm long, the spikelets densely congested, the branches mostly less than 1 cm long and erect-pressed; leaves tending to be basal ............................................................ K. spicata

2 Panicles 8-24 cm long, the spikelets somewhat crowded to loosely arranged, the branches (1)2-6 cm long and ascending to somewhat divergent; leaves tending to be cauline ............................................................. K. vaseyi

Koeleria macrantha (Ledebour) J.A. Schultes [large-flowered] JUNEGRASS [Afra macrantha Ledebour, Koeleria cristata of many authors, Koeleria nitida Nuttall]. Tufted perennial, 20-85 cm or more tall; leaves mostly basal; panicles 5-35 cm long, the primary branches with axillary pulvini, causing them to spread during anthesis; spikelets 2.5-6.5 mm long, obovate; lemmas 2.5-6.5 mm long, shiny, glabrous, rarely with an awn to 1 mm long. ●Mountain slopes, foothills, and plains, throughout the state. ●Shiny glumes and puberulent pedicels and branchlets are distinctive. Plants in flower will often have branches spreading branches with pubescent glumes, so the panicles are broadly pyramidal, spaced and up to 8 cm wide; they close again after anthesis. Koeleria pyramidalis (Lamrock) Beauvois is a closely related European species.

Koeleria spicata (Linnaeus) Barberá, Quintanar, Soreng, & P.M. Peterson [spike-like] SPIKE TRISETUM [Atro spicata Linnaeus, Trisetum spicatum (Linnaeus) Richter]. Tufted perennial, sometimes with short rhizomes, 10-60 cm tall; sheaths glabrous; ligules about 1 mm long; blades glabrous to rarely hairy; panicles 3-10 cm long, densely congested and spike-like, the branches mostly less than 1 cm long, the peduncle densely hairy below the panicle, the hairs 0.2-1 mm long; spikelets 4.5-6.6 mm long; rachilla 0.8-1.1 mm long, with hairs 0.5-1 mm long; glumes subequal or the first at least ⅔ the second; lowermost lemmas 4.5-5 mm long, the awn 4-6 mm long; ovary glabrous. ●Alpine to subalpine ridges, slopes, and forest clearings, mostly in the northern mountains, generally at higher elevations than K. montana. ●Formerly included within a now dismembered Triquetum. ♦

Koeleria vaseyi Barberá, Quintanar, Soreng, & P.M. Peterson [for George S. Vasey (1822-1893), curator of the U.S. National Herbarium] [Trisetum canescens of NM reports, Trisetum montanum Vasey. Triquetum spicatum (Linnaeus) Richter subsp. montanum (Vasey) Weber]. Tufted perennial, 30-70 cm tall; sheaths glabrous to pilose; ligules about 3 mm long; blades glabrous to pilose, generally not very congested; panicles 10-24 cm long, lax and somewhat open to contracted, the peduncle glabrous below the panicule or with minute hairs; spikelets 4-6 mm long; rachilla about 0.8 mm long, with hairs less than 0.5 mm long; glumes unequal, the first about ⅔ the second; lowermost lemma 4.5-5.5 mm long, the awn 3-6 mm long; ovary glabrous. ●Mountain woodlands and grasslands, clearings, grassy slopes, roadsides; widespread in the mountains, generally at lower elevations than K. spicata. ●Formerly included within a now dismembered Triquetum. We include here plants that have been dubiously reported as Trisetum canescens Buckley, which is a species mostly of the Pacific Northwest, extending to southeastern Arizona and Utah, but not known in New Mexico (nor Colorado).

Lagurus [here's tail] HARE’S TAIL [1].

Tufted annual, the culms erect to ascending, the foliage pilose to villous; sheaths open, inflated; auricles absent; ligules membranous, densely villous on the back; inflorescence a dense, ovoid, woolly panicle; spikelets with a single floret, the rachilla prolonged, disarticulation above the glumes, the floret falling; glumes exceeding the floret, 1-nerved; lemmas 3-nerved, 3-awned, the lateral nerves prolonged into awns, the central awn arising from the distal ⅔ of the lemma; anthers 3. ●A monotypic genus of the Old World, native to the Mediterranean Basin and nearby regions. Ten grasses in the world carry the epithet ‘laguroides,’ whose wooly or silky seedheads allude to the genus Lagurus.


Lagurus ovatus Linnaeus [egg-shaped]. Plants 10-50 cm tall; sheaths 2-8 cm long, inflated; blades 3-10 mm wide; panicles 1.5-3 cm long, 1-2 cm wide, the branches pilose; glumes 6-10 mm long, the awn to 3 mm; lemmas 3-5 mm long; central awn 10-22 mm long, the laterals much shorter. ●A recently found adventive, rarely escaping from cultivation as an ornamental or garden plant; native to the Mediterranean region. ●The woolly heads resemble somewhat Polygonum monspeliensis, which is very common in wet places in the wild, and has nearly glabrous foliage.

Leersia [for Johann Daniel Leers (1727-1774), German botanist-pharmacist] CUTGRASS [1].

Usually tufted or rhizomatous perennials, often rooting at the nodes; sheaths open; auricles absent; ligules membranous; inflorescence a well-developed panicle; disarticulation below the spikelets; spikelets with 1 floret, usually awnless; glumes absent; floret flattened, the lemma and palea subequal and broadened somewhat; lemmas 5-nerved; anthers 1, 2, 3, or 6. ●A genus of about 17 species of wetlands worldwide.

Leersia oryzoides (Linnaeus) Swartz [rice-like] [Phalaris oryzoides Linnaeus]. Rhizomatous perennial, 35-150 cm tall, the culms decumbent-based and rooting at the nodes; sheaths scabrous; ligules to 1 mm long; blades 5-15 mm wide, the margins scabrous; panicles 10-30 cm long, the branches spreading; spikelets elliptic, 4-6 mm long, nearly 2 mm wide; lemmas and paleas ciliate on the keels and margins; anthers chasmosmogous (1-3 mm long) or cleistogamous (to 1 mm long). ●River and stream banks in the southern region, often aquatic; expected in more counties than currently known.

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Leptochloa [a slender grass] [1].

Tufted perennials; sheaths open; auricles absent; ligules a membrane, truncate to obtuse, somewhat erose or ciliate; inflorescence a panicle of spicate branches, these subdigitate to separated shortly on the main axis; spikelets 2- to 5-flowered, the lowest 1-2 florets fertile, the remaining upper ones sterile; disarticulation above the glumes, the florets falling together; lemmas 3-nerved, awned; anthers 2-3. ♦Traditionally, Leptochloa has been defined by annual or perennial plants having panicles with spicate branches scattered along the main axis, and awned or awnless spikelets with several florets of 3-nerved lemmas. Recent phylogenetic studies have shown this circumscription to be polyphyletic, bringing together disparate and unrelated populations, even though they share a morphologic similarity (Peterson et al. 2012; Peterson et al. 2015). We follow Peterson and colleagues in recognizing Leptochloa in a more restricted but more phylogenetically accurate sense, which also embraces members of the genus Trichloris (which will be an odd alignment for some). Other members of the former Leptochloa are dispersed within the genera Dinebra, Diplachne, and Disakisperma, all of which are included in the key below. ♦Leptochloa nealleyi Vasey [=Dinebra nealleyi (Vasey) P.M. Peterson & N. Snow] was reported for New Mexico by W&S, but this is a species of the coastal prairies of Texas and Louisiana and is not present in the state.

1 Plants annual
2 Ligules 2-8 mm long, attenuate, not lacerate except by tearing ................................................................. go to Diplachne
3 Ligules 1-3 mm long, truncate to rounded, often erose or lacerate ......................................................... go to Dinebra

Leptochloa crinita (Lagasca) P.M. Peterson & N. Snow [furnished with hairs] FALSE RHODESGRASS [Chloris crinita (Lagasca, Trichloris crinita (Lagasca) Parodi]. Tufted perennial, sometimes with short stolons, 45-100 cm or more tall; sheaths glabrous to sparsely hirsute; blades 5-10 mm wide; panicle narrow, 8-15 cm long; panicle branches 6-20 in number, erect, to 15 cm long; spikelets with 1 fertile and 1 sterile floret, the lemmas of both 3-awned; awns 5-12 mm long.

Disturbed ground, roadsides, fields, and drainages in the desert grasslands. ♦Occasionally used by local florists in dried bouquets.

Leptochloa [a slender grass] [1].

Tufted perennials; sheaths open; auricles absent; ligules a membrane, truncate to obtuse, somewhat erose or ciliate; inflorescence a panicle of spicate branches, these subdigitate to separated shortly on the main axis; spikelets 2- to 5-flowered, the lowest 1-2 florets fertile, the remaining upper ones sterile; disarticulation above the glumes, the florets falling together; lemmas 3-nerved, awned; anthers 2-3. ♦Traditionally, Leptochloa has been defined by annual or perennial plants having panicles with spicate branches scattered along the main axis, and awned or awnless spikelets with several florets of 3-nerved lemmas. Recent phylogenetic studies have shown this circumscription to be polyphyletic, bringing together disparate and unrelated populations, even though they share a morphologic similarity (Peterson et al. 2012; Peterson et al. 2015). We follow Peterson and colleagues in recognizing Leptochloa in a more restricted but more phylogenetically accurate sense, which also embraces members of the genus Trichloris (which will be an odd alignment for some). Other members of the former Leptochloa are dispersed within the genera Dinebra, Diplachne, and Disakisperma, all of which are included in the key below. ♦Leptochloa nealleyi Vasey [=Dinebra nealleyi (Vasey) P.M. Peterson & N. Snow] was reported for New Mexico by W&S, but this is a species of the coastal prairies of Texas and Louisiana and is not present in the state.

1 Plants annual
2 Ligules 2-8 mm long, attenuate, not lacerate except by tearing ................................................................. go to Diplachne
3 Ligules 1-3 mm long, truncate to rounded, often erose or lacerate ......................................................... go to Dinebra

Leptochloa crinita (Lagasca) P.M. Peterson & N. Snow [furnished with hairs] FALSE RHODESGRASS [Chloris crinita (Lagasca, Trichloris crinita (Lagasca) Parodi]. Tufted perennial, sometimes with short stolons, 45-100 cm or more tall; sheaths glabrous to sparsely hirsute; blades 5-10 mm wide; panicle narrow, 8-15 cm long; panicle branches 6-20 in number, erect, to 15 cm long; spikelets with 1 fertile and 1 sterile floret, the lemmas of both 3-awned; awns 5-12 mm long.

Disturbed ground, roadsides, fields, and drainages in the desert grasslands. ♦Occasionally used by local florists in dried bouquets.

1 Plants annual
2 Ligules 2-8 mm long, attenuate, not lacerate except by tearing ................................................................. go to Diplachne
3 Ligules 1-3 mm long, truncate to rounded, often erose or lacerate ......................................................... go to Dinebra

Leptochloa crinita (Lagasca) P.M. Peterson & N. Snow [furnished with hairs] FALSE RHODESGRASS [Chloris crinita (Lagasca, Trichloris crinita (Lagasca) Parodi]. Tufted perennial, sometimes with short stolons, 45-100 cm or more tall; sheaths glabrous to sparsely hirsute; blades 5-10 mm wide; panicle narrow, 8-15 cm long; panicle branches 6-20 in number, erect, to 15 cm long; spikelets with 1 fertile and 1 sterile floret, the lemmas of both 3-awned; awns 5-12 mm long.

Disturbed ground, roadsides, fields, and drainages in the desert grasslands. ♦Occasionally used by local florists in dried bouquets.
Leptoloma [a thin border] LEPTOLOMA [1].

Annuals to perennials, tufted to rhizomatous; sheaths open; auricles absent; ligules membranous, sometimes with a ciliate fringe; inflorescence an open, branched panicle, the entire inflorescence breaking at the base (except on one species); spikelets awnless, 2-flowered, the lower floret staminate to sterile, the upper floret fertile, the rachilla elongated between the two glumes; disarticulation below the glumes; lower glume absent to no more than ¼ the length of the spikelet; upper glume short to subequal to the spikelet; lower lemma pubescent; upper lemma clasping the palea and forming a seed case, this not indurate; anthers 3. With 4-5 species, North America. Most recently included within a broadly defined (and possibly polyphyletic) Digitaria; we maintain a more traditional approach until the generic relationships are resolved.

Leptoloma pubiflorum (Vasey) Wipfl & Shaw [with hairy flowers] FALL WITCHGRASS [Digitaria cognata (Schultes) Pilger subsp. pubiflora (Vasey) Wipfl, Digitaria pubiflora (Vasey) Wipfl, Leptoloma cognatum (Schultes) Chase subsp. pubiflora (Vasey) Wipfl & Hack, Panicum antimumale Boce ex Sprengel var. pubiflorum Vasey]. Densely tufted to loosely rhizomatous perennial, 20-70 cm tall; foliage glabrous to densely pubescent; panicles widely open, 5-25 cm long, 6-30 cm wide, the branches divergent and rebranched; spikelets on long divergent pedicels, 2.3-3.3 mm long; upper glume 2-3 mm long, densely pilose between the 3 nerves; lower lemma 5-nerved; upper floret 2-3.1 mm long, glabrous, dark when mature. Southern and eastern plains.

Leucopoa [white Pau] [1].

Tufted and rhizomatous perennials, dioecious; sheaths open; auricles absent; ligules membranous; inflorescence a panicle; spikelets unisexual, with 2-6 florets; disarticulation above the glumes and between the florets; glumes mostly hyaline and thinner than lemmas; lemmas 5-nerved, awnless or short-awned, subequal to the subrachis; anthers 3. About 10 species, mostly Asian. Closely related to Lolium and Schedonorus, but not so closely to Festuca.

Leucomia [an anagram of Elymus] WILDFIRE [5].

Tufted to rhizomatous perennials; sheaths open; auricles usually present; ligules membranous; inflorescence a spike with 1-8 spikelets per node, sometimes paniculate; spikelets usually sessile, with 2-12 florets; disarticulation above the glumes and between the florets; glumes often reduced and needle-like; lemmas 5-7-nerved, awned or awnless; anthers 3. All the species of Leucomia have been taken out of Elymus, based on a suite of morphological, chromosomal, anatomical, and molecular features. Many of the species are large, tussocky grasses.

Leymus [an anagram of Elymus] WILDFIRE [5].

Generally rocky ground. With 4-5 species, southern and eastern plains. Closely related to Digitaria and Schedonorus, and to some degree to Festuca. About 10 species, mostly Asian. Closely related to Elymus and Schedonorus, but not so closely to Festuca. About 10 species, mostly Asian. Closely related to Elymus and Schedonorus, but not so closely to Festuca. A morphology-based cladistic analysis of Digitaria (Poaceae) and related genera using chloroplast DNA restriction site variation. Canad. J. Bot. 70: 2415-2429. Hall, H.H. & S. Flowers. 1961. Vascular plants found in the Navajo Reservoir Basin, pp. 47-87. IN: D.M. Pendergast (ed.). Ecological studies of the flora and fauna of Navajo Reservoir Basin, Colorado and New Mexico. Univ. Utah Anthropological Papers, number 55. [Hesperochloa kingii] (S. Watson) W.A. Weber [for Clarence King (1842-1901), American geologist and mountaineer]. SPIRE: Elymus kingii (S. Watson) Cassady, Poa kingii S. Watson. Tufted and rhizomatous perennial; 30-100 cm or more tall; panicles 7-22 cm long, with erect to ascending branches; spikelets 6-12 mm long; lemmas 4.5-10 mm long, awnless or with a macro; anthers 3-6 mm long; ovaries in pistillate plants hairy at the apices.

Leymus ambiguus (Vasey & Scribner) D.R. Dewey [uncertain] [Elymus ambiguus Vasey & Scribner]. Loosely tufted perennial, sometimes with short rhizomes, 60-110 cm tall, the culms 1-1.5 mm thick; auricles to 1.1 mm long; spikes 8-17 cm long, 5-10 mm wide, with 2-3 spikelets per node; glumes needle-shaped; lemmas 8-14 mm long, with awns 1-7 mm long. Dry, rocky foothills and plains, sometimes mountain slopes with oak brush.

Leymus cinereus (Scribner & Merrill) Love [ash-colored] GREAT BASIN WILDFIRE. Elymus cinereus Scribner & Merrill. Tussocky perennial, weakly rhizomatous, 70-270 cm tall, the culms 2.5-3 mm thick, usually green and not glaucous, populations appear ash-colored from a distance; auricles to 1.5 mm long; spikes 10-30 cm long, 8-17 mm wide, with 2-7 spikelets per node; glumes needle-shaped; lemmas 6-12 mm long, acute to awned to 3 mm. Known only from Colfax and San Juan counties, where it appears to be adventive or deliberately planted; native to the western United States. An earlier report of this species from San Miguel County is corrected to Leymus racemosus. Seedheads are prone to ergot infestation.
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*Leymus racemosus* (Lamarck) Tzvelev [rare-like] *Elymus racemosus* Lamarck. Strongly rhizomatous perennial, weakly tufted, often glaucous, 50-100 cm tall or more, the culms 8-12 mm thick; spikes 15-35 cm long, with 3-8 spikelets per node; glumes tapering to needle-shaped, equal to or exceeding the florets; lemmas 15-20 mm long, tapering to an awn 1.5-2.5 mm long. Known only from a few collections along weedy roadsides in San Miguel and Colfax counties; native to Europe and central Asia.

*Leymus salina* (M.E. Jones) A. Löve [Salina Pass, Utah] *Elymus salina* M.E. Jones. Tufted perennial, sometimes weakly rhizomatous, 35-140 cm tall, the culms 1.5-3 mm thick; spikes 4-14 cm long, with mostly 1(2-3) spikelet per node; glumes needle-like, shorter than the florets; lemmas 7-12 mm long, awnless or awned to 2.5 mm long. Dry plains in the Four Corners region. The specific epithet refers to a geographical place name (Salina Pass, Utah), and not to a saline habitat; it is used as a noun in apposition and is hence not declined to salinus.

*Leymus triticiodes* (Buckley) Pilger [resembling Triticum] CREEPING WILDRYE *Elymus simplex* Scribn & Williams, *Elymus triticiodes* Buckley. Elymus triticiodes Buckley var. simplex (Scribner & Williams) Hitchcock. Strongly rhizomatous perennial, 45-125 cm tall, the culms 1.8-3 mm thick; auricles to 1 mm long; spikes 5-20 cm long, 5-15 mm wide, with 2 spikelets per node (varying proximally and distally); glumes needle-like, shorter than the florets; lemmas 5-12 mm long, with awns to 3 mm long. Some of our plants are from high mountain forest clearings (introduced there?), but the species is more common on clay flats and swales at much lower elevations; early reports included plantings in Dona Ana County, but plants have not persisted.

*Lolium* [ancient Latin name] RYEGRASS [2].

Tufted annuals and perennials, sometimes short-rhizomatous; sheaths open; auricles present or absent; ligules membranous; blades flat; inflorescence a spike, with 1 spikelet per node, the spikelets attached edgewise to the rachis; spikelets with several florets; disarticulation above the glumes and between the florets; glumes 1, 2 in the terminal spikelet, 3-9-nerved, awnless; lemmas 3-7-nerved; awnless or awned; anthers 3. Species of *Lolium* are very closely related to *Schedonorus*, and fertile hybrids are easily produced among them. The two genera could certainly be combined, or the two genera could be submerged within *Festuca*; many such proposals have merit. To avoid undue confusion, we follow here the treatment of the recent *Flora of North America*, vol. 24, which presents the genera *Festuca*, *Leucoapo*, *Lolium*, *Schedonorus*, and *Vulpia*, while acknowledging the inter-relatedness of all five species groups.


1 Glume exceeding the uppermost floret.................................................. L. temulentum
1 Glume shorter than the spikelet, the florets extending beyond the glume .................................................. L. perenne

*Lolium perenne* Linnaeus [perennial] PERENNIAL RYEGRASS. Tufted perennial, sometimes annual; spike 5-45 cm long; spikelets with 2-22 florets; lemmas 3.5-9 mm long, awned or awnless; anthers 2-5 mm long. Introduced from Europe and Asia for lawns, roadsides, and pastures, escaping to moist weedy ground; expected in all the counties.

Numerous cultivars, strains, and races have been developed for agricultural uses. Vegetative clumps in lawns are usually easily recognized by their shiny blades and well-developed auricles. Two weak, intergrading, and interfertile varieties are noted: §

- a Lemmas awnless or with awns less than 1 mm long; young vegetative leaf blades folded (conduplicate); spikelets with 5-10 florets; plants generally perennial...var. perenne
- a Lemmas, at least some, with awns more than 1 mm long; young vegetative leaf blades rolled (convolute); spikelets with 10-22 florets; plants annual to short-lived perennials...var. aristatum* Wildenow [awned] [Lolium multiflorum Lamarc, Lolium multiflorum Lamarc subsp. italicum (A. Braun) Schinz & R. Keller, Lolium perenne* Linnaeus var. italicum (A. Braun) Parmel]

*Lolium temulentum* Lamnaeus [awned] Tufted annual, 10-120 cm tall; spikes 2-40 cm long; spikelets with 3-20 florets; lemmas 3.5-8.5 mm long, awnless or with awns to 23 mm long; anthers 1.4-4.4 mm long. Moist weedy ground, known only from Santa Fe Ski Basin; native to Eurasia. Once a serious weed of oats and other crops, but now becoming less common in the United States with more efficient methods of grain cultivation and harvest. This is said to be the tares of the Bible (Matthew 13).

*Lycurus...go to Muhlenbergia alopecuroideus & M. phleoides

*Melica* [honey] *MELICA* [2].

Tufted perennial, occasionally producing rhizomes; sheaths closed; auricles sometimes present; ligules thin, membranous; inflorescence a panicle with rebranched branches; spikelets with several fertile florets, terminating in a sterile rudimentary floret or florets; disarticulation above or below the glumes; lemmas 5-7-nerved, awned or awnless; anthers 2(3). About 90 species, temperate regions of the world.


1 Rudiments at end of rachilla blunt and club-like, not resembling the other florets in shape, 1.3 mm long................................................. M. niten
1 Rudiments at end of rachilla pointed, resembling the other florets in shape, 2-5 mm long.................................................. *M. porteri*

*Melica nitens* (Scribn) Nuttall ex Piper [shining] *Melica difusa* Pursh var. nitens Scribn. Shortly rhizomatous perennial, 55-130 cm tall; panicles 9-26 cm long, the branches 3-6 cm long and often spreading to reflexed; pedicels sharply bent below the spikelets; disarticulation below the glumes; spikelets 8-12 mm long, awnless; lower glumes 5-9 mm long; rudiments 1-3 mm long, club-like, not resembling the other florets in shape. Calcareous soil and rocky outcrops of the Guadalupe Mts, Eddy County. *A* Charles Wright collection in 1851-1852 (#2062), without locality other than “New Mexico” has been presumed to be from Grant County, but that is unsubstantiated, and is probably not even from New Mexico.

*Melica porteri* Scribn. [for Thomas Conrad Porter (1822-1901), American poet, clergyman, botanist]. Shortly rhizomatous perennial, 55-100 cm tall; panicles 13-25 cm long, the branches 1-9 cm long and erect-pressed to strongly divergent; pedicels sharply bent below the spikelets; disarticulation below the glumes; spikelets 8-16 mm long, awnless; lower glumes 3.5-6 mm long; rudiments 1.8-5 mm long, resembling the other florets in shape. Mountain slopes and forest clearings. We have two varieties:
a Panicle branches mostly erect...v. porteri

1 Lower sheaths conspicuously compressed-keeled........................................ M. emersleyi

1 Lower sheaths rounded on the back

2 Glumes, excluding the awns 3-4 or more the length of the floret; spikelets awnless

3 Ligules 1-3 mm long; panicles tightly contracted, spike-like, the branch tips erect-appressed.......................... M. rigens
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3 Ligules 6-20 mm long; panicles loosely contracted, mostly not spike-like, the branch tips often spreading .................. M. longiligula
2 Glumes, excluding the awn, 2/3 or less the length of the floret; spikelets awned or awnless
4 Panicles open, very diffuse, 8-40 cm wide, strikingly reddish when mature; landscape plants, not known to escape to the wild ....
4 Panicles narrow or somewhat open, not reddish, or if so, then not in cultivation
5 Lemma awns 0-4(5) mm long
6 Awns (3)5-10 mm long; panicles reddish; glumes 1.5-2 mm long ............................................................................ M. rigida
6 Awns 0-4(5) mm long; panicles greenish; glumes 2-3 mm long ........................................................................... M. dubia

Key II. All species

1 Plants annual
2 First glume prominently 2-nerved, usually cleft; panicle branches falling as a unit, bearing 2-3(4) spikelets
3 Glumes about 2/3 the length of the floret; spikelets 4-6 mm long; lemma awns (5)10-20 mm long................................. M. brevis
3 Glumes and floret about equal in length; spikelets 2.5-3.5 mm long; lemma awns 0.5-5(10) mm long......................... M. depauperata
2 First glume 1-nerved; panicle branches persistent
4 Lemma awns 10-30 mm long
5 Second glume (1)2- to 3-nerved, the apex truncate to acute, 2- or 3-toothed................................................................. M. peruviana
5 Second glume 1-nerved, the apex acute to acuminate........................................................................................... M. tenuifolia
4 Lemma awns 0-5 mm long
6 Mature panicles narrow, contracted, the branches appressed to the main axis.......................................................... M. filiformis
6 Mature panicles open, the branches spreading
7 Glumes glabrous or nearly so
8 Pedicels 0.1-1 mm long, stout, of equal thickness throughout; blades lacking white margins................................. M. ramulosa
8 Pedicels 2-8 mm long, capillary but straight, narrowed downward; blades with thickened white margins .............. M. fragilis
7 Glumes minutely-pubescent to long-pubescent, at least at the apex (use a lens)
9 Terminal pedicels 2 mm long, the lateral ones appressed to the branchlets ............................................................... M. eludens
9 Terminal pedicels mostly longer than 5 mm, the lateral ones spreading to flexuous
10 Pedicels sinuous, often tangled with one another; anthers 0.9-1.4 mm long.............................................................. M. sinuosa
10 Pedicels straight or subflexuous, not tangled; anthers 0.3-0.5 mm long
11 Lemma awnless, 0.8-1.5 mm long.................................................................................................................. M. minutissima
11 Lemma usually awned, 1.3-2 mm long.................................................................................................................. M. texana

1 Plants perennial
12 Second glume evidently 3-nerved, often 3-toothed; lower sheaths flattened, ribbon-like
13 Sheaths usually becoming coiled and appearing like wood shavings; second glume acute, entire or occasionally toothed, nearly as long as the floret.......................................................... M. straminea
13 Sheaths not conspicuously coiled; second glume toothed, shorter than the floret
14 Ligules 2-5 mm long; stems and blades very slender and narrow; plants usually 15-30 cm tall.................................. M. filiculmis
14 Ligules 10-20 mm long and the tip often shredded; stems and blades more robust; plants 25-80 cm tall.............. M. montana
12 Second glume 1-nerved, entire or fringed; lower sheaths usually not ribbon-like
15 Stems stiff, wiry, much-branched, the plants bush-like.................................................................................... M. porteri
15 Stems not as above, the plants not bush-like
16 Plants with evident, slender, creeping rhizomes
17 Callus hairs copious, as long as the body of the lemma ............................................................ M. andina
17 Callus hairs long-pubescent to glabrous, but the hairs much shorter than the body of the lemma
18 Awn of the lemma 6-25 mm long
19 Blades mostly 2-6 mm wide, mostly flat ........................................................................................................ M. mexicana
19 Blades 0.5-2(2.5) mm wide, mostly rolled
20 Anthers purple, 1.3-3 mm long; lemmas lanceolate, 3.5-5 mm long, the awns 4-12(20) mm long; ligules with lateral lobes to 1.5 mm long................................................................. M. arsenei
20 Anthers orange, 1.5-2 mm long; lemmas elliptic, 2-3.5 mm long, the awns 10-25 mm long; ligules lacking lateral lobes................................................................. M. polycaulis
18 Awn of the lemma 0-3(5) mm long
21 Panicles open, loosely flowered with usually spreading to divergent branches at maturity......................... M. pungens
22 Awns 1-1.5(2) mm long; panicle branches attached in clusters ................................................................. M. pungens
22 Awns 0-0.3 mm long; panicle branches not clustered
23 Ligules with pointed lateral extensions 1-2 mm long; blades with thickened white margins and midribs.......... M. arenacea
23 Ligules without lateral extensions; blades without thickened white margins or midribs ................................. M. arenacea
21 Panicles contracted, narrow and usually densely flowered, the branches mostly erect to appressed
24 Blades (2.5)3-6 mm wide, mostly flat
25 Glumes 2-3.5 mm long, subequal to the lemma ................................................................. M. mexicana
25 Glumes 4.5-6 mm long, the awn-tips much exceeding the lemma
26 Internodes dull and puberulent, usually terete; culms seldom branched above the base; ligules 0.2-0.6 mm long................................................................. M. glomerata
26 Internodes polished and glabrous, keeled; culms much-branched above the base; ligules 0.6-1.7 mm long................................................................. M. racemosa
24 Blades 0.5-2(3) mm wide, rolled
27Lemma long-pubescent below
28 Blades 4 cm or more long; glumes acuminate or aristate ..............................................M. glauca
28 Blades 2-4(5) cm long; glumes acute
29 Lemma 2-2.5 mm long; glumes about half as long as the floret.................................M. villiflora
29 Lemma 3-4 mm long; glumes shorter than to nearly as long as the floret .....................M. thurberi
27Lemma glabrous or scabrous only
30 Inflorescence usually included in the sheath at least below, with 9 nodes or fewer; ligules 0.5-1.5 mm long; glumes ½ to equaling the floret.................................................................M. repens
30 Inflorescence usually well-exserted from the sheath, with 11-12 nodes; ligules 1-3 mm long; glumes ½ to ⅓ as long as the floret.................................................................M. richardsonis

16 Plants tufted, or sometimes the bases decumbent and spreading, but lacking creeping rhizomes
31 Panicles of long, strongly divergent, unbranched primary branches bearing widely spaced, sessile, awnless spikelets; blades usually spirally twisted ........................................................................................................ M. paniculata
31 Panicles and blades not as above
32 Nerves of lemmas and paleas densely pubescent..........................................................M. tricholepis
32 Nerves of lemmas and/or paleas glabrous, scabrous, or short-pubescent but not densely or noticeably so
33 Sheaths (at least the lower) compressed-keeled; blades flat or folded
34 Panicles 20-40 cm long; plants 50-100 cm or more tall in large tussocks.....................M. emersleyi
34 Panicles 5-10 cm long; plants 20-60 cm tall in small tufts
35 First glume 1-nerved, awnless or with an awn to 1 mm long; lemma awns 0.3-1 mm long
36 Ligules less than 1 mm long; glumes gradually narrowed to a mucro at most 0.3 mm long .........M. caspida
data
36 Ligules 1-5 mm long; glumes abruptly narrowed to awns 0.5-1 mm long..........................M. wrightii
35 First glume 2-nerved, with awns 1.5-3.5 mm long; lemma 1.5-3 mm long (Lycurus)
37 Blades terminating in a slender, hair-like bristle 3-12 mm long; ligules acute to acuminate, 3-10 mm long; culms erect..........................M. alopecuroideas
37 Blades acute or with a bristle 1-3 mm long; ligules 1.5-3 mm long, with lateral acuminate projections on either side; culms erect to ascending, often geniculate............................M. phleioides
33 Sheaths rounded on the back; blades usually becoming rolled
38 Lemma awns 0-4(5) mm long
39 Glumes, excluding the awn, 3/4 or more the length of the floret
40 Ligules 1-3 mm long..........................................................M. rigens
40 Ligules 6-20 mm long ..........................................................M. longiligula
39 Glumes, excluding the awn, 2/3 or less the length of the floret
41 Blades 25-60 cm long
42 Awns (3)5-10 mm long; panicles reddish; glumes 1.5-2 mm long..........................M. rigida
42 Awns 0-4(5) mm long; panicles greenish; glumes 2-3 mm long............................M. dubia
41 Blades 1-15 cm long
43 Mature panicles narrow, 0.5-1 cm wide, the primary branches erect to appressed ..........M. filiformis
43 Mature panicles open, 4-15 cm wide, at least the primary branches widely spreading
44 Blades mostly flat, the margins white-cartilaginous ....................................................M. arizonica
44 Blades mostly rolled or folded, rarely flat, the margins not white-cartilaginous
45 Blades strongly arcuate, curving, less than 1 mm wide, 1-3(4) cm long; leafy portion ⅛ or less the length of the plant; lateral pedicels commonly longer than the spikelets.......M. torreyi
45 Blades rather straight, 1-2 mm wide, 3-15 cm long; leafy portion ⅜ to ½ the length of the plant; lateral pedicels commonly shorter than the spikelet..................M. arenicola
38 Lemma awns 7-40 mm long
46 Awns 7-10 mm long
47 Blades 20-60 cm long
48 Glumes awned; panicles 8-20 cm wide or more; introduced ornamental plants ........M. capillaris
48 Glumes awnless; panicles 2-4 cm wide; native plants in the wild..............................M. rigida
47 Blades 1-14 cm long; glumes acute to aristate
49 Blades mostly 1-4(5) cm long; glumes acute; lemmas and paleas sparsely but noticeably short-pilose on the lower half; lateral lobes of ligules less than 1.5 mm long ..................M. arsenei
49 Blades mostly 4-14 cm long; glumes acuminate to aristate; lemmas and paleas glabrous or minutely scaberulous; lateral lobes of ligules 1.5-3 mm long.............................M. pauciflora
46 Awns 10-40 mm long
45 Ligules 3-15 mm long
50 Ligules 3-15 mm long
51 Lemmas purple, scaberulous near the apex; glumes 1-1.3 mm long..........................M. rigida
51 Lemmas straw-colored, smooth and shining; glumes 1.5-2.1 mm long.....................M. setifolia
50 Ligules 0.5-3 mm long
52 Glumes obtuse, 0.5-1 mm long; lemma awn 20-40 mm long..............................M. spiciformis
52 Glumes acute to subaristate, 1-2 mm long; lemma awn mostly 10-15 mm long
53 Lemmas essentially glabrous, with only a few closely appressed callus hairs; ligules with lateral lobes 1.5-3 mm long.........................................................M. pauciflora

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53 Lemmas pubescent on the lower half; ligules without lateral lobes
54 Plant bases usually geniculate and rooting at some of the lowest nodes, sometimes
erect, with the lowest sheaths nearly lacking blades; anthers 1.5-2 mm long, orange; 
leaves to 0.5 mm long.................................................M. polycaulis
54 Plant bases usually erect, sometime geniculate, rarely rooting at the lowest nodes; 
anthers 0.5-1.5 mm long, yellowish; lemma hairs 0.5-1.5 mm long...............
M. tenuifolia

Muhlenbergia alopecuroides (Grisebach) Peterson & Columbus [resembling Aloepecurus] WOLFTAIL. [Lycurus phleoides.
Kunth var. glaucofolius Beal, Lycurus setosus (Nuttall) C. Reeder]. Tufted perennial, 30-60 cm tall; sheaths compressed-keeled; 
ligules 2-12 mm long, long-acuminate, sometimes with a short cleft on either side; blades with prominent whitish 
midribs extending as fragile bristles 3-12 mm long; panicles 4-10 cm long, 5-8 mm wide, with spikelets borne in 
unequally pedicellated pairs; disarticulation below the spikelet pair; lower glume 2-nerved, awned to 1-3.5 mm; upper 
glume 1-nerved, awned to 5 mm; lemmas 3-4 mm long, with an awn 1.5-3 mm long. ●Dry slopes, plains, and woodlands, nearly 
throughout the state. Formerly in the genus Lycurus, which has been subsumed in Muhlenbergia (see Peterson et al. 2010).
WOLFTAIL species may be distinguished as follows: §
a Blades terminating in a slender, hair-like bristle 3-12 mm long; ligules acute to acuminate, 3-10 mm long; culms erect...M. alopecuroides
b Blades acute or with a bristle 1-3 mm long; ligules 1.5-3 mm long, with lateral acuminate projections on either side; culms erect to ascending, often
geniculate...M. phleoides

Muhlenbergia arenacea (Buckley) A.S. Hitchcock [of sandy ground] EAR MUHLY [Sporobolus arenaceus Buckley, 
Sporobolusauriculatus Vassey]. Rhizomatous perennial, 10-35 cm tall; ligules 0.5-2 mm long, with pointed lobes 1-2 
mm long; blades 1-5 cm long, with thickened white margins; panicles 5-15 cm long, nearly as wide; spikelets 1.5-2.6 
mm long, sometimes with 2 florets; glumes slightly shorter than the floret, awnless to mucronate; lemmas 1.5-2.5 mm 
long, awnless or with a mucro to 0.3 mm. ●Plays and clay flats in the southern regions, often growing with 
Scleropogon brevifolius. ●Spikelets may contain 2 florets. The ligular extensions and whitish thickened blade margins are diagnostic. 
See Muhlenbergia torreyi for discussion of similar species.

Muhlenbergia arenicola Buckley [sand-dwelling] SAND MUHLY. Tufted perennial, 15-65 cm tall, the bases 
decumbent; blades 4-15 cm long, the margins not whitish-thickened; panicles 12-30 cm long, 5-20 cm wide, ½ or more 
the length of the plant; spikelets 2.5-4.2 mm long; glumes shorter than the floret, acute to awn-tipped to 1 mm; lemmas 2.5-4.2 
mm long, with awns 0.5-4.2 mm long. ●Sandy plains, nearly throughout the state. Slightly curving blades 
extending partly up the shoots, decumbent-based tufted clumps, and short lateral pedicels help to identify this species. 
See Muhlenbergia torreyi for discussion of similar species.

Muhlenbergia arizonica Scribner [of Arizona]. Tufted perennial, lacking rhizomes, the shoots erect to decumbent, 
15-40 cm tall; blades 4-7 cm long, with whitish-thickened margins; panicles 4-20 cm long, 4-15 cm wide; spikelets 2-3 
mm long; glumes shorter than the floret, awnless; lemmas 2-3.5 mm long, with short awns 0.5-1 mm long. ●Moist plains and 
rocky hillsides in the boithoel region, uncommon. A report from Socorro County is unverified. See Muhlenbergia 
torreyi for discussion of similar species.

Muhlenbergia arenseae A.S. Hitchcock [for Frère Gerfroy Arsène (1867-1938), French clergyman-botanist at Sacred Heart Training 
College in Las Vegas, New Mexico]. Rhizomatous to tufted perennial, 10-50 cm tall, decumbent-based; ligules with lateral 
lobes; blades 1-5 cm long; panicles 4-13 cm long, 1-5 cm wide, loosely contracted; spikelets 3.5-5 mm long; glumes 
shorter than the floret, awnless or with a short awn to 1.5 mm; lemmas 3.5-5 mm long, pubescent on the lower ½ to ⅓ 
with awns 4-12 (rarely longer) mm long. ●Limestone rock outcrops, gypsum sands, stream-banks; northwestern region.
The inflorescence and spikelets are similar to Muhlenbergia pauciflora, but that species has glabrous florets with awns 7-25 mm long.

Muhlenbergia asperifolia (Nees & Meyer ex Trininius) Parodi [with rough leaves] SCRATCHGRASS [Sporobolus 
asperifolius (Nees & Meyer ex Trininius) Nees, Villa asperifolia Nees & Meyer ex Trininius]. Rhizomatous perennial, occasionally 
stononiferous, 10-100 cm tall, branching profusely and bushy-like; ligules less than 1 mm long, without lateral 
extensions; panicles 6-21 cm long, 4-16 cm wide, breaking in the peduncle; spikelets 1-2 mm long, occasionally with 2- 
florets; glumes shorter than the floret, awnless; lemmas 1-2 mm long, glabrous, awnless to mucronate. ●Damp or wet 
ground along streams and rivers, floodplains, alkaline meadows, along seeps and springs; expected in all counties. ●Plants frequently 
produce spikelets with 2 florets, and are sometimes infected by a smut fungus (Tilletia asperifolia).

Muhlenbergia brevior C.O. Goodding. [short]. Tufted annual, 3-20 cm tall; blade margins whitish-thickened; panicles 
3-12 cm long, the branches bearing the spikelets in pedicellate pairs, which fall together or with other pairs on the short 
branch; spikelets 2.5-6 mm long; glumes shorter than the floret, the lower glume 2-nerved with teeth or awns to 2 mm, 
the upper glume 1-nerved and awned to 2mm; lemmas 3.5-6 mm long, with awns 10-20 mm long. ●Grassy slopes and 
clearings in volcanic soils in the western half of the state. See comments under Muhlenbergia depauperata for 
comparison to other common annuals.

*Muhlenbergia capillaris (Lamarck) Trininius [hair-like] PINK MUHLY. Tufted perennial in expansive clumps, 60-100 cm or more tall; 
panicles 20-60 cm long, 5-30 cm wide, reddish to pinkish, open and diffuse, the branches and pedicels capillary; spikelets 3-5 
mm long; glumes shorter than the spikelets, short-awned; lemmas 3-5 mm long, with awns 2-13(15) mm long. ●Introduced as an 
ornamental landscape plant, not known in the wild; native to eastern Texas and Oklahoma and eastward.

Muhlenbergia cuspidata (Torrey ex Hooker) Rydberg. [sharp pointed] [Vilfa cuspidata. Torrey ex Hooker]. Tufted perennial 
with knotty bases, not rhizomatous, 20-60 cm tall; sheaths compressed-keeled; ligules 0.2-0.8 mm long; panicles 4-14 
cm long, spike-like, less than 1 cm wide; glumes shorter than the floret, 1-nerved, gradually acute, with a mucro to 0.3 
mm long; lemmas 2.5-3.6 mm long, with a mucro to 0.6 mm long. ●Plains and gravely slopes in the eastern region, 
uncommon. ●Similar to Muhlenbergia wrightii, but much less common, and distinguished by the ligule and glume features.
Muhlenbergia depauperata

Scribner [impoverished] SIX-WEEKS MUHLY [Lyrurus schaffneri (Fournier) Mez, Muhlenbergia schaffneri Fournier]. Tufted annual, 3-15 cm tall, branching at the nodes; sheaths often longer than the internodes; panicles 2-9 cm long, less than 1 cm wide; spikelets 2.5-5.5 mm long, in unequally pedicelled pairs, the pair falling as a unit or with other pairs on the short branch; glumes equaling or exceeding the floret, the lower glume 2-nerved and 2-cleft or awned; lemma 2.5-4.5 mm long, with an awn 6-15 mm long. Grassy slopes and clearings in volcanic soils in the southern regions. In addition to this species, most of the annuals could be called “six-weeks muchy,” coming up quickly in bare areas after rains and quickly flowering before the next dry spell; these can be sorted into visual groups as follows:

- **Muhlenbergia dubia**
  - Tussocky annual, forming large clumps, 30-100 cm tall; ligules 4-10 mm long; blades 10-60 cm long; panicles 10-40 cm long, 0.5-2.5 cm wide; contracted, grayish green; spikelets 3.8-5 mm long; glumes shorter than the florets, blunt, aawnless; lemma 3.8-5 mm long, aawnless to awned 6 mm. Woodlands, rocky mountain slopes, canyons.

- **Muhlenbergia eluendens**
  - C.G. Reeder [evading or baffling]. Scant, tufted annual, 10-40 cm tall; sheaths longer than the internodes; panicles 10-20 cm long, 3-7 cm wide; spikelets 1.7-5 mm long; glumes shorter than the floret, sparsely short-hirsute, 1-nerved, aawnless or awned to 1 mm; lemma 1.7(2)-2.5 mm long, with awns 1.2-3.5 mm long. Rocky woodlands and forest clearings in the western mountains; known from only a few collections. See comments under Muhlenbergia depauperata for comparison to other common annuals.

- **Muhlenbergia emersleyi**
  - Vasey [for John Dare Emersley (ca. 1826-ca. 1899), Scottish miner and botanical collector] BULLGRASS. Robust, tussocky perennial, lacking rhizomes, 50-150 cm tall; sheaths compressed-keeled; ligules 10-25 mm long; blades 20-50 cm long, flat or folded, 2-6 mm wide; panicles 20-45 cm long, loosely contracted to open, 3-15 cm wide, the branches not bearing spikelets in the lower parts; spikelets 2.2-3.2 mm long; glumes longer than the floret, 1-nerved; lemma 2.3 mm long, short-hairy on lower ⅔, with awns 1.5 mm long. Rocky hills and woodlands, mostly in the southern regions. Another tussocky, long-liguled species in New Mexico is Muhlenbergia longiligula, but that species has rounded basal sheaths, panicule branches spikelet-bearing to the base, and aawnless, glabrous florets.

- **Muhlenbergia filiculmis**
  - Vasey [thread-like stems]. Tufted perennial, lacking rhizomes, 5-30 cm tall; sheaths becoming flattened and ribbon-like but not coiling like wood-shavings; ligules 2.5(8) mm long; panicles 2-7 cm long, 1-2 cm wide; spikelets 2.2-3.5 mm long; glumes shorter than the floret, the lower 1-nerved and awn-tipped, the upper 3-nerved and 3-toothed; lemma 2.2-3.5 mm long, appressed short-hairy on lower half, with awns 1.5 mm long. Moist, sandy ground in high mountain grasslands and clearings, in the northern mountains.

- **Muhlenbergia filiformis** (Thurber ex S. Watson) Rydberg [thread-like] PULL-UP MUHLY [Vilfa depauperata Torrey ex Hooker var. filiformis Thurber ex S. Watson]. Tufted annual, sometimes appearing perennial, 5-35 cm tall, erect to geniculate-based and rooting at the lower nodes; sheaths shorter than the internodes; panicles 1-6 cm long, less than 1 cm wide; spike-like, the branches well-spaced; spikelets 1.5-3.2 mm long; glumes shorter than the floret, 1-nerved, rounded to acute; lemma 1.5-3 mm long, appressed hairy with hairs to 0.3 mm long, aawnless or with a macro shortly than 1 mm. Ponderosa/Douglas-fir forests, occasionally higher, mostly in the northern mountains, but populations also in the Mogollon Mountains.

- **Muhlenbergia fragilis** Swallen [fragile] DELICATE MUHLY. Tufted annual, 10-35 cm tall; ligules 1-3 mm long, with long lateral lobes or projections on the sides; blade margins whitish-thickened; panicles 10-24 cm long, 4-11 cm wide, open and diffuse; pedicels capillary, 2-8 mm long, generally straight, narrowed downward from the spikelet; spikelets tiny, 1-1.2 mm long; glumes shorter than or subequal to the floret, glabrous or nearly so, aawnless; lemma 1-1.2 mm long, glabrous to hairy on the nerves, aawnless. Moist sandy soil and rocky clearings in the western mountain regions and northwestern mesas. See comments under Muhlenbergia depauperata for comparison to other common annuals.

- **Muhlenbergia glauca** (Nees) B.D. Jackson [bright green] Muhlenbergia lemmontii Scribner, Podosemum glaucum Nees]. Rhizomatous perennial, 25-60 cm tall, often decumbent; blades 4-12 cm long, 1.2-2.5 mm wide; panicles 4-17 cm long, 0.5-2.5 cm wide, contracted; spikelets 2.4-3.5 mm long; glumes shorter than to subequal to the floret, 1-nerved, acuminate, with awns to 1 mm; lemma 2.4-3.5 cm long, hairy on the lower ⅔, short-aawned to 5 mm. Desert plains in the boooth region, with an outlier eastward; little known in New Mexico.

- **Muhlenbergia glomerata** (Wildenedow) Trinius [wound up] SPIKE MUHLY [Polygonum glomeratus Wildenedow]. Rhizomatous perennial, 30-120 cm tall, seldom branched above the base; internodes dull, puberulent, terete; ligules 0.2-0.6 mm long; blades 2-6 mm wide; panicles 2-12 cm long, 0.5-2 cm wide, lobed; spikelets 3-8 mm long; glumes subequal, much exceeding the floret (including the awn-tip); lemma 2-3 mm long, long-hairy on the lower ⅔, aawnless or awn-tipped to 1 mm. Moist shaded ground in conifer forest; known from a single collection in Colfax County.

- **Muhlenbergia longiligula** A.S. Hitchcock [with long ligules] LONGTONGUE MUHLY [Epicampes stricta Presl]. Tufted, tussocky perennial, 60-130 cm tall; sheaths rounded; ligules (6)10-30 mm long; panicles 15-55 cm long, 1-15 cm wide, loosely contracted; spikelets 2.3-5 mm long; glumes mostly longer than the floret, aawnless or with a macro to 0.2 mm; lemma 2-3 mm long, aawnless or awned to 2 mm. Canyons and rocky slopes, mostly in the southwestern region. Large Muhlenbergia with noticeable ligules include M. dubia (4-10 mm), M. emersleyi (10-25 mm), M. longiligula (10-30 mm), M. mossieana (40-20 mm), and M. rigidia (1-15 mm).

- **Muhlenbergia mexicana** (Linnaeus) Trinius [of Mexico] [Agrostis filiformis Torrey, Agrostis mexicana Linnaeus, Muhlenbergia mexicana (Linnaeus) Trinius forma ambiguia (Torrey) Fernald, Muhlenbergia mexicana (Linnaeus) Trinius var. filiformis (Torrey) Scribner]. Rhizomatous perennial, 30-90 cm tall, much-branched above the base; sheaths somewhat keeled; ligules 0.4-1 mm long; blades 2-6 mm wide; panicles 3-20 cm long, 0.5-3 mm wide, dense, interrupted; spikelets 1.5-3.8 mm long; glumes equaling or slightly shorter than floret, acuminate, aawnless or awn-tipped to 2 mm; lemma 1.5-3.8 mm long.
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hairy on the lower 1/3, awnless or with awns to 10 mm long. ● Moist thickets, woodlands, and canyon bottoms, scattered locales; not well-known in the state. ● Some have segregated long-awned forms as var. filiformis, but the distinction seems without merit. Despite the name, *Muhlenbergia mexicana* is not known to occur in Mexico.

*Muhlenbergia minutissima* (Steudel) Swallen [very tiny] LEAST MUHLY [Agrostis minutissima Steudel, *Sporobolus confusus* auctores]. Tufted, annual, 5-40 cm tall, much-branched from the base; ligules 1-2.5 mm long, sometimes with lateral projections; blade margins not whitish-thickened; panicles 5-20 cm long, 1.5-6 cm wide, open, diffuse; pedicels straight or curving somewhat, but not flexuous; spikelets 0.8-1.5 mm long; glumes shorter than the floret, sparsely hairy, 1-nerved, acute; lemmas 0.8-1.5 mm long, awnless. ● Moist, sandy or rocky slopes, widespread. ● See comments under *Muhlenbergia depauperata* for comparison to other common annuals.

*Muhlenbergia montana* (Nuttall) A.S. Hitchcock [of mountains] MOUNTAIN MUHLY [Calycodon montanus Nuttall, *Muhlenbergia trifida* Hackel]. Tufted perennial, 20-80 cm tall; sheaths becoming flattened and ribbon-like, usually not coiled like woodshavings but sometimes so; ligules 4-20 mm long; panicles 5-25 cm long, 1-6 cm wide; spikelets 3-7 mm long; glumes shorter than the floret, the lower 1-nerved and awnless or nearly so, the upper 3-nerved and 3-toothed to shortly 3-awned; lemmas 3-7 mm long, appressed-hairy on the lower portion, with awns 6-25 mm long. ● Rocky or grassy slopes, ledges, forest clearings, widespread. ● Mountain muhly has been confused with *Muhlenbergia straminea*, which has prominently coiled old sheaths and second glumes equaling or exceeding the lemma. This is a common understory grass in ponderosa pine forests, providing abundant forage.

*Muhlenbergia paniculata* (Nuttall) P.M. Peterson [having a panicle] TUMBLEGRASS [Lepturus paniculatus Nuttall, *Schedonorus paniculatus* (Nuttall) Trelase]. Tufted perennial, 10-55 cm tall; leaves mostly basal; sheaths compressed-keeled; blades usually spiral-twisted in age, the margins whitish-thickened; panicles 8-45 cm long, breaking at the base and rolling, the spike-like branches widely spaced, 5-16 cm long; spikelets mostly sessile and widely spaced, 3-5.5 mm long, awnless; glumes a bit shorter than the floret; lemmas 3-5 mm long, awnless or awn-tipped. ● Plains and grasslands generally throughout the state. ● We follow Peterson et al. (2010) in subsuming *Schedonorus* within *Muhlenbergia*. The twisted blades and curved panicle with spike-like branches are distinctive.

*Muhlenbergia pauciflora* Buckley [few-flowered] NEW MEXICO MUHLY [Muhlenbergia neomexicana Vassey]. Tufted perennial, often bushy, sometimes rhizomatous or geniculate and rooting at the lower nodes, 30-70 cm tall; sheaths shorter than the internodes; ligules 1-5 mm long, with lateral projections 1.5-3 mm longer than the central portion; blades 4-15 cm long; panicles 3-15 cm long, 1-3 cm wide; loosely contracted, the branches spikelet-bearing to the base; spikelets 3.5-5.5 mm long, occasionally with 2 florets; glumes shorter than the floret, acuminate to awn-tipped to 2 mm, lemmas 3.5-5 mm long, often purplish, glabrous except for the callus, with awns 2-25 mm long. ● Rocky slopes, ledges, and mountain outcrops, widespread. ● A bushy habit, purplish panicles, visible awns, and glabrous florets help distinguish this species.

*Muhlenbergia persica* (Beauvois) Steudel [of Peru] [Clenoma persica Beauvios, Muhlenbergia pulcherrima Scribn]. Tufted annual, 3-25 cm tall; ligules 1.5-3 mm long; blades 1-5 mm long, somewhat stiff and straight, at least when young; panicles 2-8 cm long, 0.5-3.5 cm wide, contracted to somewhat open; spikelets 1.5-4.2 mm long; glumes shorter than the floret, awnless, awn-tipped, or the upper one 2-3-toothed; lemmas 1.5-4.2 mm long, sparsely short-hairy below, with awns 3-10 mm long. ● Mountain meadows and cienagas, known only from Catron County.

*Muhlenbergia phleoides* (Kunth) Columbus [resembling Phleum] WOLFTAIL [Lycurus phleoides Kunth]. Tufted perennial, 20-50 cm tall; sheaths compressed-keeled; ligules 1.5-3 mm long, acute to acuminate, with pointed lateral projections 1.5-4 mm long on either side; blades with prominent whitish midribs extending as a bristle only as much as 3 mm; panicles 4-10 cm long, 5-8 mm wide, with spikelets borne in unequally pedicelled pairs; disarticulation below the spikelet pair; lower glume 2-awned, awned to 3.5 mm; upper glume 1-awned, awned to 5 mm; lemmas 3-4 mm long, with an awn 1.5-3 mm long. ● Dry slopes, plains, and woodlands mostly in the southern regions. ● Formerly in the genus *Lycurus*, which has been subsumed in *Muhlenbergia* (see Peterson et al. 2010). *Wolftail* species may be distinguished as follows:

<table>
<thead>
<tr>
<th>Species</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>M. alopecuroides</em></td>
<td>Blades acute or with a bristle 1-3 mm long; ligules 1.5-3 mm long, with lateral acuminate projections on either side; culms erect, often thickly geniculate.</td>
</tr>
<tr>
<td><em>M. phleoides</em></td>
<td>Blades terminating in a slender, hair-like bristle 3-12 mm long; ligules acute to acuminate, 3-10 mm long; culms erect.</td>
</tr>
</tbody>
</table>

*Muhlenbergia polycalis* Scribn [many-stemmed]. Loosely tufted perennial usually with geniculate-decumbent bases and rooting at the lower nodes, sometimes shortly rhizomatous, 15-45 cm tall; ligules 0.5-2.5 mm long, without lateral projections; panicles 2-12 cm long, 1-2 cm wide, interrupted; spikelets 2.5-4 mm long; glumes shorter than the florets, acute to acuminate, awnless or awn-tipped to 1.5 mm; lemmas 2.3-5 mm long, appressed hairy on the lower portion, the hairs to 0.5 mm long; awns 10-25 mm long. ● Shaded ledges and grassy slopes in the southern regions. ● This species is poorly known in the state, with few collections.

*Muhlenbergia porteri* Scribn ex Beal [for Thomas Conrad Porter (1822-1901), American poet, clergyman, botanist] BUSH MUHLY. Tufted, bushy perennial, lacking rhizomes, 25-100 cm or more tall, the culms wiry, stiff, geniculate, zig-zaggy; sheaths shorter than the internodes; ligules 1-4 mm long, with short lateral lobes; panicles 4-14 cm long, 6-15 cm wide, widely open and diffuse, breaking at the base and bowing in the wind; spikelets 3.4-5 mm long; glumes shorter than the florets, acuminate to micro-tipped; lemmas 3.4-5 mm long, appressed-pubescent on the lower portion, with awns 2-13 mm long. ● Dry plains, nearly throughout the state. ● This is an important species in the desert grasslands, nearly always found in the protection of shrubs. Early settlers and soldiers would gather large quantities of bush muhly for feed for their animals, and the grass was called HOE-GRASS for a time; it is called MESQUITE-GRASS in W&S. ● The blades are stiff and pungent, capable of puncturing the skin. Rattlesnakes seem to enjoy these grasses, as well as agrostologists.
Muhlenbergia racemosa (Michaux) Britton, Stems, & Poggenburg [race-like] GREEN MUHLY [Agrostis racemosa Michaux]. Rhizomatous perennial, 30-110 cm tall, much-branched above the middle of the shoot; internodes flattened; sheaths slightly keeled; ligules 0.6-1.7 mm long; blades 2-5 mm wide, flat; panicles 2-16 cm long, 0.5-2 cm wide, dense, lobed; spikelets 3-8 mm long; glumes longer than the lemma, averted to 5 mm; lemma 2.2-3.8 mm long, pilose on the lower ½, the hairs to 1 mm long; awnless or awn-tipped to 1 mm. ●Canyon bottoms, riparian strands, irrigation ditches, moist prairies, roadsides. ●Similar to the rare (in NM) and mostly Canadian Muhlenbergia glomerata, which is distinguished by shoots seldom branched above, dull puberulent internodes, and ligules 0.2-0.6 mm long.

Muhlenbergia ramulosa (Kunth) Swallen [much-branched] RED MUHLY [Muhlenbergia woffii (Vasey) Rydberg, Viña ramulosa Kunth]. Tufted annual, 3-25 cm tall, much-branched; ligules 0.2-0.5 mm long, without lateral projections; panicles 1-9 cm long, 1-3 cm wide, the primary branches spreading; pedicels tending to be appressed, 0.3-1.1 mm long, stout, of equal thickness throughout; spikelets tiny, 0.8-1.3 mm long; glumes shorter than the floret, glabrous, awnless; lemmas 0.8-1.3 mm long, oval, awnless. ●Moist soil in forest clearings in the central and western mountains, and northwestern mesas. ●See comments under Muhlenbergia depauperata for comparison to other common annuals.

Muhlenbergia repens (Presl) A.S. Hitchcock [creeping] CREEPING MUHLY [Sporobolus repens Presl]. Rhizomatous perennial, 5-40 cm tall, the shoots decumbent-based, forming mats; ligules 0.2-1.8 mm long; blades 1-6 cm long; panicles 1-9 cm long, less than 1 cm wide, with few widely spaced spikelets, usually partially included in the subtending sheath; spikelets 2.6-4.2 mm long, occasionally with 2 florets; glumes ½ to equalling the floret; lemmas 2.6-4.4 mm long, awnless or with a mucro to 0.3 mm long. ●Flats, roadside swales, moist prairies, widespread and expected in all the counties. ●Sometimes confused with Muhlenbergia utilis (Torrey) A.S. Hitchcock of high elevation wet meadows, but that species is as yet unknown from the state.

Muhlenbergia richardsonis (Trinius) Rydberg [for John Richardson (1787-1865), Scottish naturalist and naval surgeon] [Muhlenbergia squarrosa Rydberg, Viña richardsonis Trinius]. Rhizomatous perennial, 5-30 cm tall, shoots decumbent to erect, forming loose mats; ligules 0.8-3 mm long; panicles 1-15 cm long, less than 2 cm wide, exerted, often spike-like; spikelets 1.7-3.1 mm long, ½ to ¾ as long as the floret, awnless; lemmas 1.7-3 mm long, awnless to mucronate to 0.5 mm. ●Mountain meadows and ciénegas; not common. ●The common name MAT MUHLY has been applied widely to both Muhlenbergia richardsonis and M. repens, and its use is abandoned here. The two species are easily confused, and reports of M. richardsonis in New Mexico should be carefully evaluated; it is much less common than M. repens.

Muhlenbergia rigens (Bentham) A.S. Hitchcock [stiff, rigid] DEERGRASS [Epicampes rigens Bentham, Muhlenbergia munda] L.M. Johnston. Tufted, tussocky perennial, 40-150 cm tall; sheaths terete basally; ligules 0.5-3 mm long; blades 10-50 cm long, stiff; panicles 15-60 cm long, 0.5-1.5 cm wide, spike-like; spikelets 2.4-4.4 mm long; glumes subequal to the floret, awnless; lemmas 2.4-4 mm long, awnless or with a mucro to 1 mm. ●Dry woodland stream banks, rocky canyons, gullies, common in the southwestern region but in scattered locales elsewhere; also found increasingly as an ornamental landscape plant.

Muhlenbergia rigida (Kunth) Trinius [stiff, rigid] PURPLE MUHLY [Muhlenbergia affinis Trinius, Muhlenbergia metcalfei M.E. Jones, Pseudospermum rigida Kunth]. Tufted, tussocky perennial, 40-100 cm tall; lower sheaths terete; ligules 1-15 mm long; blades 12-35 cm long; panicles 10-30 cm long, 2-10 cm wide, narrow but loose and sometimes quite open, purplish; spikelets 3.5-5 mm long, purplish; glumes shorter than the floret, awnless; lemmas 3.5-5 mm long, purplish, with awns (5)10-22 mm long. ●Rocky hillsides, canyon slopes, and woodlands in the southern regions. ●Plants with narrower panicles and shorter awns have been called Muhlenbergia metcalfei, which is absorbed here; the diminution of M. metcalfei is historically unfortunate, as the epithet honors Orrick Baylor Metcalfe (1879-1936), botanical collector and student of E.O. Wooton.

Muhlenbergia setifolia Vasey [with bristle- or hair-like leaves] CURLYLEAF MUHLY. Tufted perennial, 30-80 cm tall; basal sheaths terete; ligules 4-10 mm long; blades 5-20 cm long, tightly rolled, curly; panicles 10-25 cm long, 2-5 cm wide, loosely contracted; spikelets 3.5-5 mm long, straw-colored to purplish; glumes shorter than the floret, awnless or with a short mucro, the lower one nerve-less; lemmas 3.5-5 mm long, smooth and shiny (except for the callus), with flexuous awns 10-30 mm long. ●Dry gravelly plains and hillsides, juniper woodlands, in the southern regions.

Muhlenbergia sinuosa Swallen [curvy]. Tufted, branched annual 15-40 cm tall; ligules 1.5-3 mm long, with lateral projections longer than the central portion; blades mostly flat, puberulent axially; panicles 10-26 cm long, 3-8 cm wide, open and diffuse; pedicels curved or sinuous, often tanged; spikelets 1.4-2.2 mm long; glumes shorter than the floret, conspicuously hairy, awnless; lemmas 1.4-2 mm long, awnless. ●Moist soil of canyon bottoms, riparian habitats, and rocky hills, mostly in the central and western mountains. ●See comments under Muhlenbergia depauperata for comparison to other common annuals.

Muhlenbergia spiciformis Trinius [spike-shaped] Muhlenbergia parviglumis Vasey]. Tufted perennial, lacking rhizomes, 25-80 cm tall, erect and wiry; ligules 1-3 mm long; panicles 5-20 cm long, 0.5-3 cm wide, narrow; spikelets 3-4 mm long; glumes much shorter than the floret, awnless; lemmas 2.8-4 mm long, slightly appressed hairy below, with awns 10-40 mm long. ●Canyons and moist woodlands, known only from a few collections in Lincoln and Eddy counties.

Muhlenbergia straminea A.S. Hitchcock [straw-like] SCREWLEAF MUHLY [Muhlenbergia virescens auctores]. Tufted perennial, 25-70 cm tall; sheaths becoming flattened and ribbon-like, coiling like woodshavings in age; ligules 6-20 mm long; panicles 8-25 cm wide, 0.5-3 cm wide, loosely contracted; spikelets 3.5-7 mm long; glumes awnless or shortly awn-tipped, the upper equaling or exceeding the floret, 3-nerved and sometimes 3-toothed; lemmas 3.5-6 mm long, hairy on the lower ½, with awns 12-30 mm long. ●Rocky slopes and clearings, mostly in pine forest, southwestern mountains. ●SCREWLEAF MUHLY has been confused with Muhlenbergia montana, with which it often occurs, which has only occasionally coiled old sheaths and second glumes shorter than the lemma. Reeder & Reeder (1995) cleared up the prior confusion with M. virescens (Kunth) Trinius, a species of Mexico.
**Muhlenbergia tenuifolia** (Kunth) Trinius [thin-leaved] MESA MUHLY [Calamagrostis tenuifolia Kunth, Muhlenbergia monticola Buckley]. Tufted annual to short-lived perennial, 20-70 cm tall; sheaths shorter than the internodes; ligules 1.2-5 mm long; panicles 7-20 cm long, 0.5-3 cm wide, lax, often nodding, interrupted; spikelets 2-4 mm long; glumes shorter than the floret, awnless or awn-tipped; lemmas 2.3-4 mm long, hairy on the lower ½, with an awn 10-30 mm long. ●Rocky ledges and outcrops, canyons, sandy drainages. ●Plants from San Juan and McKinley counties must be examined closely, as these have been confused with M. pauciflora, which has nearly glabrous florets.

**Muhlenbergia texana** Buckley [of Texas]. Slender tufted annual, 10-35 cm tall; ligules 1-2.5 mm long; panicles 9-21 cm long, 2-7 cm wide, loosely diffuse; spikelets 1.3-2 mm long; glumes shorter than the floret, sparsely short-hairy, awnless or with a mucro; lemmas 1.3-2 mm long, short-appressed-hairy on the lower ½, awnless or with an awn to 2 mm. ●Rocky outcrops, sandy drainages, disturbed ground, southwestern counties.

**Muhlenbergia thurberi** (Scribner) Rydborg [for George Thurber (1821-1890), American botanist and naturalist]. Rhizomatous perennial, 12-36 cm tall, the aerial stems densely clustered at the base of the shoot; sheaths shorter than the internodes; ligules 0.9-1.2 mm long; blades 0.5-4 cm long, tightly rolled; panicles 1-6 cm long, less than 1 cm wide; spikelets 2.6-4 mm long; glumes shorter than the floret, awnless; lemmas 2.6-4 mm long, hairy on the lower ⅓, awnless or with an awn to 1 mm. ●Dry hills in the northwestern region.

**Muhlenbergia torreyi** (Kunth) A.S. Hitchcock ex Bush [for John Torrey (1796-1873), distinguished American botanist] RING MUHLY [Aegilis torreyi Kunth, Muhlenbergia gracillima Torrey]. Tufted perennial lacking rhizomes, the bases decumbent, 10-45 cm tall; ligules concentrated at the base of the plant, the leafy portion in the lower ¼ or less; blades 1-5 cm long, tightly folded or rolled, strongly curved, the margins not whitish-thickened; panicles 7-21 cm long, 3-15 cm wide; spikelets 2.3-3.5 mm long; glumes shorter than the floret, awnless or with an awn to 1 mm; lemmas 2.3-3.5 mm long, with awns 0.5-4 mm long. ●Sandly plains, throughout the state. ●An abundance of this grass often indicates an overgrazed range. As the clumps grow, the interior portions die off, producing a ring-like growth form; the short curving blades concentrated at the base of the plant are distinctive. Four species of low stature and similar habitat that are likely to be confused are compared below: §

<table>
<thead>
<tr>
<th></th>
<th>arenacea</th>
<th>arenicola</th>
<th>arizonica</th>
<th>torreyi</th>
</tr>
</thead>
<tbody>
<tr>
<td>habit</td>
<td>rhizomatous</td>
<td>tufted, bases decumbent</td>
<td>tufted, bases erect to decumbent</td>
<td>tufted, bases decumbent</td>
</tr>
<tr>
<td>ligules</td>
<td>with lateral extensions</td>
<td>lacking extensions</td>
<td>lacking extensions</td>
<td>lacking extensions</td>
</tr>
<tr>
<td>blade / plant ratio</td>
<td>⅓ or more plant height</td>
<td>⅓ or more plant height</td>
<td>⅓ or more plant height</td>
<td>⅓ or less plant height</td>
</tr>
<tr>
<td>blade shape</td>
<td>± straight</td>
<td>± straight to slightly curving</td>
<td>± straight</td>
<td>strongly curving</td>
</tr>
<tr>
<td>blade length</td>
<td>1.5 cm</td>
<td>4-15 cm</td>
<td>4-7 cm</td>
<td>1.5 cm</td>
</tr>
<tr>
<td>blade margins</td>
<td>whitish-thickened</td>
<td>not whitish-thickened</td>
<td>whitish-thickened</td>
<td>not whitish-thickened</td>
</tr>
<tr>
<td>lateral pedicel length</td>
<td>&gt; spikelets</td>
<td>&lt; spikelets</td>
<td>&gt; spikelets</td>
<td>&gt; spikelets</td>
</tr>
<tr>
<td>lemmas length</td>
<td>1.5-2.5 mm</td>
<td>2.5-4.2 mm</td>
<td>2-3 mm</td>
<td>2.3-3.5 mm</td>
</tr>
<tr>
<td>lemma awn</td>
<td>0-0.3 mm</td>
<td>0.5-4.2 mm</td>
<td>0.5-1 mm</td>
<td>0.5-4 mm</td>
</tr>
</tbody>
</table>

**Muhlenbergia tricholepis** (Torrey) Columbus [hairy scale] PINE DROPSEED [Blepharoneuron tricholepis (Torrey) Nash, Vilfa tricholepis Torrey]. Plants perennial, tufted, 15-65 cm tall; panicle 3-22 cm long, the branches spreading; pedicels capillary, sinuous; spikelets with a single floret, grayish, 1.8-3 mm long; disarticulation above the glumes; lemma slightly longer than the glumes, 3-nerved, silky hairy on the nerves and margins, awnless; palea shorter than the lemma, densely silky hairy, anthers 3. ●Widespread on rocky or gravely slopes in the mountains and foothills. ●Formerly segregated as M. villosa (Swallen) Nash, but we agree with Peterson et al. (2010) in its realignment with Muhlenbergia. A related species, Muhlenbergia shepherdi Vasey, is known in the mountains of Chihuahua, Mexico, and may be looked for in Hidalgo County; it is a slender annual with smaller florets. §

**Muhlenbergia villosa** A.S. Hitchcock [shaggy-haired flowers]. Rhizomatous perennial, 5-30 cm tall; sheaths shorter than the internodes; ligules 0.5-1.5 cm long; blades tightly rolled; panicles 1-5 cm long, less than 1 cm wide, not dense, usually exserted from the subtending sheath; spikelets 1.4-2.5 mm long; glumes shorter than the floret, glabrous, awnless; lemmas 1.4-2.5 mm long, villous nearly throughout, awnless or with a short mucro to 0.5 mm. ●Dry plains; known in New Mexico from a few collections in Eddy and Otero counties. ●Our plants belong to var. villosa (Swallen) Morden [shaggy-haired] [Muhlenbergia villosa Swallen].

**Muhlenbergia wrightii** Vasey ex Coulter [for Charles Wright (1811-1885), outstanding American botanical collector] SPIKE MUHLY. Tufted perennial, 15-60 cm tall; sheaths compressed-keeled; ligules 1-5 mm long; panicles 5-16 cm long, 1 cm wide or less, spike-like, interrupted below; spikelets 2-3 mm long; glumes ⅓ or less the length of the lemma, abruptly acuminate to an awn-tip to 1 mm; lemmas 2-3 mm long, minutely hairy on the lower ⅓, awnless or with an awn-tip to 1 mm. ●Plains and grassy hills and slopes, widespread. ●We have six Muhlenbergia species with compressed-keeled sheaths: alopecuroides, cuspidata, emersleyi, paniculata, phleoides, and wrightii. This is a convenient vegetative identification feature; combined with the following, the species can be eliminated in order:

- Plants 50-150 cm tall, tussocky
- Blades spirally-twisted and with whitish-thickened margins
- Blades terminating in a bristle 3-12 mm long
- Ligules less than 1 mm long
- Ligules with long pointed lateral projections on either side of the central portion
- And the last man standing

Both Alopecuroides spicatus and M. cuspidata are often confused with M. wrightii.
Munroa [for William Munro (1818-1880), British botanist & soldier] [2].

Stoloniferous annuals or perennials, often mat-forming, the stolons ending in fascicles of leaves from which arise new shoots; sheaths open, with a tuft of hair at the throat; auricles absent; ligules a ring of hairs; blades flat or involute; inflorescence a dense, head-like cluster of spike-like branches, the branches hidden in the subtending sheath and bearing a few spikelets; spikelets with few to several florets, the lower fertile, the upper sterile; disarticulation both above the glumes and between the florets or beneath the leaves subtending the panicle; glumes subequal to the adjacent lemmas; lemmas 3-nerved, 2-lobed, pilose along the nerves; paleas subequal to the lemmas; anthers 2-3. ● All but 2 of the 6 species in this genus are confined to South America. We include the genus Dasyochloa here. The name was originally mis-spelled Monroa, an obvious orthographic error that is correctable and need not endure. Young plants of both species may produce a white, wooly covering, appearing like floccose hairs. These are hair-like, water soluble crystals that wash off in water, the product of transpiration and evaporation (Parodi 1934). Munroa squarrosa var. floccuosa was named from such a specimen.


1 Plants perennial; blades rolled; glumes longer than the lower lemma................................................................................ M. pulchella
1 Plants annual; blades flat; glumes shorter than the lower lemma................................................................................ M. squarrosa

Munroa pulchella (Kunth) L.D. Amarilla [beautiful and little] FLUFFGRASS [Dasyochloa pulchella (Kunth) Willdenow ex Rydberg, Erioseuron pulchellum (Willdenow ex Rydberg) Tateoka, Triodis pulchella (Willdenow ex Rydberg) Hitchcock, Triodia pulchella Kunth]. Stoloniferous perennial (though sometimes short-lived), 2-15 cm tall, the peduncle/stolon 3-10 cm long; blades 2-6 cm long, involute; panicles 1-2 cm long, densely white-hairy; glumes 6-9 mm long; lemmas 3-6 mm long, the apex 2-lobed to about 3 mm, awned from the midnerve 2-4 mm long. ● Rocky desert flats and hills, common in the southern
regions, but extending northward to San Juan County. This species is a nomenclatural and systematic vagabond, passing through Triodia, Koeleria, Urolepis, Tricuspid, Siegelwria, Triten, Erioneuron, and Dasychoila, before finding a permanent (it is hoped) home in Munroa. Florets are gathered by harvester ants, taken below ground to the nest where the grain is excised, and the chaff is brought back up and piled in large mounds around the entrance to the nest.

**Munroa squarrosa** (Nuttall) Torrey [projecting downward] FALSE BUFFALOGRASS *Oryzopsis squarrosa* Nuttall, *Munroa squarrosa* (Nuttall) Torrey var. *flaccuosa* Vasey ex Best. Annual, producing short stolons, 3-15(30) cm tall; blades 1-5 cm long, flat, 1-2 mm wide; spikelets with 3-5 florets; glumes of lower spikelets 2.5-4 mm long, acute; lemmas of lower spikelets with tufts of hair on the lateral nerves, the midnerves extended into a mucro or awn-tip 0.5-2 mm long. Sandy plains and flats throughout the state. True BUFFALOGRASS, *Bouteloua dactyloides*, is a perennial that produces buoyant seed burs among the leaves and staminage flags raised above. Even more similar, though is its congener, *Munroa pulchella*, which differs by the key features.

**Nassella** [narrow-necked] NEEDLEGRASS [2].

Mostly tufted perennials, rarely annual or rhizomatous; sheaths open; auricles absent; ligules membranous, sometimes ciliate; inflorescence generally a rebranching panicle; spikelets with 1 floret, the rachilla not prolonged; disarticulation above the glumes; lemmas 3-5-nerved, longer than the floret; lemma 3-5-nerved, convolute, wrapped around the palea and grain; awns present; paleas to ½ the length of the lemma; anthers 1 or 3. • About 116 species of the New World. Our species were all formerly included in *Stipa*, most species of the genus are South American.


**Nassella tenuissima** (Trinius) Barkworth [very slender] MEXICAN FEATHERGRASS *Oryzopsis tenuissima* Trinius. Tightly tufted perennial, 25-100 cm tall; sheaths without conspicuous hairs at the summit; ligules 1.5-5 mm long; blades to 60 cm long, convoluted and very thick, to 1.5 mm wide; panicles 8-50 cm long, loosely contracted; glumes 5-13 mm long, aristate; florets 2-3 mm long; awns 4-10 cm long. Rocky slopes and woodlands, mostly in the southern regions.

Plants are gaining popularity as an ornamental grass, but they easily escape their plantings to adjacent ground; considered noxious in other states. The seedheads become tangled in the wind, forming very dense balls of florets reaching the size of a softball.

**Nassella viridula** (Trinius) Barkworth [greenish] GREEN NEEDLEGRASS *Stipa viridula* Trinius. Tufted perennial, 35-120 cm tall; sheath margins ciliate, with a conspicuous tuft at the summit; ligules 0.2-1.2 mm long; blades 10-30 cm long, 1.5-3 mm wide, flat to rolled; panicles 3-7 cm long, loosely contracted; glumes 7-13 mm long, apicate; florets 3.5-6 mm long; awns 2-3 cm long. Grassy hills, plains, and flats in the northern regions.

**Oryzopsis** [resembling rice] [1].

Tufted perennial; leaves mostly basal; sheaths open; auricles absent; ligules membranous; inflorescence a contracted panicle; spikelets with 1 floret, the rachilla not prolonged; disarticulation above the glumes; glumes subequal to the floret; lemmas 5-7 mm long; awns straight, deciduous, 7-15 mm long; anthers 2-4 mm long.

**Oryzopsis asperifolia** Michaux [with rough leaves] MOUNTAIN RICEGRASS. Tufted perennial, 25-65 cm tall; leaves mostly basal; ligules less than 1 mm long; bases of blade leaves 30-90 cm long, 4-9 mm wide, the bases twisted so the adaxial surface is uppermost, remaining green through the winter; panicles 3-13 cm long; glumes 6-10-nerved, 5-7.5 mm long, subequal to the lemma; lemmas 5-7 mm long; awns straight, deciduous, 7-15 mm long; anthers 2-4 mm long. Moist wooded sites in the northern mountains, usually in the shade. The species is unmistakable, with a prominent cluster of broad green basal leaves, the blades twisted upside-down, and narrow few-flowered panicles with plump spikelets and short awns (many of which have fallen).

**Oryzopsis asperifolia** Michaux [with rough leaves] MOUNTAIN RICEGRASS, Tufted perennial, 25-65 cm tall; leaves mostly basal; ligules less than 1 mm long; bases of blade leaves 30-90 cm long, 4-9 mm wide, the bases twisted so the adaxial surface is uppermost, remaining green through the winter; panicles 3-13 cm long; glumes 6-10-nerved, 5-7.5 mm long, subequal to the lemma; lemmas 5-7 mm long; awns straight, deciduous, 7-15 mm long; anthers 2-4 mm long. Moist wooded sites in the northern mountains, usually in the shade. The species is unmistakable, with a prominent cluster of broad green basal leaves, the blades twisted upside-down, and narrow few-flowered panicles with plump spikelets and short awns (many of which have fallen).

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<table>
<thead>
<tr>
<th>Plants annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Plants annual</td>
</tr>
<tr>
<td>2. Lemma of the upper floret wrinkled; spikelets nearly sessile on simple or nearly simple primary branches.</td>
</tr>
<tr>
<td>3. First glume about 1/4 as long as the spikelet, obsolete or rounded at the tip; stems as much as 1 m long, coarse and often somewhat trailing.</td>
</tr>
<tr>
<td>4. Spikelets less than 4 mm long; panicle usually not nodding.</td>
</tr>
<tr>
<td>5. Mature panicles 2-3 cm long and congested among the leaves, never exceeding the foliage; plants 2-8 cm tall.</td>
</tr>
<tr>
<td>6. Mature panicles longer, exceeding the leaves; plants usually taller</td>
</tr>
<tr>
<td>7. Palea of lower floret well developed, as long as the length of the entire plant; panicle axes pubescent.</td>
</tr>
<tr>
<td>8. Upper floret ovoid to ellipsoid, not stipitate, lacking thickenings at the base, but with 2 small scars, the base with a cavity when mature and the palea usually bulging outward at the base</td>
</tr>
<tr>
<td>9. Terminal spikelet of each branch subtended by one or more bristles (vestigial branchlets)</td>
</tr>
<tr>
<td>10. First glume about as long as the second; primary panicle branches mostly unbranched; long stolons developed.</td>
</tr>
<tr>
<td>11. Spikelets 4-8 mm long</td>
</tr>
<tr>
<td>12. Spikelets 6-8 mm long.</td>
</tr>
<tr>
<td>13. Spikelets 4-5(dm) mm long</td>
</tr>
<tr>
<td>14. Panicles open, not contracted.</td>
</tr>
<tr>
<td>15. Panicles open; scaly rhizomes; blades not curling.</td>
</tr>
<tr>
<td>16. Spikelets less than 4 mm long</td>
</tr>
<tr>
<td>17. Palea of the lower floret inflated, enlarged, obovate, forking the spikelet to give open.</td>
</tr>
<tr>
<td>18. Panicles shorter than the second; primary panicle branches often rebranched; stolons not developed</td>
</tr>
<tr>
<td>19. Spikelets appressed and usually closely clustered on simple or nearly simple panicle branches or on short spur branches.</td>
</tr>
<tr>
<td>20. Lower floret smaller, producing anthers, which are usually visible; plant usually dark green, the blades rarely curling.</td>
</tr>
<tr>
<td>21. Lower floret neuter, anthers not produced; plants usually bluish green, the blades often curling.</td>
</tr>
<tr>
<td>22. Spikelets not appressed on simple panicle branches, the pedicels and branches spreading and open</td>
</tr>
<tr>
<td>23. First glume and lower lemma 5-nerved; sheaths keeled; culms conspicuously swollen and bulb-like at the base in many (but not all) populations.</td>
</tr>
<tr>
<td>24. Second glume and lower lemma 7- to 11-nerved; sheaths not keeled; culms not swollen and bulb-like at the base, though they may be thickened in Panicum virgatum</td>
</tr>
<tr>
<td>25. Plants with stout, scaly rhizomes; blades usually not curling.</td>
</tr>
<tr>
<td>26. Plants lacking rhizomes; blades often curling.</td>
</tr>
<tr>
<td>27. Panicum alatum Zuloaga &amp; Morrone [winged]. Glabrous to hispid, tufted annual, 8-65 cm or more tall; ligules of hairs, 0.7-1.8 mm long; blades 3-17 mm wide, sparsely pilose; panicles 4-23 cm long, 2-11 cm wide, the branches stiffly spreading; pedicles and terminal branchlets tending to be appressed; spikelets 2.4-4.5 mm long; lower glume ½ to ⅔ the length of the spikelet; upper glume ovobovoid when mature, very shortly stipitate; with 2 fleshy thickenings at the base, the base lacking a cavity and the palea not protruding but even with the palea.</td>
</tr>
<tr>
<td>28. Sandy to clayey disturbed ground, roadsides, swales, in the boothel region. Plants belonging to this species were formerly treated in Panicum hirticaule. We have two obscure varieties:</td>
</tr>
<tr>
<td>a. Upper floret dull, densely papillose all over (use magnification). var. alatum</td>
</tr>
<tr>
<td>b. Upper floret smooth, shiny, not papillose except at the tip of the palea... var. minus (Anderson) Zuloaga &amp; Morrone [less]</td>
</tr>
<tr>
<td>230</td>
</tr>
</tbody>
</table>
Panicum amarum Elliott [bitter]. Rhizomatous perennial, glabrous and glaucous throughout, 30-200 cm or more tall; ligules 1-5 mm long; blades 2-13 mm wide; panicles 10-80 cm long, 2-17 cm wide, loosely contracted; spikelets 4-7.7 mm long, glabrous; lower glume ⅓ to nearly as long as the spikelet; upper glume and lower lemma exceeding the fertile floret by 1.5-3 mm; lower floret stamine; fertile floret 2.4-4 mm long, smooth, shiny, the lemma clasping the palea only at the base. ♦Planted for erosion control near Zului, Cibola County; native to the sandy beaches and plains of the Atlantic and Gulf coasts.

Panicum antidotale Retzius [antidote] BLUE PANICUM. Rhizomatous, glaucous perennial, 50-300 cm tall, becoming somewhat woody and much-branched in age; scales of the rachis densely brownish pilose; basal buds silky long-hairy; nodes swollen, sometimes hairy; ligules 0.3-1.5 mm long; blades 3-20 mm wide; panicles 10-45 cm long, about ½ as wide; spikelets 2.4-3.4 mm long, glabrous; lower glume ⅓ or less the spikelet length; lower floret stamine; fertile floret 1.8-2.8 mm long, shiny, smooth. ♦Introduced for range restoration; native to India. ♦Plants may accumulate toxic levels of nitrates, especially after fertilization and irrigation.

Panicum bulbosum Kunth...go to Zuloagaea

Panicum capillare Linnaeus [hair-like] WITCHGRASS. Often densely hirsute or hispid annual, the hairs bulbous-based, 15-130 cm tall; ligules membranous-ciliate, 0.5-1.5 mm long; blades 3-18 mm wide; panicles 13-50 cm long, 7-24 cm wide, very open and diffuse, usually more than ½ the length of the plant, the bases often in the subtending sheath, breaking and rolling in the wind when mature, or remaining intact; spikelets 2.4-5 mm long; lower glume ⅓ or less the spikelet length; lower floret sterile, the lemma extending beyond the fertile floret by 0.5-1 mm, the palea present or absent; fertile floret sometimes falling out of the spikelet. ♦Roadsides and other disturbed sites throughout the state. ♦Some populations may accumulate toxic levels of nitrates. Panicum turn a bright red in the fall and are unmistakable along the road. The origin of the name WITCHGRASS is unknown, perhaps alluding to the broom-like panicles? We have two subspecies:

- Panicum capillare capillare (Chase) Freckman & Lelong [for Frederick Hebard Hillman (1863-1954), Nevada botanist] ♦Frequent along roadside, ditches, irrigated pastures on the eastern plains.
- Panicum capillare filipes Scribner [for Elihu Hall (1822-1882), American plant collector from Illinois] ♦Panicum lepidulum A.S. Hitchcock (from Mexico and Central America) that would key here; the specimen in question was reported for New Mexico, but reported for occasional dry plains in the southeastern corner of the state, uncommon.

Panicum coloratum Linnaeus [colored] KLEINGRASS. Tufted perennial, but also with short rhizomes, 50-140 cm tall; shoots with abundant foliage; sheaths shorter than the internodes; ligules 0.5-2 mm long; blades 2-8 mm wide, flat; panicles 5-30 cm long, 3-14 cm wide; spikelets 2.5-3.5 mm long, glabrous; lower glume about ⅓ the length of the spikelet; lower floret stamine, the palea 2-3 mm long; fertile floret 2.2-5 mm long, smooth, shiny. ♦Introduced for irrigated pastures, escaping along roadsides; probably more common in the state than indicated by the collections; native to Africa. ♦Though reasonably good pasture forage, plants have also been associated with photosensitivity in sheep and horses, called “big-head.” The origin of the English name is unknown, perhaps alluding to the person involved in its introduction as a forage grass.

Panicum dichotomiflorum Michaux [paired flowers] FALL PANICUM. Tufted annual or short-lived perennial under mild conditions, 10-200 cm tall, gynoeceum-based and rooting at the lower nodes in wet soil or water; culms of zigzag and somewhat flattened; sheaths compressed, inflated; ligules 0.5-2 mm long; blades 3-25 mm wide, glabrous to pilose; panicles both terminal and axillary, 5-40 cm long, diffuse when mature; spikelets 1.8-3.8 mm long, glabrous; lower glume very short, about ¼ the spikelet length; lower floret sterile, the palea vestigial to well-developed; fertile floret 1.5-2.5 mm long, smooth, shiny. ♦Moist stream banks, meadows, roadsides, not common; native to central and eastern United States and Canada.

Panicum hallii Vasey [for Elihu Hall (1822-1882), American plant collector from Illinois] [Panicum lepidulum of NM reports]. Tufted perennial, 10-100 cm tall; leaves clustered at the base of the plant; ligules 0.6-2 mm long; blades 2-10 mm wide, mostly flat, generally curling in age; panicles 7-30 cm long, 3-15 cm wide, the branches ascending, the pedicels appressed (common) to spreading; spikelets 2-4.2 mm long, glabrous; lower glume ⅓ the spikelet length; lower floret stamine, the palea nearly as long as its floret; fertile floret 1.5-2.5 mm long, smooth, darkening. ♦Plains and rocky slopes, foothills, often on limestone, also clay swales and flats, up to about 7400 ft. ♦Earlier New Mexico works reported Panicum lepidulum A.S. Hitchcock (from Mexico and Central America) that would key here; the specimen in question was determined to be P. hallii. We have two varieties:


Panicum havardii Vasey [for Valéry Havard (1846-1927), distinguished Army surgeon and botanist] [Panicum virgatum Linnaeus var. macranthemum Vasey]. Robust rhizomatous perennial, 0.6-1.5 m tall, with decumbent bases, shoots arising singly or in small clusters, glabrous throughout, often glaucous; sheaths longer than the internodes; ligules a ciliate membrane, 2-4 mm long; blades 5-10 cm wide; panicles 17-40 cm long, nearly as wide, the branches stiffly ascending to spreading; spikelets 6-8 mm long; lower glume ⅓-⅔ the spikelet length; upper glume and lower lemma exceeding the fertile floret by 1-2 mm; fertile floret 4.5-5 mm long. ♦Sandy plains and dunes on the eastern plains. ♦Some include this within Panicum virgatum, to which it is certainly related, but it differs strikingly in the solitary, decumbent-based culms and larger spikelets. The seemingly out-of-range report for San Miguel County is a specimen collected by Vasey (the author of the species) near Las Vegas in 1880.

Panicum hirticaule Presl [hairy stem] Tufted, branched, annual, 15-75 cm or more tall; foliage generally hirsip with bulbous-based hairs; sheaths shorter than the internodes; ligules 1-1.5 mm long; blades 0.5-2 mm wide; panicles ⅓ or less the length of the plant, 9-20 cm long, 5-10 cm wide, glabrous in the axils; pedicels generally appressed along the branchlets; spikelets 1.8-4 mm long, glabrous; lower glume ½-⅔ the length of the spikelet; lower floret sterile, with a...
palea ½ or less the length of the adjacent fertile floret; fertile floret 1.5-2.4 mm long, smooth, shiny to dull, with 2 small scars at the base but lacking fleshly thicknesses; palesa of fertile floret usually bulging outward at the base. ● Rocky to sandy slopes, plains, and washes, mostly in the southwestern regions, common. ● We have three obscure varieties:

- **Fertile floret dull, covered with conspicuous papillae on both lemma and palea (use magnification)... var. verrucosum Zuloaga & Morrone [wartly]. Known only from the Animas Valley, Hidalgo County.**
- **Fertile floret shiny, smooth, with sparse papillae only at the tip of the pala**
- **Lower glumes ½-⅔ the spikelet length; spikelets 2-3.6 mm long... var. hirticola.** Widely spread, the most common variety.

- **Lower glumes ½ to nearly equalling the spikelet; spikelets 3-6.4 mm long... var. papposiphon (A.S. Hitchcock) Beech.** [with many shoots].

- **Panicum capillare Linnaeus var. papposiphon A.S. Hitchcock & Chase.** Gould, Panicum papposiphon A.S. Hitchcock & Chase. [Dona Ana and Grant counties.]

- **Our only verified records of var. papposiphon are from the late 1800s or early 1900s; it is likely that this is no longer present in the state; more recent collections are known from Arizona.**

*Panicum mohavense* Reeder. [from the Mojave region, Arizona]. Tiny annual, 2-8 cm tall, the foliage generally hispid with publess-based hairs; ligules 0.2-0.4 mm long; blades 1-4 cm long, 1-3 mm wide, flat; panicles down among the blades, about as wide as long; spikelets 2-2.2 mm long, glabrous, plump, obtuse-acute; lower glume about 1/3 the spikelet length; lower floret sterile, with a tiny palea; fertile floret 1.4-1.8 mm long. ● Limestone ridges of the Oscura Mts, Socorro County; also Arizona.

*Panicum stramineum* A.S. Hitchcock & Chase [Panicum hirticaule Peel var. stramineum (A.S. Hitchcock & Chase) Beech]. Tufted annual, 10-70 cm or more tall; sheaths glabrous to hirsute with publess-based hairs; ligules 1.2-2.5 mm long; blades 3-20 mm wide; panicles 3-30 cm long, 4-15 cm wide; spikelets 2.3-3.2 mm long; lower glume ½-⅔ the length of the spikelet; palea of the lower floret as long or longer than the adjacent fertile floret; fertile floret 1.5-2.5 mm long. ● Reported by several previous works, but re-examination of the specimens from New Mexico failed to confirm its presence; it likely be found in the bootheel region. ● It may be that this species is better treated as a variety or subspecies of Panicum hirticola.  *Panicum virgatum* Buckley [Panicum virgatum L. var. brevispathum (A.S. Hitchcock & Chase) Beech]. Tufted perennial, 40-200 cm or more tall, the culms solitary or more commonly forming dense clumps; sheaths longer than the lower internodes, glabrous or pilose, the margin usually ciliate; ligules 2-6 mm long; blades 2-15 mm wide; panicles 10-50 cm long, about ⅓ as wide; spikelets (3)-8 mm long, glabrous, acuminate; lower glume ½ to nearly as long as the spikelet, acuminate; upper glume and lower lemma extending 1-3 mm beyond the upper floret; lower floret staminate, the palea well-developed; fertile floret 2.3-3 mm long, smooth, shiny. ● Moist plains, prairies, and meadows, roadsides, mostly in the eastern regions; also used in seed mixes for range restoration. ● The large pointy spikelets are distinctive, with generally three points: one each from the lower glume, the upper glume, and the lower lemma. An excellent forage grass where abundant, though it does have the rare capacity for photosensitization. Many of the plants and birds in the mountains, come from seeding programs. Gain popularity as an ornamental.

**Pappophorum** [pappus-bearing] PAPPUSGRASS [1].

Tightly tufted perennial; sheaths open; auricles absent; ligules a ring of hairs; inflorescence a narrow, spike-like panicle; spikelets with 3-5 florets, the lower ones sterile, the upper ones sterile; disarticulation above the glumes, all florets falling together; glumes 1-nerved, reaching at least to the awns of the florets; lemma ± 7-nerved, the nerves extending into minutely hairy awns, the awns forming a papposiphon-like crown; anthers 3.  ● About 8-10 species of North and South America.

**Pappostipa** [pappus-bearing Stipa] NEEDLEGRASS [2].

Tightly tufted perennial; sheaths open; auricles present; ligules membranous, ciliate; blades flat to convolute, adaxial surface hairy; inflorescence a narrow panicle; spikelets with a single floret; glumes large, subequal, longer than the floret (except the awn); florets fusiiform,awned; lemmas rolled around the pala, but the margins only slightly overlapping; awns 2-10 cm or more long, strongly once-geniculate, the basal segment densely pilose with hairs 3-10 mm long; palesa ½ to subequal to the lemma.  ● About 14 species, all but one of which occur in South America. Originally classified in *Stipa*, and from thence to *Achnatherum*, *Jarava*, and lastly, *Pappostipa*, all in the search for monophyly.

**Pappostipa speciosa** (Trinius & Ruprecht) Romaschenko [showy, handsome] [Achnatherum speciosum (Trinius & Ruprecht)] Barkworth, *Jaraea speciosa* (Trinius & Ruprecht) Peñailillo, *Stipa speciosa* Trinius & Ruprecht. Tufted perennial, 30-60 cm tall; basal sheaths reddish brown, becoming flat and ribbon-like in age; ligules variable, those of the lower leaves densely ciliate with hairs 0.3-1 mm long; panicles 10-15 cm long, contracted, usually partially included in the subtending sheath; spikelets 16-24 mm long (excluding awns); florets 6-10 mm long; awns 3.5-8 cm long, once-geniculate, with hairs 3-8 mm long on the basal segment, the terminal segment glabrous. ● Desert canyons and rocky hills, known in New Mexico only from San Juan and Sandoval counties. ♦ The reddish-brown sheaths and once-geniculate awns with long hairs on the basal segment serve to identify this species. Plants may hybridize with *Eriocoma huyenoides*, the offspring being referred to as *Eriocoma × bloomeri* (Bolander) Barkworth.

**Pascopyrum** [pasture wheat] WHEATGRASS [1].

Rhizomatous perennial; leaves tending toward the base; sheaths open; auricles present; ligules membranous; inflorescence a spike mostly with 1 spikelet per node; spikelets with several florets; disarticulation above the glumes and between the florets; glumes narrowly lanceolate, curving to falcate, 1-nerved distally, acuminate; lemmas lanceolate, mucronate to awned; anthers 3. ● Most recently classified in *Elymus*. *Pascopyrum smithii* is the derivative of hybridization between *Elymus* and *Leymus* species, with a unique genomic complement; because of this, it is placed in the monotypic genus *Pascopyrum*.

**Pascopyrum smithii** (Rydberg) Barkworth & Dewey [for Jared Gage Smith (1866-1925), botanist and agrostologist for U.S.D.A.] WESTERN WHEATGRASS [Agropyron mollae (Scribner & Smith) Rydberg, Agropyron occidentale Scribner, Agropyron palmeri (Scribner & Smith) Rydberg, Agropyron smithii Rydberg var. mollae (Scribner & Smith) M.E. Jones, Agropyron smithii Rydberg var. palmeri (Scribner & Smith) Heller, *Elymus smithii* (Rydberg) Gould, Elyrigia smithii (Rydberg) Nevski]. Rhizomatous perennial, 25-100 cm or more tall; foliage with a bluish cast; ligules tiny, about 0.2 mm long; blades rigid, prominently veined on the upper surface; spikes 5-18 cm long, spikelets 12-26 mm long, ascending, sometimes curving outward; glumes about ½ the length of the spikelet, stiff, curving to one side; lemmas 6-12 mm long, glabrous to hairy, acute to awned to 5 mm; anthers 4-6 mm long.
Monocotyledonous Plants - Poaceae

Standley (1912) in “The Grasses and Grass-Like Plants of New Mexico,” about the scientific name of WESTERN WHEATGRASS: “Within the past 10 or 15 years the name of this grass has been changed quite frequently. It was first referred to Agropyron repens, an Eastern species. Then it was recognized as A. repens var. glaucum. Then it was considered as a separate species and the usual custom followed and it was called A. glaucum. But the name was already in use for another and prior publication so two attempts were made to correct this. One author called it A. occidentalis and another A. smithii. The former name was taken up for some time though it appears the latter really has the claim of priority; hence it is used here, though its author uses the other in the ‘Flora of Colorado.’”

Paspalum [ancient name for a millet] Paspalum [3].

Tufted, rhizomatous, or stoloniferous annuals and perennials; sheaths open; auricles usually absent (ours), sometimes present; ligules membranous or absent (ours); inflorescence a panicles of spike-like branches, sometimes rebranching shortly; spikelets dorsally compressed, flat on one side and rounded on the other, borne on one side of the branch, awnless, with 2 florets, the lower sterile, the upper fertile; glumes unequal, the lower vestigial to absent, the upper as long as the spikelet and similar to the lower lemma in size and texture; upper floret fertile, indurate at maturity, the lemma edges clasping the palea. Identification can be confusing for the novice, because of the absence of the first glume, leading some to think the spikelets are 1-flowered.

- Allred, K.W. 2008. Plant distribution reports [Pennisetum setaceum]. The New Mexico Botanist 43:
- Chemisquy et al. (2010) argue with some justification for the merger of Cenchrus and Pennisetum (within Cenchrus) in order to uphold monophyly, but we allow a paraphyletic Pennisetum, and maintain the obvious and practical morphological distinctions among Setaria, Pennisetum, and Cenchrus as follows: a) bristles subtending the spikelets but not fused and remaining on the plant at disarticulation = Setaria; b) bristles fused at least basally to form a disarticulating bur but not spinose = Pennisetum; c) bristles fused to form a disarticulating bur and some or all of the bristles spinose = Cenchrus. All Pennisetum in New Mexico are exotics used in landscaping that have escaped to the wild, or forage grasses introduced in neighboring states (P. ciliare) that have found their way here.

Pennisetum setaceum Michaux [bristle-like]. Tufted perennial, sometimes with short rhizomes 25-110 cm tall; sheaths glabrous or pubescent; ligules 0.2-0.5 mm long; panicles with 1-6 branches 2-15 cm long; spikelets 1.4-2.6 mm long, elliptic, glabrous; lower glume absent or to 1 mm. Weedy along ditches and ponds, slow-moving streams and sloughs; widespread, nearly throughout the state.

Poaceae

1 Inflorescence branches 2 in number, attached less than 1 cm apart; (1 or 2 additional branches occasionally present below)

2 Second glume and lemma of lower floret glabrous (sometimes obscurely so); ditchbanks and sloughs

3 Spikelets 1.5-2.6 mm long, the margins conspicuously ciliate with soft hairs

*Paspalum dilatatum* Poiret [dilatated] Dallisgrass. Tufted perennial with short rhizomes, 40-125 cm or more tall; sheaths glabrous or pubescent; ligules 1.5-3.8; blades to 16 mm wide; panicles with 2-7 branches 2-12 cm long; spikelets 2.3-4.4 mm long, ovate, pilose; lower glume absent. Introduced as a pasture grass and persisting along old roadsides and in moist fields and waste places; expected in weedy sites in many counties. This is the first grass keyed-out by the author, in 1968, solo, without benefit of a dissecting scope or any training in grasses; it took a while!

Paspalum distichum Linnaeus [two-ranked] Knotgrass [Paspalum distichum var. indutum Shimsh]. Tufted or rhizomatous perennial, 10-65 cm tall; sheaths glabrous to weakly pilose distally; ligules 1-2 mm long; panicles with 2-7 cm long, attached less than 1 cm apart, a 3r branch sometimes present below; spikelets 2.3-3.2 mm long, elliptic, glabrous; lower glume absent or to 1 mm. Weedy along ditches and ponds, slow-moving streams and sloughs; widespread, nearly throughout the state.

Paspalum setaceum [3].

Tufted, rhizomatous, or stoloniferous annuals and perennials; sheaths open; auricles usually absent (ours), sometimes present; inflorescence a panicles of spike-like branches, sometimes rebranching shortly; spikelets dorsally compressed, flat on one side and rounded on the other, borne on one side of the branch, awnless, with 2 florets, the lower sterile, the upper fertile; glumes unequal, the lower vestigial to absent, the upper as long as the spikelet and similar to the lower lemma in size and texture; upper floret fertile, indurate at maturity, the lemma edges clasping the palea. Identification can be confusing for the novice, because of the absence of the first glume, leading some to think the spikelets are 1-flowered.
**Phalaris** [the coot] CANARYGRASS [5].

Tufted or rhizomatous annuals and perennials; leaves glabrous; sheaths open; auricles absent; ligules membranous; blades usually flat; inflorescence a dense, narrow, often spike-like panicle; spikelets with 1-3 florets, awoles, with 1-2 lower reduced sterile florets or rudiments and 1 terminal well-developed fertile floret; disarticulation below the glumes (ours), the florets falling together; glumes exceeding the florets, keeled and sometimes winged; sterile florets reduced, less than ¾ the length of the fertile floret; outer bristles 1-18 mm long; inner bristles 11-25 mm long; primary bristles 21-24 mm long.

- **Phalaris arundinacea** [Linnaeus] *Tufted perennial,* also adventive in a few places in the southern desert and foothill regions; native to Africa, Asia, India; widely introduced in semi-tropical regions for forage.
- **Phalaris canariensis** (Sprengel) [narrow]. Tufted, tussock-forming perennial (annual in cooler climates), 1.5-1.7 m tall; leaves burgundy-colored; sheaths glabrous; ligules 0.5-0.8 mm long; to 55 mm long, 6-11 mm wide, the midnerve not noticeably thickened; panicle 20-35 cm long, 3-6 cm wide, exserted, burgundy-colored, the rachis hairy; buds with 1-3 spikelets; outer bristles 1-18 mm long; inner bristles 11-25 mm long; primary bristles 21-24 mm long.
- **Pennisetum ciliare** (Linnaeus) Link [*fringed with hairs*] BUFFELGRASS *Cenchrus ciliaris* Linnaeus. Tufted perennial from a hard, knotty base, sometimes with short rhizomes, 20-150 cm tall; sheaths glabrous, but with ciliate margins; ligules 0.5-3 mm long; blades to 65 cm long, 2-3.5 mm wide, convolute or folded, the midnerve noticeably thickened; panicles 3-30 cm long, 4-5 cm wide, exserted, green, brownish, to purplish, the rachis scabrous, but not hairy; buds with 1-14 spikelets; outer bristles 1-12 mm long; inner bristles 4-14 mm long; primary bristles 10-23 mm long. Introduced as an ornamental landscape plant in the southern regions; only recently known to escape to the wild in the southern desert regions.

- **Pennisetum villosum** R. Brown ex Fresenius [villus, shaggy] *Cenchrus longisetus* M.C. Johnston. Tufted perennial, also with short rhizomes, 20-75 cm tall; sheaths glabrous, but with ciliate margins; ligules 1.3-1.5 mm long; blade to 40 cm long, 2-4.5 mm wide, flat to folded, glabrous to pubescent, with ciliate margins; panicles ovoid, 4-12 cm long, 5-8 cm wide, white to tawny, the rachis hairy proximally; buds with 1-4 spikelets; outer bristles 1-14 mm long; inner and primary bristles 13-50 mm long.
- **Pennisetum setaceum** (Forsskål) Morrone, *Tufted, tussock-forming perennial, 45-150 cm tall; sheaths glabrous, but with ciliate margins; ligules 0.5-1.1 mm long; blades to 50 cm long and 13 mm wide, with ciliate margins; panicles 3-20 cm long, 4-5 mm wide, exserted, green, brownish, to purplish, the rachis scabrous, but not hairy; buds with 1-14 spikelets; outer bristles 2-3 mm long; inner bristles 4-14 mm long; primary bristles 10-23 mm long.

**Phalaris** [the coot] CANARYGRASS [5].

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**Phalaris caroliniana** Walter [from Carolina]. Tufted annual, lacking rhizomes, 30-150 cm tall; ligules 1-7 mm long; blades 2-11 mm wide; panicles 1-9 cm long, 8-20 mm wide, ovoid to cylindrical; spikelets 3.8-8 mm long; glumes narrowly to broadly winged on the keels, the lateral nerves prominent; sterile florets needle-like, \( \frac{1}{2} \) or more the length of the fertile floret; fertile floret 3-4.7 mm long, hairy, shiny when mature. Moist weedy ground.

*Phalaris minor* Retzius [smaller]. Tufted annual, 15-100 cm tall; ligules 5-12 mm long; blades 2-10 mm wide; panicles 1-8 cm long, 1-2 cm wide, dense, narrowly ovoid to elliptic, truncate at the base; spikelets 4-6.5 mm long; glumes winged on the keels, the lateral nerves prominent; sterile florets single, scale-like, \( \frac{1}{2} \) or less the length of the fertile floret; fertile floret 2.5-4 mm long, hairy, becoming shiny.

Adventive weed escaping from agricultural fields in Doña Ana County where it has been grown for birdseed production, also Los Alamos County; native to the Mediterranean region and northwestern Asia. Named for Timothy Hansen, who promoted its use in Virginia and the Carolinas about 1720.

1 Panicles several times longer than wide, (3)-4-16 cm long and 5.7-10(20) mm wide; awns of glumes 1.5-2 mm long; sheaths deciduous in age, the culms 0.5-1.5 cm thick, 1-4 m tall, the culms 0.5-1.5 cm thick; ligules about 1 mm long; lemmas 8-15 mm long, narrow, glabrous. About 18 species, all but one native to Europe, Asia, and North Africa. Named for Timothy Hansen, who promoted its use in Virginia and the Carolinas about 1720.

Tufted annuals and perennials, sometimes with short rhizomes; sheaths open; auricles absent; ligules membranous, not ciliate; blades usually flat; inflorescence a narrow, dense, spike-like panicle, the branches highly reduced; spikelets strongly laterally compressed, with 1 lacinia, the rachilla not or sometimes prolonged beyond the floret; disarticulation above the glumes and below the floret, or sometimes below the glumes late in the season; glumes longer than the floret, strongly keeled and ciliate, 3-nerved, abruptly compressed, with 1 floret, the rachilla not or sometimes prolonged beyond the floret; disarticulation above the glumes and below the floret, 1 floret, the rachilla not or sometimes prolonged beyond the floret; disarticulation above the glumes and below the floret; glumes winged on the keels, the lateral nerves prominent; sterile florets single, scale-like, \( \frac{1}{2} \) or less the length of the fertile floret; fertile floret 2.5-4 mm long, hairy, becoming shiny. Adventive weed escaping from agricultural fields in Doña Ana County where it has been grown for birdseed production, also Los Alamos County; native to the Mediterranean region and northwestern Asia. Named for Timothy Hansen, who promoted its use in Virginia and the Carolinas about 1720.

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Phyllostachys [leafy spike] BAMBOO [0].

Shrubby, rhizomatous perennials; nodes swollen; internodes flattened; leaves early deciduous; sheaths open; auricle present or absent; ligules a ciliate membrane; inflorescence and spikelets never produced in New Mexico. ♦Bamboo is seen sparingly in the state as a landscape ornamental, and should be planted in containment boxes or they will rapidly invade adjacent ground by their aggressive rhizomes. Spikelets are never found. It is not found outside of cultivation in the state.
Monocotyledonous Plants - Poaceae

*Phyllostachys aurea* Carr ex A.C. Rivière GOLDBAM BOOM, FISHPOLE BAMBOO. Rhizomatous perennial to 3 m tall (ours), the culms 1-4 cm thick; sheaths glabrous except for a basal line of white hairs, not glaucescent; auricles absent on culm leaves, present on foliage leaves. Introduced from Asia as an ornamental landscape plant, not common and not known in the wild; not known to grow in New Mexico.

**Piptatheropsis** [resembling *Piptatherum*] RICEGRASS [2].

Tufted perennials, sheaths open; auricles absent; ligules membranous; inflorescence a panicle, the rebranching sometimes slight; spikelets with 1 floret; glumes subequal, slightly longer than the floret, 3-3-nerved; florets dorsally compressed to terete; disarticulation above the glumes, the floret falling; the scar circular or elliptic; lemma glabrous, 3-5-nerved, the central nerve obscure, the margins not overlapping, the palea exposed, the awn deciduous. Formerly included in *Piptatherum*, which is considered strictly Eurasian, and before that in *Oryza* (see Romaschenko et al. 2011).

1 Florets not modified into small leafy plantlets; stems slightly to strongly bulb-like at the base

2 Anthers 1 mm long or less, nearly all of them well-developed; plants annual or perennial

3 Callus without a tuft of long hairs (but the nerves of the lemma pubescent) .......................................................... P. annua

3 Callus with a tuft of long, cobwebby hairs

4 Panicles narrow, contracted; paleas pubescent on the keels; plants mostly annual or infrequently short-lived perennial........ P. bigelovii

4 Panicles open when mature; paleas glabrous or pubescent; plants perennial

5 Sheath margins fused together ⅔ or less their length; first glume mostly 3-nerved....................................................... P. palustris

5 Sheath margins fused together ⅔ to ⅚ their length; first glume mostly 1-nerved

6 Sheaths densely scabrous with downward pointing hairs, rarely glabrous; panicles (8)13-40 cm long, the internodes of the main axis mostly 4 cm or more long ................................................................. P. occidentalis

6 Sheaths glabrous to sparsely scabrous with downward pointing hairs; panicle mostly less than 12 cm long, the internodes of the main axis shorter than 3.5 cm

7 First glume linear-lanceolate, much narrower than the second; paleas glabrous to scabrous on the keels . P. leptocoma

7 First glume about the same shape and width as the second, both broadly lanceolate; paleas pubescent on the keels.......................... P. reflexa

2 Anthers mostly longer than 1 mm, or vestigial and poorly developed; plants perennial

8 Stems and nodes strongly flattened; plants strongly rhizomatous; sheath margins open to near the base

9 Lemmas 5-6 mm long; spikelets unisexual, with both sexes in the same floret; rare................................. P. arachnifera

9 Lemmas 2-3 mm long; spikelets bisexual, with both sexes in the same floret....................................................... P. compressa

8 Stems and nodes round or nearly so; plants tufted or rhizomatous; sheath margins fused or open

10 Callus of the floret with a tuft of cobwebby hairs, these short-kinky to long-sinuous, borne on the back surface of the lemma and distinct from any hairs on the lemma midnerve

11 Plants dioecious, with unisexual spikelets and the sexes on separate plants; long, delicate rhizomes developed; panicles oblong, compact, the terminal branches densely-flowered from near the base; rare............................................ P. arachnifera

11 Plants bisexual, or if female then the pedicel more open and the branches sparsely flowered; rhizomes present or absent

12 Sheath margins fused ⅓ their length or more; panicles mostly 13-29 cm long, the lower internodes of the main axis mostly longer than 3.5 cm; anthers averaging 2.2 mm long ....................................................................................... P. tracyi

12 Sheath margins fused ⅔ their length or less; panicles mostly less than 13 cm long (longer in Poa palustris), the internodes of the main axis rarely longer than 3.5 cm; anthers mostly less than 1.9 mm long

13 Plants with strong rhizomes; sheath margins fused together ⅔ to ⅔ their length; panicle branches glabrous to moderately scabrous, round

14 Glumes distinctly keeled, scabrous on the nerves, the second glume plainly shorter than the first lemma; panicles often with 4 or more branches at the lowermost node (some occasionally vestigial); ligules mostly ⅓-2 mm long ............................................................................................................................ P. pratensis

14 Glumes weakly keeled, nearly glabrous, the second glume subequal to or longer than the first lemma; panicles usually with fewer than 4 branches at the lowermost node; ligules 2-4 mm long ................. P. arctica

15 Plants tufted, lacking rhizomes (in wet habitats occasionally producing decumbent stems that root at the nodes); sheath margins fused together ⅓ or less their length (to ⅖ in P. trivialis); panicle branches distinctly scabrous, mostly angled

16 Ligules 3-10 mm long; lemmas sparsely pubescent on the keel near the base and mostly glabrous on the marginal nerves and between the nerves; first glume very narrow, sickle-shaped, 1-nerved............. P. trivialis

16 Ligules mostly less than 4 mm long; lemmas pubescent on the keel and marginal nerves and often between the nerves; first glume narrow to broad, not sickle-shaped, 1- to 3-nerved

17 Panicles mostly 10-30 cm long, abundantly rebranched; stems often decumbent and rooting at the nodes, stout and leafy well above the middle, 25-120 cm tall ................................................................. P. palustris

17 Panicles mostly less than 12 cm long; sparingly rebranched if at all; stems never decumbent and rooting at the nodes, leafy or not, mostly less than 50 cm tall

18 Plants unisexual, all the spikelets of a plant either male or female

19 Plants rhizomatous; uppermost stem blade well-developed; rare in New Mexico....................................................... P. Wheeleri

19 Plants mostly tufted; uppermost stem blade very reduced; common in New Mexico................................................. P. fendleriana

18 Plants bisexual, the spikelets both with anthers and pistil in a single floret

20 Lemmas glabrous to scabrous; sheath margins not fused together........................................................................ P. secunda

20 Lemmas prominently pubescent or puberulent; sheath margins fused together or not

21 Plants rhizomatous

22 Sheath margins fused together ⅖ to ⅔ their length; glumes weakly keeled; plants subsalpine to alpine (subsp. grayana) ................................................................. P. arctica

22 Sheath margins overlapping most of their length, fused ⅔ or less; glumes strongly keeled; plants of plains and valleys .................................................................................................................. P. arida
Plants tufted, not rhizomatous

23 Stem bases enclosed in persistent, thickened, closely overlapping sheaths; panicle branches widely spreading at maturity; spikelets ovate to subulate; blades 2-4 mm wide

24 Lemmas keeled on the back, the pubescence on the nerves longer and more dense than between the nerves; ligules 1-3 mm long (subsp. rupicolata)................................................................. P. alpina

24 Lemmas rounded on the back, minutely pubescent all across the base, the hairs on nerves and between nerves similar; ligules 2-7 mm long........................................................................ P. secunda

Poa alpina Linnaeus [alpine or high mountains] ALPINE BLUEGRASS. Tufted perennial, 10-40 cm tall; leaves mostly basal, the basal sheaths persistent, closely overlapping; upper ligules 4-5 mm long; blades 2-4 mm wide; panicles 2-8 cm long, open; spikelets ovate to subulate, with 3-7 florets; lemmas 3.5-4 mm long, the nerves villous, without tuft of cobwebby hairs; anthers 1.3-2.3 mm long. Alpine to subalpine slopes, meadows, talus, and moist ledges. This is one of the easier Poa to identify, with its broad, almost rosette-like, basal leaves and cordate-based spikelets, always at high elevations, known only from the northern mountains.

*Poa annua* Linnaeus [annual] ANNUAL BLUEGRASS. Densely tufted annual, rarely with short stolons from the base, 2-25 cm tall; sheaths closed on lower ⅓; ligules 0.5-5 mm long; blades flat to folded, 1-5 mm wide; panicles 1-8 cm long, about ⅓ as wide; spikelets with 2-6 florets; lemmas 2.5-4 mm long, the nerves villous, without a tuft of cobwebby hairs at the base; anthers 0.6-1 mm long. Lawns, flower beds, moist disturbed ground; native to Europe. Annual bluegrass has the potential to flower throughout the year under favorable growing conditions. In lawns, the grass can produce seedheads even when mowed regularly to a height of 6 mm, with the culms extending out nearly horizontal to the ground, resulting in a form called LOW SPEARGRASS. Exceptionally tall forms may produce stolons.

*Poa arachnifera* Torrey [bearing spider webs]. Dioecious, loosely tufted to rhizomatous perennial, 20-85 cm tall; sheaths closed on lower ⅓; ligules 1-4 mm long; blades 1.5-4.5 mm wide; panicles 5-18 cm long, loosely (staminate) to narrowly (pistillate) contracted, with numerous spikelets; spikelets unisexual, with 2-10 florets; staminate lemmas with a weak tuft of cobwebby hairs, the anthers vestigial (to 0.2 mm long) or well-developed (1.5-2.5 mm long); pistillate florets 4-6.5 mm long, with copious cobwebby hairs from the base and villous hairs running up the nerves. Known only from a single collection from the Bosque del Apache wildlife refuge (Socorro County), presumably brought in by wildfowl. The hairs of the callus of pistillate florets are especially long and copious (hence, spider-like).

Poa arctica R. Brown [arctic] ARCTIC BLUEGRASS. Rhizomatous perennial, 10-60 cm tall, usually with solitary aerial culms; sheaths closed only at the base; ligules 2-7 mm long; blades flat to folded, 1-6 mm wide; panicles 2-15 cm long, ovoid and to nearly as wide; spikelets with 3-6 florets; glumes strongly keeled; lemmas 3-7 mm long, the nerves short-hairy, without a tuft of cobwebby hairs; anthers 1.5-2.5 mm long. Forests and subalpine and alpine meadows in the northern mountains, usually in deep, rich soil. We have three basically sympatric subspecies that are difficult to distinguish:

a) Panicles erect with relatively stout and straight branches; culms wiry, usually several together; callus glabrous to short-webbed...subsp. praeterita (Scribner & Merrill) Soreng (open) [Poa praeterita Scribner & Merrill, Poa gracillima of NM authors]

b) Panicles lax to erect with flexuous to straight branches; culms not wiry, solitary or several together; callus glabrous to long-webbed...subsp. glauca (Vasey) A. & D. Löve & Kapoor [for Asa Gray (1810-1888), preiminent American botanist of the 19th century]

Poa gracillima Scribner & Merrill, Poa gracillima of NM authors]

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Monocotyledonous Plants - Poaceae

**Poa fendleri**a (Steudel) Vasey [for Augustus Fendler (1813-1883), German-born botanical collector who visited Santa Fe in 1847] MUTTONGRASS. Densely tufted perennial, often with weak short rhizomes, 15-70 cm tall, erect to decumbent-based, the plants sometimes stamine or pistillate; sheaths closed about ⅔ their length; ligules 0.2-18 mm long; cauline blades shortened distally, usually rolled, 1-4 mm wide; panicles 4-15 cm long, congested, narrow; spikelets with 2-10 florets, ovate, flattened; glumes distinctly keeled; lemmas 3-6 mm long, the nerves glabrous to villous, lacking a tuft of cobwebby hairs at the base; anthers vestigial (0.1-0.2 mm long) or well-developed (2-3 mm long). Alpinands, rocky hills, mountain slopes; very widespread. We have three subspecies: §

a. **Poa fendleri**a subsp. alpinae (Lindman) Hinton [originating in the mountains] [Poa alpinae Lindman]. Known only from the mountains. Known only from the mountains.

b. **Poa fendleri**a subsp. albescens (A.S. Hitchcock) Scribnr [short]. Poa albescens A.S. Hitchcock. Known only from the

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b. **Poa fendleri**a subsp. alpinae (Lindman) Hinton [originating in the mountains]. Known only from the mountains.
Monocotyledonous Plants - Poaceae

Poa secunda Presl [second] SANDBERG’S BLUEGRASS. Densely tufted perennial, sometimes glaucous, 15-120 cm tall, the bases erect to slightly decumbent; sheath closed ⅔ or less their length; ligules 1-8 mm long; blades flat, folded, to the rolled, 0.5-5 mm wide; shortened upwards; panicles 4-25 cm long, loosely contracted, 2-4 cm wide, the branches erect-ascending; glabrous to densely scabrous; spikelets mostly with 3-5 florets, nearly terete to slightly flattened; lemma 3.5-6 mm long, the nerves glabrous to short-villos, the base glabrous or with a short tuft of soft hairs; anthers 1.5-3 mm long. ●Forest clearings, sagebrush plains, meadows, disturbed ground. ●Poa secunda is a complex of up to 45 facultative apomorphic forms, most of which have been described as species. A conservative approach recognizes two subspecies in New Mexico with overlapping morphologies and distributions in the northern and western regions of the state:

- A Lemmas prominently crisp-puberulent on the back toward the base; ligules of axillary shoots usually longer than 2 mm...subsp. secunda [Poa canbyi (Scriber) Piper, Poa laevisigata Scriber, Poa lucida Vasey, P. sandbergii Vasey, P. scabraella (Thurber) Vasey].
- A Lemmas glabrous to minutely scabrous on the back; ligules of axillary shoots to 2 mm long...subsp. juncifolia (Scriber) Soreng [with leaves as in junceus].

Poa tracyi Vasey [for Samuel Mills Tracy (1847-1920), American botanist and horticulturalist]. Loosely tufted perennial with short rhizomes, 30-100 cm or more tall; sheaths closed from ½ to nearly all their length, keeled, frequently retrorsely pubescent; ligules 2-4.5 mm wide; blades lax, flat, 2-5 mm wide; panicles 10-30 cm long, open, to ½ as wide, the branches spreading to drooping, flexuous, scabrous; spikelets with 2-8 florets; lemmas 2.5-5 mm long, the nerves glabrous to short-villos, without a tuft of cobwebby hairs at the base; anthers vestigial (0.1-0.2 mm long) or well-developed (1.5-3 mm long). ●Rich humus and moist loam of forests and woodlands in the mountains.

*Poa trivialis* Limaeus [commonplace]. Loosely to densely tufted perennial, with weak stolons or trailing stems, 25-100 cm or more tall; sheaths closed ⅔-⅔ their length, densely scabrous; ligules 3-10 mm long; blades 1-5 mm wide, flat, lax; panicles 8-25 cm long, open, loose, the branches ascending to spreading, densely scabrous; spikelets with 2-4 florets; lower glume very narrow, sickle-shaped, 1-nerved; lemmas 2.3-3.5 mm long, the marginal nerves glabrous, with a tuft of long cobwebby hairs at the base; anthers 1.3-2 mm long. ●Known from shaded, moist sites in the south-central mountains, but expected in other disturbed mountain areas; native to Europe. ●Sometimes used as a turf grass at golf courses.

Poa wheeleri Vasey [for George Montague Wheeler (1842-1905), director of the western surveys of 1869-1879] [Poa nervosa (Hooker) Vasey var. wheeleri (Vasey) C.L. Hitchcock]. Tufted perennial with short rhizomes, 35-80 cm tall, often decumbent-based; sheaths closed ⅓-⅓ their length, some retrorsely pubescent; ligules 0.5-2 mm long; blades flat or folded, 2-3.5 mm wide, the uppermost blades well-developed; panicles 3-18 cm long, loosely contracted to open, the branches ascending to reflexed, scabrous; spikelets with 2-7 florets; lemmas 3-6 mm long, the nerves generally glabrous but also short-villos, without a tuft of cobwebby hairs at the base; anthers usually vestigial, 0.1-0.2 mm long, but sometimes aborted late in development and up to 2 mm long. ●Subalpine mountain slopes in rich soils in the northern mountains; known from only a few collections.

Podagrostis [stalked Agrostis] [0].

Tufted to rhizomatous perennials; sheaths open; auricles absent; ligules membranous; inflorescence a rebranching panicle; spikelets with a single floret, the rachilla prolonged; disarticulation above the glumes and below the floret; glumes equalling or surpassing the floret; rachilla prolonged; disarticulation above the glumes and below the floret; glumes equaling or surpassing the floret; glumes prolonged; disarticulation above the glumes and below the floret; glumes exceeding the floret, awned (usually)

- *Podagrostis humilis* (Vasey) Bjorkman [dwarfish, low-growing, humble] [Agrostis humilis Vasey]. Low perennial, 3-25 cm tall, sometimes with short rhizomes; panicles 2-6 cm long, less than 2 cm wide; spikelets purplish, 1.5-2 mm long; rachilla prolonged beyond the floret 0.1-0.6 mm, often with a tiny tuft of hairs at the tip; paleas well-developed, 1.5-1.5 mm long. ●Reported for the state (Cronquist et al. 1977), but specimens are as yet unknown; if present, to be found in high elevation meadows and forest clearings in the northern mountains; known from adjacent counties in Colorado. ●Podagrostis humilis resembles Agrostis variabilis, but that species has a very short palea and the rachilla is not prolonged.

Pogonarthria : Pogonarthria falcata (Hackel ex Shinz) Rendle was grown in experimental plots on the NMSU College Ranch in Doña Ana County in the 1940s, and some herbarium specimens exist; no plants remain in the wild.

Polypogon [many awns] POLYPOGON [4].

- *Polypogon interruptus* Kunth [not continuous, interrupted] [×Agropogon littoralis (Small) C.E. Hubbard, ×Agropogon latifolius (Poiret) Fournier, Polypogon littoralis Small]. Tufted perennial, 20-80 cm tall, decumbent-based; ligules 2-6 mm long; blades 3-6 mm wide; panicles 3-15 cm long, 1-3 cm wide, lobed; glumes 2-3 mm long, with awns to 3.2 mm long; lemma 1.5-1.5 mm long, ovoid, with awns 1-3.2 mm long. ●Wet ground, ditches, seeps, and springs; rarely collected; native to South America. ●Some propose this to be a hybrid between Polypogon multisemipennis and Agrostis stolonifera.

- *Polypogon maritimus* Willdenow [sea-side or water’s edge] MEDITERRANEAN BEARDGRASS. Tufted annual, 10-50 cm tall, genculate-based; uppermost sheaths sometimes inflated; ligules 3-7 mm long; blades 1-5 mm wide; panicles 2-12 cm long, dense, elliptoid, sometimes lobed; glumes 1.8-3.2 mm long, with awns 4-12 mm long; lemma 0.5-1.5 mm long, awnless or with awns to 1 mm long. ●Disturbed wet places; known in New Mexico from a single
collection in Eddy County; native to Europe.

*Polygonon monspeliensis* (Linnaeus) Desfontaines [of Montpellier, France] RABBITFOOTGRASS [*Allopecurus monspeliensis* Linnaeus]. Tufted annual, 10–100 cm tall, erect to geniculate-based; uppermost sheaths sometimes inflated; ligules 3–16 mm long; blades 1–7 mm wide; panicles 2–17 cm long, 2–4 cm wide, very dense, occasionally lobed; glumes 1–3 mm, with awns 4–10 mm long; lemma tiny, 0.5–1.5 mm long, with awns 1–4 mm long. • Diich banks, seeps, wet disturbed ground, throughout the state; native to Europe. §

*Polygonon viridis* (Gouan) Breitstroffer [green] [*Agrostis semivernus* (Forskål) Christensen, *Agrostis viridis* Gouan, Polygonon semiverticillatum (Forskål) Hylander]. Tufted perennial, 10–90 cm tall, sometimes decumbent and rooting at the lower nodes; sheaths not inflated; ligules 1–5 mm long; blades 1–6 mm wide; panicles 2–10 cm long, 1–3 cm wide, dense but lobed and interrupted; glumes 1.5–2 mm long, awnless; lemmas 0.8–1.2 mm long, awnless. • Wet ground of springs, seeps, ponds, ditch banks, and the like, widespread, expected in all the counties; native to Europe.

Psathyrostachys [brittle spike] [1].

Tufted perennials, sometimes also with rhizomes or stolons; basal sheaths closed to near the top; auricles sometimes present; ligules membranous; inflorescence a spike with 2–3 spikelets per node; disarticulation below the spikelets in the main axis; spikelets with 1–3 florets; glumes 1-nerved, needle-like, shorter than the florets; lemmas 5.5–14 mm long, 5–7-nerved, awned; paleas equaling or longer than the lemmas; anthers 3. • *Psathyrostachys* species are native to Eurasia; one species has been introduced as forage.


*Psathyrostachys juncea* (Fischer) Nevski [nush-like] RUSSIAN WILDRYE [*Elymus juncea* Fischer]. Densely tufted perennial, 25-80 cm or more tall; old sheaths persistent; ligules 0.2-0.3 mm long; blades flat or rolled; spikes 7-12 cm long, 0.5-2 cm wide; spikelets strongly overlapping, the lateral spikelets slightly larger; glumes 3-9 mm long; lemmas 5.5-7.5 mm long, glabrous or with short hairs, awn-tipped or with awns to 4 mm long; anthers 2.5-5.5 mm long.

• Introduced from northern Asia for range restoration and erosion control, scattered localities. Couponed needle-like glumes are distinctive, but are also found in *Leymus*.

Pseudoeriocoma [false *Eriocoma*] NEEDLEGRASS [1].

Tufted perennials, usually short-risthomatozous from a knotty base, the culms often geniculate, 3-6 mm thick, with numerous nodes; sheaths open, shorter than the internodes, glabrous to hairy; auricles absent; ligules membranous; blades flat to tightly involute or convolute; inflorescence a rebranching panicle; disarticulation above the glumes and below the floret; spikelets with 1 floret, the rachilla not prolonged; glumes longer than the floret, 1.7-nerved; floret usually fusiform, evenly hairy; lemmas coriaceous, the margins enveloping most of the floret, the awns 2-geniculate, flexuous; paleas ½ to ¾ as long as the lemma, 2-nerved, the nerves not prolonged; anthers 3. • With 6 species in southwestern United States and Mexico. Formerly treated in a polyphyletic *Achnatherum*, and before that, *Stipa*.


Pseudoeriocoma eminens (Cavanilles) Romaschenko [eminent, standing out] *Achnatherum eminens* (Cavanilles) Barkworth, *Stipa eminens* Cavanilles. Perennial, 50-100 cm tall, with knotty bases, sometimes with short rhizomatous shoots; blades flat when fresh, 1-3 mm wide; panicles with drooping branches, 20-40 cm long, 3-8 cm wide; glumes unequal, 3-5-nerved, the lower 5-12 mm long, the upper 1-4 mm shorter; florets 4-7 mm long, the callus sharp and 1-2 mm long; awns 3.5-7 cm long, twice-geniculate, the terminal segment flexuous. • Rocky foothills, upland plains, and bajadas of the southern region. • The open, wavy panicle and long awns with curvly end-segments is distinctive.

Pilagrostis [feathery *Agrista*] [1].

Tightly tufted perennials; leaves mostly basal; sheaths open; auricles absent; ligules membranous; blades convolute; inflorescence a panicle with flexuous branches; disarticulation above the glumes and below the floret; spikelets with 1 floret, the rachilla not prolonged; florets fusiform; lemmas awned, the margins not overlapping; paleas well-developed; anthers 3. • Formerly included in the genus *Stipa*, but differing in morphological, anatomical, and molecular features.


Pilagrostis porteri (Rydberg) W.A. Weber [for Thomas Conrad Porter (1822-1901), American poet, clergyman, botanist] *Stipa porteri* Rydberg. Tufted perennial, 23-50 cm tall; ligules 0.7-1.5 mm long; blades rolled-filiform; panicles 7-12 cm long, open or contracted, the branches ascending to spreading, with few spikelets; glumes hyaline, without evident nerves, 4.5-6 mm long, broad, acute to obtuse, awnless; florets 2.5-4 mm long; awns 5-25 mm long, the basal segment hairy with hairs 1-2 mm long; anthers 1-3 mm long. • Mossy hummocks at very high elevations in the northern mountains; very uncommon. • Thought to be endemic to Colorado, *Pilagrostis porteri* was only recently (2010) discovered in northern New Mexico. It is distinctive by the filiform leaf blades, sparsely flowered panicles, broad nerve-less glumes, and glumes hairy on the lower segment.

Puccinellia [for Benedetto Luigi Puccinelli (1808-1850), Italian botanist] ALKALIGRASS [3].

Titted to stoloniferous annuals to perennials, the culms sometimes decumbent; sheaths open; auricles absent; ligules membranous; inflorescence a rebranching panicle; spikelets with several florets, awnless; disarticulation above the glumes and between the florets; glumes 1-3-nerved, shorter than the lowest lemma; lemmas mostly 5-nerved, the apex rounded to truncate and somewhat erose, the nerves parallel, not reaching the apex and not converging; anthers 3. • About 120 species of the Northern Hemisphere. Plants are generally found in wet, alkaline or saline, environments. These grasses are commonly called SALTGRASS in many regions.


P. parishii

1 Plants annual, 3-10(15) cm tall. 1 Plants perennial (sometimes short-lived), 15 cm or more tall.

P. parishii

1 Plants annual, 3-10(15) cm tall. 1 Plants perennial (sometimes short-lived), 15 cm or more tall.
2 Lemmas with conspicuous nerves; plants with creeping rhizomes; blades mostly flat, 4-15 mm wide; freshwater habitats (T. pauciflora) ................................................................. go to Torreyochloa

2 Lemmas with obscure or indistinct nerves; plants tufted, lacking rhizomes; blades rolled, or if flat then 1-3(4) mm wide; usually alkaline or saline habitats

3 Plants with yellow-green herbage and erect culms; lower panicle branches erect to divergent at maturity; lemmas 2.3-5 mm long; anthers 0.6-2 mm long .............................................. P. nuttalliana

3 Plants with blue-green herbage and often geniculate-based culms; lower panicle branches divergent to reflexed at maturity; lemmas 1.5-2.2 mm long; anthers 0.4-0.8 mm long ..............................................

\*Puccinellia distans (Jacquin) Parlatore [separating] (Poa distans Jacquin). Tufted perennial, 10-60 cm tall, not forming mats, erect to decumbent; blades 1-7 mm wide; panicles 3-20 cm long, open, the branches divergent-horizontal to reflexed; spikelets 2.5-7 mm long; lemmas 1.5-2.2 mm long; anthers 0.4-0.8 mm long. •Alkalai flats and floodplains; native to Eurasia.

\*Puccinellia nuttalliana (Schultes) A.S. Hitchcock [for Thomas Nuttall (1786-1859), English botanist, ornithologist, naturalist, and explorer] [Poa nuttalliana Schultes, Puccinellia arvicaea (Nuttall) S. Watson & Couler]. Tufted perennial, 10-100 cm tall, not forming mats, erect; blades 1-4 mm wide; panicles 5-30 cm long, open, the branches erect to divergent; spikelets 3.5-9 mm long; lemmas 2-3.5 mm long; anthers 0.6-2 mm long; •Alkalai flats and floodplains.

\*Puccinellia parishii A.S. Hitchcock [for Samuel Bonsall Parish (1838-1928), southern California naturalist]. Tufted annual, 3-15 cm tall; leaves mostly basal; blades 0.2-1.2 mm wide; panicles 1-8 cm long, mostly contracted in our populations, sometimes open; spikelets 3.5-5 mm long; lemmas 1.8-2.2 mm long, the nerves densely hairy on the lower ½-¾; anthers 0.4-0.5 mm long. •Alkalai flats and seeps, in numerous scattered localities in the western half of the state. •Now known to be more common than once thought, this is a species of conservation concern in New Mexico. §

Redfieldia [for John Howard Redfield (1815-1895), American amateur botanist] [1].

Strongly rhizomatous perennial, rooting at the nodes; leaves cauleine; sheaths open, shorter than the internodes; ligules a ciliate membrane; auricles absent; blades rolled; inflorescence an open, diffuse, rebranching panicle; pedicels longer than the spikelets; anthers ovate to obovate, olive-green to brownish, awoless, with 2-6 florets, the distal florets sometimes sterile; disarticulation above the glumes and between the florets; glumes 1-3-nerved; fertile lemmas narrowly lanceolate to falcate, with a dense tuft of straight soft hairs at the callus; anthers 2. •Redfieldia is a monotypic genus endemic to the Great Plains of the United States, with a few scattered outlying reports. Peterson et al. (2010) included Redfieldia within an expanded Muhlenbergia, based on several phylogenetic studies all showing it to be paraphyletic within that genus; we leave Redfieldia as a separate genus, however, because its morphologic differences are so conspicuous (even though we do not dispute the phylogenetic argument for its inclusion in Muhlenbergia).


Redfieldia flexuosa (Thurber) Vasey [much curved, tortuous] BLOWOUT GRASS [Graphiophorum flexuosum Thurber ex A. Gray, Muhlenbergia ammophila P.M. Peterson]. Rhizomatous perennial, 50-130 cm tall, rooting at the nodes as the sand covers them; ligules 0.5-1.5 mm long; blades to 45 cm long, 2-8 mm wide; panicles 20-50 cm long, 8-28 cm wide, the lower branches ascending, the upper spreading; glumes acute-attenuate; fertile lemmas 4.5-6 mm long; anthers 2.3-6 mm long. •Deep sand hills and dunes, blowout areas. •We know of no specimens of blowout grass from New Mexico, but it was reported for the state by Hitchcock & Chase (1951), a plant from Roosevelt County was identified as such by a botanist of the Natural Resources Conservation Service in 1993, and Hatch (2003) shows it in Colfax County. Also, Heerwagen (in Grasslands of the Great Plains, by J.E. Weaver & F.W. Albertson, 1956) reported that this grass was an uncommon pioneer on blowouts in the sand dunes of eastern New Mexico. It apparently lived here in the past, and determined searches may yet yield a voucher record. Saccate crystals... go to Tripodiun

Schedonarius... go to Muhlenbergia paniculata

Schedonarius [growing in or near the mountains] FESCUE [2].

Plants tufted perennials, rarely rhizomatous; sheaths open; auricles present, clasping; ligules membranous; inflorescence a panicle, the branches weakly rebranched; disarticulation above the glumes and between the florets; spikelets several-flowered; lemmas 3-7-nerved, the apex short-awned to about 3 mm; anthers 3. •The genus is Eurasian, and all species in New Mexico are exotic, introduced for forage and turf species. For this reason we refer to Lolium, with which it easily hybridizes, and its members were formerly placed in Festuca, thence combined in Lolium. The classification of this and related taxa is controversial and chaotic, with proposed classifications ranging from a single large genus to numerous small segregate genera; all have some degree of justification. To avoid undue confusion, we follow here the treatment of the recent Flora of North America, vol. 24, which recognizes the genera Festuca, Leliceppa, Lolium, Schedonarius, and Vulària, while acknowledging the inter-relatedness of all five species groups.


1 Auricles with minute cilia (10x or greater); two or three panicle branches borne at the lowestmost node, together rarely bearing more than 6 spikelets; old sheaths brown, decaying to fibers; blades 3-6(7) mm wide. .............................................................. 1 S. pratensis

1 Auricles with minute cilia (10x or greater); two or three panicle branches borne at the lowestmost node, together usually bearing 5-18(30) spikelets; old sheaths pale straw-colored, often remaining intact; blades 3-12 mm wide.............................................. S. arundinaceus

\*Schedonarius arundinaceus (Schreber) Dumortier [resembling a reed] TALL FESCUE [Festuca arundinacea Schreber, Festuca elatior Linnaeus, Lolium arundinaceum (Schreber) S. Darbyshire, Poa phoenix Scopoli, Schedonarius phoenix (Scopoli) Holub]. Plants to 2 m tall, often shorter; auricles ciliate; blades rolled in young shoots; panicle branches with abundant spikelets (up to 30 or more); lemmas 5-10 mm long, awnless to shawntoed to about 3 mm. •Introduced from Europe for lawns, improved pastures, and revegetation, widespread. •The name Schedonarius arundinaceus (Schreber) Dumortier is conserved over Schedonarius arundinaceus Roemer & Schultes (Taxon 55:798. 2006). Also, the priority of Festuca arundinacea over Poa phoenix may not be accurate and warrants further validation. Potentially toxic to grazing animals, as it sometimes causes summer fescue toxicity and fescue-foot.
*Schedonorus pratensis* (Hudson) P. Beauvois [of meadows] MEADOW FESCUE [Festuca elatior of many authors, *Festuca pratensis* Hudson, *Lolium pratense* (Hudson) Darbyshire]. Plants to 1.3 m tall; auricles glabrous; blades folded or rolled in young shoots; lower panicle branches with few spikelets (less than 8 spikelets); lemmas 5-8 mm long, awnless or with a very short mucro. Introduced from Europe for lawns, improved pastures, and revegetation, widespread in scattered locales, but seemingly less common than tall fescue. This and *Festuca arundinacea* are closely related to *Lolium perenne*, and form fertile hybrids. The hybrid of *F. pratensis × Lolium perenne* has been named ×*Festulolium loliaceum* (Hudson) P. Fournier – it produces a panicle with the upper spikelets sessile and arranged in a spike and the lower spikelets stalked and on branches.
Schismus [a split or cleft] MEDITERRANEANGRASS [1].

Tufted annuals or short-lived perennials; sheaths open, usually shorter than the internodes, with tufts of hair at the comers; auricles absent; ligules a ciliate membrane; inflorescence a small, dense panicle, sometimes racemose, the branches weakly developed with few spikelets; spikelets with several florets; disarticulation above the glumes and between the florets, sometimes below the glumes; glumes subequal, nearly as long as the spikelet, 3-7-nerved; lemmas 7-9-nerved, the margins villous, the apices cleft to broadly notched, sometimes with a mucro from the sinus; anthers 3; grain strikingly pale orange-iridescent. ♦ About 4 species native to Africa and Asia. This is a small genus native to Africa and Asia, with a single species introduced to North America.


*Schismus barbatus* (Loefling ex Linnaeus) Thellung [bearded]. Often densely tufted annual, 2-25 cm tall; blades 3-15 cm long, 0.3-2 mm wide, glabrous to hairy adaxially; panicles 1-7 cm long, 1-3 cm wide, glumes 4-6 mm long; lower lemmas 1.5-2.5 mm long, variously hairy between the nerves and on the margins; paleas shorter to longer than the lemmas. ● Adventive in dry waste places, fields, roadsides, mostly in the southern desert region, but in scattered locales elsewhere; native to Africa and Asia. ♦ Grains are harvested by desert ants, *Pogonomyrmex rugosus*, which increases their dispersion (Rissing 1986). We have two very similar varieties, sometimes treated as separate species and sometimes completely merged. One can find many plants corresponding to the following patterns, but also many that defy categorization:

[use the lowermost florets for identification]

a Teeth at tip of lemma narrowly triangular, clearly longer than broad; palea reaching at most to the middle of the lemma teeth, usually only as far as the base of the cleft; lower glumes equaling or exceeding the distal florets… var. *arabicus* (Nees) J.P. Smith [of Arabia] [Schismus arabicus Nees]

a Teeth at tip of lemma broadly triangular, about as broad as long; palea reaching at least as far as the lemma teeth and often projecting well beyond; lower glumes shorter than the distal florets… var. *barbatus* [Festuca barbata Loefling ex Linnaeus].

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Schizachne [a split scale] FALSE MELIC [1].

Loosely tufted perennial, often decumbent-based; sheaths closed to almost the summit; ligules membranous; inflorescence a weakly developed panicle, often racemose; spikelets with 3-6 florets; disarticulation above the glumes and between the florets; glumes shorter than the adjacent lemma; lemmas papery, 7-9-nerved, the nerves parallel; awned from a cleft apex; anthers 3. ♀Schizachne is a monotypic genus of boreal and montane regions in the Northern Hemisphere.


Schizachne purpurascens (Torrey) Swallen [purplish] [Andropogon purpurascens (Torrey) Swallen]. Tufted perennial, 30-80 cm or more tall; ligules 0.5-1.5 mm long; blades folded or loosely rolled, 2-5 mm wide; panicles 7-17 cm long, narrow to open; glumes unequal, 3-5-nerved, often flushed with purple; lemma 8-12 mm long; awns 8-15 mm long, divergent; anthers 1.4-2 mm long. ● Moist woods, pine forests, streambeds, and meadows.

Schizachyrium [a split chaff] BLUESTEM [3].

Tufted to rhizomatous annual and perennials; sheaths open; auricles absent; ligules membranous; blades of uppermost leaves highly reduced; inflorescence a single spike raceme (rakom) composed of repeating pairs of sessile and pedicelled spikelets subtended by a spathe, generally several of these separate rames on a flowering shoot; disarticulation below the glumes, the pair of spikelets falling together with a section of the rame; rame internode somewhat flattened, without a medial groove; sessile spikelets with 2 florets, the lower sterile, the upper fertile, the glumes enclosing the florets and awnless, the upper lemma deeply bifid and awned from the sinus; pedicelled spikelets staminiate or sterile, shorter or equaling the sessile spikelet, awned or awnless. ● About 60 species of the tropical, subtropical, and warm-temperate regions of the world. Formerly included in Andropogon.

1 First glume of the sessile spikelet pubescent on the back................................................................. .......................... S. sanguineum

1 First glume of the sessile spikelet glabrous on the back, but this sometimes obscured by subtending hairs

2 Pedicelled spikelets about the same size as the sessile; internodes and pedicels nearly glabrous or short-ciliate with very short hairs to 1 mm that do not at all obscure the spikelets ................................................................. .......................... S. cirratum

2 Pedicelled spikelets much shorter and narrower than the sessile; internodes and pedicels densely ciliate with hairs 1.5-6 mm long that often obscure the spikelets................................. S. scoparium

Schizachyrium cirratum (Hackel) Wooton & Standley [curly] [Andropogon cirratum Hackel]. Tufted perennial, ours lacking short rhizomes, 30-75 cm tall, often decumbent-based but not rooting; ligules 1-2.5 mm long; blades 2-4 mm wide; rames 4-6 cm long, usually exserted from the spathe; internodes straight, with a tuft of short hairs at the base but otherwise nearly glabrous; sessile spikelets 8-9 mm long, the subtending hairs less than ⅓ their length; lower glumes glabrous; upper lemmas cleft to ⅓ their length; awns 8-12 mm long; pedicelled spikelets 6-10 mm long, about the same length as the sessile, staminiate to sterile, awnless, the pedicel stiffly ciliate on one side near the tip. ● Woodlands and rocky hills in the southwest quarter of the state.

Schizachyrium sanguineum (Retzius) Alston [blood-red; hairy flowers]. Tufted perennial, 40-110 cm or more tall, glaucous; ligules 1-2 mm long; blades 2-5 mm wide, with long bulbous-based hairs at the base; rames 4-12 cm long, usually exserted from the spathe; internodes straight, glabrous to hirsute; sessile spikelets 5-9 mm long, the subtending hairs to ⅔ their length; lower glumes hirsute; upper lemmas cleft to nearly their length; awns 10-15 mm long; pedicelled spikelets 3-5 mm long, smaller than the sessile, staminate to sterile, with awns 0.3-5 mm long, the pedicels curling outward in age. ● Woodlands and rocky hills in the southwestern mountains and foothills. ● Our plants belong to var. hirtiflorum (Nees) Hitch. [hard flowers] [Andropogon hirtiflorus (Nees) Kunt.].

Schizachyrium scoparium (Michaux) Nash [broom-like]. Tufted (ours) to rhizomatous perennials, greenish to purplish, 10-100 cm or more tall (taller elsewhere); ligules 0.5-2 mm long; blades 2-9 mm wide; rames 3-8 cm long, usually exserted from the spathe; internodes sparsely to densely ciliate; sessile spikelets 4-11 mm long, the subtending hairs to ⅔ their length as the spikelet; lower glumes glabrous; upper lemmas cleft to ⅔ their length; awns 3-17 mm long; pedicelled spikelets 1-10 mm long, narrower than the sessile spikelet, sterile to staminiate, awnless or awned to 4 mm. ● Hills, prairies, and woods, rocky slopes, throughout the state. ● This species extends from the Canadian plains to central Mexico, and exhibits considerable variation. Two varieties are found in New Mexico: §

a Rachis and pedicels flexuous, curved away from one another, thin, less villous, sometimes quite sparingly so... var. scoparium LITTLE BLUESTEM [Andropogon scoparium Michaux, Andropogon scoparius Michaux var. frequens C.E. Hubbard, Schizachyrium scoparium (Michaux) Nash var. frequens (C.E. Hubbard) Gould]. ● Throughout the state.

b Rachis and pedicels straight and relatively thick at maturity, copiously and thickly villous... var. neomexicanum (Nash) Hitchcock [from New Mexico] NEW MEXICO BLUESTEM [Andropogon neomexicanus Nash, Andropogon scoparius Michaux var. neomexicanus (Nash) Hitchcock, Schizachyrium neomexicanum (Nash) Nash]. ● Sandy plains and hills, often on gypsum.

Sclerochloa [hard grass] HARDGRASS [1].

Tufted annuals; sheaths open to closed ½ their length; auricle absent; ligules membranous; inflorescence a small raceme clustered among the leaves, sometimes weakly paniculate; spikelets laterally compressed, glabrous, subsessile on short pedicels to 1 mm long, with 2-7 florets, awnless; glumes unequal, shorter than the lowermost lemma, blunt to rounded, 3-5-nerved, with hyaline margins; lemmas indurate when mature, 7-9-nerved, with hyaline margins, rounded to emarginate; anthers 3. ♀ Eurasian genus of only 2 species, with one found throughout the world as a weed.


* Sclerochloa dura (Linnaeus) Beauv. [hard, durable] [Poa dura Linnaeus]. Tufted annual, 2-15 cm tall, the shoots usually prostrate to sometimes ascending; foliage overlapping and usually surpassing the foliage; blades 1-4 mm wide, the apices pinnate-shaped; racemes 1-5 cm long, the base usually still in the subtending sheaths; spikelets 4-10 mm long; both glumes much shorter than the lowermost lemma; lemmas 4-7 mm long, the nerves scabrous, the distal lemmas smaller. ● Adventive in lawns, golf course, athletic fields, and other moist waste places, uncommon in scattered localities, and expected in more counties; native to Eurasia.
Scleropogon [hard bearded] BURROGRASS [1].

Stoloniferous (sometimes rhizomatous), usually dioecious (sometimes monoecous) perennial, the stolons rooting at the nodes and producing new plants; leaves mostly basal; sheaths open; ligules a ring of hairs; blades flat or folded, stiff; inflorescence a spike-like raceme or weakly paniculate, rising above the leaves; staminate spikelets awnless or short-awned, not disarticulating; the glumes and lemma usually 1-nerved; pistillate spikelets with several florets, the lower fertile, the upper ones reduced to awns, disarticulating above the glumes and below all the florets, the lemma long-awned. *Scleropogon* is a monotypic genus of the Americas.

- **Brix, J.** 1826. Botanischer Garten. 

*Scleropogon brevifolius* Philipp. [short-leaved] *[Festuca macrostachya* Torrey & Gray, *Scleropogon longissima* Beetle].

Plants 10-20 cm tall, the stolon internodes 5-15 cm long; basal sheaths hairy; ligules about 1 mm long; blades about 1 cm long and 1-2 mm wide; staminate spikelets with 2 florets, the glumes and lemmas 1-3-nerved; pistillate spikelets with several florets, the glumes and lemma 3-nerved, the lemma awns 3-15 cm long, widely divergent. 

- **Grassy plains and clay flats, widespread.** 
- **The dispersal unit of BURROGRASS is the cluster of long-awned pistillate florets.** 
- **At maturity the awns bend outward and downward, forming a spider-like structure that creeps and skitters across the clay flats where the species is powered by gentle puffs of air arising from heat convection off the desert floor.** 
- **The pointed florets catch and are embedded in the cracks and crevices of the drying clay, effectively planting the grains (see Allred 1989).** 
- **This was called NEEDLEGRASS in the early days, as was *Aristida purpurea*.**

- **The grass increases under heavy grazing, and a 1938 Soil Conservation Service Bulletin reported that BURROGRASS was “…a heavenly gift to fools who insist on grazing the last spear of grass from the range.”**

Secale [an ancient name for some grass] RYE [1]

Tufted annuals and perennials; sheaths open; auricles present; ligules membranous; inflorescence a spike, with 1 spikelet per node; spikelets with 2 florets; disarticulation above the glumes and between the florets; glumes needle-like, 1-nerved, shorter than the lemmas; lemmas strongly compressed and keeled, the keel ciliate, awned; anthers 3. 

- **A genus of 2-3 species (or more, depending on who’s doing the counting), native to Eurasia.**


*S. cereale* Linnaeus [agricultural]. 

- **Tufted annual, mostly 50-120 cm or more tall; blades 4-12 mm wide; spikes 3-15 cm long, erect to nodding; disarticulation below the glumes in the rachis or above the glumes and below the florets; glumes 8-20 mm long, with an awn 1-3 mm long; lemma 14-18 mm long, with awns 7-50 mm long; anthers about 7 mm long.**

- **Introduced as a cultivated crop plant, and also widely used for erosion control along road sides, occasionally escaping around fields, but not persisting long; native to Eurasia; expected in any of the countries.**

- **Plants are susceptible to root infestation by numerous fungi, particularly *Claviceps purpurea*. Unlike wheat, barley, and oats, which are normally self-pollinated, rice is cross-pollinated. Hybrid rice and wheat are known agronomically as *TRITICALE*, and are herein treated in the hybrid genus *×Triticosecale*, q.v.**


Tufted annuals and perennials, rarely with rhizomes; sheaths open; ligules a ring of hairs, or a ciliate membrane; inflorescence a usual spike-like panicle, the branches sometimes nearly absent but usually discernible, also composed of numerous bristles below the spikelets that represent highly reduced branchlets; disarticulation below the glumes and above the bristles; spikelets with two florets, the lower sterile or sterile, the upper fertile, awnless; lower palea usually developed; upper floret indurate when maturity, transversely rugose (rarely smooth); anthers 3.

- **About 140 species of tropical to warm temperate regions worldwide.**

*S. scheelei* (Steudel) A.S. Hitchcock and *Setaria villosissima* (Scribner & Merrill) K. Schumann have been reported for the state from time to time, but no validating specimens are known.


1 A single bristle usually present at the base of only the terminal spikelet of each branch. 

2 Bristles present below all or nearly all the spikelets 

3 Margins of the upper sheaths thin and translucent, glabrous, often with a slight auricle at the summit; blades stiff-pubescent on both surfaces. 

4 Margins of the upper sheaths not thin and translucent, pubescent, lacking an auricle at the summit; blades scabrous or stiff-pubescent on the upper surface only. 

5 Plants perennial from hard, knotty, nearly rhizomatous bases, the stems arising singly or in small tufts; spikelets 2-2.8 mm long. 

6 Plants annual, though often coarse and robust 

7 Panicles contracted, but relatively loose and often lobed or interrupted below, the main axis visible..............*S. grisebachii* 

8 Panicles dense, cylindrical and spike-like, lobed and interrupted in *S. italica*, otherwise the main axis obscured 

9 Terminal panicles 18 cm or more long, as much as 40 cm long; shoots 1.2-3 m tall.......................*S. magna* 

10 Terminal panicles 3-15 cm long; shoots mostly 0.2-0.7 m tall 

11 Bristles with upward-pointing bracts, the seedheads not readily clamping 

12 Margins of the glumes slender; bristles 4-13 below each spikelet; second glume ½ to ¼ the length of the adjacent upper lemma 

13 Plants perennial from hard, knotty, nearly rhizomatous bases, the stems arising singly or in small tufts; spikelets 2-2.8 mm long. 

14 Plants annual, though often coarse and robust 

15 Panicles contracted, but relatively loose and often lobed or interrupted below, the main axis visible..............*S. grisebachii* 

16 Panicles dense, cylindrical and spike-like, lobed and interrupted in *S. italica*, otherwise the main axis obscured 

17 Terminal panicles 18 cm or more long, as much as 40 cm long; shoots 1.2-3 m tall .......................*S. magna* 

18 Terminal panicles 3-15 cm long; shoots mostly 0.2-0.7 m tall 

19 Panicles lobed; disarticulation above the glumes, the upper floret falling away from the spikelet ...............*S. italica* 

20 Panicles not lobed, cylindrical; disarticulation below the glumes .......................*S. viridis*
6 Plants perennial
10 Palea of the lower floret nearly as long as the adjacent upper palea; spikelets mostly 2-2.3 mm long, appearing globose; blades, at least some, 7-15 mm wide..........................S. macrostachya
10 Palea of the lower floret ½ to ¾ as long as the adjacent upper; spikelets 2.2-3 mm long, elliptic; blades typically 2-5(7) mm wide.................................................................S. leucopila

*Setaria adhaerens* (Forskål) Chiovenda [clinging, adhering] CLINGING BRISTLEGRASS [Panicum adhaerans Forskål]. Tufted annual, 20-60 cm tall; sheath margins thin and translucent distally, glabrous; ligules 1-2 mm long, a ring of hairs; blades 5-10 mm wide, with bulbous-based hairs on both surfaces; panicles 2-6 cm long, the bristles 4-7 mm long, retrorsely scabrous, solitary beneath each spikelet; spikelets 2.2-3.3 mm long; lower glume about ½ the spikelet length; lower palea less than ½ the spikelet length; upper floret finely transversely rugose. ● Weedy sites, roadsides, lawns, widespread; native to tropical regions throughout the world. ○ Similar to the much less common *Setaria verticillata*, but rather easily told apart by the key features. The seedheads cling tenaciously to socks and pant legs, and mischievous little boys have been known to toss the entangling burs into the long tresses of little girls fleeing before them.

*Setaria grisebachii* Fournier [for August Heinrich Rudolf Grisebach (1814-1879), German botanist and professor] [Chaetochloa grisebachii (Fournier) Scribner, Chaetochloa grisebachii (Fournier) Scribner var. ampla Scribner & Merrill]. Tufted annual, 30-100 cm tall; sheath margins ciliate; ligules a ring of hairs; blades flat, 4-20 mm wide, pilo-hispid on both surfaces; panicles 3-18 cm long, lobed and interrupted, the main axis visible, often purple, the bristles 1-3 below each spikelet, 5-15 mm long; spikelets 1.5-2.2 mm long; lower glume about ½ the spikelet length; lower palea about ½ the spikelet length; upper floret finely transversely rugose. ● Canyon bottoms, rocky hills, and stream banks. ○ A form of this species with very poorly developed bristles below only some of the spikes is known from the Sierran foothills.

*Setaria italic* (Linnaeus) Beauvois [of Italy] FOXTAIL MILLET [Chaetochloa italica (Linnaeus) Scribner, Panicum italicum (Linnaeus)]. Tufted annual, 10-100 cm or more tall; sheaths mostly glabrous, the margins sparsely ciliate; ligules 1-2 mm long; blades 2-1 mm wide; panicles 8-30 cm long, dense and congested, often drooping, sometimes lobed below, the bristles 1-3 below each spikelet, 3-12 mm long; spikelets 3-3.1 mm long, the fertile floret falling out; lower glume about ½ the spikelet length; lower palea about ½ the spikelet length; upper floret appearing smooth, but very finely transversely rugose with magnification. ○ Introduced as a cultivated crop in many parts of the world, also present in birdseed mixes, escaping but rarely persisting for long; native to Asia. ● This species varies greatly in size, blade width, panicle length and density, and bristle length. The term millet is used for many grasses with edible grains, including species of *Echinochloa*, *Elymus*, *Eragrostis*, *Panicum*, *Paspalum*, *Setaria*, and *Sorghum*.

*Setaria leucopila* (Scribner & Merrill) K. Schumann [white haired] PLAINS BRISTLEGRASS [Chaetochloa leucopila Scribner & Merrill, Setaria macrostachya sensu many North American authors]. Tufted perennial, 20-100 cm tall; sheath margins villous distally; ligules a ciliate membrane 1-2.5 mm long; blades 2-5 mm wide; panicles 6-15 cm long, congested, the bristles usually solitary, 4-15 mm long; spikelets 2.2-2.8(3) mm long, elliptical; lower glume about ½ the spikelet length; lower palea ½-⅔ the length of the adjacent upper palea; upper floret finely transversely rugose. ○ Plains, rocky hills and slopes, widespread. ● This and *Setaria macrostachya* Kunth have been confused for many years, and both common and scientific names have been used interchangeably; most of the records of *S. macrostachya* in New Mexico pertain to *S. leucopila*, which is very common in New Mexico. The two are accurately distinguished by the features in the key. §

*Setaria macrostachya* Kunth [large-spiked] [Chaetochloa composita (Kunth) Scribner]. Tufted perennial, 60-120 cm tall; sheath margins with only a few hairs at the throat; ligules 2-4 mm long, densely ciliate; blades 7-15 mm wide; panicles 10-30 cm long, congested, the bristles usually solitary, 10-20 mm long; spikelets 2.2-2.3 mm long, nearly spherical; lower glume ½-⅔ the spikelet length; lower palea nearly equalling the adjacent upper palea; upper floret finely transversely rugose. ● Rocky hills of the southern mountains in the bootheel region and Guadalupe Mountains of Eddy County; uncommon. ○ See comment under *Setaria leucopila*.

*Setaria magna* Grisebach [great or large] GIANT FOXTAIL. Tufted annual, 1.5-4 m or more tall; sheath margins villous distally; ligules 1.2-2 mm long, ciliate; blades 1.5-3.5 cm wide; panicles 20-50 cm long, 2-5 cm wide, congested, the bristles 1-2 below each spikelet, 10-20 mm long; spikelets about 2 mm long, the upper floret falling out; lower glume ½ the spikelet length; lower palea large, equalling the lower lemma and adjacent upper palea; upper floret smooth and shiny brown. ○ Marshy ground at the Bitter Lake Refuge in Chaves County, presumably introduced by water fowl, and moist road sides in Curry and Quay counties; native to eastern and Gulf coasts of the United States. ● Unmistakable because of its giant size.

*Setaria parviflora* (Poirier) Kerguelen [small-flowered] KNOTROOT BRISTLEGRASS [Setaria geniculata (Lamarck) Beauvois]. Semi-tufted perennial with short knotty rhizomes, 30-120 cm tall; sheath margins glabrous; ligules a short ring of hairs, less than 1 mm long; blades 2-8 mm wide; panicles 3-10 cm long, dense, the bristles 4-12 below each spikelet, 2-12 mm long; spikelets 2-2.8 mm long; lower glumes about ½ the spikelet length; lower palea equalling the lower lemma; upper floret distinctly transversely rugose. ● Open moist habitats in the foothills of the southern and central mountains, not common. ● Glabrous sheath margins, many bristles, and a hard knotty base are diagnostic for this species.

*Setaria pumila* (Poirier) Roemer & Schultes [small, dwarf] YELLOW BRISTLEGRASS [Chaetochloa glauca of authors, Panicum pumilum Poirier, Setaria glauca of authors, Setaria latifrons (Weigel) F.T. Hubbard]. Tufted annual, 30-100 cm or more tall; sheath margins glabrous; ligules ciliate; blades 4-10 mm wide, with bulbous-based hairs proximally on the adaxial surface; panicles 3-15 cm long, dense, yellowish, the bristles 4-12 below each spikelet, 3-8 mm long; spikelets 2-3.4 mm long, turbid; lower glumes about ⅓ the spikelet length; upper glumes about ⅔ the spikelet length; lower palea equalling the lower lemma; upper floret exposed (not covered by the upper glume), strongly rugose. ● Weedy ground along roads, fields, in lawns, widespread; native to Europe. ○ This went by the name *Setaria glauca* for many years, presumably based on *Panicum glaucum* Linnaeus, but that basionym is correctly applied to *Pennisetum americanum* (Linnaeus) Leeke (Kerguelen 1977; Webster 1993). The species is quickly told by the visible rugose upper floret, only half hidden by the upper glume.
*Setaria reverchonii* (Vasey) Pilger [for Julien Reverchon (1837-1905), French-born botanist and colonist in Texas]. Rhizomatous perennial, the bases knotty, 30-90 cm tall; sheath margins ciliate distally; ligules a ring of stiff hairs 1-2 mm long; blades 1-7 mm wide, rolled, stiff; panicles 5-20 cm long, loose, lobed and interrupted, the branches weakly developed, the bristles 2-8 mm long, solitary below usually only the terminal spikelet of the branches, sometimes present below other spikelets as well; spikelets 2-4.5 mm long; lower glumes ½ the spikelet length; lower paleas absent; upper floret finely transversely rugose. ● Dry plains and scrublands in the southeastern region, uncommon. ♦ Our plants belong to subsp. *ramiseta* (Scribner) W.E. Fox [bristle-branch] [Panicum ramisetum Scribner, *Setaria ramiseta* (Scribner) Pilger]. Stiff blades, weakly developed panicles, and paucity of bristles distinguish this species.

*Setaria verticillata* (Linnaeus) Beauvois [whorled] HOOKED BRISTLEGRASS [Panicum verticillatum Linnaeus]. Tufted annual, 30-100 cm tall; sheath margins ciliate distally, not thin and translucent; ligules a densely ciliate membrane 0.3-1 mm long; blades 5-15 mm wide, scabrous on the adaxial surface only; panicles 5-15 cm long, dense, the bristles solitary, 4-7 mm long, retrorsely scabrous; spikelets 2-2.3 mm long; lower glumes about ½ the spikelet length; lower palea about ½ the spikelet length; upper floret finely transversely rugose. ● Weedy ground, known only from a few old collections in Doña Ana County, perhaps no long present in the state; native to Europe.

*Setaria viridis* (Linnaeus) Beauvois [green] GREEN BRISTLEGRASS [Chaetochloa viridis (Linnaeus) Scribner, Panicum viride Linnaeus]. Tufted annual, 20-100 cm tall; sheath margins ciliate distally; ligules a ciliate membrane 1-2 mm long; blades 4-25 mm wide, glabrous; panicles 3-20 cm long, dense, sometimes the apex nodding, the bristles 1-3 below each spikelet, 5-10 mm long; spikelets 1.8-2.2 mm long; lower glumes about ⅓ the spikelet length; lower palea about ⅓ the lower lemma length; upper floret very finely transversely rugose, greenish. ● Common weed in disturbed ground, throughout the state; native to Europe. ♦ Very similar to *Setaria italicata*, which differs in panicle, disarticulation, and upper floret features, all perhaps tied to the domestication of *S. italicata*. Children (and young-at-heart grassy old folks) play wooly-bear caterpillar with the seedheads, by squeezing the inflorescence in the closed hand and watching it wiggle out from between the fingers.
Sorghastrum [resembling Sorghum] [1].

Tufted and annuals and perennials, sometimes rhizomatous; sheaths open; auricles present or absent; ligules membranous, sometimes ciliate; inflorescence a branching panicle, the branches (rames) composed of repeating units of sessile spikelets and pedicels (the pedicelled spikelets absent); disarticulation below the spikelets; all spikelets sessile, with two florets, the lower sterile, the upper fertile; glumes coriaceous, enclosing the florets; upper lemma fertile, bifid, awned from the sinus; pedicels slender, lacking a spikelet at the tip, but sometimes with a vestige of a scale. About 18 species of tropical to warm-temperate regions of the Americas and Africa. Because pedicelled spikelets are absent in Sorghastrum, all the spikelets are alike, well-developed, awned, and fertile.


Sorghastrum nutans (Linnaeus) Nash [drooping] INDIANGRASS, Rhizomatous perennial, the aerial shoots sometimes forming small clumps, 50-200 cm or more tall; sheaths with thick erect auricles at the collars adjacent to the ligule; ligules 2-6 mm long; blades 1-4 mm wide, usually glabrous; panicles 20-75 cm long, yellowish to brownish or copper-colored, loosely contracted, the branches ascending; pedicels and rachises copiously hairy; spikelets 5-8.7 mm long, sparsely long-hairy; awns 10-30 mm long. Grasslands, open woods, prairies, and moist rocky hillsides, often included in reseeding mixes, widespread. This is a handsome plant with golden panicles, and seeing increased use as an ornamental. Several cultivars have been developed for forage and pasture use. A form with pinkish rather than coppery-colored hairs is known from the southwestern mountains. §

Sorghum [Italian sorge, for a tall cereal grass] [2].

Tufted to rhizomatous annuals and perennials; sheaths open; auricles absent; ligules membranous and ciliate, or a ring of hairs; blades usually broad and flat; inflorescence a branching panicle, the terminal branches (rames) composed of repeating pairs of sessile and pedicelled spikelets, the sessile ones fertile, the pedicelled ones staminate or sterile; sessile spikelets with 2 florets, the lower usually shorter than the florets and the upper usually longer; lemmas 1-3-nerved, keeled; anthers 3.


1 Plants perennial, with strong rhizomes; rame segments breaking apart easily ................................................................. S. halepense

* Sorghum bicolor (Linnaeus) Moench [of two colors] SORGHUM, MILO. Tufted robust annual, sometimes longer lived, 50-300 cm or more tall, the culms 1.5 cm thick; blades to 1 m long and 10 cm wide; panicles 10-60 cm long, open or contracted; disarticulation not occurring or tardily so; sessile spikelets 3-9 mm long, glabrous to variably hairy, awnless or with an awn 5-30 mm long; pedicelled spikelets 3-6 mm long, somewhat shorter than the sessile spikelet, awnless. Grown as a cultivated crop, infrequently escaping along fields but not persisting long; its distribution in New Mexico (as a crop) is much more than shown on the map; native to Africa and Asia. ● There are numerous cultivars and agricultural races, with great variability in features; the following seems to comprise much of the variation we see in New Mexico plants:

a Panicule axis much thicker than the branches, tough; branches remaining intact...subsp. bicolor GRAIN SORGHUM [Holcus bicolor Linnaeus, Sorghum vulgare Persoon]. ● Here are placed nearly all the cultivated varieties and races.

a Panicule axis only slightly thicker than the branches, fragile; branches disarticulating tardily...subsp. drummondii (Nees ex Steudel) deWet [for Thomas Drummond (1790-1833), Scottish explorer & naturalist] SUTAND-GRASS [Sorghum drummondii (Nees ex Steudel, Sorghum sudanense (Piper) Stapf]. ● This represents hybrids and backcrosses between subsp. bicolor and subsp. arundinaceum (Desv.) Harlan & DeWet, sometimes cultivated or popping up in fields of grain sorghum as seed contaminants.

* Sorghum halepense (Linnaeus) Persoon [from Aleppo, Syria] JOHNSONGRASS [Holcus halepensis Linnaeus]. Rhizomatous perennial, 50-200 cm or more tall, the culms 0.5-2 cm thick; blades to 90 cm long and 4 cm wide; panicles 10-50 cm long, generally open, 5-25 cm wide; disarticulation below the spikelet pair; sessile spikelets 4-6.5 mm long, pubescent, awnless or with awns to 13 mm long; pedicelled spikelets 3.5-5.5 mm long, somewhat shorter than the sessile spikelets, awnless. ● An aggressive weed of fields, ditches, and moist waste places, widespread; expected in more counties than shown; native to the Mediterranean region. Johnsnggrass hybridizes with S. bicolor, and one of those hybrid derivatives is known as Sorghum ×albnum Parodi, an annual or short-lived perennial sometimes grown for feed and seed. Johnsongrass produces cyanide when growing under stress or unusual conditions, such as frost, nitrogen fertilization, or just-mowed fields, and can cause serious problems for domestic livestock if eaten before drying. §

Spartina [cord-like] CORDGRASS [2].

Tufted to rhizomatous perennials; sheaths open; auricles absent; ligules ciliate from a short membrane; inflorescence a panicle of spike-like branches, the branches scattered along the rachis, not digitate, erect-appressed to divergent; spikelets sessile, with 1 floret, laterally compressed, crowded on one side of the branch; disarticulation below the glumes, the spikelet falling; glumes keeled, unequal, the lower usually shorter than the florets and the upper usually longer; lemmas 1.3-nerved, keeled, anthers 3. ● Usually found in wet, marshy, saline habitats. Recent work by Peterson et al. (2014) and others has shown Spartina to be closely aligned to Sporobolus, and they have proposed, with reason, the submergence of Spartina into Sporobolus; we maintain Spartina in the traditional practical sense, based on its differences in panicle morphology, leaving Sporobolus paraphyletic.


1 Plants slender, the shoots 2-4 mm thick; most blades less than 5 mm wide; upper (longer) glumes only slightly longer than the floret, 6-10 mm long, acute to attenuate but not awned.............................. S. gracilis

1 Plants robust, the shoots 3-11 mm thick; most blades more than 5 mm wide; upper (longer) glumes nearly twice as long as the floret, 10-25 mm long, including the awn.............................................. S. pectinata
**Monocotyledonous Plants - Poaceae**

*Spartina gracilis* Trin. [slender, graceful] \[Sporobolus hookeriensis P.M. Peterson & Saarela\]. Strongly rhizomatous perennial, 40-100 cm tall, the culms slender, 2-4 mm thick; ligules 0.5-1 mm long; blades 2.8-8 mm wide; panicles 8-25 cm long, with 3-12 branches 2-8 cm long, with 10-30 spikelets; spikelets 6-11 mm long; upper glumes 6-10 mm long, subequal to the floret, acute to attenuate, awnless. ● Marshes and wet prairies, known only from San Miguel County and last found in 1945.

*Spartina pectinata* Bosc ex Link [comb-like] \[Sporobolus michaianus A.S. Hitchcock\]. Strongly rhizomatous perennial, 50-150 cm or more tall, the culms robust, 3-11 mm thick; ligules 1-3 mm long; blades 5-15 mm wide; panicles 30-90 cm long, with 5-50 branches 2-15 cm long, with 10-80 spikelets; spikelets 10-25 mm long; upper glumes 10-25 mm long (including the awn), much exceeding the floret, with an awn 3-8 mm long. ● Marshes and wet prairies on the eastern plains, uncommon.

**Sphenopholis** [wedge-scale] WEDGESCALE [3].

Tufted annuals and perennials; sheaths open; auricles absent; membranes; inflorescence an open to contracted panicle; disarticulation below the glumes, the upper florets sometimes falling prior; spikelets with 2-3 florets, laterally compressed, the rachilla exceeding beyond the terminal floret; glumes unequal and dissimilar, with scarious margins, somewhat wedge-shaped; lemma 3-5-nerved, but the nerves scarcely visible, awned or awnless; anthers 3. ● About 6-8 species native to North America.

1 Plants annual; spikelets short-awned .......................................................... 2

1 Plants perennial; spikelets awnless .......................................................... S. interrupta

2 Second glume blunt to acute, oblongate, not hood-shaped; lemma 1-nerved; paleas well-developed, often as long as or longer than the lemma; fruit a utricle, the pericarp becoming free from the seed. .......................... S. obtusata

3 Inflorescence at maturity 3-4 times longer than broad, head-like, often remaining partially within the sheath; spikelets pale to purple-tinged .......................................................... S. alopecuroides

2 Sheaths prominently inflated; blades widely spreading to reflexed; inflorescence dense and head-like or spike-like, the base often included in the sheath (Crypsis)

3 Inflorescence at maturity 5-6 times longer than broad, spike-like, exserted beyond the sheath; spikelets often black-tined .......................................................... S. interrupta

2 Sheaths, blades, and panicles not all as above

**Sphenopholis intermedia** (Vasey) Heller [not continuous] \[Trisetum interruptum Buckley\]. Tufted annual 5-50 cm tall; leaves tending to be basal; sheaths glabrous to pilose; ligules 1-2.5 mm long; blades glabrous to hairy, the margins ciliate; panicles 2-15 cm long, to 1.5 cm wide, congested, the branches short and usually erect; spikelets 3-5.6 mm long, with 2-3 florets; disarticulation above and below the glumes; rachillas 0.8-1 mm long, with hairs about 0.5 mm long; glumes subequal, elliptical to oblanceolate, the lower about ⅔ as wide as the upper; lowermost lemma 3.4-5 mm long, the 4-8 mm long; ovary glabrous to sparingly hairy near the apex. ● Dry, rocky, desert hills, mostly in the southern counties. ● Formerly placed in a now-rejected genus *Trisetum*.

**Sphenopholis obtusata** (Michaux) Scribner [blunt] \[Sporobolus robustus (Vasey) Heller\]. Tufted perennial, 150-150 cm or more tall; sheaths glabrous to hairy; ligules 1-2.5 mm long; blades 1-8 mm wide; panicles 5-25 cm long, usually erect, the spikelets densely arranged; spikelets 2-3.5 mm long; upper glume 1.5-2.5 mm long, broadly ovate, somewhat ciliate, the apex rounded to blunt. ● Marshes and wet ground along streams; springs, canals, and ditches, low to medium elevations; widespread.

**Sporobolus** [thrown seed] DROPSUEED [18].

Tufted, rhizomatous, and stoloniferous annuals and perennials; sheaths open, with tufts of hair at the collar’s edge or ciliate on the margins; ligules a ring of hairs; inflorescence a panicle, sometimes reduced and racemose; spikelets with 1 floret (rarely 2 or 3), awnless, disarticulation below the glumes, or above the glumes with the lemmas and paleas separating and the seeds falling from the ovary as well; lemma 1-nerved; palea well-developed, often as long as or longer than the lemma; fruit a utricle, the pericarp becoming free from the seed. ● Nearly 200 species of tropical to warm-temperate regions worldwide. Recent studies by Peterson et al. (2014) and others have shown the close relationship of the genera *Crypsis* and *Calamovilfa* into *Sporobolus*; they share hairy ligules, 1-flowered spikelets, 1-nerved lemmas, and fruits with a free pericarp, as well as always occurring within *Sporobolus* in several molecular-phylogenetic studies; we adopt their conclusion of merging *Crypsis* and *Calamovilfa* into *Sporobolus*. *Spartina* is similarly related, but we maintain it as a separate genus largely on the basis of having panicles of spike-like, unbranched primary branches, leaving *Sporobolus* primarily peripheral (but not polypetalous).

1 Plants annual

2 Sheaths prominently inflated; blades widely spreading to reflexed; inflorescence dense and head-like or spike-like, the base often included in the sheath (Crypsis)

3 Inflorescence at maturity 3-4 times longer than broad, head-like, often remaining partially within the sheath; spikelets pale to purple-tinged .......................................................... S. alopecuroides

2 Sheaths, blades, and panicles not all as above

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4 Spikelets all less than 2 mm long; glumes very unequal; panicles narrow in flower and open at maturity, the lower branches whorled. .......................................................... S. pyramidatus
4 Spikelets, at least some, more than 2 mm long; glumes equal or nearly so; panicles narrow, the lower branches often included in the subtending sheath
5 Florets glabrous .......................................................................................................................... S. nealleyi
5 Florets pubescent ....................................................................................................................... S. vaginiflorus
1 Plants perennial
6 Lemma with a prominent tuft of hairs at the base
7 Lemma and palea long-pubescent along the back above the callus hairs ........................................ S. arenicola
7 Lemma and palea glabrous above the callus hairs ........................................................................ S. rigidus
6 Lemmas lacking a tuft of hairs at the base
8 Lateral pedicels 5-25 mm long ........................................................................................................ S. texanus
8 Lateral pedicels 4 mm or less long
9 Spikelets 1-2(2.9) mm long

10 Panicles dense and spike-like, the branches appressed
11 Stems robust, 1-2 m tall, 3-8 mm thick at the base; anthers 0.6-1 mm long ................................................ S. giganteus
11 Stems more slender, mostly less than 1 m tall, 1.5-3.5 mm thick at the base; anthers 0.3-0.5 mm long ...... S. contractus
10 Panicles open, the branches spreading at least from the middle and at the tip, the lower portion often enclosed in the subtending sheath
12 Base of the plant knotty, nearly rhizomatous; blades stiff, spreading at right angles; stems mostly less than 30 cm tall. .......................................................... S. nealleyi
12 Base of plant loosely tufted, not knotty; blades erect or ascending; stems often taller than 30 cm (except S. pyramidatus)
13 Primary panicle branches with sticky glandular streaks or patches; lowermost branches in definite whorls; stems 10-60 cm tall .......................................................... S. pyramidalus
13 Primary panicle branches lacking any sticky glandular patches; lowermost branches whorled or not, often in the sheath; stems often 40-120 cm or more tall
14 Sheaths with many long hairs at the summit; plants more slender, the shoots easily pulled from the ground, the basal sheaths not shiny, often darkened, the roots thin
15 Mature panicle branches and pedicels divaricate and flexuous, usually tangled with other branches or other panicles; branch pulvini pubescent; spikelets loosely arranged on the branches ................................................................................................. S. flexuosus
15 Mature panicle branches erect to spreading but not flexuous nor tangled; branch pulvini glabrous; spikelets crowded on the branches ........................................................................................................ S. cryptandrus
14 Sheaths glabrous or with only a few long hairs at the summit; plants robust, the shoots difficult to pull from the ground, the basal sheaths shiny and cream-colored, the roots thick
16 Panicles 10-45 cm long; branchlets naked below, the pedicels 0.5-2 mm long, often spreading. S. airoides
16 Panicles 20-60 cm long; branchlets densely flowered to the base, the pedicels less than 0.5 mm long, appressed to the branchlets ................................................................................ S. wrightii

9 Spikelets, at least some, 3 mm or more long
17 Second glume shorter than the lemma, the floret extending beyond the glume .................................................................................................. S. compositus
17 Second glume equal to or longer than the lemma, the floret not extending beyond the glume, but often surpassed by it
18 Panicles usually spike-like; spikelets 2.5-3.5 mm long; grain not globe-shaped; blades as much as 10 mm wide .......... S. giganteus
18 Panicles usually loose, the branches spreading; spikelets 4-6 mm long; grain globe-shaped; blades 1-2 mm wide .......................................................... S. heterolepis

*Sporobolus airoides* (Torrey) Torrey [resembling the genus *Aira*] ALKALI SACATON [Agrostis airoides Torrey]. Densely tufted perennial, forming large tussocks to 1 m or more across, lacking rhizomes, 35-150 cm tall; adventitious roots thick, 2-4 mm diameter; lower sheaths shiny, becoming straw-colored; sheath apices glabrous or only sparingly hairy with long hairs; ligules less than 0.5 mm long; blades to 60 cm long, weeping; panicles 15-45 cm long, very open and diffuse at maturity, the base often included in the sheath; pulvini glabrous; spikelets 1.3-2.8 mm long; glumes unequal, the upper subequal to the floret, the lower ½ or less the spikelet length. ♦Sandy, gravelly, clayey plains, flats, mesas, playas, floodplains, throughout the state. ♦Floodplains and playa beds can be covered with an almost solid expanse of these plants, and seem to harbor a disquieting number of rattlesnakes. The plants are firmly rooted in the soil, and even small portions can be very difficult to pull out by hand. Sometimes confused with small plants of *S. wrightii*. §

*Sporobolus alopecuroides* (Piller & Mitterpacher) P.M. Peterson [resembling Alopecurus] [Crypsis alopecuroides (Piller & Mitterpacher) Schrader, Pileum alopecuroides Piller & Mitterpacher]. Tufted annuals, 5-70 cm long, rarely branched above, the shoots prostrate to erect; blades 1-3 mm wide; panicles dense, spike-like, 1.5-6.5 cm long, 4-6 mm wide, often purplish, completely exerted from the subtending sheath when fully mature; spikelets 1.8-2.8 mm long. ♦Shore lines of ponds and lakes; presently known from only a few counties; native to Europe, Africa, Asia. ♦Formerly recognized in the genus *Crypsis*, which has been totally immersed in *Sporobolus* (see note in genus description). §

*Sporobolus arenicola* P.M. Peterson [gigantic] BIG SANDREED [Calamagrostis gigantea Nuttall, Calamovilfa gigantea (Nuttall) Scribner & Merrill]. Perennial with elongate shiny rhizomes, 1-2.4 m tall; sheaths glabrous or pubescent at the throat; ligules 0.7-2 mm long; blades elongate, to 90 cm long and 12 mm wide; panicles 25-80 cm long, 20-55 cm wide, the branches ascending to divergent; spikelets 7-11 mm long; tuft of hairs at base of floret ¼-⅓ the floret length; lemmas 6-10 mm long, pubescent on the back above the callos hairs. ♦Sandy hills and dunes in the eastern plains; a not uncommon and valuable sand-binder. ♦Formerly recognized in the genus *Calamovilfa*, which has been totally immersed in *Sporobolus* (see note in genus description). §
Sporobolus compositus (Poiret) Merrill [Agrostis composita Poiret, Sporobolus asper (Beauvois) Kunth]. Tufted perennial, without rhizomes (ours), 25-100 cm or more tall; sheath apices sparsely pilose; ligules less than 0.5 mm; panicles 8-30 cm long, contracted and spike-like, with smaller cleistogamous panicles produced in the axils of the sheaths; spikelets 4-8 mm long; glumes $\frac{1}{2}$-$\frac{2}{3}$ the spikelet length; lemmas (2.3)3-6 mm long, extending beyond the upper glume; paleas subequal to the lemmas. ●Plains and grasslands, sometimes roadsides, in scattered localities. ♦Our plants belong to the typical variety.

Sporobolus contractus A.S. Hitchcock [drawn together] SPIKE DROPSEED [Sporobolus strictus Merrill]. Tufted perennial, lacking rhizomes, 40-100 cm or more tall, the culms 2-5 mm thick; sheaths margins densely ciliate, the apices with conspicuous tufts of pilose hairs; ligules 0.4-1 mm long; panicles 10-50 cm long, 0.3-1 cm wide, spike-like, the base often in the sheath; spikelets 1.7-3.2 mm long; glumes unequal, the lower about $\frac{1}{2}$ or less the length of the upper; lemmas 2-3.2 mm long, surpassing both glumes; paleas subequal to the lemmas. ●Sandy hills and plains, widespread and expected in all the counties. ●This and Sporobolus giganteus produce narrow, spike-like panicles; when mature, S. giganteus differs in having taller shoots (100-200 cm), thicker stems (4-10 mm), wider panicles (1-4 cm), and longer anthers (0.6-1 mm). §

Sporobolus cryptandrus (Torrey) A. Gray [hidden stamens] SAND DROPSEED [Agrostis cryptandra Torrey]. Tufted perennial, lacking rhizomes, 30-120 cm tall, the culms 1-3.5 mm thick; sheath margins sometimes ciliate, the apices with conspicuous tufts of pilose hairs 2-4 mm long; ligules 0.5-1 mm long; panicles erect, 15-40 cm long, 2-14 cm wide, open in age but often spike-like when young, the branches ascending to reflexed, not entangled; secondary branchlets and spikelets generally appressed along the primary branches; pulvini glabrous; spikelets 1.5-2.7 mm long; glumes unequal, the lower $\frac{1}{2}$ or less the length of the upper; upper glume $\frac{2}{3}$ or more the spikelet length; lemmas 1.4-2.7 mm long; paleas subequal to the lemmas. ●Sandy or gravelly plains, mesas, roadsides, waste places, throughout the state. ●Similar to Sporobolus flexuosus, but differing in the key features; also, the primary panicle branches are generally persistent, and even if they break, they do not leave a spine-remnant as in MESA DROPSEED. §
Sporobolus giganteus Nash [gigantic] GIANT DROPSEED. Large tufted perennial, lacking rhizomes, 100-200 cm tall, the culms 4-10 mm thick; sheath margins ciliate distally, the apices with tufts of pilose hairs to 2 mm long; ligules 0.5-1.5 mm long; panicles 25-75 cm long, 1-4 cm wide, spike-like, the base often in the sheath, the branches mostly appressed but sometime ascending outward; pulvini glabrous; spikelets 2.5-4 mm long; glumes unequal, the lower about ½ the length of the upper; upper glumes subequal to the floret; lemmas 2.5-4 mm long; paleas equal to the lemmas. Sandy hills and plains, widespread. This and Sporobolus contractus produce narrow, spike-like panicles; when mature, S. contractus differs in having shorter shoots (40-120 cm), thinner stems (2-5 mm), narrower panicles (0.1-1 cm), and shorter anthers (0.3-0.5 mm).

Sporobolus heterolepis (A. Gray) A. Gray [different scales] PRAIRIE DROPSEED [Vilfa heterolepis A. Gray]. Tufted perennial, lacking rhizomes, 30-80 cm tall; sheath margins glabrous, the apices with sparse hairs; ligules 0.1-0.3 mm long; blades 1-2.5 mm wide; panicles 5-25 cm long, 1-11 cm wide, contracted to loosely open, the branches erect to ascending-spread; pulvini glabrous; spikelets 3-6 mm long; glumes unequal, the lower about ½ the upper; upper glume usually surpassing the floret; lemmas 2.7-4.3 mm long; paleas equal to longer than the lemmas; fruit globose, indurate, without a loose pericarp. Grasslands and woodlands in the northeastern region; currently known from only a few collections in Colfax County.

Sporobolus nealleyi Vasey [for Greenleaf Cilley Nealley (1846-1896), USDA plant collector] GYGRASS. Tufted perennial, the bases hard and knotty, 10-50 cm tall, the culms 0.7-1.2 mm thick; sheath margins villous-ciliate, the apices with a tuft of hairs to 4 mm long; ligules 0.2-0.4 mm long; blades stiff, spreading at right angles; panicles 3-10 cm long, 1-6 cm wide, the branches eventually spreading the divergent, the secondary branches spreading to appressed; spikelets 1.4-2.1 mm long; glumes unequal, the lower one about ½ the upper; upper glumes about as long as the spikelet; lemmas 1.4-2.1 mm long; paleas equal to the lemmas. Sandy, alkaline, and mostly gypsiferous plains and flats.

Sporobolus neglectus Nash [overlooked] PUFFSHEATH DROPSEED. Tufted delicate annual, 10-40 cm tall; sheath inflated, the margins glabrous, the apices with small tufts of hairs to 3 mm long; ligules 0.1-0.3 mm long; panicles 2.5-6.5 cm long, to 0.5 cm wide, often completely hidden in the sheaths; spikelets 1.6-3 mm long; glumes nearly equal, shorter than the floret; lemmas 1.6-2.9 mm long, glabrous; paleas equaling the lemmas. Sandy fields, floodplains, stream banks, disturbed ground, scattered localities but not common; common in central and northeastern United States.

Axillary cleistogamous panicles of this and Sporobolus vaginiflorus yield seeds of two different sizes and growth patterns. Larger seeds at the upper part of the panicles germinate in the spring after one overwintering period, and smaller seeds toward the base of the panicles require two overwintering periods separated by a rest period (McGregor 1990).

Sporobolus pyramidatus (Lamarrck) A.S. Hitchcock [pyramid-shaped] [Agrostis pyramidata Lamarrck, Sporobolus pulvinatus Swallen]. Tufted annual, sometimes longer lived, 7-40(60) cm tall; erect to decumbent; sheath margins ciliate, the apices with a tuft of pilose hairs to 3 mm long; ligules 0.3-1 mm long; blades 2-6 mm wide, the margins pectinate-ciliate; panicles 4-18 cm long, open, pyramidal, 1-6 cm wide, the lower branches whorled, with elongated glandular patches or streaks; pulvini glabrous; spikelets 1.2-1.8 mm long; glumes strongly unequal, the lower less than 1 mm long, the upper 1.2-1.8 mm long, ½ or more the spikelet length; lemmas 1.2-1.7 mm long; paleas equal to the lemmas. Sandy plains, clay flats, disturbed ground, widespread. See note about seed production under Sporobolus neglectus. This is apparently very similar to the Asian and African S. coronandulianus (Reutzius) Kunth, but whether these are conspecific or not is yet to be determined.

Sporobolus rigidosus (Buckley) P.M. Peterson [stiff, rigid] PRAIRIE SANDREED [Calamagrostis longifolia Hooker, Calamovilla longifolia (Hooker) Scribnber, Vilfa rigida Buckley]. Strongly rhizomatous perennial, 0.5-2 m tall; sheaths glabrous to softly pilose, the margins glabrous to ciliate, the apices often with scattered hairs; blades elongate, to 65 cm long and 12 mm wide; panicles 15-70 cm long, 4-25 cm wide, the branches ascending to divergent; spikelets 5-8.5 mm long; lemmas 4-7 mm long, glabrous on the back above the callus hairs. Sandy hills and dunes in the eastern plains; known from only a few collections, but common in the central plains northward. Buckley’s basonym Vilfa rigida must be used instead of Hooker’s more familiar longifolia, which is unavailable in Sporobolus because of S. longifolia (Torrey) Alph. Wood.

Sporobolus schoenoides (Linnneaus) P.M. Peterson [resembling Schoenoe] [Crypsis schoenoides (Linnneaus) Lamarrck, Phleum schoenoides Linnneaus]. Tufted annual, the shoots 2-75 cm long, usually not branching, but some plants strongly branched above the base; blades 2-6 mm wide; panicles dense, spike-like or head-like, 0.5-7 cm long, 5-8(12) mm wide, the base usually remaining in the subtending sheath at maturity; spikelets 2.7-3.2 mm long, strongly laterally compressed; glumes subequal, larger than the floret; lemmas 2.4-3 mm long, the palea slightly smaller. Wet ground along ponds and marshes; presently known from only a few western counties; native to Europe, Africa, Asia, India. Formerly recognized in the genus Cryptis, which has been totally immersed in Sporobolus (see note in genus description).

Sporobolus texanus Vasey [of Texas]. Tufted perennial, 20-70 cm tall; sheath margins glabrous, the apices glabrous or with sparse pilose hairs to 4 mm long; ligules 0.2-0.6 mm long; panicles 10-35 cm long, widely diffuse, ½ to nearly as wide, the base usually in the sheath, all branches, branchlets, and pedicels spreading; pedicels 5-25 mm long; spikelets 2.3-3 mm long; glumes strongly unequal, the lower ½ or less the upper; upper glumes ½ to slightly longer than the floret; lemmas 1.8-3 mm long, glabrous; paleas equal to the lemmas. Low wet plains and swales, uncommon.

Sporobolus vaginiflorus (Torrey ex Gray) Wood [with sheathed flowers] POVERTY DROPSEED [Vilfa vaginiflora Torrey ex Gray]. Tufted delicate annual, 15-60 cm tall; sheaths often inflated, the margins glabrous, the apices sometimes with small tufts of hair to 3 mm long; ligules 0.1-0.3 mm long; panicles 1-5 cm long, 2-5 mm wide, spike-like, enclosed in the sheath; spikelets 3-6 mm long; glumes subequal, narrowly lanceolate, slightly shorter or longer than the floret; lemmas and paleas 3-5.4 mm long. Sandy and disturbed ground, uncommon, known from a few old collections in Bernalillo and Doña Ana counties, and one fairly recent (1999) collection from Roosevelt County; native to central and northeastern United States, and considered adventive in New Mexico.
**Sporobolus wrightii** Munro ex Scribner  [for Charles Wright (1811-1885), outstanding American botanical collector]  GIANT SACATON  *Sporobolus airoides* (Torrey) Torrey var. wrightii (Scribner) Gould.  Large tussocky perennial, 1-2.5 m tall; sheath margins not ciliate, the apices sparsely hairy with hairs to 6 mm long; ligules 1-2 mm long; blades to 70 cm long, flat, 3-10 mm wide; panicles 20-60 cm long, 12-26 cm wide, open, broadly lanceolate, generally fully exserted, the secondary branches, branchlets, and pedicels usually appressed; spikelets 1.5-2.5 mm long; glumes unequal, the lower about ½ the length of the upper; upper glumes ¾ to subequal to the floret; lemmas 1.2-2.5 mm long, glabrous; paleas equal to the lemmas. ●Swales, playas, ditches, often in hard-packed alkaline soil, widespread. ●According to Wooton & Standley (1912), giant sacaton was preferred by liverymen over alfalfa for hay for buggy horses rented out to hard service. It is finding increased use as an ornamental. §
Steinchisma [a narrow gap or split] [1].

Tufted perennials, sometimes with short tillering rhizomes; sheaths open, usually keeled; auricles absent; ligules a minute ciliate membrane; inflorescence a rebranching panicle; disarticulation below the glumes; spikelets elongate, gaping open in age, with 2 florets, the lower staminate or sterile, the upper fertile; lower paleas longer than the lower lemmas, becoming greatly inflated and indurate at maturity; upper floret forming a seed case, becoming indurate at maturity. Formerly included in Panicum, Steinchisma includes about 6 species of the Western Hemisphere, with only one in North America.

Formerly included in *Panicum*, *Steinchisma* includes about 6 species of the Western Hemisphere, with only one in North America.

*S. hians* (Elliott) Nash [gaping] GAPING PANIC-GRASS [*Panicum hians* Elliott]. Tufted perennial, 20-75 cm tall, the shoots and sheaths compressed; sheaths shorter than the internodes, sparsely ciliate at the summit; ligules 0.2-0.5 mm long; blades 2-5 mm wide, sparsely pilose adaxially at the base; panicles 5-20 cm long, about \( \frac{1}{2} \) as wide, open, the branches lax, the secondary branchlets appressed; spikelets 1.8-2.4 mm long, often purplish; lower glumes about \( \frac{1}{2} \) the spikelet length; lower palea slightly longer than the lower lemma; fertile floret 1.6-2 mm long, dull, minutely papillose, with an acute apex. Collected once in Las Cruces in 1895, undoubtedly an accidental introduction and not persisting; native to southeastern United States to Argentina.

Stenotaphrum [narrow trench] [0].

Tufted annuals and perennials, sometimes rhizomatous or stoloniferous; sheaths open, compressed, shorter than the internodes; ligules a ciliate membrane or ring of hairs; inflorescence a spike-like panicle, the branches very short and partially embedded in the rachis; disarticulation below the glumes; spikelets awnless, the lower glume oriented away from the rachis, with 2 florets, the lower staminate or sterile, the upper fertile. About 7 species primarily of the Indian Ocean region, with one species native to coastal areas of the New World.

*Stenotaphrum* [narrow trench] [0].
**Stenotaphrum secundatum** (Walter) Kuntze [one-sided] ST. AUGUSTINEGRASS [Ischaemum secundatum Walter]. Stoloniferous perennial, 10-30 cm tall; sheaths sparingly pilose, constricted at the summit; ligules about 0.5 mm long; blades 3-15 cm long, 4-10 mm wide, thick, flat; spicate panicles 4-10 cm long, less than 1 cm wide, the rachis flattened and winged; spikelets 3.5-5 mm long; lower glume 1/3 or less the spikelet length; upper lemma papery, weakly clasping the palea. **Cultivated as a coarse-textured lawn grass for shaded areas in the southern counties, not known in the wild; native to southeastern United States and southward.** Seed production is practically nil, and sod must be planted by plugs. A form with longitudinally striped leaves (var. variegatum A.S. Hitchcock) is sometimes grown as a hanging basket plant.

**Stipa** [low fibers] [0].

Many recent studies in the *Stipa*eae have resulted in the relegation of North American members of *Stipa* to segregate genera, which are keyed below. The genus *Stipa* remains a Eurasian taxon.

1 Palea hardened, longitudinally grooved and slightly longer than the lemma, protruding from between the lemma margins as a small point; lemma margins involute, fitting into the grooves of the palea.................................................go to *Piptochaetium*

1 Palea usually membranous, not grooved, shorter than or equaling the lemma, not protruding as a small point; lemma margins flat

2 Lemma margins strongly overlapping; palea less than 1/3 the length of the lemma, glabrous, lacking veins............. go to *Nassella*

2 Lemma margins not or only slightly overlapping; palea 1/3 to equaling the length of the lemma, always pubescent when short, sometimes glabrous when longer, 2-veined

3 Awns 6-20 cm long or more; glumes longer than 1.8 cm d Membranous ligules of lower leaves densely hairy, with hairs 0.3-1 mm long.......................................................go to *Pappostipa*

d Membranous ligules of lower leaves glabrous or at most minutely ciliate..................................................go to *Hesperostipa*

3 Awns 0.5-7.5 cm long, if longer than 6 cm then the glumes 1-1.5 cm long

4 Palea pubescent, the apex flat, the veins terminating below the apex; lemma coriaceous at maturity but not strongly indurate

5 Glumes without evident nerves, the apices rounded to acute; plants alpine, growing on mossy hummocks in wet ground.....

............................................................................................................................... ...................................go to *Ptilagrostis*

5 Glumes with 1-5 evident nerves and/or the apices attenuate; plants growing in various habitats, but rarely as above

6 Plants with neither woody nor bamboo-like culms 3-6 mm thick, with mostly 2-3 nodes............................................ *Eriocoma* Pseudoerio coma

6 Plants with ± woody, bamboo-like culms 3-6 mm thick below, with 3-13 nodes................................................ *Trachypogon*

7 Palea glabrous or pubescent, the apex appearing prow-tipped or pinched, the veins extending to the apex; lemma indurate at maturity

7 Florets dorsally compressed; lemma margins not overlapping, the palea exposed, at least in part ........ go to *Piptatheropsis*

7 Florets terete; lemma margins slightly overlapping, the palea hidden.......................................................... go to *Oryzopsis*

**Trorreyochloa** [Torrey’s grass, for John Torrey (1796-1873), distinguished American botanist] MANNAGRASS [1].

Rhzomatous perennials; sheaths open; auricles absent; ligules membranous; blades flat; inflorescence a panicle; spikelets with 2-8 florets; disarticulation above the glumes and between the florets; glumes shorter than the lowermost floret; lemma rounded, with 7-9 prominent nerves.

Our plants belong to var. **pauciflora** (J.S. Presl) J.I. Davis [few-flowered] *Glyceria pauciflora* Presl, *Puccinellia pauciflora* (J. Presl) Munz, *Trachypogon pauciflorus* (Presl) Church]. The report of *Renneria* in 1923 from San Juan County is in error; the locality (Manzanares Creek) is actually in San Miguel County.

**Trachypogon** [rough-bearded] [1].

Tufted to shortly rhizomatous annuals and perennials; sheaths open; auricles absent; ligules membranous; inflorescence a solitary raceme (rare) composed of repeating pairs of subsessile and pedicelled spikelets; disarticulation beneath the pedicelled spikelet; subsessile spikelets staminate or sterile, awnless, otherwise similar to the pedicelled spikelets; pedicelled spikelets fertile, with a sharp callus, the glumes firm and enclosing the 2 florets, the lower floret sterile, the upper floret perfect, the awns twisted, plumesome. About 4 species of warm-temperate to tropical regions of the Americas and Africa. *Trachypogon* is curious in the Andropogoneae, because it is the pedicelled spikelets that are fertile while the subsessile spikelets are staminate or sterile, reverse to the customary condition in the tribe; also, only the pedicelled spikelet disarticulates from the rachis, leaving the subsessile spikelets on the plant.

Our plants belong to var. **pauciflora** (J.S. Presl) J.I. Davis [few-flowered] *Glyceria pauciflora* Presl, *Puccinellia pauciflora* (J. Presl) Munz, *Trachypogon pauciflorus* (Presl) Church]. The report of *Renneria* in 1923 from San Juan County is in error; the locality (Manzanares Creek) is actually in San Miguel County.

**Trachypogon plicatus** (Linnaeus f.) Kuntze [spike-like] CRINKLE-AWN [Heteropogon secundus Presl, Stipa spicata Linnaeus v., Trachypogon montefauri (Kuntth.) Nees, Trachypogon plumosus (Humboldt & Bonpland ex Willdenow) Nees, Trachypogon secundus (Presl) Scribner]. Tufted perennial, 60-120 cm tall, generally unbranched from the base, the nodes appressed-hirsute; sheaths sparingly appressed-pilose; ligules 2-5 mm long; racemes 10-18 cm long; pedicelled spikelets 6-8 mm long, the glumes pilose, the awns 4-6 cm long with pilose hairs to 2 mm proximally, nearly glabrous distally. Rocky hills and slopes in the mountains of the bootheel region.

**Tragus** [for Jerome Bock (Hieronymus Tragus) (1498-1554), German physician and herbalist] BURGRASS [1].

Tufted annuals and perennials; sheaths open, shorter than the internodes; ligules a ciliate membrane; blade margins ciliate; inflorescence a spike-like, reduced panicle, the branches very short and bearing 2-5 spikelets, the branch bur-like; disarticulation at the base of the branch; spikelets with 1 floret, the lower floret minute, the distal spikelets sterile and smaller; lower glume minute or absent; upper glume as large as the spikelet, 5-7-nerved (seen by viewing the interior or the glume), with 5-7 rows of straight or hooked spine-like projections; lemmas membranous, 3-nerved. A small genus of 7 species native to the Old World, easily recognized by the bur-like branches and hook-covered glumes.

1 Second glume 5-nerved, with 5 longitudinal rows of hooked projections; branch (bur) mostly with 2 spikelets. **T. berteronianus**

1 Second glume 7-nerved, with 6-7 longitudinal rows of hooked projections; branch (bur) mostly with 3-5 spikelets. **T. racemosus**

*T. berteronianus* Schultes [for Carlo Giuseppe Bertero (1789-1831), Italian botanist]. Tufted annual, the shoots 3-40 cm long, erect to prostrate; blades 1-8 cm long; panicles 1-13 cm long, 4-8 mm wide; branches 0.5-3 mm long, with 2(3) spikelets; lower (inner) glumes 0.1-0.6 mm long; upper (outer) glumes 1.8-4.3 mm long, 5-nerved, with 5 longitudinal rows of hooked projections 0.3-1 mm long. ●Disturbed ground in desert plains, mesas, and bajadas.

*T. racemosus* (Linnaeus) Allioni [in a raceme]. *Cenchrus racemosus* Linnaeus. Tufted annual, the shoots 5-40 cm long; blades 1-6 cm long; panicles 2-11 cm long, 7-13 mm wide; branches 2-4.8 mm long, with 2(3)-5 spikelets; lower (inner) glumes 0.7-1.1 mm long; upper (outer) glumes 1.8-4.3 mm long, 7-nerved, with 6-7 longitudinal rows of hooked projections 0.2-1.3 mm long. ●Not yet known from New Mexico, but to be looked for in arid plains and foothills of the southwestern counties; it occurs in adjacent Arizona. **T. racemosus** has been reported for the state in various works through the years, but all specimens have turned out to be *T. berteronianus*.

**Trichachne** [hair-scale] COTTON-TOP [1].

Tufted perennials, with knotty or spreading rhizomes; sheaths open; auricles absent; ligules membranous, sometimes with a ciliate fringe; inflorescence a panicle of branched or branching primary branches alternating along the central axis, not detaching at maturity, the spikelets in pairs of one sessile and one pedicellate, appressed in two rows along the one side of the branch; spikelets awnless, silky-pubescent, the hairs generally longer than the spikelet, 2-flowered, the lower floret staminate to sterile, the upper floret fertile, the anthers 3.

*Trichachne* in the more traditional sense until the classification is resolved.

■ *T. californica* (Bentham) Chase [of California] ARIZONA COTTONTOP [2]. *Digitaria californica* (Bentham) Henrard, *Panicum californicum* Bentham, *Valota saccharata* (Buckley) Chase. Tufted perennial, 40-100 cm tall; basal sheaths villous; panicles 8-15 cm long, densely villous; panicle branches appressed to ascending, not digitate but attached along the main axis; spikelets short-pedicelled; upper glume and lower lemma densely villous with hairs to 5 mm long. ●Rocky plains, foothills, and bajadas, mostly in the southern half of the state. §
1 Panicles open, loose, the branches spreading to drooping
2 Lemmas 2-3 mm long, only the midnerve projecting as a short point (T. eragrostoides) ............................................. go to Triplasiella
2 Lemmas 3-5 mm long, the midnerve and lateral nerves projecting as short points ..................................................

1 Panicles narrow, contracted, the branches erect
3 Nerves of the lemma glabrous or pubescent only at the base..............................................................
3 Nerves of the lemma plainly pubescent (T. muticus) ..........................................................

Tridens abscess (Vasey) Wootton & Standley [whitish] WHITE TRIDENS [Triodia abscess Vasey]. Tufted perennial, often with a knotty short–rhizomatous base, 30–100 cm tall; ligules to 0.5 mm long; panicles 8-25 cm long, 0.5–1.5 cm wide; glumes about as long as the adjacent lemma, 1-nerved; lemmas 3-5 mm long, papery, whitish or purplish, glabrous or with a few short hairs at the base of the lateral nerves; paleas long hairy. • Low swales and ditch banks in the plains, deserts, and prairies.

*Tridens flavus* (Linnaeus) A.S. Hitchcock [yellow, golden] PURPLE-TOP [*Poa flava* Linnaeus]. Tufted perennial, with short rhizomes from a knobby base, 60–180 cm tall; ligules to 0.5 mm long; panicles 15-40 cm long, ½ as wide, open, pyramidal, the branches rebranched and drooping, covered with glandular dots; glumes shorter than the adjacent lemmas, 1-nerved; lemmas 3-5 mm long, the nerves prominently villous-ciliate and extended as 3 tiny mucros; paleas glabrous, widened or bowed-out below. • Prairies and grassy hills; known from a single collection near Clines Corners in Torrance County and perhaps not persisting; native to central and eastern United States. • It is unclear why Linnaeus applied the epithet *flavus*, yellow or golden, to this species.

**Tridentopsis** [resembling *Triden*] TRIDENS, TRIDENTOPSIS [1].

Tufted perennials, with short knotty rhizomatous bases, lacking stolons, the nodes often bearded; sheaths open, shorter than the internodes; auricles absent; ligules a ciliate membrane or a ring of hairs; inflorescence a panicle, the branches racemose and erect to widely spreading or reflexed; spikelets with several florets, sometimes the distal ones sterile; disarticulation above the glumes and between the florets; glumes glabrous, awnless; lemmas 3-nerved, usually hairy on the nerves; awnsless or the midnerve excurrent to a mucro or awn-tip; paleas not widened or bowed-out below; anthers 3, purplish. • A genus of 2 species, most recently included in the genus *Tridens*, but its creation renders *Tridens* and its segregates monophyletic.


**Tridens muticus** (Torrey) P.M. Peterson [cut-off] SLM TRIDENS. Tufted perennial, with short rhizomes from a knobby base, 20-80 cm tall; ligules 0.5-1 mm long; panicles 7-25 cm long, somewhat racemose, to 1 cm wide, the branches racemose; glumes shorter than adjacent lemmas, 1-7-nerved; lemmas 3-5 mm long, purplish, the nerves pilose ab. —Rarely excr. —Paleas shorter than the lemma. • Dry flat, hills, outcrops, on young limestone, widespread, more common in the southern regions. • We have two intergrading varieties:


· A Second glume 3- to 7-nerved, typically 6-8 mm long… var. elongata (Buckley) P.M. Peterson & Romaschenko [lengthened] *[Tridens elongatus* (Buckley) Nash, *Tridens muticus* (Torrey) Nash var. elongatus (Buckley) Shimners, *Triodia elongata* (Buckley) Scribner, *Urolepis elongata* Buckley]. More mesic sites than the above.

**Tripidium** [perhaps an allusion to three stamens, or to the genus *Ripidium*, or both] [1].

Tufted perennials from a knobby base, 10–30 cm tall; ligules 1-3 mm long; panicles 3-6 cm long, 0.5–1 cm wide; the spikelets crowded; the spikelets smaller than the adjacent lemmas, 1-7-nerved; lemmas 3-5 mm long, papery, usually hairy on the nerves; glumes glabrous or the midnerve excurrent to a mucro; paleas not widened or bowed-out below; anthers 3, purplish. • About 3 species, Europe, Africa, Asia. • Recently segregated from an otherwise polyphyletic *Saccharum* (Welker et al., 2015), and placed in *Erianthus* before that.


· Tripidium ravennae (Linnaeus) H. Scholz [from Ravenna, Italy] RAVENNA-GRASS [Andropogon ravennae Linnaeus, *Erianthus ravennae* (Linnaeus) Beauvios, *Ripidium ravennae* (Linnaeus) Triinus, *Saccharum ravennae* (Linnaeus) Linnaeus]. Large, tussocky, tufted perennial, 4-20 cm tall; culms and leaves glabrous; ligules about 1 mm long; blades to 40 cm long and 1.5 cm wide; panicles usually about the same as the leaves, 20-80 cm long and about ½ as wide; spikelets 4-6 mm long, the silky basal hairs as long as the spikelet; awns 2-5 mm long, obscured by the hairs. • Increasingly cultivated as an ornamental landscape plant, and found more and more as an escape in scattered locales; native to northern Africa and the Mediterranean region. • Ravenna-grass has fled the Albuquerque Zoo (aided by rebellious elephants and giraffes) and has spread along the Rio Grande floodplain nearby and plant; plants are also expanding in range along the Pecos River near the Bitter Lakes Wildlife Refuge in Chaves County, along the highway between Shiprock and Farmington in San Juan County, and near New Mexico State University in Dona Ana County.

**Triplasiella** [resembling the genus *Triplasis*] TRIPLASIELLA [1].

Tufted perennials, with knotty rhizomatous bases; sheaths open; auricles absent; ligules a ciliate membrane; inflorescence open, rebranching panicle, cleistogamous spikelets not produced in any of the sheaths; spikelets with several florets, the distal ones sometimes sterile, the rachilla prolonged; disarticulation above the glumes and between the florets; glumes shorter than the lowermost lemma, 1-nerved; callus hairy; lemmas 3-nerved, the nerves puberulent, the midnerve sometimes excurrent as a small mucro, the lateral nerves not excr. and often not reaching the apex; palea keels smooth or scabrous, not villous, not widened or bowed-out below; anthers 3. • A monotypic genus, most recently included in a polyphyletic *Tridens*, but its creation renders *Tridens* and its segregates monophyletic.
a Lemmas with awns longer than 3 mm, easily visible

*bTriticiella eragrostoides* (Vasey & Scribner) P.M. Peterson & Romaschenko *resembling Eragrostis* [Triticiella eragrostoides (Vasey & Scribner) Nash, Tritordeum eragrostoides (Vasey & Scribner) P.M. Peterson, Tridria eragrostoides Vasey & Scribner]. Tufted perennial, with a knotty short-rhizomatous base, 50-100 cm tall; ligules 1.2-3 mm long; panicles 10-30 cm long, 8-20 cm wide, the branches somewhat racemose, ascending to reflexed in age; glumes 1-nerved, purple, dissimilar, the upper one subequal to the adjacent lemma; lemmas 2.3-5 mm long, the nerves puberulent, the midnerves sometimes excurrent as a macro, otherwise awnless; palea glabrous or scabrous proximally. ■ Desert plains and bajasadas in brushy country; known from a single collection in Luna County; native to Texas south into Mexico and Cuba.

**Triplasis** [tripple] SANDGRASS [1].

Tufted annuals and perennials, sometimes rhizomatous; sheaths open; auricles absent; ligules a ring of hairs or a ciliate membrane; inflorescence a rebranching panicle, axillary cleistogamous panicles also produced; spikelets with several florets, the distal ones sometimes sterile, the rachilla prolonged; disarticulation above the glumes and between the florets, or the florets falling together, also in the nodes of the culm and the axillary panicles dispersing; glumes shorter than the lowest lemma, 1-nerved; callus hairy; lemmas 3-nerved, the nerves villous, awned from the sinus at the apex or awnless; palea keels villous; anthers 3. ■ An American genus of only 2 species.

*bTriticeae* (Walter) Chapman [purple]. ■ Aera purpurea Walter. Tufted annual to short-lived perennial with short rhizome-tillers, 15-100 cm tall, nodes hairy; sheaths inflated late in season with development of axillary cleistogamous panicles; ligules a ring of hairs to 1 mm long; blades hairy; panicles 3-7 cm long, the base often in the sheath spikelets 6-9 mm long with 3-4 florets; lemmas 3.4 mm long, the apical lobes shorter than 1 mm; awns straight, shorter than 2 mm; paleas about 2.5 mm long, the keels conspicuously villous. ■ Sandy flats and plains, disturbed ground, in the southeastern region; rarely collected. ■Small vestigial cleistogamous panicles are conspicuous in the swollen sheath segments, which blow about when old culms break into indeterminate axes.

**Tripsacum** [a rubbed (smooth) grain] GAMAGRASS [0].

Monoeocious genera, the staminate and pistillate spikelets separated in the same inflorescence; sheaths open; ligule a ciliate membrane; inflorescence a panicle of 1-2 species native to Europe and Asia (exotic elsewhere), none of which occur in New Mexico. Our taxon is currently unsettled, but it shows affinities to *Koeleria*, which remains a small genus of 1-2 species native to Europe and Asia (exotic elsewhere), none of which occur in New Mexico. Our *Triisetum* have been apportioned to the genera *Graphephorum*, *Koeleria*, and *Sphenopholis*, as seen below. **Triissetum canescens** Buckley has been reported from Colfax County, but the specimen in question belongs to *Koeleria veseyi* (Triissetum montanum); the classification of the canescens taxon is currently unsettled, but it shows affinities to *Graphephorum*, and may end up there (R. Soreng, pers. comm. 2019).

*bTripsacum lanccolatum* Ruprecht ex Fournier [spare-shaped] MEXICAN GAMAGRASS. Rhizomatous perennial, 1-2 m tall; lower sheaths hispid; blades to 1 m long and 3 cm wide; terminal panicle with 3-7 rames; pistillate spikelets 2-3 mm wide, shiny, bead-like; staminate spikelets in pairs of 1 sessile and 1 pedicelled, the glumes 5-10 mm long; pedicels 2-5 mm long. ■Reported by W&S, and thence others, but the specimen in question (E.C. Merton 2015, US) was collected in the vicinity of Monument No. 73 on 27 Aug 1893, either in Arizona or Sonora, but certainly not in New Mexico (see Mearns [1907] for itinerary and dates). No other specimens or reports are known.

**Trisetum** [three-awned].

Recent phylogenetic analyses have resulted in the reorganization of species formerly classed within *Triisetum*, which remains a small genus of 1-2 species native to Europe and Asia (exotic elsewhere), none of which occur in New Mexico. Our *Trisetum* have been apportioned to the genera *Graphephorum*, *Koeleria*, and *Sphenopholis*, as seen below. *Triissetum canescens* Buckley has been reported from Colfax County, but the specimen in question belongs to *Koeleria veseyi* (Triissetum montanum); the classification of the canescens taxon is currently unsettled, but it shows affinities to *Graphephorum*, and may end up there (R. Soreng, pers. comm. 2019).


*bTrisetum* accidental species, the rachilla prolonged; disarticulation above the glumes and between the florets, or the florets falling together, also in the nodes of the culm and the axillary panicles dispersing; glumes shorter than the lowest lemma, 1-nerved; callus hairy; lemmas 3-nerved, the nerves villous, awned from the sinus at the apex or awnless; palea keels villous; anthers 3. ■ An American genus of only 2 species.


*bTriticosecale* E.C. Merton 2015. Can. J. Bot. 93:452-457. ■ Triticosecale Wittman ex A. Camus. ■ Triticosecale Wittman ex A. Camus. Tufted, erect Annual, to 130 cm tall; spikes 8-20 cm long; spikelets 2-3 florets, the terminal floret usually reduced; glumes ovate, 9-12 mm long, asymmetrically keeled and toothed distally, with awns 3-4 mm long; lemmas ovate, 10-15 mm long, the nerves converging at the apex, the awns 3.50 mm long. ■ A rather common, though non-persistent, waif of agriculture, more frequent than collections indicate. ■ The name *Triticosecale* refers to tetraploids derived by artificial hybridization between wheat (*Triticum*) and rye (*Secale*). There is no valid specific epithet for this agricultural invention (Stace 1987), and the crop generally goes by the common name, *Triticale*. Cultivars are referred to in the normal way, e.g., *Triticosecale* ‘NEV 812′ or *Triticosecale* ‘BOKOLO’. The last 50 years or so has the crop been developed commercially. The genetics are extremely complex, involving multiple hybridizations, backcrossing, and artificially induced chromosome doubling. The morphological variation is correspondingly diverse, and plants rarely fall strictly intermediate to the two parents. Triticale is most commonly confused with wheat, since the glumes are broad in both, but triticale is usually glaucous and has lemma nerves converging toward the apex.
Monocotyledonous Plants - Poaceae

**Triticum** [classical Latin name for wheat] WHEAT [1].

Tufted annuals; sheaths open; ligules membranous; inflorescence a spike, with 1 spikelet per node; disarticulation in the rachis (wild species) or not disarticulating (domesticated species); spikelets with 2-9 florets, the distal often sterile; glumes ovate, thick, leathery, prominently keeled, awned; lemmas keeled, the lower lemmas usually awned; anthers 3. ± About 25 species of both wild and cultivated entities. Wheat is one of the world’s most important crops, and was first cultivated in western Asia at least 9,000 years ago.

*Urochloa* glaucous and with the nerves of the lemmas converging at the apex. 9,000 years ago.

**Urochloa**

- **U. arizonica** (Buckley) R.D. Webster [very or most ciliate] [Brachiaria ciliatissima (Buckley) Chase, Panicum ciliatissimum Buckley]. Rhizomatous or stoloniferous perennial, 10-40 cm tall; nodes villous; sheaths glabrous or with a scant basal membranous portion terminated by hairs; blades flat; inflorescence a panicles, the branches spike-like, rarely rebranched; disarticulation beneath the spikelets; spikelets borne on one side of the branch, with 2 florets, the lower staminate or sterile, the upper fertile; lower glumes ¼ or less the spikelet length; upper glumes and lower lemmas similar in size and texture; upper florets perfect, fertile, becoming indurate and forming a seed case. ± About 100 species of warm-temperate to tropical regions of the world. Our native species were formerly classed in the genera *Brachiaria* and (before that) *Panicum*.

1 Spikelets with conspicuous and dense villous hairs (easily visible without magnification) on the second glume and lemma of lower floret; plants perennial with short rhizomes ................................................................. **U. ciliatissima**

1 Spikelets glabrous or with short, inconspicuous hairs (hardly visible without magnification); plants annual, lacking rhizomes

2 Leaf margins noticeably crinkled; lemma of upper floret with a stiff bristle projecting from an otherwise blunt apex ............................................................. **U. panicoides**

2 Leaf margins not crinkled, smooth; lemma of the upper floret without a bristle, the apex rounded to acute

3 Spikelets 5-6 mm long; plants often 50 cm or more tall ................................................................. **U. texana**

3 Spikelets 2-4 mm long; plants rarely taller than 50 cm and usually much shorter (in ours)

4 Spikelets glabrous or nearly so, mostly 2-3 mm long, the base truncate; upper lemma with deep transverse furrows ...........

4 Spikelets definitely puberulent, mostly 3-4 mm long, the base drawn out somewhat and attenuate; upper lemma with minute bumps but lacking obvious transverse furrows ........................................................................... **U. fuscoides**

**Urochloa arizonica** (Scribner & Merrill) Morrone & Zuloaga [of Arizona] [Brachiaria arizonica (Scribner & Merrill) S.T. Blake, Panicum arizonicum Scribner & Merrill]. Tufted annual, 15-65 cm tall, erect to geniculate-based; sheaths glabrous or pubescent; panicles 6-20 cm long, hairy with bulbous-based hairs, open, the branches 3-7 cm long; spikelets 3-4 mm long, appressed to the branches, generally puberulent; lower glumes ⅔ the spikelet length; upper floret 2.8-3 mm long, lacking deep transverse furrows. ± Disturbed ground and rocky slopes in the deserts and woodlands of the southwestern region.

**Urochloa ciliatissima** (Buckley) R.D. Webster [very or most ciliate] [Brachiaria ciliatissima (Buckley) Chase, Panicum ciliatissimum Buckley]. Rhizomatous or stoloniferous perennial, 10-40 cm tall; nodes villous; sheaths glabrous or with bulbous-based hairs; panicles 3-6 cm long, narrow, the branches appressed to each other; lower glumes ⅔ the spikelet length; upper glume and lower lemma with evident cross-venation; upper floret 1.8-3 mm long. ± Disturbed ground of the southwestern region.

**Urochloa fasciculata** (Torrey) Beal, Panicum fasciculatum Swartz var. reticulatum (Torrey) Beal, Panicum fasciculatum Swartz, Urochloa fasciculata (Swartz) R.D. Webster. Tufted annual, 15-120 cm tall; nodes glabrous or pilose; sheaths glabrous to hispid, the margins ciliate; panicles 5-15 cm long, the branches appressed to divergent and 2-10 cm long, scabrous to sparsely pilose; secondary branchlets developed below; spikelets 2.3-4 mm long, glabrous or rarely puberulent, usually dark at maturity; lower glume about ⅔ the spikelet length; upper glume and lower lemma with evident cross-venation; upper floret 1.8-3 mm long. ± Disturbed ground of the southwestern region.

**Urochloa panicoides** Beauvois [resembling Panicum]. LIVERSEED GRASS. Tufted annual, erect to decumbent, 10-55 cm or more long, rooting at lower nodes; sheaths hispid, the margins ciliate; blades with bulbous-based hairs on both surfaces; panicles 3-10 cm long, narrow to open, the branches 1-7 cm long, erect to spreading, ciliate with bulbous-based hairs; pedicels with a few long hairs below the spikelet; spikelets 2.5-5.5 mm long, appressed to the branches, glabrous; lower glume less than ⅔ the spikelet length; upper florets 2.6-3.5 mm long, short-awned to 1 mm. ± Weedy ground along sidewalks, in flower beds, waste ground; native to Africa. ± LIVERSEED GRASS is listed as a noxious weed by the U.S. Department of Agriculture, and is found in a few localities in Doña Ana County. The Flora of North America treatment (2003) reported that populations of this species in New Mexico were destroyed, but collections have been made in late 2003 and 2006.
Urochloa texana (Buckley) R.D. Webster [of Texas] [Brachiaria texana (Buckley) S.T. Blake, Panicum texanum Buckley]. Tufted annual, 20-100 cm tall or more, erect or geniculate-based and forming stolons; sheaths hairy with bulbous-based hairs, the margins ciliate; blades pubescent on both surfaces; panicles 8-24 cm long, narrow, less than 1 cm wide, the branches erect-appressed; spikelets 4.8-6 mm long, sparsely puberulent, appressed to the branches; lower glumes ½ or less the spikelet length; upper floret 3.6-4.1 mm long, acute. 

Vulpia [for Johann Samuel Vulpian (1760-1846), German amateur botanist] SIXWEEKS-FESCUE [4].

Tufted annuals, sometimes longer-living; sheaths open, usually glabrous; auricles absent; ligules membranous; inflorescence a panicle or raceme, open or spike-like; spikelets with 1-17 florets, the distal florets often reduced; disarticulation above the glumes and between the florets; glumes shorter than the adjacent lemma, awnless or awn-tipped; lemma membranous, 3-nerved, the margins rolled over the edges of the grain, acute to awned; anthers usually 1, sometimes 3 in chasmogamous spikelets. 

Vulpia microstachya microstachya. Madroño 38:298-301.

1 First glume less than ½ the length of the second glume, often nearly absent.................................................. V. myuros
2 First glume more than ½ the length of the second glume

*Vulpia bromoides* Linnaeus S.F. Gray [resembling Bromus] [Festuca bromoides Linnaeus, Festuca dertonensis (Allioni) Ascherson & Graebner]. Annual, 5-50 cm tall; sheaths glabrous or pubescent; panicles 1-15 cm long, 0.5-3 cm wide, mostly narrow; spikelets with 4-8 florets, the rachilla internodes 0.6-1.1 mm long; lower glumes ½ to nearly the length of the upper; upper glumes 4.5-9 mm long; lemmas 4-8 mm long, scabrous distally, the lower awns 2-13 mm long.

V. myuros Linnaeus K.C. Gmelin [mouse tail]. Annual, 10-75 cm tall; sheaths glabrous; panicles 3-25 cm long, 0.5-2 cm wide, rather dense, sometimes racemose, pulvini absent; spikelets with 3-7 florets, the rachilla internodes 0.7-2 mm long; glumes strongly unequal, the lower less than ½ the length of the upper; lemmas 4.5-7.5 mm long, margins sometimes ciliate, the lower awns 3-20 mm long. 

V. octoflora (Walter) Rydberg [eight-flowered]. Annual, 5-60 cm tall; panicles 1-20 cm long, 0.5-1.5 cm wide, the branches appressed to spreading; spikelets with 4-17 florets evenly spaced like a comb, the rachilla internodes 0.5-0.7 mm long; lower glumes ½-⅔ the length of the upper; lemmas 2.7-6.5 mm long, the lower awns 0.3-9 mm long. 

Zeä [Greek name for some grain] CORN, MAIZE [1].

Monoeocious annuals and perennials; sheaths open; auricles sometimes present; ligules membranous, ciliate; blades flat; inflorescence unisexual or bisexual, highly modified panicles, sometimes spike-like; pistillate inflorescence terminal on axillary branches, spike-like; staminate inflorescence (tassel) panicle-like; staminate spikelets in pairs of 1 sessile and 1 pedicelled, each with 2 staminate florets, the glumes mostly broad, large, and enclosing the florets; pistillate spikelets in domesticated taxa in dense cobs or ears in subspecies; ears each with 1 floret, the glumes hyaline, the sterile ones shorter than the spikelets and hyaline distally and curved; pistillate spikelets in wild taxa in small axillary spikes and enclosed within a hardened seed case formed by the rachis; styles (silks) 2, fused except at the very tip, long. 

*Zeä* is an American genus of about 5 species. The wild taxa, known as teosinte, produce essentially inedible pistillate spikelets, the grain being enclosed in a bony seed case formed by the rachis; they are used extensively in breeding experiments. Our common domesticated corn, with all its variation and cultivars, is *Zeä* "mays."
Monocotyledonous Plants - Pontederiaceae

**Zea mays** (Linnaeus) Steudel [bulbous] BULB PANIC-GRASS [Panicum bulbosum Kunth, Panicum bulbosum Kunth var. minus Vasey, Panicum bulbosum Kunth var. sciriphitum (Ruprecht) Hitchcock & Chase, Panicum plenum Hitchcock & Chase]. Tufted perennial, with or without rhizomes (creeping rootstock), 25-150 cm or more tall, lowest internodes often thickened into hard, bulb-like corms; sheaths open, glabrous to pilose, keeled; auricles absent; ligules membranous, ciliate, 0.3-5 mm total; blades flat, to 75 cm long, 0.2-1.5 mm wide; inflorescence an open, pyramidal panicle, 10-75 cm long, the branches ascending to diverging, bristles absent; spikelets dorsally compressed, awnless, 3-5.5 mm long, with 2 florets, the lower stamens fertile; the upper stamens sterile; the lower glume about ½ as long as the spikelet; upper glume similar in size and texture to the lower lemma; lower palea present, about as long as its companion lemma in the lower floret; the upper glume as long as the spikelet; upper glume enclosing the floret, leathery, glossy, the apices acute; racemes 2-4 cm long, rising above the leaves; spikelets 2.5-3.5 mm long, 1.5-1.7 mm wide, the lemma slightly shorter than the glume, 1-1.5 mm long; blades flat, to 75 cm long, 0.2-1.5 mm wide, thinly pilose adaxially, the apices acute; racemes 2-4 cm long, rising above the leaves; spikelets 2-3 mm long, about 1 mm wide, the lemma obscurely 3-nerved, the palea present, ½ as long as the lemma, the anthers 1-1.5 mm long. Occasionally planted as a lawn grass; not known outside of cultivation.

*Zuloagaea bulbosa* (Kunth) Bess [bulbous] BULB PANIC-GRASS [Panicum bulbosum Kunth, Panicum bulbosum Kunth var. minus Vasey, Panicum bulbosum Kunth var. sciriphitum (Ruprecht) Hitchcock & Chase, Panicum plenum Hitchcock & Chase]. Tufted perennial, with or without rhizomes (creeping rootstock), 25-150 cm or more tall, lowest internodes often thickened into hard, bulb-like corms; sheaths open, glabrous to pilose, keeled; auricles absent; ligules membranous, ciliate, 0.3-5 mm total; blades flat, to 75 cm long, 0.2-1.5 mm wide; inflorescence an open, pyramidal panicle, 10-75 cm long, the branches ascending to diverging, bristles absent; spikelets dorsally compressed, awnless, 3-5.5 mm long, with 2 florets, the lower stamens fertile; the upper stamens sterile; the lower glume about ½ as long as the spikelet; upper glume similar in size and texture to the lower lemma; lower palea present, about as long as its companion lemma in the lower floret; upper lemma 2.5-3.5 mm long, finely rugose, clasping the edges of the palea, together forming a hardened seed case; anthers 3. Canyon bottoms and moist slopes in the mountains and foothills. *Zuloagaea* is a monotypic genus, taken out of Paniceae because of molecular and phylogenetic matters, with which it shares a strong outward resemblance. The genus is most closely related to species of the genus *Zuloagaea*, which is native to subtropical regions. Our plants belong to subsp. *buloosa* because of molecular and phylogenetic matters, with which it shares a strong outward resemblance. The genus is most closely related to species of the "Zuloagaea" subgenus (the "Zuloagaea" subgenus, which is native to subtropical regions.

**Zuloagaea** [for Fernando O. Zuloaga (1951-)], Argentinian botanist & authority on Panicum | 1.

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**Pontederiaceae** PICKEREL-WEE FAMILY [1/2/2]

Aquatic, glabrous, rhizomatous herbs, floating to emergent, the stems spongy; leaves alternate, basal, opposite, or whorled, the petiole commonly enlarged with air cells, the base sheathing, the venation parallel to palmate; stipules present, withering but remaining attached; inflorescence racemose or spicate; flowers usually showy, actinomorphic or zygomorphic, perfect; perianth of 6 tepals, connate to form a tube; stamens 3 or 6, the filaments adnate to the perianth tube; pistil single, superior, of 3 united carpels, the style single, the stigma 1- or 3-lobed; fruit an nut or capsule, surrounded by a persistent basal portion of the perianth tube. *With 2 genera (Pellgreni et al. 2018), and about 35 species, widespread in wetlands of tropical and subtropical regions. Pontederia (Eichornia) crassipes Martius is an extremely aggressive aquatic weed that has invaded the Gulf Coast states, California, and adjacent Arizona; it is not (yet) known from New Mexico.

Heteranthera [with varying anthers] MUD-PLANTAIN [2].

Annual to perennial herbs, rooting the mud, submersed to emergent; sessile leaves submersed or emergent, the blades linear to oblanceolate; petiolate leaves floating to emergent, the blades reniform, cordate, to oblong, 1-5 cm long, about as wide; inflorescences 1-5-flowered; flowers opening shortly after dawn and withering by mid-day; perianth blue to white, salverform, the tube 15-44 mm long, the limbs narrowly elliptic, 5-26 mm long. ♦ Shallow water of ponds and ditches; scattered locales.

Heteranthera limosa (Swartz) Willdenow [muddy] [Pontederia limosa Swartz]. Annual herbs; sessile leaves submersed, forming a basal rosette, the blades linear to oblanceolate, 3-6 cm long; petiolate leaves emergent, the blades oblong to ovate, 1.5 cm long and mostly longer than wide, the bases truncate to cuneate, the apices acute to obtuse; flowers opening shortly after dawn and withering by mid-day; perianth blue to white, salverform, the tube 15-44 mm long, the limbs narrowly elliptic, 5-26 mm long. ♦ Shallow water and muddy ground of ponds, ditches, and ephemeral pools. §

POTAMOGOTONACEAE PONDWEED FAMILY [3/15/17] [Zannichelliaaceae]

Annual to perennial, aquatic herbs, submersed to emergent, with or without rhizomes; leaves alternate, simple, entire, opposite, or whorled, submersed to floating, often dimorphic, the bases stipulate-like and often sheathing but not persisting; inflorescences axillary, cymose and sessile or spike-like and emergent; flowers small, actinomorphic, perfect to unisexual (monoecious or dioecious); perianth absent, the stamens with accessory appendages the form what appears to be a perianth; stamens 1 or 4; pistils 4-5; superior; fruit a cluster of achenes or drupes. A small family of 4-5 genera, found throughout the world in wetland habitats. Many of the species form hybrids, with the resulting intergradation of form. We follow Judd et al. (2016) in placing Zannichelliaaceae here, but it is often maintained as a separate family, with ample justification either way.

1 Leaves mostly opposite; flowers unisexual and borne on sessile submerged clusters.......................................................................................................................... Zannichellia

1 Leaves mostly alternate; flowers bisexual and borne on pedunculate emergent spikes

2 Submersed leaves linear, mostly more than 10 times as long as wide

3 Stipules free from the leaf or united less than ½ the length of the stipule (less than 4 mm), the petioles or blades directly attached at the nodes or close to them .......................................................... Potamogeton

3 Stipules united with the base of the leaf more than ½ the length of the stipule (7 mm or more), the petioles or blades not directly attached at the nodes but diverging from the distal portion of the stipules

4 Plants with long-petioled floating leaves and sessile linear submersed leaves; if floating leaves absent then the flowering spikes of submersed parts capitulate and sessile or nearly so (Potamogeton diversifolius) .............................................................................................................. Potamogeton

4 Plants with submersed leaves only; fruiting spikes slender................................................................................................................................. Stuckenia

Potamogeton [river neighbour] PONDWEED [10]. Perennial herbs, rhizomes present or absent, tubers absent, the stems terete or compressed; leaves all submersed or both submersed and floating, alternate to nearly opposite, the stipules connate or node, forming ligule-like structures; submersed leaves sessile or petiolate, the blades translucent, the margins entire to toothed; floating leaves petiolate leathery, the margins entire; inflorescence a spike or panicle of spike-like branches, submersed or emergent, capitulate or cylindric, the peduncles stiff and projecting the inflorescence out of the water when long; pistils 1 or 4. ♦ All our species are found in aquatic and wetland habitats, lakes, ponds, canals, with fast to slow moving water. ♦ Many species provide important food for wildlife and water fowl. Very similar to Stuckenia, which was formerly included within Potamogeton, differing in features of the stipule adnation, presence of floating leaves, translocation of submersed blades, and projection of the inflorescence above the water. The generic name is properly treated as masculine, and not neuter (Haynes & Hellquist 2000).

1 Floating leaves linear, mostly more than 10 times as long as wide

2 Stipules united with the base of the leaf for a distance of 7 mm or more, the petioles or blades not directly attached at the nodes but diverging from the distal portion of the stipules ........................................................................................................................................ P. diversifolius

2 Stipules free from the leaf or united for a distance of less than 6 mm, the petioles or blades directly attached at the nodes or close to them
3 Floating leaves absent
4 Dorsal keel of fruits prominent, thin, winged, undulate or toothed
4 Dorsal keel of fruits rounded or acute but never thin and winged

3 Floating leaves usually present, with broad blades and long petioles
5 Submersed leaves linear, usually bladeless and filiform, 10-30 cm long, 0.8-2 mm wide; blade (when present) linear-lanceolate and on a very long petiole; base of floating leaves subcordate
5 Submersed leaves linear to linear-obovate, often very unequal in size, usually tapering to tip and base, 3-12 cm long, 1.15 mm wide; base of floating leaves acute to rounded

1 Submersed leaves lanceolate to ovate or spathulate, mostly less than 10 times as long as wide
6 Leaves both submersed and floating, the floating leaves with broad blades and long petioles
6 Leaves all (or nearly all) submersed and essentially alike; petioles short or absent
7 Submersed leaves clasping the stem

P. alpinus Balbis [of high mountains]. Rhizomes present; stems terete; turions absent; leaves reddish, submersed and floating, or floating leaves absent; submersed leaves sessile, narrowly oblong to lanceolate, 4-18 cm long, with 7-9 veins; floating leaves petiolate, elliptic, oblong, to obovate, 4-10 cm long, with 9-13 veins; spikes 10-35 mm long. ● Northern mountains. ● Plants often appear red when taken from the water.

● Potamogeton crispus Linnaeus [curled]. Rhizomes absent; stems flattened; turions common, both axillary and terminal, 1-3 cm long; leaves submersed, almost spirally arranged; stipules free from the blade; ligules absent; blades linear, 10-90 mm long, 4-10 mm wide, the margins sharply serrate and undulate; spikes 10-15 mm long. ● Widespread in scattered sites, though not commonly collected; native to America.

● Potamogeton diversifolius Rafinesque [with different kinds of leaves]. Rhizomes present; stems compressed; leaves floating or both submersed and floating; submersed leaves sessile, reddish, linear, 2-4 cm long the stipule adnate to the blade for ½ the stipule length; floating leaves petiolate, light green, elliptic to obovate, 1-4 cm long; spikes dimorphic, the submersed capitulate and 2-3 mm long, the emergent cylindric and 5-10 mm long. ● Known from a few scattered localities in the state.

● Potamogeton foliosus Rafinesque [with abundant leaves]. Potamogeton foliosus Rafinesque var. genuinus Fernald, Potamogeton foliosus Rafinesque var. macclerus Fernald. Rhizomes absent; stems slightly compressed; turions uncommon; leaves submersed, spirally arranged, sessile, pale to olive green, 9-20 cm long, with 7-15 veins; fruits with an abaxially winged keel. ● Widespread. ● Our plants belong to subsp. foliosus. This is the most common Potamogeton in the state, with submersed leaves and winged fruits.

● Potamogeton gramineus Linnaeus [grass-like]. Potamogeton gramineus Linnaeus var. typicus Ogden, Potamogeton gramineus Linnaeus var. maximus Morong. Rhizomes present; stems terete to compressed; turions absent; leaves both submersed and floating, or just submersed; submersed leaves sessile, lax, green or brownish green, elliptic, 3-9 cm long, with 3-9 veins; floating leaves (when present) with petioles 3-4 cm long, yellow-green to dark green, elliptic to obovate, 3-4 cm long, with 3-9 veins; spikes 15-35 mm long. ● Across the northern tier of counties. ● Grades into Potamogeton illinoensis, but told apart when similar by submersed leaves with acuminate apices (mucronate in illinoensis) and fewer veins in the leaves.

● Potamogeton illinoensis Morong [of Illinois]. Rhizomes present; stems terete; turions absent; leaves both submersed and floating, or just submersed; submersed leaves sessile or petiolate (1-4 cm long), lax, reddish to green, lanceolate to elliptic, 5-20 cm long, with 7-19 veins; floating leaves (when present) with petioles 2-9 cm long, light green, elliptic to obovate, 4-19 cm long, with 13-29 veins; spikes 25-70 mm long. ● Known from only a few collections from Colfax and Eddy counties. ● Grades into Potamogeton gramineus, but told apart when similar by submersed leaves with mucronate apices (acuminate in gramineus) and more veins in the leaves.

● Potamogeton natans Linnaeus [floating]. Rhizomes present; stems terete, often rust-spotted; turions absent; leaves both submersed and floating; submersed leaves sessile, rigid, green, 9-20 cm long, linear, with 3 veins; floating leaves petiolate; green, lanceolate to elliptic or oblong, 2.5 cm long, the bases rounded to cordate, with 9-numerous veins; spikes 10-35 mm long. ● Northern and western mountain regions.

● Potamogeton nodosus Poiret [with many nodes]. Potamogeton americanus Chamisso & Schlechtendal. Rhizomes present; stems terete; turions absent; leaves both submersed and floating, or just submersed; submersed leaves with petioles 2-13 cm long, lax, green, linear-lanceolate to narrowly elliptic, 9-20 cm long, with 7-15 veins; floating leaves (when present) petiolate, light green, elliptic, 3-11 cm long; spikes 20-70 mm long. ● Widespread in mountain regions.

● Potamogeton puellulus Linnaeus [small]. Rhizomes absent; stems terete to slightly compressed; turions common; leaves submersed, spirally arranged, sessile, pale to olive green, linear, 1-7 cm long, mostly with 3-13 veins; spikes submersed or emergent, 2-10 cm long. ● Mostly northern counties. ● We have 2 varieties: a Mature fruits oblong or ovoid, widest at the middle or below, the sides concave; peduncles 1-3 per plant... var. puellulus
   a Mature fruits obovoid, widest toward the tip, the sides concave; peduncles 1-3 per plant... var. tenuissimus Mertens & Koch [very slender]. Potamogeton berchtoldii Fieber, Potamogeton berchtoldii Fieber var. tenuissimus (Mertens & Koch) Fernald.

● Potamogeton richardsonii (Bennett) Rydberg [for John Richardson (1787-1865), Scottish naturalist, naval surgeon]. Potamogeton perfoliatus Linnaeus var. richardsonii Bennett. Rhizomes present; stems terete; turions absent; leaves submersed, sessile, lax, olive green, lanceolate to ovate-lanceolate, 2-13 cm long, the bases rounded, with 3-35 veins; spikes 13-37 mm long. ● Lakes, streams, and ponds in the northern mountains.
Perennial herbs, with rhizomes, tubers absent or present, the stems terete; leaves submersed, alternate, sessile, linear, entire, opaque, 1-5-veined, the stipules adnate to the base of the blades for ⅓ or more the length of the stipule, extending upwards as a ligule; inflorescence a capitately or cylindrical spike, submersed, the peduncles lax and not raising the spikes above the water; pistils 4; fruit a cluster of achenes. ♦About 6 species, worldwide, in brackish to alkaline waters of lakes, streams, rivers, floodplains, canals, and similar wetlands. Very similar to Potamogeton, and formerly included within that genus, differing in features of the stipule adnation, presence of floating leaves, translucence of submersed blades, and projection of the inflorescence above the water.

Stuckenia [for Wilhelm Adolf Stucken, 1860-1901, German botanist]. PONDWEED [4].

Perennial herbs, with rhizomes, tubers absent or present, the stems terete; leaves submersed, alternate, sessile, linear, entire, opaque, 1-5-veined, the stipules adnate to the base of the blades for ⅓ or more the length of the stipule, extending upwards as a ligule; inflorescence a capitately or cylindrical spike, submersed, the peduncles lax and not raising the spikes above the water; pistils 4; fruit a cluster of achenes. ♦About 6 species, worldwide, in brackish to alkaline waters of lakes, streams, rivers, floodplains, canals, and similar wetlands. Very similar to Potamogeton, and formerly included within that genus, differing in features of the stipule adnation, presence of floating leaves, translucence of submersed blades, and projection of the inflorescence above the water.

Stuckenia filiformis (Persoon) Boerner [thread-like]. Stems freely branching proximally, sparsely branching distally, subterete; stipular sheaths of inflated on proximal portion of stems; ligules about 1 mm long; blades linear, 5-15 cm long, to 0.2-1 mm wide, the apices acute to mucronate or apiculate; spikes 5-55 mm long. ♦We have two subspecies:

a Plants 20-100 cm long; stipules on lower portions of the stems tightly clasping or hardly inflated, persistent; fruits common...subsp. occidentalis (J.W. Robbins) R.R. Haynes, Les, & M. Kral [western] [Potamogeton marinus Linnaeus var. occidentalis J.W. Robbins]. •Known only from an early collection from a stock tank in Doña Ana County.

a Plants 10-30 cm long; stipules on lower portions of the stems tightly clasping or hardly inflated, persistent; fruits common...subsp. alpina (Blytt) R.R. Haynes, Les, & M. Kral [of high mountains] [Potamogeton filiformis Persoon var. alpina (Blytt) Ascherson & Graebner, Potamogeton filiformis Persoon var. borealis (Rafinesque) St. John, Potamogeton filiformis Persoon var. macounii Morong, Potamogeton marinus Linnaeus forma alpina Blytt]. •A few scattered localities in the northern and western mountains.

Stuckenia pectinata (Linnaeus) Boerner [comb-like] [Potamogeton pectinatum Linnaeus]. Stems freely branched, especially distally, terete to slightly compressed; stipular sheaths not inflated; ligules about 1 mm long; blades linear, 5-10 cm long, to 1 mm wide, the apices acute to apiculate, with 1-3 veins; spikes 14-22 mm long. •Widespread throughout the state, but nowhere very common (perhaps because of collecting deficiency?). •Extremely important for waterfowl, which aid in dispersal.

Stuckenia striata (Ruiz & Pavon) Holub [striped] [Potamogeton latifolius (J.W. Robbins) Morong, Potamogeton striatus Ruiz & Pavon]. Stems branched distally, terete to 5-rigided; stipular sheaths not inflated; ligules 2-11 mm long; blades linear, 5-21 cm long, to 5 mm wide, the apices apiculate, cuspidate, or rarely rounded, with 3-5 veins; spikes 13-45 mm long. •Known from only a few collections in Eddy and San Juan counties. •Plants from New Mexico are known only in the vegetative state, without flowers or fruits (Hellquist 2013).

Stuckenia vaginata (Turczaninow) Holub [sheathed] [Potamogeton vaginatus Turczaninow]. Stems freely branching proximally and distally, terete; stipular sheaths inflated; ligules absent to 0.2 mm long; blades filiform to linear, 1-15 cm long, to 3 mm wide, the apices rounded to slightly notched, mostly with 1 vein; spikes 10-80 mm long. •Known only from high mountain ponds in the Chuska Mountains.
Monocotyledonous Plants - Ruppiaceae

**Zannichellia** [for Giovanni Girolamo Zannichelli (1662-1729), Italian physician-botanist] HORNED-PONDWEED [1].

Annual herbs, without rhizomes or turions; leaves alternate, opposite or nearly whorled, often all on the same plant, submersed, sessile, sheathed basally, the stipules often forming a ligule, the blades filiform to linear, mostly with 1 vein; flowers unisexual (monoecious) and borne in small sessile, cymose, submersed clusters of 1 staminate and 1 pistillate (with 4-5 pistils); fruits drupe-like, short-stalked, the papillose endocarp visible after decay of the outer wall.

**Zannichellia palustris** Linnaeus [of marshes]. Submersed annuals, to 50 cm long; leaves nearly terete, entire, filiform, 3-5 cm long. & Streams, lakes, ponds, and sloughs; widespread, nearly throughout the state, and expected in most unrecorded counties.

**RUPPIACEAE** DITCH-GRASS FAMILY [1/1/1]

Aquatic herbs, mostly annual, lacking rhizomes, mostly submersed, turions rarely present; leaves alternate or opposite, simple, submersed, narrowly linear, toothed at the apex, the base sheathing; flowers small, actinomorphic, perfect, borne in 2-flowered spikes; perianth none or greatly reduced; stamens 2; pistils 4, superior, the 4 carpels distinct, the style absent; fruit drupe-like. ● The family has but a single genus, nearly worldwide.

**Ruppia** [for Heinrich Bernhard Ruppius (1688-1719), German physician and botanist] DITCH-GRASS.

Annual herbs, rooting at the lower nodes; blades 1-veined; inflorescences with fewer than 20 flowers, initially enclosed in sheathing leaf bases; fruits beaked, also long-stipitate. ● The relationships and classification of the species is in disarray, with anywhere from 2-10 species recognized by various investigators; we follow Haynes (2000) and Ito et al. (2017) for our New Mexico plants.

**Ruppia maritima** C. N. & T. N. S. Watson ex Rothrock [for George Montague Wheeler 1842-1905), pioneer surveyor of the western U.S.]. ● Leaves whitish or bluish green, waxy-glaucous, papillose and dull; fascicles of flowers 8-12 cm long from base to tip; distal wing lobes of fruiting capsules 2-3 mm. ● Lakes, rivers, and ponds with high concentrations of sulfur or calcium; widespread, but apparently less common in mountains. ● Haynes et al. (2017) has corrected the nomenclature in the Ruppia maritima complex, resulting in a change in the name of our plants from *Ruppia cirrhosa* to *R. spiralis*.

**Ruppia spiralis** Don. [in a spiral] *Ruppia cirrhosa* of NM reports. *Ruppia maritima* of NM reports. Stems to 50 cm long and 0.3 cm wide; leaves 3-4.5 cm long, the blades less than 0.5 mm wide; peduncles with 5-30 coils in fruit, 3-30 cm long; stalk of fruit 2-4 mm long. ● Lakes, rivers, and ponds with high concentrations of sulfur or calcium; widespread, but apparently less common in mountains. ● Haynes et al. (2017) has corrected the nomenclature in the *Ruppia maritima* complex, resulting in a change in the name of our plants from *Ruppia cirrhosa* to *R. spiralis*.

**RUSCACEAE** BUTCHER’S BROOM FAMILY [4/8/8]

[Convallariaceae, Dracencoraceae, Nolinaceae]

Plants perennial, rhizomatous herbs to trees; stems glabrous or with simple hairs; leaves alternate and spiral along stems or in a basal rosette, with parallel veins, simple, entire or with marginal prickles, sometimes petiolar, stipules absent; inflorescences determinate, terminal or axillary; flowers bisexual, unisexual, or functionally unisexual; tepals (4)6, distinct or connate; stamens (4)6, filaments distinct or connate; carpels (2)3, ovary superior; stigma 1; fruit a berry or capsule. ● At one time, all of our species were placed in a large and polyphyletic Liliaceae; the woody members were then classed together in the Agavaceae and Nolinaceae, and the herbaceous members in the Convallariaceae. Monophyly of the current alignment is supported by numerous studies, and we follow Judd et al. (2016) in placing the following genera together in the Ruscaceae; other current works broaden the Asparagaceae and place this family therein (as subfamily Nolinoideae). The family takes its name from the genus *Ruscus* (butcher’s broom), which has leaves reduced to scales and the flattened, leaf-like stems (phyllodes) performing the necessary photosynthesis.

**Dasylirion** [thick lily] SOTOL [2].

Plants short-stemmed to arborescent; leaves in a basal rosette, persistent, linear, elongate, with broad bases; margins with hooked prickles; inflorescences paniculate, borne on long, woody stalks; flowers unisexual or functionally unisexual; tepals 6, distinct; fruit a 1-loculed, 1-seeded, 3-winged capsule. ● At one time 17 species of the southwestern United States and Mexico.

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**Dasylirion wheeleri** S. Watson ex Rothrock [for George Montague Wheeler 1842-1905], pioneer surveyor of the western U.S.]. & Leaves whitish or bluish green, waxy-glaucous, papillose and dull; marginal prickles pointed mostly toward the base, some otherwise......

**Dasylirion whitiwheelii** Engelmann ex Trelease [with smooth leaves]. Leaf blades bright green, smooth, glabrous, shiny, not waxy or glaucous; fascicles of flowers 8-12 cm long from base to tip; distal wing lobes of fruiting capsules 1.5-2 mm. ● Gravely slopes, badjas, and canyons in the southeastern plains and foothills.

**Dasylirion wheeleri** S. Watson ex Rothrock [for George Montague Wheeler 1842-1905], pioneer surveyor of the western U.S.]. & Leaves whitish or bluish green, waxy-glaucous, papillose and dull; marginal prickles pointed mostly toward the apex......

**Dasylirion wheeleri** D. leiophyllum Engelmann ex Trelease [smooth leaves]. Leaf blades bright green, smooth, glabrous, shiny, not waxy or glaucous; fascicles of flowers 8-12 cm long from base to tip; distal wing lobes of fruiting capsules 2-2.5 mm. ● Rocky slopes, badjas, and canyons from the central to the southern desert plains and foothills. ● *Dasylirion* is used in distilling a mezcal-like alcoholic beverage, "sotol". Plants of this species are widely used in landscaping, and are often called DESERT SPOON. §
**Maianthemum** [May-flower] FALSE SOLOMON’S-SEAL [2].

Plants herbaceous; rhizomes creeping, spreading and filiform or cylindric and fleshy; stems simple, zig-zag; leaves alternate, lanceolate to ovate, sessile, clasping, or short-petiolate; inflorescences terminal, paniculate or racemose; tepals distinct; tepals and stamens 6 (sometimes 4 in species outside our area); a fruit a greenish or reddish berry. ● About 40 species of temperate regions of North America, Europe, and Asia, including the former genus *Smilacina.*

1. Bracts of the inflorescence persistent; inflorescence not or only partly exceeding the leaves
   1. Bracts of the inflorescence deciduous, rarely persistent; inflorescence much exceeding the leaves
      2. Inflorescence conspicuously tinged purple, diffuse, the main rachis and divisions slender and flexible; fruiting pedicels jointed near the middle, not noticeably dilated ............................................................................................................... *M. racemosum*  
      3. Inflorescence not purplish, or only rarely so, dense, the main rachis and divisions thick and rigid; fruiting pedicels jointed near the middle, noticeably dilated ............................................................................................................... *M. stellatum*  

**Maianthemum racemosum** (Linnaeus) Link [with flowers in a raceme]. Rhizomes 8-14 mm in diameter; stems erect; leaves elliptic to ovate, sessile and clasping, 9-17 cm long, 5-8 cm wide; flowers numerous, on pedicels 1-2 mm long; stamens mostly longer than the tepals; berry 8-9 mm in diameter. ● Shaded woodlands and forests; widespread in the mountains. ○ Our plants belong to subsp. *amplexicaule* (Nuttall) LaFrankie [clasping the stem] [Maianthemum racemosum (Linnaeus) Link var. *amplexicaule* (Nuttall) Dom, *Smilacina amplexicaulis* Nuttall, *Smilacina racemosa* (Linnaeus) Desfontaines var. *amplexicaulis* (Nuttall) S. Watson, *Vagniera amplexicaulis* (Nuttall) Greene]; subsp. *racemosum* occurs in the eastern half of the United States. In spite of the specific epithet, inflorescences are usually paniculate, and only rarely racemose. Plants are vegetatively very similar to *Streptopus amplexifolius* (Liliaceae), which has usually smaller leaves and 1-2 white to greenish axillary flowers hanging below the leaves. §

**Maianthemum stellatum** (Linnaeus) Link [star-like] [Convallaria stellata Linnaeus, *Smilacina stellata* (Linnaeus) Desfontaines, *Vagniera stellata* (Linnaeus) Moreng., Rhizomes 1-4.5 mm in diameter; stems erect; leaves ovate-elliptic to lanceolate, sessile and clasping, 5-6 cm long, 2.5-3.5 cm wide; flowers few on pedicels 5-15 mm long; stamens mostly shorter than the tepals; berry 4-5 mm in diameter. ● Riparian areas, meadows, shaded forest slopes; widespread in mountain areas. §

**Nolina** [for Abbé C.P. Nolin (1717-1795), French arboriculturist] BEARGRASS [3].

Plants perennial, acaulescent to short-acaulescent; leaves numerous, forming rosettes; blades elongate, linear, not rigid, usually much broadened at the base, margins entire to serrate; inflorescence a compound racemose panicle; flowers numerous, small, perfect or imperfect; fruit a 3-winged capsule. ● Despite persistent attempts to distinguish the species based on degree of toothing of the leaves, this remains an elusive and confusing feature, with inconsistent occurrences in *Nolina microcarpa* and *N. texana,* and this feature is ignored herein. Leaves are commonly gathered for weaving and thatching.

1. Lowermost pedicels 1-2 mm long; tepals 1-2 mm long; berry 4-5 mm in diameter ............................................................................................................... *N. microcarpa*  
2. Lowermost pedicels 1-2 mm long; tepals 1-2 mm long; berry 4-5 mm in diameter ............................................................................................................... *N. texana*  

**Nolina microcarpa** S. Watson [small-fruited]. Plants acaulescent; leaves 6-12 mm wide; inflorescence much exceeding the leaves, mainly rhachis and divisions slender and flexible; bracts persistent; fruiting pedicels 2-4 mm long, jointed near the middle, not noticeably dilated distally; capsules firm-walled, inflated. ● Southern grasslands and plains, limestone or sandy hills.

**Nolina texana** S. Watson [of Texas] [Nolina greenii S.Watson]. Plants acaulescent; leaves 2-6(-10) mm wide; inflorescence not exceeding the leaves, main rachis and divisions thick and rigid, bracts persistent; tepals white to yellow-green; fruiting pedicels 4-7 mm long, jointed near the base, noticeably dilated distally; capsules thin-walled, inflated. ● Rocky hillsides, open woodlands, and plains; scattered, through much of the state. §

**Polygonatum** [resembling the genus Polygonum (Polygonaceae)] SOLOMON’S-SEAL [1].

Plants perennial from knotty, creeping rhizomes; stems simple, leafy, erect or arching; leaves simple, alternate, short-petiolate, sessile or clasping, ovate, lanceolate, or elliptic, margins entire; flowers nodding, pendulous, on peduncles from leaf axils; tepals connate into a cylindric tube with free tips; fruit a blue or black berry. ● About 60-70 species, mostly Asian. The common name supposedly comes from a fanciful resemblance of cross-sections of the rhizome (seen when broken at the nodes) to King Solomon’s royal seal.

1. Leaves lanceolate to broadly elliptic, 10-20 cm long, 4-9 cm wide, sessile to clasping, glabrous; inflorescences in most leaf axils, peduncles deflexed, (1)2(-4)10) flowered; flowers whitish or yellowish-green, on pedicles much shorter than peduncles; berries 8-12 mm in diameter. ● Infrequent in mountain forests and moist canyons. §
Scapose perennial herbs from a fibrous corm, lacking an onion-like odor; leaves all basal, simple, linear, with parallel venation and sheathing bases; flowers bisexual, actinomorphic, arranged in a terminal scapose umbel; perianth of 6 similar sepals and petals; stamens 6 or 3 alternating with 3 staminodes, inserted on tepals; pistil single, superior, of 3 carpels, the style single; fruit a capsule. The family was traditionally placed in a large and polyphyletic Liliaceae; current studies recognize it as a subfamily of an enlarged Asparagaceae, or as herein, a separate family (Fay & Chase 1996; Judd 2016).


Androstephium [male crown] FUNNEL-LILY [1].

Perennial, scapose herbs from corms; leaves basal, the blades linear and channeled; scapes solitary, terete; inflorescences umbellate, 2-12-flowered, subtended by 3 bracts; perianth connate basally into a funnelform floral tube less than ½ the total length; tepals 6, petaloid; stamens 6, epipetalous, the filaments connate with apical appendages forming a crown; fruit a capsule, subglobose, with
Monocotyledons - Typhaceae

numerous black seeds. ■ Only 3 species of western United States and northern Mexico.

Sparganium

Perennial, scapose herbs from corms; leaves basal, the blades usually keeled and channelled; scapes solitary, weak, terete; inflorescences umbellate or racemose, 2-15-flowered, subtended by 2-4 bracts; flowers cylindric to campanulate; tepals petaloid, connate basally into a tube, this not narrowed above the ovary; stamens 6, with 3 small and 3 large, the outer filaments winged or dilated basally; fruit a capsule, ovoid, with numerous black seeds. ■ A monotypic genus of a single species of western United States and northern Mexico (Preston 2017). Closely related to Brodiaea or Dichelostemma, and sometimes included there.

Perennial, scapose herbs from solitary corms; leaves basal; blades linear, channelled to terete; scapes terete; inflorescences an umbel-like cluster, 1-many-flowered, subtended by 4 triangular bracts; flowers appearing unequally pedicellate, salverform; tepals petaloid, connate into a long floral tube that is adnate to a stipe, white with a strong abaxial midvein; ovary long-stipitate; fruit a capsule, ovoid to oblong, beaked, with numerous black seeds. ■ A small genus of 6-10 species, North to Central America.

Muilla coronata (Bentham) Rydberg [head-like]. Leaves 2-3 in number, 10-70 cm long, the blades scarcely keeled; umbels dense, 2-5-flowered; flowers purplish, bluish, pinkish, or white; perianth not connate above the ovary, the tepals 3-12 mm long; stamens 6, the 3 smaller one on the outer tepals. ■ Arid regions in the southwestern plains and foothills. ■ Our plants belong to subsp. pauciflorus (Torrey) R.E. Preston [few-flowered]

Milla rifflora Cavanilles [2-flowered]. Corms 1-2 cm long, the coat minutely striate and splitting into strips; leaves to 1 mm wide, ½ to equaling the scapes; flowers 3-5 cm long; inflorescences with 1-9 flowers; tepals 1.5-2.5 cm long, white with green abaxial stripe; capsules ovoid, 1-2 cm long, the beak 1-3 mm long. ■ Dry volcanic hillsides and ridges in the bookeel. §

Muilla [an acronym of Allium spelled backwards] MUILLA [1].

Perennial, scapose herbs, scapose from fibrous-coated corms; leaves 1-10 per plant, basal, the blades linear and flat; scapes 1-2, the inflorescences umbellate, bracteate; tepals 6, petaloid, not connate into a tube, whitish to bluish; stamens 6, the filaments filiform to conspicuously dilated; ovary superior, with a single style; fruit a capsule, globose. ■ Species 3, of western North America; not to be confused with Muilla.

Muilla coronata Greene [crowned]. Plants 3-8 cm tall (above ground), the corms 1-2 cm diam; leaves (rarely) 2, 17-18 cm long, to 1 mm wide; scapes 3-5 cm long, with 2-10 flowers; tepals white or rarely bluish, the midvein greenish, slightly united basally to about 0.5 mm, but not forming a perianth tube, the lobes 3-6 mm long; filaments conspicuously dilated their entire length, the margins overlapping with the adjacent filament to form a crown but not connate, the anthers yellow; capsules globose, 3-angled, 3-7 mm diam; flowering spring. ■ Loose sandy ground of the Chihuahuan Desert, among Prosopis coppice dunes; known from a single population in Luna County; otherwise Mojave Desert of southern California and Nevada.

TYPHACEAE CATTAIL FAMILY [2/7/7]

[Sparganiaceae]

Perennial, rhizomatous, aquatic or semi-aquatic herbs, sometimes forming dense colonies in marshy ground; leaves alternate, 2-ranked, simple, linear, entire, sheathing at the base, floating or emergent, with parallel venation, often spongy with air canals and partitions containing stellate cells; stipules lacking; inflorescence of densely clustered flowers in spikes or globose heads, often subtended by linear bract; flowers unisexual (monoeccious), actinomorphic, the staminate above the pistillate in the spike, or staminate heads above pistillate heads; tepals 1-6, not petaloid; stamens 1-6-8, the filaments distinct or connate; ovary superior; fruit a drupe or achene. ■ A small family of 2 genera and about 30 species, throughout the world (especially Northern Hemisphere) in aquatic and wetland habitats. Evidence from morphology and molecular phylogenetics strongly supports the merger of Typhaceae and Sparganiaceae, with little justification for the separation other than tradition. The starchy rhizomes and young staminate inflorescences are edible.

1 Flowers in dense globose heads usually separated by naked internode segments.................................Sparganium

1 Flowers in dense continuous spikes, the distal staminate portion contiguous or separated from the proximal pistillate portion ... Typha

Sparganium [a ribbon] BUR-REED [4].

Erect or floating herbs; leaves basal and cauline, pleno-convex to V-shaped in cross-section, spongy, the margins entire; inflorescences terminal, emergent or floating, mostly not exceeding the basal leaves, of unisexual globose heads on an often zig-zag rachis, the smaller staminate heads distal, deciduous, the rachis persistent, the larger pistillate heads proximal, becoming bur-like because of the beaked fruits; tepals 3-6, distinct, translucent to opacous; fruits achene-like drupes, beaked. ■ About 14 species, mostly north-temperate, providing important food and habitat for waterfowl.

1 Leaves and inflorescences usually floating

2 Staminate heads single; pistillate heads 8-12 mm diam ................................................................. S. natans
2 Staminate heads usually more than 1; pistillate heads 10-40 mm diam

3 Leaves mostly 5-18 mm wide; staminate heads not contiguous; fruit beaks 2-5 mm long; leaves keeled toward the base.......................... S. emersum
3 Leaves mostly 2-5 mm wide; staminate heads nearly contiguous, often appearing as a single elongate head; fruit beaks 1-2 mm long; leaves keeled.......................... S. angustifolium

1 Leaves and inflorescences emergent, stiff and out of the water

4 Inflorescences unbranched; stigmas 1 in all of the pistillate flowers; fruits fusiform and tapering at the apices, tightly constricted below the equator.......................................................... S. eurycarpum
4 Inflorescences usually branched; stigmas 2 in most of all the pistillate flowers; fruits obpyramidal and truncate to rounded at the apices, not constricted.......................................................... S. angustifolium

Sparganium angustifolium Michaux [narrow-leaved] [Sparganium multipedunculatum (Morong) Rydberg]. Plants slender, 2 m or more long; leaves and inflorescences usually floating; leaves limp, flat to plano-convex, mostly 20-80 cm long, but as long as 200 cm, 2-15(10) cm wide; inflorescences unbranched, the pistillate heads 1-3 cm diam; staminate heads 1-4 in number, contiguous to each other, but not with the pistillate heads; stigmas 1; fruit bodies 3-7 mm long, the beaks 1-2 mm long. ● Shallow oligotrophic waters of ponds, streams, and ditches, mostly in the northern mountains.

Sparganium emersum Rehmann [emerging]. Plants robust to slender, to 2 m tall; leaves and inflorescences stiff and emergent, or some of the leaves limp and floating; stiff erect leaves to 80 cm long, 4-10 mm wide; limp floating leaves to 2 m long, 4-10 mm wide; inflorescences unbranched, the pistillate heads 1-4 cm diam; staminate heads 3-10 in number; stigmas 1; fruit bodies 3-4 mm long, about ½ as wide, the beaks 2-5 mm long. ● Quiet eutrophic waters, mountains and foothills. §

Sparganium eurycarpum Engelmann ex Gray [with broad fruits]. Plants robust, to 2.5 m tall, the leaves and inflorescences emergent; leaves erect, keeled, distally flattened, 6-20 mm wide; inflorescences usually branched, the pistillate heads 1-5 cm diam; staminate heads 10-40 or more in number; stigmas usually 2; fruit bodies 5-10 mm long and nearly as wide, the beaks 2-4 mm long. ● Quiet waters of ponds and marshes; known from only a few collection sites from Otero and Santa Fe counties.

Sparganium natans Linnaeus [floating] [Sparganium minimum of authors]. Plants slender, to 60 cm long, the leaves and inflorescences floating, or suberect when stranded; leaves limp, not keeled, to 80 cm long, 1-5 mm wide; inflorescences unbranched, the pistillate heads. 8-12 mm diam; staminate heads single, terminal; stigmas 1; fruit bodies ellipsoid to obovoid, 2-4 mm long, the beaks 0.5-1.5 mm long. ● Quiet waters of ponds, ditches, and wetlands; known in New Mexico from only a few collections in the Chuska Mountains.

Typha [marsh] CATTAIL [3].

Floating to emergent perennial herbs, with stalky rhizomes; shoots to 4 m tall; leaves persistent, the sheaths open and overlapping, the blades loosely twisted, flattened; inflorescences terminal, equalled or exceeded by the leaves, cylindrical, dense and spike-like, the staminate flowers distal and often separated from the proximal pistillate flowers; flowers unisexual (monoecious), densely beset with hairs; fruit an achene or follicle. ● About 10-12 or more species nearly worldwide. All our species are known to hybridize among themselves, and intergradation among them is to be expected.

1 Staminate and pistillate portions of the inflorescence contiguous; leaves flat on the back.......................................................... T. latifolia
1 Staminate and pistillate portions of the inflorescence separated by a naked interval; leaves commonly convex on the back

2 Mucilage glands absent from the upper (adaxial) surface of the blade and generally from the central part of the sheath near the summit; summit of sheath with membranous auricles (disintegrating late in season) .......................................................... T. angustifolia
2 Mucilage glands present on the upper (adaxial) surface of the sheath and adjacent 1-10 cm of the blade; summit of sheath tapering to the blade and generally without auricles (but sometimes with auricles) .................................................................................. T. domingensis

*Typha domingensis Persoon [from Santo Domingo]. Plants 1.5-4 m tall; sheaths with or without apical auricles, the transition from sheath to blade marked with brown mucilage glands; widest blades 8-12 mm wide when fresh, 3-8 mm when dry; staminate and pistillate portions of the spike usually separated by 1-12 cm, the pistillate portion 13-22 mm wide in fruit. ● Widespread in wet ground, perhaps more common in the eastern half of the state. §

Typha latifolia Linnaeus [broad-leaved]. Plants 1.5-3 m tall; sheaths with apical auricles or not, the transition from sheath to blade colorless and obscure; widest blades 1-3 cm wide when fresh, 5-20 mm when dry; staminate and pistillate portions of the spike usually contiguous to each other, or sometimes separated 1-4 cm, the pistillate portion 2.5-3.5 cm thick in fruit. ● Widespread in wet ground. §

Typha angustifolia Linnaeus [narrow-leaves]. Plants 1.5-3 m tall; sheaths with apical auricles, the transition from sheath to blade marked with brown mucilage glands; widest blades 6-18 mm wide when fresh, 5-15 mm when dry; staminate and pistillate portions of the spike usually separated from each other by 1-8 cm, the pistillate portion 15-25 mm wide in fruit. ● Widespread in wet ground.

Typha domingensis Linnaeus [broad-leaved]. Plants 1.5-3 m tall; sheaths with apical auricles or not, the transition from sheath to blade colorless and obscure; widest blades 1-3 cm wide when fresh, 5-20 mm when dry; staminate and pistillate portions of the spike usually contiguous to each other, or sometimes separated 1-4 cm, the pistillate portion 2.5-3.5 cm thick in fruit. ● Widespread in wet ground. §
Monocotyledonous Plants - Typhaceae

Androstaphyllum breviflorum

Chaza Canyon April 26

Dipterostemon capitatus

Chase Canyon April 26

Milla biflora

white with purple lines

purple

desert hills

Apr. 6
Peloncillo Mts.

white

Animas Mts.
Sept. 15
Monocotyledonous Plants - Typhaceae

Staminate head of Broad-leaved cattail Typha latifolia

Pistillate head of Narrow-leaved cattail Typha angustifolia

Leaves lie flat on water surface

Sacramento Mtn. High Rolls July 26

Spartanium emersum Bosave del Apache July 7
REFERENCE MATERIAL

Glossary


A
abaxial: the side away from the axis, for instance the lower surface of a leaf.
accrescent: increasing in size with age, such as a calyx that continues to grow after the corolla has fallen, for example in Physalis peruviana.
-aceae: the suffix added to the stem of a generic name to form the name of a family.
ache: a dry 1-seeded indehiscent fruit
acicular: slender or needle-shaped. See Leaf shape.
actinomorphic: radially symmetrical; may be bisected into similar halves in at least two planes. Generally applies to flowers in which the petal segments within each whorl are alike in size and shape; compare zygomorphic.
aculate: armed with prickles; e.g. the stem of a rose.
acuminate: tapering gradually to a point.
acute: sharply pointed; converging edges making an angle of less than 90°; compare obtuse.
adaxial: the side next to the axis; e.g. the upper surface of a leaf.
adnate: fused to an organ of a different kind; e.g. a stamen fused to a petal; compare connate.
adventitious: a structure produced in an abnormal position; e.g. an adventitious bud produced from a stem rather than from the axil of a leaf.
adventive: introduced accidentally (usually referring to weeds).
alternate: (as adjective) leaves or flowers borne singly at different levels along a stem; compare opposite and whorled.
amplexicaul: with the base dilated and clasping the stem, usually of leaves.
androecium: male parts of flower; the stamens of a flower collectively; compare gynoecium.
androgyne: with male and female flowers in the same inflorescence.
angiosperms: 'flowering plants'; plants with developing seeds enclosed in an ovary.
anual: a plant that completes its life cycle and dies within one year.
ante: pollen-bearing part of the stamen.
anthesis: time of flowering; the stage at which the pollen is released from the anthers inside the bud, usually corresponding with flower opening.
antrorse: directed towards or upwards, e.g. of hairs on a stem; compare retrorse.
apetalous: without petals.
apex (plural apices, adj. apical): the tip; the point furthest from the point of attachment.
apiculate: terminating in a short sharp flexible point; less abrupt than mucronate.
apomixis: reproduction, where viable seed or spores are produced without fertilization. A plant produced in this way is an apomict.
appressed: pressed closely, but not fused; e.g. leaves against a stem.
aquatic: plants whose natural habitat is water; living in or on water for all or a substantial part of the organism's life span, generally restricted to fresh or inland waters.
arborescent: tree-like in growth or general appearance.
areole: (from areola) in cacti, the region of a cactus bearing the flowers and/or spines.
aristate: with a stiff, bristle-like awn or tip.
articulate: jointed; separating freely, leaving a clean scar; for example the fronds of certain ferns where they join the rhizome.
ascending: spreading horizontally, then becoming erect.
asexual: of reproduction that does not involve the gametes; i.e. vegetative reproduction.
ateninate: narrowing gradually.
auricle (adjective auriculate): ear-shaped lobe; in grasses, found a junction of sheath and blade.
avn: fine bristle-like appendage; e.g. terminating or on the back of glumes and/or lemmas of some grass spikelets.
avxil: the upper angle between one part of a plant and another; e.g. the stem and a leaf.
avxillary: borne in or arising from the axil of a leaf.
axis: a line passing through the center of something; it usually refers to the main stem of a whole plant or inflorescence.
B
bark: the protective external layer of tissue on the stems and roots of trees and shrubs; includes all of the living and non-living tissue external to the cambium.
basal: at the base, situated or attached at the base.
basifixed: something attached by its base; e.g. an anther attached to the filament.
beak: a pointed projection.
berry: a fleshy indehiscent fruit, with the seeds immersed in the pulp, for instance tomato.
biennial: plant which completes its life cycle and dies within the second year; usually also forms a basal rosette of leaves the first year and flowers and fruits the second year.
bifid: forked; cut in two for about half its length.
bilabiate: having two lips; e.g. the form of the petals in many irregular flowers.
bilateral: two-sided, arranged on opposite sides; e.g. leaves on a stem.
binomial: making use of names consisting of two words to form the scientific name (or combination) in a Latin form. For example, where the first is the name of the genus to which the species belongs, and the second is the epithet given to that species to distinguish it from others in the same genus.
bipinnate: twice pinnate; for example of a compound leaf with individual leaflets pinnately divided.
bipinnatisect: a pinnatisect leaf with deeply dissected segments.
bipinnatisect: a pinnatisect leaf with deeply dissected segments.
biserse: bearing both male and female reproductive organs; usually, flowers with both stamens and carpels; hermaphrodite.
blade: the lamina or flattened part of a leaf, excluding the stalk.
bloom (noun): a fine white or bluish waxy powder occurring on plant parts, usually stems, leaves and fruits. It is easily removed by rubbing.
bract: a modified leaf associated with flower or inflorescence, differing in shape, size or color from other leaves (and without an axillary bud).
Glossary

bracteole: small bracts borne singly or in pairs on the pedicel or calyx.
branchlet: a small branch.
bull: thick storage organ, usually underground, consisting of a stem and leaf bases (the inner ones fleshy).

C
caducous: falling off early; compare persistent.
caesiptose: tufted; e.g. the growth form of some grasses; also cespitose.
calyx (plural calyces): the outer whorl of a flower, usually green; the sepals of one flower collectively.
calyx tube: a tube formed by the fusion of the sepals (calyx), at least at the base.
campanulate: bell-shaped.
canaliculate: channeled; with a longitudinal groove.
capillary: the branches and foliage of a tree; crown.
capitulum: with a knob-like head; of an inflorescence, with the flowers unstalked and aggregated into a dense cluster; of a stigma, like the head of a pin.
capitule: a spike, usually pendulous, in which the mostly small flowers are unisexual and without a conspicuous perianth; e.g. willows, poplars, oaks. The individual flowers often have scaly bracts; they are generally wind-pollinated. The catkins are usually shed as a unit.
caudate: having a narrow tail-like appendage.
cauline: borne on an aerial stem, e.g. leaves, flower or fruits.
centrifixed: of a two-branched organ attached by its center, e.g. a hair, or anther.
cesiptose: tufted; e.g. the growth form of some grasses; also cesiptose.
chartaceous: with a papery texture.
chasmogamous: of flowers that are pollinated when the perianth is open; compare cleistogamous.
cladate: generally, having hairs more or less confined to the margins of an organ, like eye-lashes.
circinate (circinante): spirally coiled with the tip innermost; e.g. the developing fronds of most ferns.
class: the principal category for taxa in a rank between division and order.
clavate: club-shaped.
claw: narrow, stalk-like basal portion of petal.
clausomalous: of flowers that self-pollinate and never open fully, or self-pollinate before opening; compare chasmogamous.
climber: a plant growing more or less erect by leaning or twining on another structure for support.
coalescent: plant parts fused or grown together to form a single unit.
cohere: (of like parts) sticking together, but not firmly or solidly as in connate.
colunar: shaped like a column.
commissure: the seam or face by which two carpels adhere.
compound: composed of several parts, for instance a leaf with leaflets, a gynoecium with several carpels, or an inflorescence made up of smaller inflorescences.
compressed: flattened lengthwise, either laterally (from side to side) or dorsally (from front to back).
concolorous: the same color throughout.
connate: fused to another organ (or organs) of the same kind; e.g. petals in a floral tube; compare adnate.
connective: the part of an anther that connects the anther cells.
conspecific: belonging to the same species.
contorted: twisted out of the normal shape.
convolute: referring to the arrangement of floral or foliar organs in a bud when each organ or segment has one edge overlapping the adjacent organ or segment.
cordate: heart-shaped, with the notch lowermost; of the base of a leaf, like the notched part of a heart.
coriaceous: leathery; stiff and tough, but somewhat flexible.
corn: fleshy, swollen stem base, usually underground, storing food reserves, with buds naked or covered by very thin scales; a type of rootstock.
corolla: collective term for the petals of a flower.
corolla: literally, crown; (1) in flowering plants, ring of tissue arising from the corolla or perianth of a flower and standing between the perianth lobes and the stamens; e.g. the daffodil trumpet.
corymb (adjective corymbose): inflorescence with branches arising at different points but reaching about the same height, giving the flower cluster a flat-topped appearance.
costa (adjective costate): a rib.
cotyledon: primary leaf or leaves of an embryo, becoming the seed leaf or leaves.
crenate: with blunt or rounded teeth, scalloped.
crenulate: minutely scalloped.
crisped: finely curled. A term generally applied to the edges of leaves and petals.
cruciform: cross-shaped.
culm: in grasses, sedges, rushes, and some other monocotyledons, an aerial stem bearing the inflorescence.
cultivar: the term cultivar is derived from cultivated variety and denotes an assemblage of cultivated plants clearly distinguished by one or more characters (morphological, physiological, cytological, chemical or other); when reproduced (sexually or asexually), the assemblage retains its distinguishing characters. A cultivar may arise in cultivation or be introduced from the wild. Cultivar names are written with single quotation marks around them e.g. 'Blue Carpet', 'Alba'.
cuneate: wedge-shaped; with straight sides converging at base.
cyathium: an inflorescence of unisexual flowers surrounded by involucral bracts, e.g. the flowers of Euphorbia.
cyme (adjective cymose): inflorescence in which the main axis and all lateral branches end in a flower (each lateral may be repeatedly branched).
**D**

deciduous: falling seasonally, for instance bark, leaves, petals.
decumbent: with branches growing horizontally but turned up at the ends.
decurrent: extending downwards beyond the point of attachment, e.g. when the base of a leaf is prolonged downwards along the stem in a raised line or narrow wing.
decussate: opposite, with successive pairs borne at right angles to the last; generally applied to the arrangement of leaves.
deflexed: bent downwards.
dehiscent: breaking open at maturity to release contents. Generally refers to the release of seed from some fruits; also pollen from anthers.
deltoid: with the shape of an equilateral triangle.
dentate: toothed.
denticulate: finely toothed.
determinate: limited, usually in growth.
dichasium: a cymose inflorescence with all branches below the terminal flower in regular opposite pairs.
dichotomous: forking into two equal branches, resulting from an equal division of the growing tip.
dimorphic: of 2 different kinds (in respect to shape and/or size), for example of stamens, fronds, leaves.
dioecious: when male and female reproductive structures develop on different individuals; of inflorescence.
disk (disc): a plate or ring of structures derived from the receptacle, and occurring between whorls of floral parts: in daisies, the central part of capitulum, hence disk flowers or florets.
disjunct: occurring in widely separated geographic areas, distinctly separate; applies to a discontinuous range in which one or more populations are separated from other potentially interbreeding populations far enough as to preclude gene flow between them.
dissected: deeply divided; cut into many segments.
distal: remote from the point of origin or attachment; the free end.
distichous: arranged in two opposite rows (and hence in the same plane).
distant: separate or free, not united.
divaricate: wide-spreading.
divergent: spreading in different directions, generally upward.
division: the term used for the rank below kingdom in the taxonomic hierarchy.
domatia: pits formed at the junction of two veins on the undersurface of leaves; often modified appendages that shelter parasites and other micro-organisms.
dorsal: the back; at the back; abaxial.
dorsifixed: having structurally different upper and lower surfaces, e.g. some leaves.
drupe: a fleshy fruit formed from one carpel, with a single seed that is enclosed by a stony layer of the fruit wall; e.g. peaches, olives.

e

e elliptical (elliptic): shaped like a flattened circle, about twice as long as broad, tapering equally both to the tip and the base.
emarginate: notched at apex (notch usually broad and shallow).
endemic: having a natural distribution restricted to a particular geographic region.
endocarp: the innermost layer of the wall of a fruit; in a drupe, the stony layer surrounding the seed.
endosperm: nutritive tissue in a seed.
eniform: shaped like the blade of a sword.
entire: having a smooth margin, not lobed, divided or toothed.
ephemeral: short-lived.
epidermis: an organ’s outermost layer of cells, usually only one cell thick.
epipetalous: of stamens that are attached to the petals.
epiphyte: one plant growing on another without deriving nourishment from it (in other words, not parasitic).
epipetalous: the adjectival component in a binomial.
equibulbous: divided into two equal parts.
equivalent: of a leaf when folded lengthwise with edges adverting except at the base, where it clasps another leaf on the opposite side of the stem.
erect: upright, more or less perpendicular to the ground or point of attachment.
erose: with the margin irregular as though nibbled or worn away.
even-pinnate: having an even number of leaflets in a compound leaf.
evergreen: not deciduous, having leaves all the year round.
ex: in nomenclature, indicating that the preceding author proposed the name but did not legitimately publish it, and that the succeeding author referred to the first author when legitimately publishing the name.
exocarp: the outer layer of the pericarp, often the skin of fleshy fruits.
exotic: not native; introduced from another region or country.
exserted: projected beyond, e.g. the stamens beyond the corolla tube.
exstipulate: without stipules.

**F**

facultative: optional.
falcate: curved like the blade of a scythe.
family: a formal group of one or more genera with features and/or ancestry in common; the term for the principal rank between order and genus.
fascicle: a cluster, e.g. a tuft of leaves all arising from the same node.
fastigiate: parallel, clustered and erect, e.g. the arrangement of branches in the Lombardy Poplar.
filament: stalk of a stamen.
filamentous: consisting of filaments or fibers.
filiform: thread-like.
fimbriate: fringed.
fibellate: fan-shaped.
flaccid: limp, tending to wilt.
Glossary

flexuous (flexuose): bent alternately in different directions; zig-zag.
floccose: with a soft and woolly covering of hairs.
floral leaves: the upper leaves at the base of the flowering branches.
floral tube: tube bearing the perianth and stamens, consisting of tissue derived from the receptacle and/or perianth and/or stamens; hypanthium.
floret: literally, a small flower; usually refers to the flowers of the daisy and grass families.
flower: the sexual reproductive structure of the angiosperms, typically with a gynoecium, androecium, perianth, and an axis.
follicle: a dry fruit formed from one carpel, splitting along a single suture, to which the seeds are attached.
forma (in common usage, form): a taxonomic category subordinate to species and within the taxonomic hierarchy, below subspecies and variety (varietas), usually differentiated by a very minor character.
free: not united with others organs of the same type; not attached at one end.
frond: a leaf of a fern, cycad or palm.
funnelform: with a form gradually widening from the base to apex; funnel-shaped.
fused: joined together.
fusiform: 3-dimensional, narrowing gradually from the middle towards each end; spindle-shaped.

G
genus (plural genera): a group of one or more species with features or ancestry (or both) in common. Genus is the principal category of taxa intermediate in rank between family and species in the nomenclatural hierarchy.
gibbous (gibbose): when part of an organ is swollen; usually with a pouche-like enlargement at base.
glabrescent: becoming glabrous, almost glabrous.
glabrous: without surface ornamentation such as hairs, scales or bristles; this is not the same as smooth.
gland: a secretory structure within or on the surface of a plant; (loosely) a smooth, usually shining, bead-like outgrowth.
glandular hair: hairs tipped with a gland.
glaucous: with a whitish bloom, blue-green in color.
globose (globular): nearly spherical.
globulose: small or nearly spherical.
glochid: a barbed hair or bristle, e.g. the fine hairs in Opuntia.
glumes: bracts subtending the floret(s) of a grass.
glutinous: sticky.
granular: of a surface, covered with small rounded protuberances.
grass: a plant belonging to the family Poaceae (Gramineae).
gymnosperm: a seed-bearing plant with ovules borne on the surface of a sporophyll within a cone; conifers.
gynobasic: of a style, arising near the base of the gynoecium, e.g. between the lobes of the ovary.
gynoeicum: female parts of flower; the collective term for the carpels of a flower whether united or free; compare pistil and androecium.
gynophore: stalk supporting the gynoecium (above the level of insertion of the other floral parts).

H
habit: the general external appearance of a plant, including size, shape, texture and orientation.
habitat: the place where a plant lives; the environmental conditions of its home.
hair: a single elongated cell or row of cells borne on the surface of an organ.
half-inferior: of ovary, partly below and partly above the level of attachment of the other floral parts.
haustate: like the head of a halbert, i.e. narrow and pointed but abruptly enlarged at the base into two acute diverging lobes; may refer only to the base of a leaf with such lobes.
haustorium: in parasitic plants, a structure developed for penetrating the host's tissues.
head: see capitulum.
helicoid: coiled; of a cymose inflorescence, when the branching is repeatedly on the same side (the apex is often recurved); compare scorpionid.
herb: a vascular plant that does not develop a woody stem; e.g. a violet.
herbaceous: not woody; usually green and soft in texture.
herbarium: a collection of preserved, usually dried, plant material.
heteromorphic: of 2 or more distinct morphologies (e.g. of different size and shape).
hilum: the scar on a seed coat where it separates from its stalk (funiculus).
hirsute: bearing coarse, rough, longish hairs.
hispid: having long erect rigid hairs or bristles, harsh to touch.
hoary: covered with a greyish to whitish layer of hairs, giving a frosted appearance.
yellow: translucent; usually delicately membranous and colorless.
yanthium: see floral tube.

I
illegitimate name (nomen illegitimum): a name not abiding by the rules of the botanical Codes, and thereby not usable.
imparipinnate: overlapping each other, of perianth parts, edges overlapping in the bud.
impatinate: a pinnate leaf with an odd number of pinnae (terminated by a single leaflet).
in: in nomenclature, where the preceding author published the name in an article or book, authored or edited by the succeeding author.
incised: cut deeply and (usually) unevenly (a condition intermediate between toothed and lobed).
included: enclosed, not protruding; for example stamens within the corolla.
incurved: bent or curved inwards; of leaf margins, when curved towards the adaxial side.
indehiscent: not opening in any definite manner at maturity; usually referring to fruit.
determinate: unlimited, usually in growth.
indigenous: native to the area, not introduced, and not necessarily confined to the region.
dindumentum: any surface covering, e.g. hairs, scales; a collective term for such coverings.
indusium: a membrane covering the sporangia of some ferns.
inferior: of an ovary, at least partly below the level of attachment of other floral parts; compare superior.
inflated: swollen, like a bladder.
inflexed: bent sharply upwards or forwards; compare deflexed.
inflorescence: several flowers closely grouped together to form an efficient structured unit; the grouping or arrangement of flowers on a plant.

infraspecific: denotes taxonomic ranks below species level, for example subspecies.

inrolled: rolled inwards.

intemodae: the portion of a stem between two nodes.

interpetiolar: of stipules, between the petioles of opposite leaves.

introfascia: of anther locules, with opening towards the center of flower (at least in bud); compare extrorse, latrorse.

involucrum: a group of bracts surrounding the base of a flower-head; e.g. as seen in a daisy.

involute: rolled inwards, for example when the margins of a leaf are rolled towards the adaxial (usually upper) surface; compare revolute.

J

joint: a node or junction of two parts; articulation.

ejovinule leaves: formed on a young plant and different in form from the adult leaves.

K

keel: a ridge like the keel of a boat, e.g. the structure formed by the fusion of the two anterior petals of a flower in the Fabaceae.

kingdom: the highest generally employed category of the taxonomic hierarchy, above that of division.

L

labellum: lip; one of three or five petals which is (usually) different from the others, e.g. in Orchidaceae.

labiate: lipped; where the limb of a corolla is divided into two parts, called an upper and lower lip, the two resembling an open mouth with lips.

lacerate: jagged, as if torn.

lactiniae: slit into narrow, pointed lobes.

lamina: the blade of a leaf or the expanded upper part of a petal, sepal or bract.

lanceolate: shaped like a lance or spear head.

lateral: attached to the side of an organ.

latex: a milky substance that exudes from such plants such as milkweeds, figs and dandelions.

lax: loose, not compact.

leaflet: the ultimate segments of a compound leaf.

legume: (1) a fruit characteristic of the Fabaceae family, formed from one carpel and either dehiscent along both sides, or indehiscent; (2) a crop species in the family Fabaceae; (3) a plant belonging to the Fabaceae.

lemma: the lower of 2 bracts enclosing a grass flower.

lenticel: a loosely packed mass of cells in the bark of a woody plant (used for gas exchange), visible on the surface as a raised powdery spot.

lepido: covered with small scurfy scales.

ligulate: (1) bearing a ligule; (2) strap-shaped.

ligule: (1) small membranous appendage on the top of the sheath of grass leaves; (2) extended, strap-like corolla of some daisy florets.

linear: very narrow in relation to its length, with the sides mostly parallel.

lobe: part of a leaf (or other organ), often rounded, formed by incisions to about halfway to the midrib.

lunate: crescent-shaped.

lyrate: lyre-shaped; deeply lobed, with a large terminal lobe and smaller lateral ones.

M

margin: the edge, as in the edge of a leaf blade.

marginal: occurring at or very close to the margin.

mealy: covered with coarse, flour-like powder, sometimes due to collapsed hairs.

membranous: thin, translucent and flexible, seldom green.

mericarp: one segment of a fruit (a schizocarp) that splits at maturity into units derived from the individual carpels, or a carpel, usually 1-seeded, released by the break-up at maturity of a fruit formed from 2 or more joined carpels.

meristem: a group of actively dividing tissues.

mesocarp: the fleshy portion of the wall of a succulent fruit inside the skin and outside the stony layer (if any), surrounding the seed.

midrib: the central, and usually most prominent, vein of a leaf or leaf-like organ; midvein.

monoecious: of vascular plants, where the male and female reproductive structures are in separate flowers but on the same plant; compare dioecious.

mucro: a sharp, short point.

mucronate: terminating in a mucro.

muculate: covered with short hard protuberances.

N

native: naturally occurring in an area, but not necessarily confined to it.

naturalized: describing a plant introduced from another region, that grows and reproduces readily in competition with the natural flora.

nectary: a specialized gland that secretes nectar.

tock: a vein.

node: the part of a stem where leaves or branches arise.

nut: a hard, dry, indehiscent fruit, containing only one seed.

nutlet: a small nut; one of the lobes or sections of the mature ovary of some members of the Boraginaceae, Verbenaceae, and Lamiaceae.

O

ob: inversely; usually same shape as suffix but attached by the narrower end, for example obcordate, oblanceolate, obovate.

oblique: slanting; of a leaf, larger on one side of the midrib than the other, in other words asymmetrical.

oblong: length a few times greater than width, with sides almost parallel and ends rounded.

obtuse: blunt or rounded at the tip or apex; converging edges making an angle of more than 90°.

ocrea (ochrea): a sheath, formed from two stipules, encircling the node in Polygonaceae.

odd-pinnate: (imparipinnate) having an odd number of leaflets in a compound leaf.

opposite: leaves or flowers borne at the same level but on opposite sides of the axis, 2 per node; or when something occurs on the same radius as
Glossary

oribicular: more or less circular.
oral: generally used to mean the same as ovate.
ovary: the basal portion of a carpel or group of fused carpels, enclosing the ovule(s).
ovate: shaped like a section through the long-axis of an egg and attached by the wider end.
ovoid: egg-shaped, with wider portion at base; 3-dimensional object, ovate in all sections through long-axis.
ovule: the seed before fertilization.

P
palea: the upper of 2 bracts enclosing a grass flower.
palmate: (1) a compound leaf divided into several leaflets arising from the same point at the top of the petiole; (2) of veins in a simple leaf when they arise in a similar fashion.
palmatifid: deeply divided into several lobes arising from more or less the same level.
palmatisect: intermediate between palmate and palmatifid, i.e. the segments are not fully separated at the base.
panicule (adjective paniculate): an indeterminate inflorescence in which the flowers are borne on branches of the main axis or on further branches of these.
papilionaceous: butterfly-like; with a corolla like that of a sweet pea.
papilla (plural papillae, adjective papillose): a small, elongated protuberance on the surface of an organ, usually an extension of one epidermal cell.
pappus: in daisy florets, a tuft or ring of hairs or scales borne above the ovary and outside the corolla (representing the missing calyx); a tuft of hairs on a fruit.
pappertate: having an even number of leaflets (or pinnae), that is terminated by a pair of pinnae as opposed to a single pinnus; compare impappertate.
papillose: a small, elongated protuberance on the surface of an organ, usually an extension of one epidermal cell.
patent: of plants, spreading.
pedicel (adjective pedicellate): the stalk of a flower or of a grass spikelet.
peduncle (adjective pedunculate): the stalk of an inflorescence.
perianth: the collective term for the calyx and corolla of a flower.
perigynous: borne around the ovary.
perianth: the collective term for the calyx and corolla of a flower.
perigynous: borne around the ovary.
persistent: remaining attached to the plant beyond the usual time of falling, for instance sepals not falling after flowering, flower parts remaining through maturity of fruit.
petal: in a flower, one of the segments or divisions of the inner whorl of non-fertile parts surrounding the fertile organs, usually soft and conspicuously colored.
petaloid: like a petal; soft in texture and colored conspicuously.
petiolate: subtended by a petiole.
petiole: the stalk of a leaf.
petiolule: the stalk of a leaflet.
pilose: covered with soft, weak, thin and clearly separated hairs, which are usually defined as long and sometimes ascending.
pinnate: a primary segment of a compound leaf.
pinnatifid: pinnately lobed.
pinnatisect: pinnately divided almost to midrib but segments still confluent.
pinnule: ultimate free division (or leaflet) of a compound leaf.
pistil: the female reproductive organ of a flower, composed of a basal ovary, the style, and a terminal stigma.
pistil: the female reproductive organ of a flower, composed of a basal ovary, the style, and a terminal stigma.
pith: the central region of a stem, inside the vascular cylinder; the spongy parenchymatous central tissue in some stems and roots.
placenta: the tissue within an ovary to which the ovules are attached.
plicate: pleated; folded back and forth longitudinally like a fan.
plumose: like a feather; with fine hairs branching from a main axis.
plumose: like a feather; with fine hairs branching from a main axis.
pollen: powdery mass shed from anthers (of angiosperms) or microsporangia (of gymnosperms); the microspores of seed plants; pollen-grains.
polyplody: with more than two of the basic sets of chromosomes in the nucleus.
prickly: hard, pointed outgrowth from the surface of a plant (involving several layers of cells but not containing a vein.
propagules: a structure capable of producing a new plant; includes seeds, spores, bulbils, etc.
prostrate: lying flat on the ground.
proximal: near the point of origin or attachment; compare distal.
pruinose: covered with a powdery, waxy material; with a bloom.
puberulent (puberulent): covered with minute soft erect hairs.
pubescent: downy; covered with short, soft, erect hairs; or, in a general sense, hairy.
pulvinus: a cushion-like swelling.
punctate: marked with dots.
pungent: having a sharp hard point.
pyramidal: of a plant's form, pyramid-shaped.
Q
quadrate: more or less square.

R
raceme (adjective racemose): an indeterminate inflorescence in which the main axis produces a series of flowers on lateral stalks, the oldest at the base and the youngest at the top.
rachilla: the axis of a grass spikelet, above the glumes.
rachis (plural rachises): the axis of an inflorescence or a pinnate leaf.
radiate: of daisies, of a capitulum, with ray florets surrounding disc florets.
recurred: bent or curved backwards or downwards.
reflexed: bent sharply back or down.
reniform: kidney-shaped.
reticulate: forming a network (or reticulum), e.g. veins that join one another at more than one point.
retorse: directed backwards or downwards; compare antorse.
retuse: with a blunt (obtuse) and slightly notched apex.
revolute: rolled under (downwards or backwards), for example when the edges of leaves are rolled under towards the midrib; compare involute.
rhizome: a perennial underground stem usually growing horizontally.
rootstock: short, erect, swollen structure at junction of a plant's root and shoot systems.
rotate: circular and flattened; for example a corolla with a very short tube and spreading lobes (for instance some Solanaceae).
rugose: wrinkled.
rugulose: finely wrinkled.
runcinate: sharply pinnatifid or cleft, the segments directed downward.

S
saccate: pouched.
sagittate: shaped like the head of an arrow; narrow and pointed but gradually enlarged at base into two straight lobes directed downwards; may refer only to the base of a leaf with such lobes; compare hastate.
scaulous: rough to the touch with short hard emergences or hairs.
scape (adjective sepalose): a stem-like flowering stalk of a plant with basal leaves.
scapsa: having the floral axis more or less erect with a few leaves or devoid of leaves; consisting of a scape.
scariosus: dry and membranous.
schizocarp: a dry fruit formed from more than one carpel but breaking apart into individual carpels (mericarps) when ripe.
scorpoid: of a cyme inflorescence, when it branches alternately on one side and then the other; compare helicoid.
second: with all the parts grouped on one side or turned to one side (applied especially to inflorescences).
seed: a ripened ovule.
sensu lato (s.l.): of a plant name, in its broadest sense.
sensu stricto (s.s.): of a plant name, in its narrowest sense.
sepal: in a flower, one of the segments or divisions of the outer whorl of non-fertile parts surrounding the fertile organs, usually green; compare petal.
septum (plural septa): a partition, for example the membranous wall separating the two valves of the pod of Brassicaceae.
sericose: silky with dense appressed hairs.
serrate: toothed with teeth pointing forward; like the cutting edge of a saw.
serrulate: finely serrate.
sessile: without a stalk.
sheath: a tubular or rolled part of an organ, e.g. the lower part of the leaf in most grasses.
shoot: usually the aerial part of a plant; a stem including its dependent parts, leaves flowers etc.
simple: undivided, for instance a leaf not divided into leaflets.
sinuate: with deep, wave-like depressions along the margins, but more or less flat; compare undulate.
sinus: a notch or depression between two lobes or teeth in the margin of an organ.
spathic: a large bract ensheathing an inflorescence.
spathulate (spathulate): spoon-shaped; broad at the tip with a narrowed projection extending to the base.
spike (adjective spicate): an unbranched, indeterminate inflorescence in which the flowers are without stalks; compare raceme.
spine (adjective spinose): a stiff, sharp structure, formed by the modification of a leaf.
spinoscent: ending in a spine; modified to form a spine.
spreading: extending horizontally, for example branches; standing out at right angles to axis, for example leaves or hairs.
stamen (adjective staminate): male organ of a flower, consisting (usually) of a stalk (filament) and a pollen-bearing portion (anther).
staminode: a sterile stamen, often rudimentary.
stellate: star-shaped, for example a type of hair.
stipe: in ferns, the stalk of a frond; generally a small stalk.
stipitate: stalked; borne on a stipe; of an ovary, borne on a gynophore.
stipulate: bearing stipules.
stipule: small appendage at the bases of leaves in many dicotyledons.
stolon: slender, prostrate or trailing stem, producing roots and sometimes erect shoots at its nodes.
stoloniferous: having stolons.
striate: striped with parallel, longitudinal lines or ridges.
strigose: covered with appressed, rigid, bristle-like, straight hairs; the appressed equivalent of hispid.
style: an elongated part of a carpel, or group of fused carpels, between the ovary and the stigma.
subspecies: a grouping within a species, usually used for geographically isolated and morphologically distinct entities. Its taxonomic rank occurs between species and variety.
subtend: to stand beneath or close to, as in a bract at the base of a flower.
subulate: narrow and tapering gradually to a fine point.
succulent: juicy, fleshy, a plant with a fleshy habit.
sulcate: furrowed; grooved.
superior: of an ovary, borne above the level of attachment of the other floral parts.
syn: (sym-): with, together.

taproot: the main, descending root of a plant with a single dominant root axis.
taxon (plural taxa): a group or category in a system of classification, derived from the Greek prefixes taxo-, taxis- meaning arrangement.
tendril: a slender organ (modified e.g. from stem, leaf, leaflet or stipule) used by climbing plants to cling to an object.
tepal: perianth segment, either sepal or petal; usually used when all perianth segments are similar in appearance.
tereate: circular in cross-section; more or less cylindrical.
terinal: situated at the tip or apex.
ternate: in groups of three; of leaves, arranged in whorls of three; of a single leaf, with the leaflets arranged in groups of three.
testa: seed coat.
thorn: a sharp, stiff point, usually a modified stem, that cannot be detached without tearing the subtending tissue.
throat: the opening of a corolla or perianth.
thyrs: a branched inflorescence in which the main axis is indeterminate (racemose) and the lateral branches determinate (cymose).
tomentum (adjective tomentose): a dense covering of short, tangled and matted hairs.
toothed: with a more or less regularly incised margin.
tree: a woody plant, usually with a single distinct trunk and generally more than 5 m tall.
tribe: a taxonomic grouping, in rank between genus and species.
trifoliate: a compound leaf of three leaflets, for example a clover leaf.
trigonous: triangular in cross-section and obtusely angled.
trinerved: having three nerves or veins.
triquetrous: more or less triangular in cross-section, but acutely angled (with 3 distinct longitudinal ridges).
truncate: cut off squarely; with an abruptly transverse end.
trunk: the upright large main stem of a tree.
tuber: an underground storage organ formed by the swelling of an underground stem which produces buds and stores food, forming a seasonal perennating organ, for example, potato.
tubercle: a small wart-like or nipple-like outgrowth.
tuberculate: covered in tubercles; warty or nipple-like.
tuberos: resembling a tuber; producing tubers.
tubular: with the form of a tube or cylinder.
turbinate: top-shaped.
turgid: swollen with liquid; firm.
tussock: a dense tuft of vegetation, usually well separated from neighboring tussocks, for example some grasses.
two-ranked: having leaves arranged in two rows in the same plane, on opposite sides of the branch; distichous.

umbel (adjective umbellate): an inflorescence in which all the individual flower stalks or secondary peduncles arise in a cluster at the top of the peduncle and are of about equal length.
uncinate: with a hook at the apex.
undulate: wavy and not flat.
unilocular: having one loculus or chamber.
uniseriate: Arranged in a single row or series.
unisexual: of one sex; bearing only male or only female reproductive organs.
urceolate: urn-shaped.
uricle: a small bladder; a membranous bladder-like sac enclosing an ovary or fruit.

valvate: of sepals and petals in bud, which meet edge to edge but do not overlap.
varietas (variety in common usage, abbreviated as var.): in the Linnaean hierarchy a rank below that of species, between the ranks of subspecies and form.
variegated: irregularly marked with blotches or patches of another color.
vein: a strand of vascular tissue; nerve.
veinlet: a small vein; the ultimate (visible) division of a vein.
velvety: densely covered with fine, short, soft, erect hairs.
venation: the arrangement of veins in a leaf.
ventral: towards the front; in particular, towards the axis in a lateral organ or towards substratum in prostrate plant; adaxial.
vernation: the arrangement of unopened leaves in a bud; the order of unfolding of leaves from a bud.
verrucose: with warts.
versatile: of anthers, swinging freely about the point of attachment to the filament.
verticillate: arranged in one or more whorls.
villos: covered with long, soft, weak hairs, the covering somewhat dense.
viscid: sticky.

warty: a surface covered with small round protuberances, especially in fruit, leaves, twigs and bark.
whorl: a ring of 3 or more organs borne at the same level or node on an axis, for example leaves, bracts or floral parts.
wolly: very densely covered with long, more or less matted or intertwined hairs, resembling sheep's wool.

zygomorphic: bilaterally symmetrical; applies to flowers in which the perianth segments within each whorl vary in size and shape; compare actinomorphic.
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