

THE JEPSON MANUAL VASCULAR PLANTS of CALIFORNIA

Edited by Bruce G. Baldwin, Douglas H. Goldman, David J. Keil, Robert Patterson, Thomas J. Rosatti, and Dieter H. Wilken

SECOND EDITION, THOROUGHLY REVISED AND EXPANDED



The Digital Jepson Manual

Vascular Plants of California, Second Edition

Thoroughly Revised and Expanded

Bruce G. Baldwin (Editor),
Douglas H. Goldman (Editor),
David J Keil (Editor), Robert Patterson (Editor),
Thomas J. Rosatti (Editor)



The Jepson Manual



The Jepson Manual

Vascular Plants of California

SECOND EDITION



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Dieter H. Wilken

Editors

Jeffrey Greenhouse Staci Markos Richard L. Moe Scott Simono Margriet Wetherwax

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Back to page 319

1 of 6039



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What's new with the second edition?

- # of Taxa
 - Native + Naturalized Species: 5,967
 - Native + Naturalized Minimum Rank Taxa: 7,601
- # of Introduced Plants
 - Naturalized Species: 991
 - Naturalized Minimum Rank Taxa: 7,601
- # of Native Taxa
 - Native Species: 4,976
 - Native Minimum Rank Taxa: 6,502
- # of Authors
 - Just over 300
- # of Taxa, Illustrated
 - Number of Terminal Taxa, Illustrated: 4,862
- Total # of Illustrations
 - In addition to the above, there are about 25 illustrations/images that are part of the front material.

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What's new with the second edition?

 Integrates the latest science with the results of intensive fieldwork, institutional collaboration, and efforts of hundreds of contributing authors. iPad 🤝 9:01 AM 97% 📼

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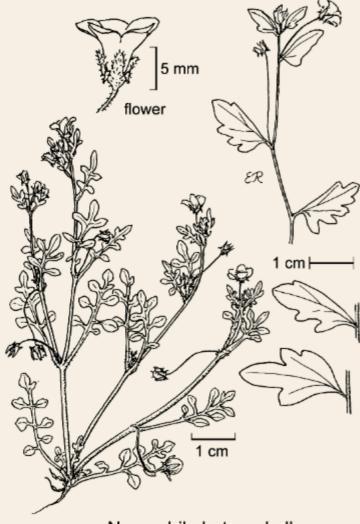
LEAF: lower opposite, I-4 cm, blade = petiole, oblong to ovate, lobes 5-7, deep, gen round, stalked, gen well separated, entire to I-3-toothed; upper alternate, ± sessile, blade lanceolate to ovate, lobes 0 or 3-5, entire.

INFLORESCENCE:

pedicels < 10 mm, < 60 mm in fr.

FLOWER: calyx lobes 2–4 mm, appendages < I mm in fr; corolla 3–IO mm, 4–I2 mm wide, bowl-shaped, white or ± blue, tube = filaments; anthers < I mm; style 2–4 mm.

SEED: 2–5, yellowbrown, smooth or roughened.



Nemophila heterophylla

n=9. Forest, chaparral, roadsides, slopes, streambanks, talus; 30–1700 m. NW, CaR, SN, GV, CW; OR. Feb–Jun

««« Nemophila maculata Lindl.

(Plate 069)

FIVESPOT

Native taxon

LEAF: opposite, petiole ≥ blade; lower blades 8–30 mm, 3–15 mm wide, oblong to ovate, lobes 5–9, entire or 1–3-toothed; upper oblanceolate to spoon-

Back to page 6756

1879 of 7590

3694 pages left in this chapter



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What's new with the second edition?

 Nearly two-thirds of the 7,600 species, subspecies, and varieties the volume describes are now illustrated with diagnostic drawings. iPad ♀ 3:29 PM

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EUDICOTS

Flower plants; cotyledons 2; fl parts gen in 4s or 5s; pollen apertures 3+ [Diospyros virginiana L. var. virginiana, American persimmon (Ebenaceae), documented from two clonal colonies in SnBr (Hrusa et al. 2002 Madroño 49:61–98.]

««« ACANTHACEAE

ACANTHUS FAMILY

Thomas F. Daniel, Margriet Wetherwax & Lawrence R. Heckard, except as noted

[Ann, per to] shrub, [tree], nodes gen swollen.

LEAF: simple, gen opposite, entire (toothed [lobed]); stipules o.

INFLORESCENCE: variable, with bracts, gen also bractlets.

FLOWER: bisexual; calyx deeply (3)4–5 lobed [(sepals free)]; corolla 4–5 lobed, radial to 2-lipped; stamens 2 or 4, epipetalous, anther sacs sometimes dissimilar in size or placement; ovary superior, 4–many-ovuled, chambers 1–2, placentas axile (free central), stigmas 1–2.

FRUIT: capsule, loculicidal, gen dehiscing explosively, valves 2.

SEED: I-4[+] each gen subtended by hook-like outgrowth that remains in fr.

220 genera, 4000 spp.: esp trop; some orn: *Justicia* (Beloperone, shrimp-plant), *Acanthus*, *Thunbergia*. [Daniel 1998 Proc Calif Acad Sci 50:217–256; Hilu et al. 2003 Amer J Bot 90:1758–1766; Schwarzbach & McDade 2002 Syst Bot 27:84–98] Scientific Editor: Thomas J. Rosatti.

I. Shrub; roots exposed at low ti	ide; h	ook-like outgrowth subtending seed 0;
fls white; coastal salt marshes,	, SCo	AVICENNIA



Back to page 6682

464 of 7071

4712 pages left in this chapter



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What's new with the second edition?

 Geographic distributions, elevation ranges, flowering times, nomenclature, and the status of non-natives and native taxa of special concern have all been updated throughout. iPad 🤝 9:04 AM 96 % 📼

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ments lanceolate to round, finely serrate Ammi majus

I' Inflorescence with disk-like receptacle; rays incurving in fr to form a nest-like umbel; cauline If segments linear Ammi visnaga

««« Ammi majus L.

Alien taxon (naturalized or waif)

Plant 2-8 dm.

LEAF: petiole I-5 cm; blade 6-20 cm, oblong, segments IO-I5 mm; cauline lvs 2-pinnately dissected.

INFLORESCENCE: scabrous; peduncle 8–14 cm; rays 20–60, 2–7 cm, slender; pedicels 1–10 mm.

FRUIT: 1.5-2 mm, oblong.

2*n*=22. Fields, roadsides, disturbed areas; gen < 1000 m. NCo, NCoRO, ScV; native to Eurasia. May–Jul

≪≪ Ammi visnaga (L.) Lam.

(Plate 012)

BISNAGA

Alien taxon (naturalized or waif)

Plant 2-8 dm.

LEAF: petiole ± 1 cm; blade 5–20 cm, triangular-ovate, segments 5–35 mm; cauline lvs I- or 2-pinnately or -ternately dissected.

INFLORESCENCE : glabrous; peduncle 8–14 cm; rays 60–100, 2–5 cm, slender; pedicels 3–13 mm.

FRUIT: 2-2.5 mm, oblong-ovate to ovate.

2n=20. Roadsides, railroad tracks, disturbed areas; gen < 1000 m. CCo, SCo; native to Eurasia. Jun–Jul

««« AMMOSELINUM

Ann, taprooted.

STEM: erect or gen loosely branched, glabrous or roughened.



Back to page 2

505 of 7590

5068 pages left in this chapter



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What's new with the second edition?

- Introduced taxa noted in several ways:
 - Alien taxon (naturalized or waif)
 - Weedy, alien taxon
 - Rare and/or endangered taxon

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GEOLOGIC, CLIMATIC, AND VEGETATION HISTORY OF CALIFORNIA

Constance I. Millar

Introduction

The dawning of the "Anthropocene," the era of human-induced climate change, exposes what paleoscientists have documented for decades: earth's environment—land, sea, air, and the organisms that inhabit these—is in a state of continual flux. Change is part of global reality, as is the relatively new and disruptive role humans superimpose on environmental and climatic flux. Historic dynamism is central to understanding how plant lineages exist in the present—their journey through time illuminates plant ecology and diversity, niche preferences, range distributions, and life-history characteristics, and is essential grounding for successful conservation planning.

The editors of the current *Manual* recognize that the geologic, climatic, and vegetation history of California belong together as a single story, reflecting their interweaving nature. Advances in the sciences of geology, climatology, and paleobotany have shaken earlier interpretations of earth's history and promoted integrated understanding of the origins of land, climate, and biota of western North America. In unraveling mysteries about the "what, where, and when" of California history, the respective sciences have also clarified the "how" of processes responsible for geologic, climatic, and vegetation change.

This narrative of California's prehistory emphasizes process and scale while also portraying pictures of the past. The goal is to foster a deeper understanding of landscape dynamics of California that will help toward preparing for changes coming in the future. This in turn will inform meaningful and effective conservation decisions to protect the remarkable diversity of rock, sky, and life that is our California heritage.

California's Prehistory: A Tale of Time and Space

Back to page 300

140 of 7071

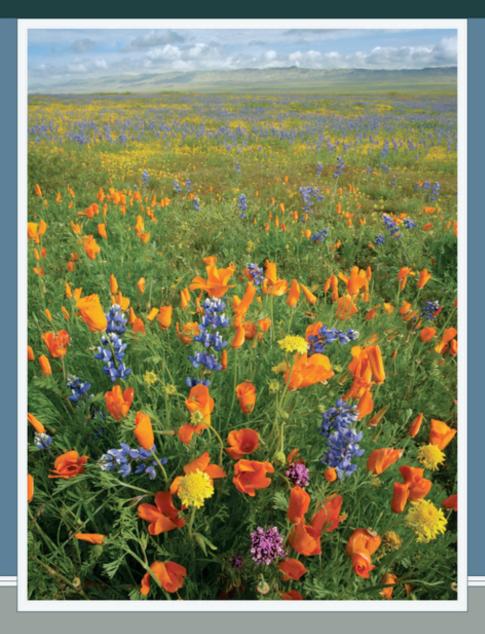
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What's new with the second edition?

 New chapter added: Geologic, Climatic, and Vegetation History of California.

Interactive Digital Version



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SECOND EDITION, THOROUGHLY REVISED AND EXPANDED





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What has remained the same?

 The Jepson Manual is still the single most comprehensive resource on California's amazingly diverse flora. iPad ♥ 4:13 PM

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USING THIS EBOOK

This ebook contains all the content from the print version of *The Jepson Manual*, Second Edition. However, we have made a few textual changes to make the ebook easier to use. We've also added extensive linking to make it easier to follow keys and find taxa. And when species are illustrated, the ebook shows the illustrations two ways: gathered on large plates, as in the print book, and in smaller figures with (or near) the taxon they illustrate.

Textual changes

- Some conventions in the print book are different from those in the ebook. We've revised the text of the Conventions chapter to make those differences clear.
- · Many abbreviations in the print book are spelled out in the ebook.
- Symbols have been replaced with text; see the Conventions chapter for details.
- Genus namesare always spelled out at the beginning of species accounts and within genus keys.

Links

Navigating with the table of contents

The table of contents links directly to chapters.

Using links to follow keys

The keys consist of numbered couplets. The numbers (1, 1', and the like) are linked to each other. Click on 1 to get to 1' and on 1' to get to 1.

Every key entry with a target taxon links to that taxon:

- The Key to Groups links to the group at the end of the entry.
- The group keys to families link to the lowest taxon in an entry, usually a family but sometimes a genus or even a species.
- Each family account contains a key to the genera within the family, and that key links to the genera.
- · Each genus contains a key to species, which links to species, subspecies, or variety.

Working backwards through keys

Each key and taxon has a backlink symbol, "<<<", at the beginning of each key. These backlink as follows:

- Species, subspecies, and variety link back to the genus key entry that has the taxon for a target.
- · Genus keys link back to the corresponding family key to genera.



Back to page 319 2 of 6039

1 page left in this chapter



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yellow glands, abaxially often with many ± yellow or ± red glands, margins not recurved; lower pinnae 2-5(7) cm; upper pinnae, pinnules on basal side of lowermost pinnae deeply pinnately lobed to \pm 1-pinnate. 2n=120. Gen shaded, near rocks, boulders; 300-1400 m. SnBr, PR, DMtns; AZ, NM, Baja CA.

subsp. triangularis (Plate 137)

LEAF: blade adaxially gen glabrous, Pentagramma not sticky, margins not recurved; lower



pallida

Pentagramma triangularis subsp. triangularis

pinnae 2–6(11) cm; upper pinnae, pinnules on basal side of lowermost pinnae deeply pinnately lobed to \pm 1-pinnate. 2n=60. Common. Gen shaded, sometimes rocky or wooded areas; < 2300 m. CA-FP, MP (caves in Lava Beds National Monument), SNE, DMtns; to BC, ID, NV, Baja CA. Varies in morphology, cytology, geography, chemistry. Plants with white (instead of yellow) exudate on abaxial blade surfaces have been treated by some as P. triangularis subsp. semipallida (J.T. Howell) Yatsk. et al. (blades adaxially glabrous) and P. triangularis subsp. rebmanii Winner & M.G. Simpson (blades adaxially sparsely whitemealy), but further study needed to decide if taxonomic recognition warranted.



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(Plate 491)

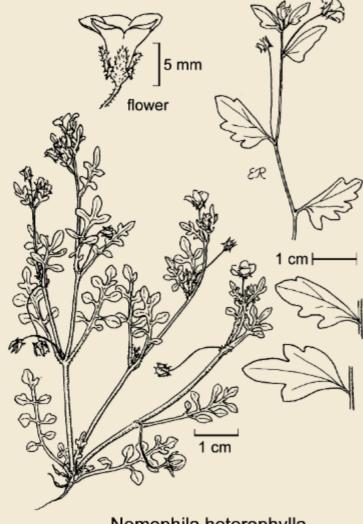
LEAF: lower opposite, 1–4 cm, blade = petiole, oblong to ovate, lobes 5–7, deep, gen round, stalked, gen well separated, entire to 1–3-toothed; upper alternate, ± sessile, blade lanceolate to ovate, lobes 0 or 3–5, entire.

INFLORESCENCE:

pedicels < 10 mm, < 60 mm in fr.

FLOWER: calyx lobes 2–4 mm, appendages < 1 mm in fr; corolla 3–10 mm, 4–12 mm wide, bowl-shaped, white or ± blue, tube = filaments; anthers < 1 mm; style 2–4 mm.

SEED: 2–5, yellowbrown, smooth or roughened. n=9. Forest, chaparral, roadsides, slopes, streambanks, talus; 30–



Nemophila heterophylla

1700 m. NW, CaR, SN, GV, CW; OR. Feb-Jun

<<<>> Nemophila maculata Lindl.

(Plate 491)

FIVESPOT

LEAF: opposite, petiole ≥ blade; lower blades 8–30 mm, 3–15 mm wide, oblong to ovate, lobes 5–9, entire or 1–3-toothed; upper oblanceolate to spoon-shaped, sessile, tip entire or 3-toothed.

INFLORESCENCE: pedicels stout, 10–20 mm, < 70 mm in fr.

FLOWER: calyx lobes 4–9 mm, appendages 1–4 mm in fr; corolla 8–20 mm, 10–50 mm wide, bowl-shaped to rotate, white with dark veins, dots, purple-spotted at

Back to page 5752

1508 of 6039

2860 pages left in this chapter



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- Additions introduced by UC Press will improve ease-of-use on e-readers and tablets:
 - Many abbreviations now spelled out
 - Taxon names all spelled out
 - All Illustrations now linked to individual accounts as well as in plates

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- Phyllaries graduated in 4–8 series
- 2. Outer fls fring
- 3. Pappus of bristles; ann, taprooted LESSINGIA (G6, 7)
- 2' Outer fls sterile
- Distal phyllary margin expanded as a spiny-margined, fringed, or irregularly toothed appendage CENTAUREA (G2,4)
- 4' Distal phyllary margin entire, tapered smoothly to tip-spine VOLU-TARIA (G4)
- 1' Phyllaries ± equal or weakly graduated in 1–3 series
- 5. Fr 10–15 mm PALAFOXIA (G7)
- 5' Fr 2-9 mm
- Phyllary margin thin, ± scarious, brown to purple HYMENOTHRIX
 (G7)
- 6' Phyllary margin not or scarcely scarious, variously colored
- 7. Lvs opposite Arnica discoidea
- 7' Lvs alternate
- Pappus scales entire or fringed; If entire to ± deeply 1-2-pinnately lobed
 CHAENACTIS (G7)
- 8' Pappus scales dissected into bristles; If sharply dentate or with a few short, sharp lobes TRICHOPTILIUM (G6, 7)

CONTRACT OF STREET OF STR

Heads disciform or unisexual; fls of 2 kinds or of 1 unisexual kind; corollas of pistillate or sterile fls inconspicuous

- 1. Pistillate and staminate fls in different heads
- 2. Pistillate and staminate heads on same plant [monoecious]
- 3. Subshrub or shrub (to small tree) ²AMBROSIA
- 3' Herb
- 4. St armed with 3-branched spines Xanthium spinosum
- 4' St unarmed
- Staminate heads well-spaced in long terminal infl; bur 2–10 mm
 AMBROSIA
- 5' Staminate heads congested; bur 10-30+ mm Xanthium strumar-ium
- 2' Pistillate and staminate heads on different plants [dioecious]

Back to page 570

572 of 6039

3796 pages left in this chapter



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Links in keys to accounts.

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Yatsk. et al. (blades adaxially glabrous) and *P. triangularis* subsp. *rebmanii* Winner & M.G. Simpson (blades adaxially sparsely white-mealy), but further study needed to decide if taxonomic recognition warranted.

subsp. viscosa (D.C. Eaton) Yatsk. et al.

Native taxon

LEAF: blade adaxially gen sticky, with \pm dense glands, margin at tip of pinnule gen \pm recurved; lower pinnae 2–5(8) cm; upper pinnae, pinnules on basal side of lowermost pinnae \pm entire to shallowly pinnately lobed.

2*n*=60. Gen shaded, wooded or grassy slopes; < 850 m. SCo, ChI; Baja CA. Exudate chemistry unique in genus; incl morphologically intergrading variants.

««« PTERIS

BRAKE

Plant gen in soil; rhizome erect or short- to long-creeping, scaly or hairy.

LEAF: gen alike, I-4-pinnate, erect-arched; stipe, axes grooved adaxially, grooves from rachis to costa connected; pinnules on basal side of lowermost pinnae more developed (exc *Pteris vittata*).

SPORANGIA: among hair-like structures in continuous, marginal bands; false indusia along segment margins exc at bases, tips, and between lobes, partly covering sporangia, scarious.

 \pm 250–300 spp.: gen trop, subtrop. (Greek: feather, for pinnae, or ancient name for ferns in general) Popular in cult.

- I. Lf 2–4-pinnate [Pteris tremula]
- I' Lf I-pinnate, proximal pinnae minutely serrate or with 2(3) deep lobes that ± resemble pinnules
- 2. Proximal pinnae > others, with I(3) deep lobes; stipe, rachis ± glabrous exc base Pteris cretica

Back to page 1

350 of 7590

11 pages left in this chapter



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 Keys with forward and backward links to other taxonomic levels The Jepson Manual

A Q

Hesperocyparis Bartel & R.A. Price.

««« Callitropsis
nootkatensis (D. Don)
D.P. Little

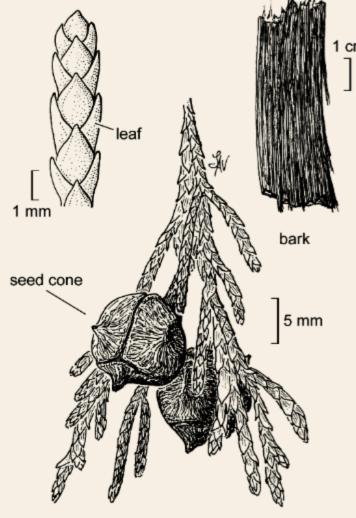
(Plate 137)

ALASKA CEDAR

Tree 20–30 m, pyramidal in youth.

STEM: ultimate 3 orders of shoots in 2-dimensional, pendent clusters; bark fibrous, fissured, peeling, orange-red to gray-brown to purple-brown; ultimate branches I.I–I.8 mm diam, ± 4-sided to flat.

LEAF: opposite, 4-ranked, of 2 kinds, both scale-like, closely appressed, overlapping, green, not glaucous; glands gen obscure; lateral lf tips gen parallel to axis of attachment or diverging.



Callitropsis nootkatensis

lel to axis of attachment Gymnosperms: Cupressaceae

POLLEN CONE: terminal, 2.4-4 mm, 1.3-2.6 mm diam, gen yellow.

SEED CONE: 6-12 mm, spheric, ash-gray; scales gen 4-6; maturing 2nd yr, opening, falling at maturity.

SEED: < 15 per cone, 3–4.6 mm, brown to red-brown, not glaucous, flat, wings gen 2, vestigial, attachment inconspicuous; cotyledons 2.

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Back to page 6136

386 of 7071

57 pages left in this chapter



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LIST OF PLATES

- ooi. Lycophytes: Isoetaceae, Lycopodiaceae, Selaginellaceae. Ferns: Aspleniaceae, Azollaceae, Blechnaceae
- 002. Blechnaceae, Dennstaedtiaceae, Dryopteridaceae, Equisetaceae
- 003. Marsileaceae, Ophioglossaceae, Polypodiaceae, Pteridaceae
- 004. Pteridaceae: Argyrochosma, Aspidotis, Astrolepis, Cheilanthes, Cryptogramma, Notholaena
- 005. Pteridaceae, Thelypteridaceae, Woodsiaceae. Gymnosperms: Cupressaceae
- 006. Cupressaceae: Chamaecyparis, Hesperocyparis, Juniperus, Sequoia, Sequoiadendron
- 007. Cupressaceae, Ephedraceae, Pinaceae
- 008. Pinaceae, Taxaceae
- 009. Nymphaeales: Cabombaceae, Nymphaeaceae. Magnoliids: Aristolochiaceae, Calycanthaceae, Lauraceae, Saururaceae. Ceratophyllales: Ceratophyllaceae
- 010. Eudicots: Acanthaceae, Adoxaceae, Aizoaceae
- oII. Aizoaceae, Amaranthaceae: Sesuvium, Tetragonia, Trianthema, Alternanthera, Amaranthus, Nitrophila
- 012. Amaranthaceae, Anacardiaceae, Apiaceae
- 013. Apiaceae: Angelica, Anthriscus, Apiastrum, Berula, Bowlesia, Cicuta, Conioselinum, Conium, Cyclospermum
- 014. Apiaceae: Cymopterus, Daucus, Eryngium, Foeniculum, Glehnia, Heracleum
- 015. Apiaceae: Ligusticum, Lilaeopsis, Lomatium
- 016. Apiaceae: Lomatium, Oenanthe, Oreonana, Orogenia, Osmorhiza
- 017. Apiaceae: Oxypolis, Perideridia, Podistera, Sanicula, Scandix
- o18. Apiaceae, Apocynaceae
- 019. Apocynaceae: Apocynum, Araujia, Asclepias, Cycladenia, Funastrum, Matelea



Back to page 350 20 of 7590

10 pages left in this chapter

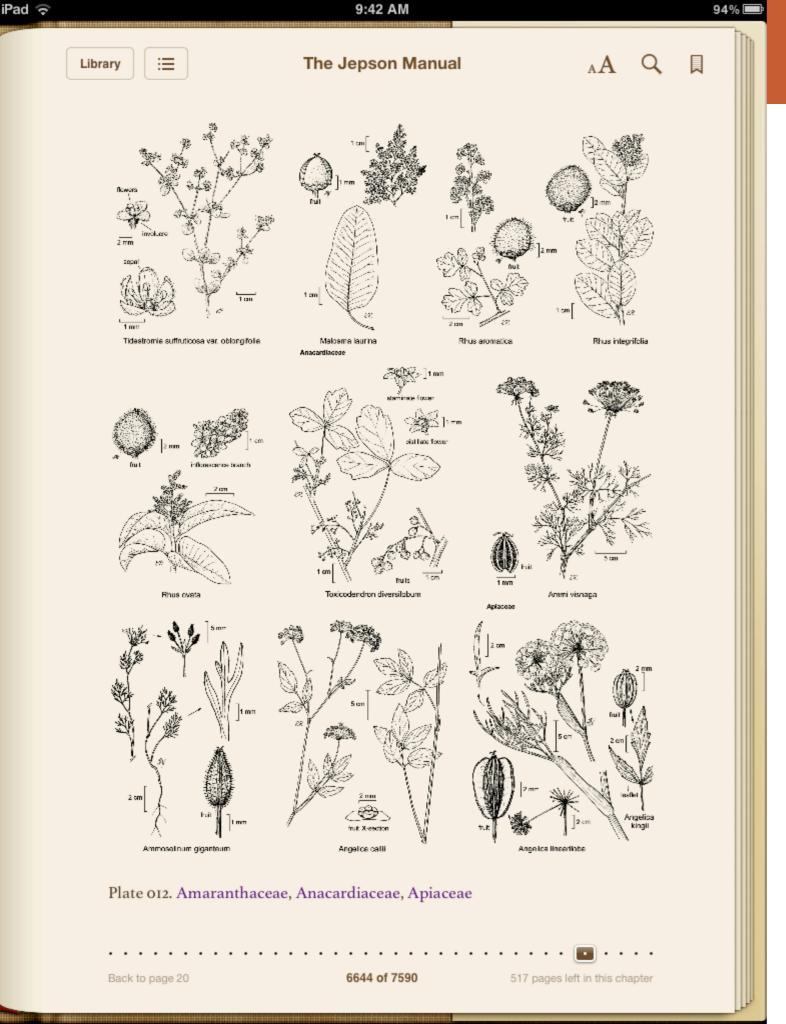


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Ammi visnaga

Ammoselinum giganteum

Angelica callii, A. lineariloba

Malosma laurina

Rhus aromatica, R. integrifolia, R. ovata

Tidestromia suffruticosa var. oblongifolia

Toxicodendron diversilobum

Back to page 20 6645 of 7590

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(Plate 491)

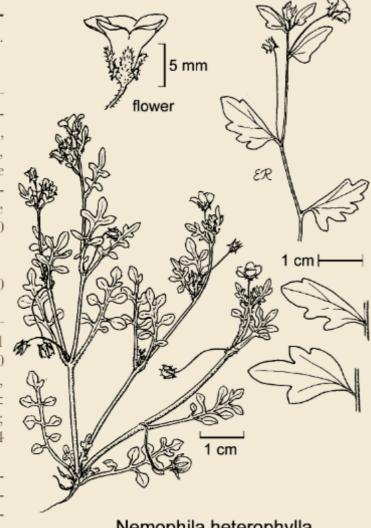
LEAF: lower opposite, 1–4 cm, blade = petiole, oblong to ovate, lobes 5–7, deep, gen round, stalked, gen well separated, entire to 1–3-toothed; upper alternate, ± sessile, blade lanceolate to ovate, lobes 0 or 3–5, entire.

INFLORESCENCE:

 $\begin{array}{ll} {\rm pedicels} \, \leq \, 10 \, {\rm mm}, \, \leq \, 60 \\ {\rm mm \ in \ fr}. \end{array}$

FLOWER: calyx lobes 2–4 mm, appendages < 1 mm in fr; corolla 3–10 mm, 4–12 mm wide, bowl-shaped, white or \pm blue, tube = filaments; anthers < 1 mm; style 2–4 mm.

SEED: 2–5, yellow-brown, smooth or rough-ened. n=9. Forest, chaparral, roadsides, slopes, streambanks, talus; 30–



Nemophila heterophylla

1700 m. NW, CaR, SN, GV, CW; OR. Feb-Jun

Wemophila maculata Lindl.

(Plate 491)

FIVESPOT

LEAF: opposite, petiole ≥ blade; lower blades 8–30 mm, 3–15 mm wide, oblong to ovate, lobes 5–9, entire or 1–3-toothed; upper oblanceolate to spoon-shaped, sessile, tip entire or 3-toothed.

INFLORESCENCE: pedicels stout, 10–20 mm, < 70 mm in fr.

FLOWER: calyx lobes 4–9 mm, appendages 1–4 mm in fr; corolla 8–20 mm, 10–50 mm wide, bowl-shaped to rotate, white with dark veins, dots, purple-spotted at

Back to page 5752

1508 of 6039

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GLOSSARY

One of the main goals of *The Jepson Manual, Second Edition (TJM 2)* is to facilitate plant identification, which often relies on extremely subtle differences in plant characters. As in *The Jepson Manual*, or *TJM* (1993), the terminology used in *TJM 2* is constrained to make the work accessible to a broad audience. About 100 new terms not used in *TJM* (1993) were judged to be of high value for improving precision and brevity of descriptions and are included here. All users are encouraged to routinely consult the glossary, and beginners are encouraged to study the glossary, especially the illustrations, as a way to acquire the basic botanical knowledge needed to identify plants.

abaxial. Side or surface of a structure away from the axis on which the structure is borne (e.g., lower surface of a leaf, outer surface of a petal). (see adaxial)

abundant. Very likely present in appropriate habitats, sometimes forming dense stands (see common, rare, uncommon)

achene. (Figures 10, II, I4) Dry, indehiscent, I-seeded fruit from a I-chambered ovary in which the fruit wall is free from the seed, sometimes winged; often appearing to be a naked seed. I-seeded dry fruit derived from an inferior ovary of > I carpel (e.g., Asteraceae) is sometimes called a cypsela.

acid (acidic). Soil or water with a low pH, often found in habitats such as coniferous forests and bogs where decomposition of plant remains liberates an excess of hydrogen ions.

acroscopic. In ferns, facing or directed toward the tip of the leaf (e.g., on any pinna, acroscopic pinnules are those on the side closest to the leaf tip). (see basiscopic, distal)

acuminate. (Figure 5) Having a long-tapered, sharp tip, the sides concave. (see acute, awl-like)

acute. (Figure 5) Having a short-tapered, sharp tip, the sides convex or straight and converging at less than a right angle. (see acuminate, obtuse)

adaxial. Side or surface of a structure toward the axis on which the structure is borne (e.g., upper surface of a leaf, inner surface of a petal). (see abaxial)

adherent. Sticking to and sometimes appearing fused to another part of like or unlike kind, but separable from it, such as "perianth adherent to fruit." (see appressed, fused)

adventitious. Arising at unusual times or places, such as roots on aerial stems.

aggressive. Growing or spreading rapidly or invasively, outcompeting other plants, difficult to control.

alien. Not native; introduced purposely or accidentally into an area. (see native, naturalized, ruderal,

alkali, alkaline. Soil or water with a high pH (i.e., basic), often found in areas where evaporation concentrates dissolved solutes.

Back to page 19

85 of 7071

29 pages left in this chapter



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Lycophytes

Isoetaceae (Quillwort)

Lycopodiaceae (Club-Moss)

Selaginellaceae (Spike-Moss)

Ferns

Aspleniaceae (Spleenwort)

Azollaceae (Mosquito Fern)

Blechnaceae (Deer Fern)

Dennstaedtiaceae (Bracken)

Dryopteridaceae (Wood Fern)

Equisetaceae (Horsetail)

Marsileaceae (Marsilea)

Ophioglossaceae (Adder'S-Tongue)

Polypodiaceae (Polypody)

Pteridaceae (Brake)

Salviniaceae (Floating-Fern or Water-Spangle)

Thelypteridaceae (Thelypteris)

Woodsiaceae (Cliff Fern)

Gymnosperms

Cupressaceae (Cypress)

Ephedraceae (Ephedra)

Pinaceae (Pine)

Taxaceae (Yew)

Nymphaeales

Cabombaceae (Watershield)

Nymphaeaceae (Waterlily)

Magnoliids

Aristolochiaceae (Pipevine)



Back to page 195

21 of 7071

6 pages left in this chapter



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INDEX

The following index includes all common names, scientific names of families and genera, and synonyms used in *The Jepson Manual, Second Edition*. It does not include scientific names of accepted species or infraspecific taxa, which are arranged alphabetically in the text (within the genus or species to which they belong). Italics are not used for scientific names of genera or species in the index. The index applies only to contents of the taxonomic treatments; introductory sections and the key to families are not referenced here.

Page numbers for all common names, synonyms, and miscellaneous entries are given in regular type. Accepted scientific names of families are followed by the page number (in **bold type**) of the beginning of the family description. Scientific names of described genera are often followed by three or more page numbers. The first, in regular type, refer(s) to the page(s) where the genus appears in a key to genera within a family treatment. Next, a single **bold type** entry indicates the page on which the generic description begins. Third, there may be one or more page numbers in *italics* that refer to illustration plate(s) for the genus.

Aaron's beard

Abies

concolor

var. concolor

var. lowiana

lowiana

magnifica

Back to page 285

6683 of 7071

386 pages left in this chapter



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MAGNOLI

Terrestrial fl plants, often scented from ether spirally arranged or in 3s; p

««« ARISTOLOC

PIPEVINE FAN

Michael R. Mesler &

Per, woody vine, [shrub], rhizomed, aromatic STEM: branched, occ ± underground.

LEAF: simple, basal, cauline, or arising fro cordate, entire.

INFLORESCENCE: fl gen I, axillary or termi FLOWER: bisexual, radial or bilateral; sepa stamens gen 6 or 12, free or fused to style; pior, chambers gen 6.

FRUIT: gen capsule.

SEED: many.

5–8 genera, ± 500 spp.: mainly trop, warr Asarum, Saruma). [Neinhaus et al. 2005 Pla Editors: Douglas H. Goldman, Bruce G. Bald

I. Woody vine; fl bilateral ARISTOLO

1' Per from rhizome; fl radial ASARU

•

Back to page 90 430 of 7590

Q Hypanthium



Glossary, Page 67

...herry, apple, the latter derived largely from the **hypanthium**); aggregate and multiple fruits develop from ovaries of one and mor...

Glossary, Page 69

hypanthium (hypanthia).

Glossary, Page 69

...e fused lower portions of the perianth and stamens (i.e., to the **hypanthium**), to the extent that these structures appear to aris...

Glossary, Page 74

...t, such as an apple or pear; derived from a hypanthium (represented as outer fleshy material and skin) surrounding and ± fuse...

Glossary, Page 79

...ower portions of these structures (i.e., free from the **hypanthium**), to the extent that these structures appear to arise at its bas...

Glossary, Page 79

...ese structures appear to arise at its base, and it appears to arise from the top of the receptacle. (see **hypanthium**, inferior ovary)

Key to Groups, Page 156

...gen falling as a unit [corolla of free petals fused to a **hypanthium** should be keyed under 19']

Key to Groups, Page 156

...ttached and gen falling singly (sometimes individually joined to a **hypanthium**; in a few families ± joined and falling in groups, but...

Group 8, Page 188



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The Jepson Manual



Jesús Valdés-Reyna

Ann, mat-forming.

STEM: stolon-like, 2–8 st to 15 cm.

LEAF: mostly basal; sh rolled, occ flat or folded

INFLORESCENCE:

clustered, subtended by **SPIKELET**: laterally of

spike•let | 'spīklit |

noun Botany

the basic unit of a grass flower, consisting of two glumes or outer bracts at the base and one or more florets above.

terminal florets sterile; glumes < spikelet, 1-veined, wawned; lower glumes gen present, upper absent or reduced on terminal spikelet; lemma pubescent or scabrous, membranous or leathery, 3-veined, lateral vein tips short-awned, tips ± 2-lobed; palea glabrous, smooth; anthers 2 or 3, yellow; styles elongate, stigmas 2 or 3. **FRUIT**: dorsally compressed. 5 spp.: w hemisphere. (W. Munro, English agrostologist, 1818–1880) [Valdés-Reyna 2003 FNANM 25:51–52] Closest relatives are thought to be *Blepharidachne* and *Dasyochloa*, both stoloniferous, mat-forming spp. with lfy-bracted panicles. *Munroa* differs from both in its ann habit.

Munroa squarrosa (Nutt.) Torr.

(Plate 1473)

FALSE BUFFALOGRASS

Plant mat-like, gen < 20 cm wide.

STEM: 3–15(30) cm, slender, many-branched, scabrous, often minutely puberulent. **LEAF**: ligule 0.5(1) mm; blade 1–5 cm, 1–2.5 mm wide.

SPIKELET: 6–8(10) mm, florets 3–5; glumes of lower 1–2 spikelets subequal, 2.5–4.2 mm, narrow, 1-veined, acute; glumes of upper spikelets unequal, lower reduced or 0 in terminal spikelet; lemma scabrous, lanceolate, lateral veins hairy-tufted near middle, tip awned, awn 0.5–2 mm, stout, scabrous; anthers 1–1.5 mm. 2*n*=16. Open, sandy, gravelly or rocky places; 1500–1800 m. DMtns (Clark Mtn Range); to Great Plains, TX, n Mex. Aug—Oct

Rare and/or endangered taxon

(((((NEOSTAPFIA

John R. Reeder

1 sp. (O. Stapf, British botanist, 1857-1933) [Reeder 2003 FNANM 25:294-295]

Back to page 570

5005 of 6039

178 pages left in this chapter

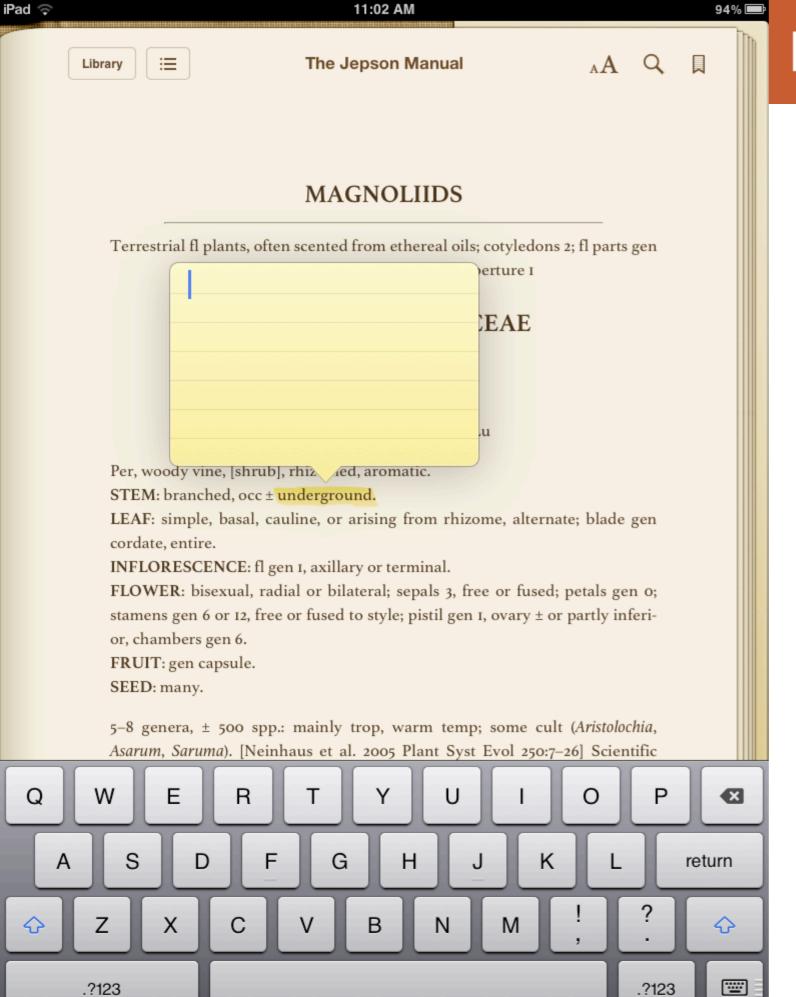


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Dictionary, also word search





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Back to page 62

The Jepson Manual



CONVENTIONS USED IN THE JEPSON MANU-AL, SECOND EDITION

Producing a field-portable manual on the California flora that is accessible to a wide audience requires balancing somewhat competing interests. For example, if technical terms are reduced in the interest of user-friendliness, more words are generally necessary to convey descriptive information and the book must be larger. In part to balance the increase in new plant taxa for California, *The Jepson Manual, Second Edition (TJM 2)* includes more technical terms — about 100 additional glossary entries — than were included in *The Jepson Manual*, or *TJM* (1993), and has continued other space-saving conventions (also see Glossary introduction). These other conventions include a concise, abbreviation-rich format that is described here (also see Abbreviations and Symbols). Those familiar with *TJM* (1993) will find many of the same conventions in *TJM 2* but also some that might not be understood without the explanation provided below.

General Conventions

Comprehensiveness. A primary goal of TfM 2 was to include all native and naturalized vascular plant taxa in California that are accepted by TJM 2 authors as scientifically sound (also see Philosophy). Natives include both endemic and nonendemic, indigenous taxa. Naturalized plants are defined here as aliens growing in wild or approximately wild conditions and reproducing either sexually or asexually. Aliens that occur in such conditions but are not reproducing and therefore not persisting and becoming established parts of the flora are considered here to be waifs. Recently documented waifs are included in the keys (with names in square brackets) but their descriptions appear only online, in the Jepson eFlora (see Associated Electronic Resources). Waifs that have not been collected recently (in the last half-century or so) are not treated at all in TJM 2, under the assumption that such "historical waifs" have not persisted to become established parts of the flora. Also excluded here, in general, are taxa represented in California by non-reproducing but longpersisting individuals (e.g., planted fruit trees) or clones. Alien taxa occurring outside cultivation but only in highly modified environments, such as urban, suburban, or agricultural lands, are not included in T_1M2 .

The establishment status of alien plant taxa in California is dynamic and sometimes questionable based on the best available evidence. Extensive consultation with weed scientists and other botanists focused on naturalized taxa in California helped greatly to improve treatment here of aliens. Nonetheless, some fully naturalized taxa as well as waifs probably have not been included in *TJM* 2; documentation was lacking to substantiate some reports that were considered during treatment prepa-

49 of 6039

12 pages left in this chapter



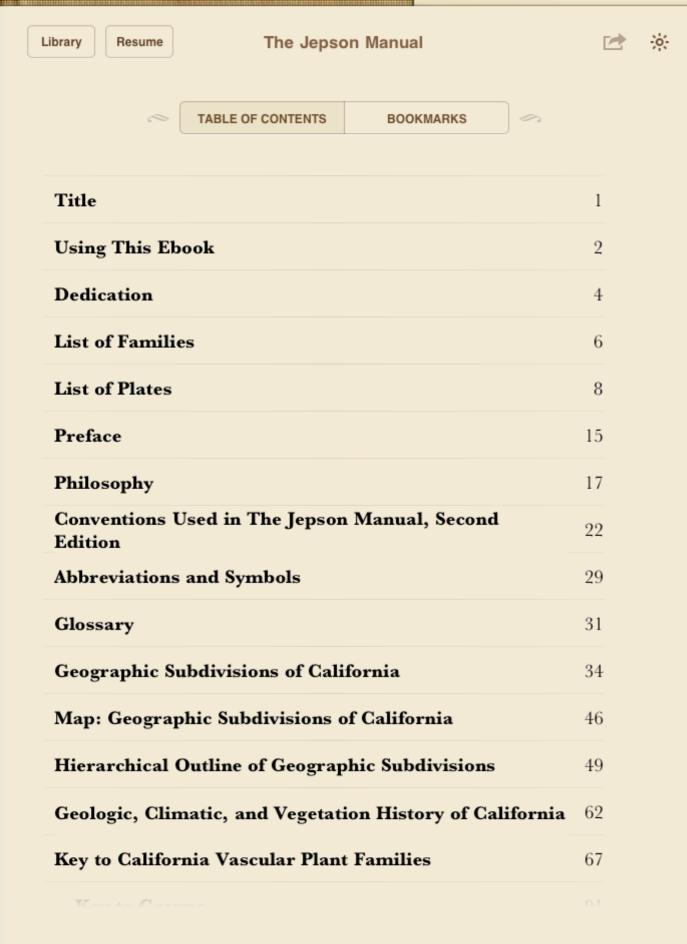
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- 2´ Outer fls sterile
- 4. Distal phyllary margin expanded as a spiny-margined, fringed, or irregularly toothed appendage CENTAUREA (G2,4)
- 4´ Distal phyllary margin entire, tapered smoothly to tip-spine VO-LUTARIA (G4)
- 1' Phyllaries ± equal or weakly graduated in 1-3 series
- 5. Fr 10–15 mm PALAFOXIA (G7)
- 5' Fr 2-9 mm
- 6. Phyllary margin thin, ± scarious, brown to purple HYMENOTHRIX (G7)
- 6' Phyllary margin not or scarcely scarious, variously colored
- 7. Lvs opposite Arnica discoidea
- 7' Lvs alternate
- Pappus scales entire or fringed; If entire to ± deeply I-2-pinnately lobed CHAENACTIS (G7)
- 8' Pappus scales dissected into bristles; If sharply dentate or with a few short, sharp lobes TRICHOPTILIUM (G6, 7)

~~~ Group 2

Heads disciform or unisexual; fls of 2 kinds or of 1 unisexual kind; corollas of pistillate or sterile fls inconspicuous

- I. Pistillate and staminate fls in different heads
- 2. Pistillate and staminate heads on same plant [monoecious]
- 3. Subshrub or shrub (to small tree) ²AMBROSIA
- 3' Herb
- 4. St armed with 3-branched spines Xanthium spinosum
- 4' St unarmed
- 5. Staminate heads well-spaced in long terminal infl; bur 2–10 mm ²AMBROSIA
- 5' Staminate heads congested; bur 10-30+ mm Xanthium strumarium
- 2' Pistillate and staminate heads on different plants [dioecious]

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Back to page 6644

677 of 7590

4896 pages left in this chapter

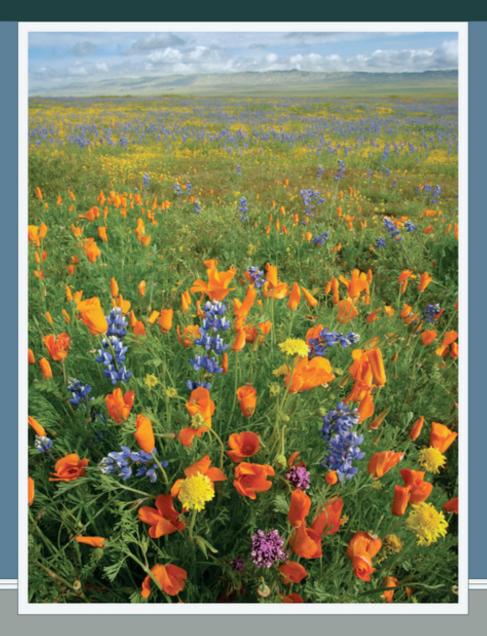


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