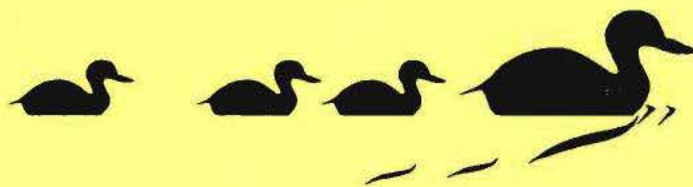


A flora of

**Dales Lake
Ecological Reserve**



California Department of Fish and Game

A FLORA OF DALES LAKE ECOLOGICAL RESERVE

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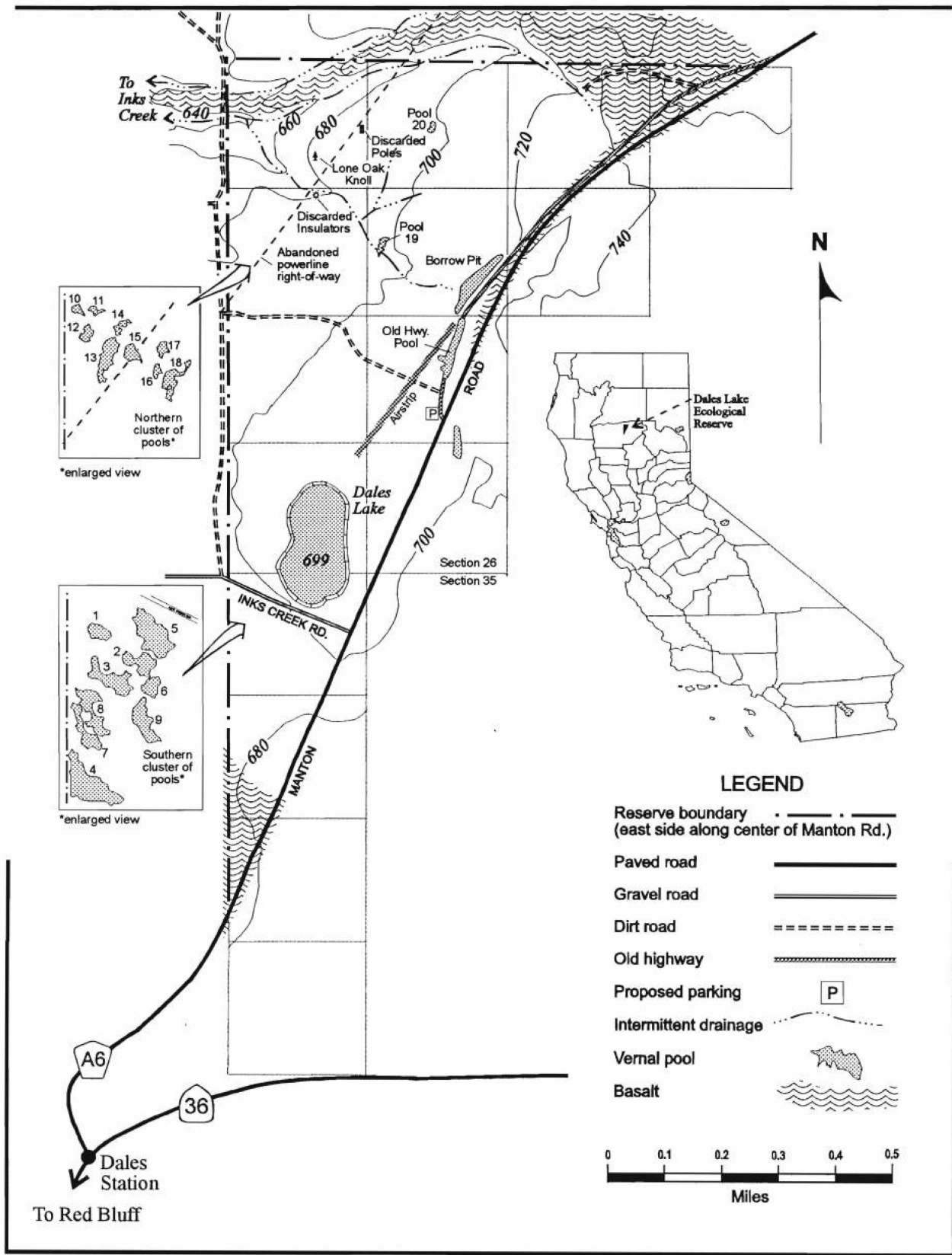


FIGURE 1. Map of Dales Lake Ecological Reserve. The grid consists of 0.25 mile squares (1/4 section of 1/4 section).

INTRODUCTION

Dales Lake Ecological Reserve is located in the Cascade Range foothills of Tehama County northeast of Red Bluff, California (Figure 1). The 366 acre reserve consists of portions of T29N R2W Sections 26 and 35 and was formerly a part of the adjacent Denny Land and Cattle Company. The land was acquired by the State of California in 1993 and is being managed by the Northern California-North Coast Regional Office of the California Department of Fish and Game in Redding. The reserve, which was formerly used as winter range for livestock, is now fenced to exclude cattle from adjacent range land.

Most of the reserve is a grassy plain consisting of low mima mounds interspersed with drainages and vernal wetlands on thinner soils. Dales Lake, a large vernal pool and centerpiece of the reserve, lies in a deeper depression on this plain. A series of pools constructed by the Pacific Gas and Electric Company in 1994 as mitigation for environmental damage incurred during the construction of a pipeline to the west of the reserve also lies on the grassy plain. On the north, a wooded ridge crosses the northeast corner and then loops back through the northwest corner of the reserve. A narrow belt of this woodland also extends southward along Manton Road.

Vegetation is closely correlated to two geological formations occurring on the reserve. The grassy plain lies on a non-marine alluvial deposit laid down during the lower Pleistocene (Strand, 1962). A layer of stony Tuscan loam lies on top of a layer of conglomerate (fanglomerate) consisting of cemented volcanic detritus derived from surrounding Tuscan Formation mudflows. The fanglomerate forms a hardpan impervious to water, resulting in waterlogged soils and the development of vernal pools and wetlands during the rainy season. The nature of the hardpan layer can best be appreciated at profiles created by the removal of gravel at the borrow pit and at eroded cutbanks along the intermittent stream draining northwestward from the borrow pit. The hardpan layer has been very effective in preventing the growth of trees and shrubs in this portion of the reserve. A few cottonwoods grow in the alluvium of the borrow pit below the level of the fanglomerate, and a single blue oak grows on a knoll of deeper soil in the northwest corner of the reserve (Figure 1).

The wooded ridge lies on a geologically recent basalt flow crossing the north end of the reserve and extending southward in a narrow strip along Manton Road to about the level the Old Highway Pool (Figure 1). The lack of a layer of hardpan on this ridge has allowed trees and shrubs to grow, resulting in brushy to open woodland. The south tip of the reserve is also covered with a thin sheet of basalt (Figure 1), but an underlying hardpan here has excluded trees and shrubs.

The climate of the area is "Mediterranean, warm summer," which applies to all of the Sacramento Valley and adjacent foothills. Dry hot summers are followed by cool, wet winters. Rainfall (based upon records at Red Bluff) averages 22 inches per year, the rainy season usually running from October to April. Our survey was conducted during an exceptionally wet year (1995), with 46 inches of rain and significant storms extending into May and early June. As a result, the spring wildflower display was outstanding, and Dales Lake still had some standing water in early August.

The survey forming the basis for this flora was conducted from early February into early September, 1995 (25 visits). During the study, 338 species and subspecific taxa of vascular plants distributed among 207 genera in 62 families were documented from within the boundaries of the reserve (Table 1). Fourteen additional species were noted on the east side of Manton Rd. These peripheral plants will be found in the annotated plant list but are not included in the data in Table 1. No study of this type is ever complete—additional plants are undoubtedly still to be found on the reserve.

TABLE 1. Numerical analysis of the vascular flora of Dales Lake Ecological Reserve.

FAMILIES	GENERA	SPECIES	SUBSPECIES AND VARIETIES	TOTAL TAXA	NON-NATIVE	CNPS LISTED
62	207	328	10	338	98 (29%)	10

Non-native species make up 29 percent of the reserve flora. These aliens are typically weedy and many are restricted to disturbed sites such as along Manton Road (including the abandoned section of roadway), along Inks Creek Road, and on or near the berms of the pools constructed by the Pacific Gas and Electric Company. Except for non-native grasses, the flora of the reserve away from these disturbed sites consists mostly of native species. The most noxious weed on the reserve is probably medusa-head (*Taeniatherum caput-medusae*) which, in the absence of grazing, forms a thick thatch that effectively smothers native plants that might otherwise grow in the area.

Ten plants growing on the reserve are listed in the *CNPS Inventory of Rare and Endangered Vascular Plants of California* (Table 2). Five of these are in List 1B, plants that are rare, threatened, or endangered in California and

elsewhere. Boggs Lake hedge-hyssop (*Gratiola heterosepala*) and slender orcuttia (*Orcuttia tenuis*) are also State listed endangered, and slender orcuttia is proposed for listing as Federally threatened. Sanford's arrowhead (*Sagittaria sanfordii*) and legenere (*Legenere limosa*) appear to be restricted to Dales Lake. The other species have a wider distribution on the reserve (Figure 2). Woolly meadowfoam (*Limnanthes floccosa* ssp. *floccosa*) is widespread on the reserve. It might more realistically be assigned to CNPS List 4 rather than List 2, since it is quite common in the foothills bordering the North Valley, and it does quite well in disturbed habitats such as roadside drainages.

TABLE 2. Rare plants growing at Dales Lake Ecological Reserve.

	CNPS LISTS
<i>Agrostis hendersonii</i> Hitchc., List 3.	
<i>Astragalus pauperculus</i> Greene, List 4.	1B Rare, threatened, or endangered in California and elsewhere.
<i>Gratiola heterosepala</i> Mason & Bacig., List 1B, CE.	2 Rare, threatened, or endangered in California, but more common elsewhere.
<i>Legenere limosa</i> (Greene) McVaugh, List 1B.	3 Plants about which we need more information—a review list.
<i>Limnanthes floccosa</i> Howell ssp. <i>floccosa</i> , List 2.	4 Plants of limited distribution—a watch list.
<i>Navarretia heterandra</i> H.Mason, List 4.	
<i>Orcuttia tenuis</i> Hitchc., List 1B, CE, PT.	
<i>Paronychia ahartii</i> Ertter, List 1B.	
<i>Psilocarphus tenellus</i> Nutt. var. <i>globiferus</i> (Bertero ex DC.) Morefield, List 4.	STATE AND FEDERAL LISTS
<i>Sagittaria sanfordii</i> Greene, List 1B.	CE State listed, endangered. PT Federally proposed, threatened.

Two additional noteworthy plants grow on the reserve. One is a perennial bunch grass, *Aristida purpurea* var. *wrightii*, which is native to the southwestern United States including the desert areas of southern California. At least seven clumps of this grass grow on a basalt outcrop at the northeast corner of the reserve. How it arrived here is unknown. A second even more interesting plant is a European clover, *Trifolium retusum*, which is locally abundant at the junction of the dirt road and old highway on the basalt ridge crossing the northeast corner of the reserve. According to Randall Morgan (pers. com., 1995), this clover is certainly a new record for California and perhaps for the United States.

The flowering interval is indicated for most plants. Each month is divided into three parts: early (day 1 through 10), mid (day 11 through 20) and late (day 21 onward), and the onset of flowering is indicated accordingly. The end of the flowering period is indicated only by the last month in which flowers were noted. In a few groups, e.g., grasses, sedges, and rushes where anthesis is not always obvious, the date indicates the presence of a well-developed inflorescence. Flowering periods can be expected to vary somewhat from year to year, depending upon the amount and distribution of rainfall during the growing season. Many of the plants flowering in September on our last visit will probably continue to bloom until the first killing frost of autumn.

Nomenclature is based upon *The Jepson Manual* (Hickman 1993). Some synonyms used in older floras are indicated in brackets. Author abbreviations follow Brummit and Powell (1992) and may deviate from those in *The Jepson Manual*. There are no accepted standards for common plant names. When available, common names correspond to those in *The Jepson Manual* and in the 5th edition of the *CNPS Inventory* (Skinner and Pavlik 1994). The remaining common names are mostly those of Abrams (1923-60). Words describing the abundance of a plant such as rare, common, abundant, etc. are entirely subjective.

Voucher specimens of most of the plants found during this study are deposited in the herbarium of California State University, Chico (CHSC) and/or in the herbarium of the Redding Office of the California Department of Fish and Game. Vouchers are indicated by collector(s) and collection number (e.g., *Oswald & Ahart 6671*).

Keys have been modified from various sources and are simplified as much as possible. Some plants are included in the keys with the notation "at Dales Lake?"—these are plants that are not documented for the reserve but are known to grow in similar habitat in the Cascade foothills bordering the north side of the Sacramento Valley.

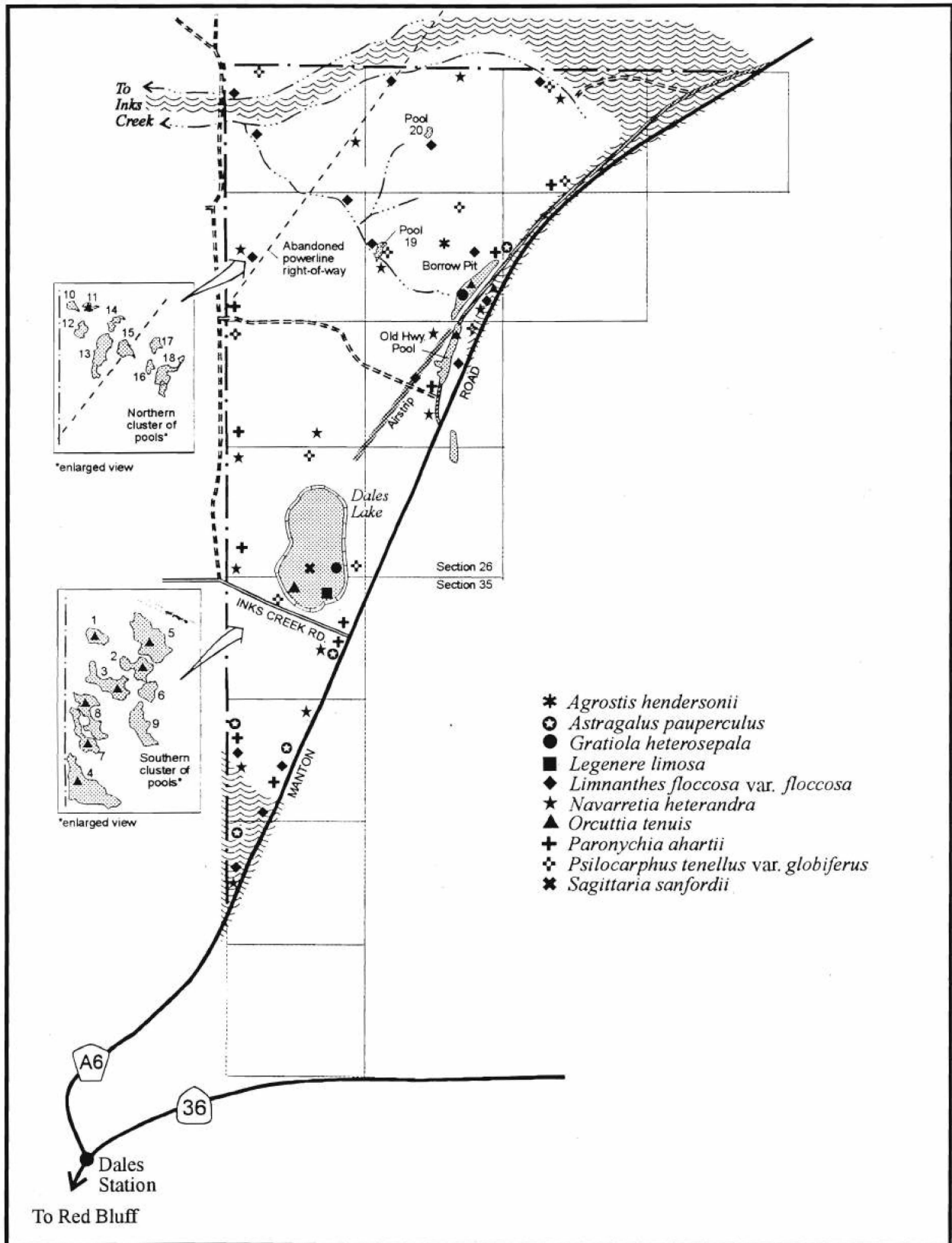


FIGURE 2. Distribution of rare plants at Dales Lake Ecological Reserve. Spots do not indicate number of individuals but rather the general area in which small to large populations were seen.

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ACKNOWLEDGMENTS

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ANNOTATED PLANT LIST¹

KEY TO MAJOR PLANT GROUPS

- 1 Plants without seeds or flowers, reproducing by 1-celled spores borne in sporangia..... FERNS AND FERN ALLIES
- 1 Plants with seeds produced in cones or by flowers.
 - 2 Plants without flowers; seeds borne on cone scales or in berry-like structures..... GYMNOSPERMS
 - 2 Plants producing flowers; seeds borne inside a fruit developing from the ovary of the flower.
 - 3 Leaves net-veined; flowers usually on a plan of 4 or 5; embryonic leaves 2..... DICOT FLOWERING PLANTS
 - 3 Leaves mostly parallel-veined; flowers mostly on a plan of 3; embryonic leaf 1..... MONOCOT FLOWERING PLANTS

FERNS AND FERN ALLIES

KEY TO FAMILIES

- 1 Plants either terrestrial and moss-like or, if rooted in water, wet earth, or drying mud, with a sporangium on the expanded basal portion of grass-like leaves.
 - 2 Plants moss-like, with small scale-like leaves..... *Selaginellaceae*
 - 2 Plants grass-like, bearing a sporangium on the expanded basal portion of each leaf..... *Isöetaceae*
- 1 Plants either fern-like or rooted in shallow water and later on drying mud, if the latter, with 4-foliate or thread-like leaves and bearing pea- or bean-shaped sporocarps at the base of the plant.
 - 3 Plants terrestrial and fern-like..... *Polypodiaceae*
 - 3 Plants growing in shallow water or becoming terrestrial during dry-down; leaves either resembling a 4-leaved clover or thread-like and lacking a blade..... *Marsileaceae*

ISÖETACEAE – QUILLWORT FAMILY

- 1 Corn 2-lobed..... *Isöetes howellii*
- 1 Corn 3-lobed.
 - 2 Plants in vernal moist soil of uplands and in shallow depressions and drainages; leaves rigid, almost brittle; megaspores averaging more than 0.35 mm in diameter..... *Isöetes nuttallii*
 - 2 Plants of vernal pools; leaves pliant; megaspores averaging less than 0.35 mm in diameter..... *Isöetes orcuttii*

Isöetes howellii Engelm. – HOWELL'S QUILLWORT.

Locally abundant perennial in a roadside pool receiving water from the culvert under Manton Rd. east of the borrow pit (Oswald & Ahart 6671: SE¼ NW¼ Sec. 26). A few plants also grow in the Old Hwy. Pool. Spring.

Isöetes nuttallii A. Braun ex Engelm. – NUTTALL'S

QUILLWORT. Common but inconspicuous herbaceous perennial near vernal pools and vernal wet drainages. It is also common but easily overlooked in grassy upland (Oswald & Ahart 6563: NE¼ SW¼ Sec. 26, upland along the unimproved road between the old highway and the airstrip). Late winter and spring.

Isöetes orcuttii A. A. Eaton – ORCUTT'S QUILLWORT.

A quillwort, at first submersed but later found on mud at dry-down, is locally abundant in the borrow pit (Oswald & Ahart 6667: SE¼ NW¼ Sec. 26). These plants, together with others found on the bottom of pools (e.g., Oswald & Ahart 7154: Dales Lake: SW¼ SW¼ Sec. 26 and Oswald & Ahart 6730: NW¼ NW¼ Sec. 26, standing water of the intermittent stream on the south side of the basalt ridge at the west boundary), may correspond to Orcutt's quillwort, but the morphological separation of *I. orcuttii* and *I. nuttallii* is not at all sharp. Spring.

¹ Non-native plants are indicated by an italic, non-serif typeface (*Bromus tectorum*); plant names that appear in non-italic boldface (**Orcuttia tenuis**) are listed in the 5th edition of the CNPS Inventory (Skinner and Pavlik, 1994).

SELAGINELLACEAE – SPIKE-MOSS FAMILY

Selaginella hansenii Hieron. – HANSEN'S SPIKE-MOSS. Locally abundant perennial on basalt outcrops and sometimes also found on eroded fanglomerate (Oswald & Ahart 6485: NW¼ NE¼ Sec. 26, basalt ridge crossing the northeast corner of the reserve). It is active during winter and spring (sporulating in Mid Feb.), becoming dormant during dry weather.

MARSILEACEAE – MARSILEA FAMILY

- 1 Leaves thread-like, without an expanded blade..... *Ptilularia americana*
- 1 Leaves with a slender petiole and 4-leaved clover-like blade..... *Marsilea vestita*

Marsilea vestita Hook. & Grev. ssp. *vestita* – HAIRY PEPPERWORT. Common along the margin of deeper ponds (Oswald & Ahart 6850: SE¼ NW¼ Sec. 26, at the borrow pit; also in Dales Lake). During winter and early spring, pepperwort can be recognized by its floating clover-like leaves. Plants become terrestrial at dry-down, resembling *Oxalis*. Winter and spring.

Ptilularia americana A. Braun – AMERICAN PILLWORT. Common but inconspicuous grass-like plant growing in vernal pools and in vernal flooded ditches and depressions, persisting for a period of time on mud as the habitat dries (Oswald & Ahart 6569: NW¼ SW¼ Sec. 26, drying bed of a shallow wetland along the unimproved road between the airstrip and the west boundary). The plant can be readily identified by its basal, pea-like sporocarps once it is dug out of the mud. Winter and spring.

POLYPODIACEAE – FERN FAMILY

- 1 Sporangia covering the entire underside of the leaf segments..... *Pentagramma triangularis*
- 1 Sporangia located under the inrolled margin of the leaf segments..... *Pellaea mucronata*

Pellaea mucronata (D. C. Eaton) D. C. Eaton var. *mucronata* – COMMON BIRD'S-FOOT FERN. Common on basalt outcrops (Oswald & Ahart 6495: NW¼ NE¼ Sec. 26, along the old highway near the northeast corner of the reserve). Active during the wet season.

Pentagramma triangularis (Kaulf.) Yatsk., Windham, & E. Wollenw. ssp. *triangularis* – GOLD-BACKED FERN. Common on basalt outcrops, in basalt cobbles, and around boulders on alluvial fan deposits (Oswald & Ahart 6643: NW¼ NE¼ Sec. 26, among basalt rocks bordering the old highway on the south side of the basalt ridge). Active during the wet season. [*Pityrogramma triangularis* (Kaulf.) Maxon]

GYMNOSPERMS

KEY TO FAMILIES

- 1 Leaves long and linear, occurring in clusters; seeds borne in a woody cone..... *Pinaceae*
- 1 Leaves scale-like, thickly covering the branches; seeds borne in a fleshy, berry-like "cone"..... *Cupressaceae*

CUPRESSACEAE – CYPRESS FAMILY

Juniperus californicus Carrière – CALIFORNIA

JUNIPER. A single small shrub grows on the north edge of the basalt outcrop crossing the northwest corner of the reserve (Oswald & Ahart 6488: NW¼ NW¼ Sec. 26).

PINACEAE – PINE FAMILY

Pinus sabiniana Douglas ex D. Don – GRAY PINE.

Common on the basalt ridge crossing the northeast corner of the reserve (Oswald & Ahart 6859: NE¼ NE¼ Sec. 26).

DICOT FLOWERING PLANTS

KEY TO FAMILIES

- 1 Petals lacking or not evident (calyx sometimes petal-like).
- 2 Plants parasitic on branches of trees..... *Viscaceae*
- 2 Plants not parasitic.
- 3 Woody trees, shrubs, or vines.
- 4 Climbing vine with pipe-shaped flowers..... *Aristolochiaceae*
- 4 Trees or shrubs.
- 5 Calyx none, the male flowers subtended by bracts; fruit a capsule, the seeds with long, cottony hairs..... *Salicaceae*
- 5 Calyx present in male flowers; fruit an acorn..... *Fagaceae*
- 3 Herbaceous plants, sometimes slightly woody at the base only.
- 6 Aquatic plants, growing more or less submerged or on wet mud as the water level drops..... *Callitricheaceae*
- 6 Land plants, sometimes growing in wet places.
- 7 Sepals absent; flowers male or female, borne in clusters surrounded by an involucre resembling a perianth, capsule 3-lobed; sap milky..... *Euphorbiaceae*
- 7 Sepals present.
- 8 Ovary enclosed in or seated in a floral tube that bears the stamens and sepals..... *Rosaceae* (Aphanes)
- 8 Ovary not enclosed in a floral tube.
- 9 Style and stigma single..... *Euphorbiaceae* (Eremocarpus)
- 9 Style and stigmas more than 1.
- 10 Ovary more than 1-chambered..... *Molluginaceae*
- 10 Ovary 1-chambered.
- 11 Ovules or seeds more than 1; fruit a capsule; leaves opposite..... *Caryophyllaceae* (Sagina)
- 11 Ovule or seed solitary; fruit mostly an achene or utricle.
- 12 Flowers, at least the female, borne in a tubular or bell-shaped involucre..... *Polygonaceae* (Chorizanthe)
- 12 Flowers not borne in an involucre.
- 13 Leaves with evident stipular sheaths above each node..... *Polygonaceae*
- 13 Leaves without stipular sheaths.
- 14 Calyx 6-cleft, subtended by a 2-lobed bract that becomes enlarged and reticulate in fruit.. *Polygonaceae* (Pterostegia)
- 14 Calyx lobes or sepals 3-5.
- 15 Leaves opposite; fruit a hard, 1-seeded utricle..... *Caryophyllaceae* (Scleranthus)
- 15 Leaves alternate.
- 16 Bracts subtending the flowers not scarious; plants mealy, glandular-pubescent, or glandular-resinous..... *Chenopodiaceae*
- 16 Bracts subtending the flowers scarious; plants not mealy, glandular-pubescent, or glandular-resinous..... *Amaranthaceae*
- 1 Petals present, evident.
- 17 Petals separate or pea-like.
- 18 Stamens numerous, more than twice as many as petals.
- 19 Ovary superior.
- 20 Sepals 2 (may be joined to form a pointed cap).
- 21 Plants ± fleshy; sepals persistent..... *Portulacaceae*
- 21 Plants not fleshy; sepals shed at flowering..... *Papaveraceae*
- 20 Sepals more than 2.
- 22 Stamens united into a tube around the pistil..... *Malvaceae*
- 22 Stamens not united into a tube.
- 23 Leaves opposite..... *Hyssericaceae*
- 23 Leaves alternate..... *Ranunculaceae*
- 19 Ovary partly or wholly inferior (represented at Dales Lake?)..... *Loasaceae*
- 18 Stamens fewer, not more than twice as many as the petals.
- 24 Pistils more than 1, nearly or quite separate.
- 25 Plants fleshy, at least the leaves so..... *Crassulaceae*
- 25 Plants not fleshy; small plants with a long tail-like spike of pistils..... *Ranunculaceae* (Myosurus)
- 24 Pistil 1, of 1 or more carpels that are more or less united.
- 26 Plants trailing or climbing by means of tendrils; leaves palmately veined..... *Cucurbitaceae*
- 26 Plants not climbing by means of tendrils or if with tendrils, the leaves not palmately veined.
- 27 Styles 2-5, separate to near the base or fused in lower third.
- 28 Plants well-developed shrubs..... *Anacardiaceae*
- 28 Plants herbaceous annuals or perennials.
- 29 Plant a submerged aquatic or growing on wet mud as the habitat dries..... *Elatinaceae*
- 29 Plant terrestrial.
- 30 Ovary more or less inferior.
- 31 Ovules solitary in each cavity of the ovary; fruit dry, eventually splitting into 2 carpels (mericarps)..... *Apiaceae*
- 31 Ovules several in each cavity of the ovary; fruit a capsule, not splitting into mericarps..... *Saxifragaceae*
- 30 Ovary clearly superior.
- 32 Sepals 2..... *Portulacaceae*
- 32 Sepals 3 or more; plants not fleshy.
- 33 Ovary mostly 1-celled..... *Caryophyllaceae*
- 33 Ovary 2-5 celled (represented at Dales Lake?)..... *Linaceae*
- 27 Style 1, sometimes more or less divided at the apex.
- 34 Ovary inferior..... *Onagraceae*
- 34 Ovary superior, but sometimes appearing inferior because it is enclosed in (but not fused to) the floral tube.
- 35 Plants well developed shrubs or trees.
- 36 Flowers rose-purple, pea-like, fruit a legume..... *Fabaceae* (Cercis)
- 36 Flowers whitish, not pea-like.
- 37 Fruit a leathery capsule with a single large, nut-like seed..... *Hippocastanaceae*
- 37 Fruit a dry 3-lobed capsule or a 3-stoned drupe..... *Rhamnaceae*
- 35 Plants herbaceous.
- 38 Flowers definitely irregular.
- 39 Flowers pea-like, fruit a legume..... *Fabaceae*
- 39 Flowers pansy-like; fruit a capsule..... *Violaceae*
- 38 Flowers nearly or quite regular.
- 40 Leaves compound, leaflets entire (represented at Dales Lake?)..... *Zygophyllaceae*
- 40 Leaves simple or if compound, the leaflets toothed.
- 41 Ovary appearing inferior (actually superior and free in floral tube)..... *Lythraceae*
- 41 Ovary distinctly superior.
- 42 Sepals and petals 4..... *Brassicaceae*
- 42 Sepals and petals 5.
- 43 Stipules none; carpels nut-like, without a tail in fruit..... *Limnanthaceae*
- 43 Stipules scarious; carpels tailed in fruit..... *Geraniaceae*
- 17 Petals more or less fused, often markedly grown together, not pea-like.
- 44 Ovary inferior or partly so.
- 45 Stamens united by the anthers.
- 46 Plants bearing tendrils; leaves palmately veined..... *Cucurbitaceae*
- 46 Plants lacking tendrils.
- 47 Flowers in involucre heads, stamens fused to the corolla..... *Asteraceae*
- 47 Flowers not in involucre heads, stamens free from corolla..... *Campanulaceae*
- 45 Stamens distinct.
- 48 Leaves alternate; flowers regular..... *Campanulaceae*
- 48 Leaves opposite or whorled.
- 49 Stamens 1-3; flowers irregular..... *Valerianaceae*
- 49 Stamens 4-5.
- 50 Herbs; flowers regular..... *Rubiaceae*
- 50 Woody vines; flowers irregular..... *Caprifoliaceae*
- 44 Ovary superior.
- 51 Stamens more than 5.
- 52 Corolla urn-shaped or tubular with the petals markedly united..... *Ericaceae*
- 52 Corolla with petals united only near the base.
- 53 Pistils 4-5; plants succulent..... *Crassulaceae*
- 53 Pistil 1; plants not succulent..... *Malvaceae*
- 51 Stamens not more than 5.
- 54 Plants consisting of twining yellowish stems lacking chlorophyll; parasites of various annual and perennial host plants..... *Cuscutaceae*
- 54 Plants with chlorophyll.
- 55 Corolla more or less irregular.
- 56 Fruit of 2-4 nutlets; leaves opposite..... *Lamiaceae*
- 56 Fruit a capsule.
- 57 Ovary 1-chambered; capsule ending in a long dehiscent horn (represented at Dales Lake?)..... *Mariaceae*
- 57 Ovary 2-chambered; capsule not as above..... *Scrophulariaceae*
- 55 Corolla regular.
- 58 Plants with milky juice..... *Asclepiadaceae*
- 58 Plants without milky juice.
- 59 Stamens forming a tube around the style..... *Primulaceae*
- 59 Stamens not forming a tube around the style.
- 60 Corolla small, veinless, dry-scarious..... *Plantaginaceae*
- 60 Corolla with veins, not dry-scarious.
- 61 Ovary 4-chambered, commonly 4-lobed, each lobe forming a nutlet (unless aborted); inflorescence usually a coiled cyme..... *Boraginaceae*
- 61 Ovary 1-, 2-, or 3-chambered.
- 62 Style 3-cleft at apex (if 2-cleft or capitate, the flowers in heads with ± spiny bracts and calyx lobes)..... *Polemoniaceae*
- 62 Style not 3-cleft.
- 63 Calyx 4-5 toothed or cleft; style 1, entire.
- 64 Plants acaulescent, the leaves and pedicels arising from a basal tuft; growing in shallow water or on wet mud..... *Scrophulariaceae* (Limosella)
- 64 Plants with leaf-bearing stems.
- 65 Leaves opposite..... *Gentianaceae*
- 65 Leaves alternate..... *Solanaceae*

- 63 Calyx of 5 distinct sepals or sepals united only at their base; styles 2 or 1, usually partly divided.
 66 Plants twining or trailing; corolla with flat folds in bud
 *Convolvulaceae*
 66 Plants erect or ascending; corolla without flat folds in bud.
 67 Flowers rose to pink; anthers coiled or spirally twisted after the flower opens
 *Gentianaceae* (Centaurium)
 67 Flowers whitish or bluish; anthers not coiled or spirally twisted
 *Hydrophyllaceae*

AMARANTHACEAE – AMARANTH FAMILY

Amaranthus albus L. – TUMBLEWEED. Occasional annual weed on the dry beds of shallow ditches and pools. A single waif was also found on gravel hauled into the parking area at the south end of the old highway (Oswald & Ahart 7064: NE¼ SW¼ Sec. 26). Native to tropical America. Mid Jul–Aug.

ANACARDIACEAE – SUMAC FAMILY

- 1 Flowers yellowish, in sessile spikes; fruit red; leaves pubescent; branches tending to be arched
 *Rhus trilobata*
 1 Flowers whitish, in loose axillary panicles; fruit whitish; leaves nearly glabrous, shining; branches stiff, erect
 *Toxicodendron diversilobum*

Rhus trilobata Nutt. ex Torr. & A. Gray – SKUNK-BRUSH. Shrub growing on a basalt outcrop on the edge of Manton Road east of the borrow pit (Oswald & Ahart 6720: NE¼ SW¼ Sec. 26). Without flowers or fruit in 1995. [Includes vars. *anisophylla* (Greene) Jeps., *mala-cophylla* (Greene) Jeps. & *quinata* Jeps.]

Toxicodendron diversilobum (Torr. & A. Gray) Greene – PACIFIC POISON-OAK. Scattered shrubs along Manton Road and on the basalt ridge crossing the northwest corner of the reserve (Oswald & Ahart 6675: NE¼ SW¼ Sec. 26, basalt outcrop on the edge of Manton road east of the borrow pit). Early Apr–May. [*Rhus diversiloba* Torr. & A. Gray]

APIACEAE – CARROT FAMILY

[*Umbelliferae*]

- 1 Inflorescence head-like, not umbellate; leaves spiny
 *Eryngium castrense*
 1 Inflorescence a distinct umbel although the secondary umbels may be head-like; leaves not spiny.
 2 Ovary and fruit bearing prickles or bristles.
 3 Fruit with a beak
 *Anthriscus caucalis*
 3 Fruit lacking a beak
 4 Plants perennial with a fleshy taproot.
 5 Leaves with a margined and toothed axis
 *Sanicula bipinnatifida*
 5 Leaves without a margined and toothed axis
 *Sanicula bipinnata*
 4 Plants annual, the root not thickened and fleshy.
 6 Rays numerous; involueral bracts pinnate; fruit with alternate rows of barbed bristles and shorter plain bristles or hairs
 *Daucus pusillus*
 6 Rays 1–12.
 7 Ray(s) arising from a cluster of leaf-like involueral bracts; bristles of fruit smooth with a curved tip, those of alternate rows larger and tending to be confluent at the base
 *Yabea microcarpa*
 7 Involucre none or of 1 linear bract, bristles of fruit scabrous and barbed at the tip, the inner mericarp sometimes with shorter scabrous tubercles lacking terminal barbs.
 8 Umbels sessile or short-pedunculate, opposite the leaves
 *Torilis nodosa*
 8 Umbels long-pedunculate, spreading, terminal and lateral
 *Torilis arvensis*
 2 Ovary and fruit without prickles or bristles.
 9 Fruit slightly compressed side to side; ribs nearly equal, not winged
 *Perideridia oregona*
 9 Fruit flattened front to back, the marginal ribs winged.
 10 Stem leaves present, their petioles conspicuously inflated (sac-like); wings of mature fruit not corky-thickened
 *Lomatium utriculatum*
 10 Leaves mostly basal, the flowering stem ± scapose, the petioles of the basal leaves not conspicuously inflated; wings of mature fruit corky-thickened
 *Lomatium caruifolium*

Anthriscus caucalis M. Bieb. – BUR-CHEVIL. Locally abundant annual in more or less shaded places on

basalt outcrops (Oswald & Ahart 6603: NW¼ NE¼ Sec. 26, among large boulders between Manton Rd. and the old highway near the northeast corner of the reserve). Native to Eurasia. Early Apr–Jun. [*A. neglecta* Boiss. & Reut. var. *scandix* (Scop.) Hyl.; *A. scandicina* (Weber) Mansf.; *A. vulgaris* (L.) Pers.]

Daucus pusillus Michx. – RATTLESNAKE-WEED. Annual forming localized populations in grassy and rocky places (Oswald & Ahart 6714: NE¼ NW¼ Sec. 26, boulder-field just east of Pool 20). Late Apr–Jun.

Eryngium castrense Jeps. – COYOTE-THISTLE. Herbaceous perennial growing in vernal pools, wetlands, and intermittent drainages (Oswald & Ahart 6853: NE¼ NW¼ Sec. 26, adobe wetland just west of Pool 20). Mid Jun–Sep. [*E. castrense* var. *vallicola* Jeps.; *E. vaseyi* J.M. Coult. & Rose var. *castrense* (Jeps.) Hoover ex Mathias & Constance; *E. vaseyi* var. *vallicola* (Jeps.) Munz]

Lomatium caruifolium (Hook. & Arn.) J.M. Coult. & Rose var. *denticulatum* Jeps. – FOOTHILL LOMATIUM. Common and widespread herbaceous perennial on the grassy flats of the reserve (Oswald & Ahart 6565: NE¼ SW¼ Sec. 26, along the unimproved road west of the airstrip). Early Feb–May. [*L. humile* (J.M. Coult. & Rose) Hoover ex Mathias & Constance]

Lomatium utriculatum (Nutt. ex Torr. & A. Gray) J.M. Coult. & Rose – BLADDER LOMATIUM. Uncommon perennial on the basalt ridge crossing the northeast corner of the reserve (Oswald 6754: NE¼ NE¼ Sec. 26, between Manton Rd. and the fence at the northeast corner of the reserve). Late Mar–May. [*L. vaseyi* (J.M. Coult. & Rose) J.M. Coult. & Rose]

Perideridia oregana (S. Watson) Math. – OREGON YAMPAH. Herbaceous perennial flowering in dry, stony upland and in the rocky bed of the intermittent stream between Pool 19 and the west boundary (Oswald 6820: NW¼ SW¼ Sec. 35, on the basalt flow near the south tip of the reserve). Late May–Jul.

Sanicula bipinnata Hook. & Arn. – POISON SANICLE. Locally abundant herbaceous perennial growing in the shade of blue oak (Oswald & Ahart 6514: NW¼ NE¼ Sec. 26, south edge of the basalt ridge in the northeast corner of the reserve). Mid Feb–Apr.

Sanicula bipinnatifida Douglas ex Hook. – PURPLE SANICLE. Uncommon herbaceous perennial forming localized populations in grassy upland (Oswald & Ahart 6585: NW¼ NW¼ Sec. 26, north slope of “Lone Oak Knoll”). Late Mar–Apr.

Torilis arvensis (Huds.) Link ssp. *purpurea* (Ten.) Hayek – PURPLE HEDGE-PARSLEY. Widespread annual on the basalt ridges crossing the north side of the reserve (Oswald & Ahart 6731: NW¼ NW¼ Sec. 26, basalt ridge crossing the northwest corner of the reserve). Native to central and southern Europe. Late Apr–Jun.

Torilis nodosa (L.) Gaertn. – KNOTTED HEDGE-PARSLEY. Weedy annual forming a localized population on the south side of the basalt ridge at the west boundary (Oswald & Ahart 6729: NW¼ NW¼ Sec. 26). Native to Eurasia. Early May–Jun.

Yabea microcarpa (Hook. & Arn.) Koso-Pol. – FALSE HEDGE-PARSLEY. Occasional annual on the basalt outcrops on the north side of the reserve (Oswald & Ahart 6685: NW¼ NE¼ Sec. 26, near the fence at the west end of the basalt ridge crossing the northeast corner of reserve). Late Apr–May. [*Caucalis microcarpa* Hook. & Arn.]

ARISTOLOCHIACEAE – PIPEVINE FAMILY

Aristolochia californica Torr. – CALIFORNIA PIPEVINE. Occasional perennial vine on basalt outcrops in the north half of the preserve (Oswald 6498: NE¼ SW¼ Sec. 26, outcrop along Manton Rd. east of the borrow pit). Late Jan–Mar.

ASCLEPIADACEAE – MILKWEED FAMILY

- 1 Leaves narrow, 1 cm or less wide; pedicels erect in fruit; plants of moist places *Asclepias fascicularis*
 1 Leaves broader, mostly 2–7 cm wide; pedicels bent down in fruit; plants of dry places *Asclepias eriocarpa*

Asclepias eriocarpa Benth. – INDIAN MILKWEED. Herbaceous perennial known only from a localized colony growing on the west bank of the intermittent stream west of “Lone Oak Knoll” (Oswald 6948: NW¼ NW¼ Sec. 26). Late Jun–Jul.

Asclepias fascicularis Decne. – NARROW-LEAVED MILKWEED. This plant has not been found on the reserve but a small colony grows nearby on the bank of the borrow pit on the east side of Manton Rd. (Oswald & Ahart 7070: SE¼ SW¼ Sec. 26). Mid Jul–Sep. [*A. mexicana* Cav., misapplied]

ASTERACEAE – SUNFLOWER FAMILY

[Compositae]

- 1 Plants thistle-like (Thistle tribe).
 2 Leaves prickly on the margins, white-mottled along the veins *Silybum marianum*
 2 Leaves not prickly on the margins, not white-mottled.
 3 Spines stout, yellow; corolla without glands *Centaurea solstitialis*
 3 Spines slender, purplish; corolla glandular *Centaurea melitensis*
 1 Plants not thistle-like.
 4 Corollas all strap-shaped, 5-toothed at apex; sap milky or colored (Chicory tribe).
 5 Pappus consisting of membranous scales, these sometimes awned above.
 6 Flowers blue; heads sessile or nearly so (at Dales Lake?) *Cichorium intybus*
 6 Flowers yellow; heads pedunculate.
 7 Scale more or less notched at the tip, the notch bearing an awn *Uropappus lindleyi*
 7 Scale not notched at the tip, tapering gradually or abruptly to the awn.
 8 Pappus scales linear-lanceolate, mostly smooth or lightly scabrous, tapering evenly into the awn *Microseris acuminata*
 8 Pappus scales lanceolate to circular, scabrous or more often hairy, gradually or abruptly tipped by an awn *Microseris douglasii*
 5 Pappus consisting of bristles.
 9 At least some of the bristles of the pappus feathery
 10 Akenes beakless; flowers bright pink to whitish (at Dales Lake?) *Stephanomeria sp.*
 10 Akenes (at least the inner) beaked; flowers yellow.
 11 Stems unbranched, lacking small bracts (in ours); receptacle naked *Leontodon taraxacoides*
 11 Stems usually branched above, bearing small bracts; receptacle with chaff-like bracts *Hypochoeris glabra*
 9 Bristles of pappus smooth, scabrous, or minutely barbed but never feathery.
 12 Akenes flattened; stems leafy.
 13 involucre cylindrical; akenes beaked *Lactuca serriola*
 13 involucre bell-shaped; akenes not beaked *Sonchus asper*

- 12 Akenes not flattened; flowers borne on a leafless scape.
 14 Akenes minutely spiny above *Taraxacum officinale*
 14 Akenes not minutely spined above *Agoseris heterophylla*
 4 At least some corollas tubular, marginal strap-shaped corollas, when present, 2-3-toothed; sap watery (several tribes).
 15 Rays absent.
 16 Pappus absent.
 17 Staminate and pistillate flowers in separate, distinctive heads, the staminate heads usually uppermost, the involucre of the pistillate heads becoming a stout spiny bur *Xanthium strumarium*
 17 Male and female flowers not in separate heads.
 18 Phyllaries in 2 overlapping series; receptacle dome-shaped to conical *Chamomilla suaveolens*
 18 Phyllaries in a single series or lacking.
 19 Leaves opposite; phyllaries lacking; white-woolly plants of drying pools and mud flats.
 20 Receptacular bracts about 3 mm long *Psilocarphus brevissimus*
 20 Receptacular bracts about 2 mm long.
 21 Leaves linear or linear-oblongate, mostly 6–12 times as long as wide *Psilocarphus oreogonus*
 21 Leaves mostly 1.5–6 times as long as wide
 22 Leaves surround base of head oblongate to obovate, mostly 2 times as long as wide or longer, spreading; plants usually not on the drying beds of well-developed vernal pools and wetlands *Psilocarphus tenellus* var. *tenellus*
 22 Leaves surrounding base of head ovate to broadly elliptic, less than 2 times as long as wide, more or less appressed to the head; plants on the drying beds of vernal pools and wetlands *Psilocarphus tenellus* var. *globiferus*
 19 Leaves mostly alternate; phyllaries present.
 23 Fruit-bearing bracts open, merely subtending the female flowers, not falling away with the akenes *Hespereris acaulis*
 23 Fruit-bearing bracts sack-like, densely long-woolly, completely enclosing the female flower and falling away with the akene *Microtopus californicus*
 15 Pappus present.
 24 Pappus scales awl-shaped *Rigiopappus leptocladus*
 24 Pappus of capillary bristles, rarely with additional outer scales.
 25 Phyllaries completely scarious or transparent; herbage more or less white woolly.
 26 Receptacle naked *Gnaphalium palustre*
 26 Receptacle chaffy except in the center *Filago gallica*
 25 Phyllaries herbaceous or only partly scarious or transparent and then the herbage usually not white-woolly.
 27 Leaves coarsely toothed to pinnately lobed; late winter to spring flowering annuals *Senecio vulgaris*
 27 Leaves entire or finely toothed; summer-flowering annuals.
 28 Outer disk corollas enlarged, palmately 5-cleft and appearing ligule-like *Lessingia virgata*
 28 Outer disk corollas very slender, not enlarged and ligule-like *Conyza canadensis*
 15 Rays present.
 29 Pappus absent (or present only on sterile disk akenes).
 30 Rays white; phyllaries in more than 1 series *Anthemis cotula*
 30 Rays yellow; phyllaries in a single series.
 31 Leaves pinnately parted into soft threadlike lobes not ending in spines; phyllaries with thin membranous margins, purple tipped, with an apical tuft of hairs; flowering in late winter and spring *Blennosperma nanum*
 31 Leaves entire or if pinnately parted, with stiff lobes ending in spines; phyllaries not as above; flowering from late spring into fall.
 32 Leaves pinnately parted, spiny *Hemizonia fitchii*
 32 Leaves entire, not spiny
 33 Upper leaves and phyllaries without open pit glands; disk flowers 6, a large central flower surrounded by 5 smaller ones *Lagophylla glandulosa*
 33 Upper leaves and phyllaries terminated by open pit plants; disk flowers not as above *Holocarpa virgata*
 29 Pappus present on some or all of the fertile akenes.
 34 Akenes with a pappus of soft capillary bristles; rays white, inconspicuous *Conyza canadensis*
 34 Akenes with a pappus of well-developed scales or of stiff awns; rays yellow or yellow with the outer half white.
 35 Receptacle chaffy throughout or with a circle of chaffy bracts surrounding the disk flowers.
 36 Rays conspicuous, yellow with a white outer half, pappus not of conspicuous silvery scales *Layia fremontii*
 36 Rays inconspicuous, yellow turning crimson; pappus of conspicuous silvery scales *Achyrochaena mollis*
 35 Receptacle not chaffy.
 37 Involucre of a series of graduated phyllaries, the tips sharply reflexed or looped; head gummy *Grindelia hirsutula*
 37 Involucre of 1–2 equal or nearly equal but not graduated series of phyllaries.
 38 Leaves alternate; wiry-stemmed annuals *Rigiopappus leptocladus*
 38 Leaves opposite; stems not wiry.
 39 Phyllaries united into a partial cup, only the tips free; rays inconspicuous *Lasthenia glaberrima*
 39 Phyllaries free to base; rays conspicuous.
 40 Pappus parts of 2 kinds, consisting of slender awns gradually widening to the base, interspersed between minute nearly square, irregularly cleft scales *Lasthenia fremontii*
 40 Pappus parts of 1 kind.

- 41 Leaves all essentially entire; pappus consisting of lanceolate scales attenuate into an awn, corollas turning dark red in alkali solution (e.g., Draino®)..... *Lasthenia californica*
 41 Leaves, especially the middle ones, usually pinnately lobed or cleft; pappus consisting of narrowly ovate scales abruptly tapering to an awn, corollas remaining yellow in alkali solution (at Dales Lake?)..... *Lasthenia platycarpha*

Achyraea mollis Schauer – BLOW-WIVES. Locally common to abundant annual in open grassland (Oswald & Ahart 6699: SW¼ NW¼ Sec. 35, edge of a shallow wetland between Manton Rd. and the fence near the south tip of the reserve). Early Apr–May.

Agoseris heterophylla (Nutt.) Greene – ANNUAL AGOSERIS. Uncommon annual in gravel on the edge of Inks Creek Rd. (Oswald & Ahart 6721: NW¼ NW¼ Sec. 35). Early May.

Anthemis cotula L. – MAYWEED. Uncommon weedy annual along roads (Oswald 6750: NW¼ NW¼ Sec. 35, on the edge of Inks Creek Rd.). Native to Europe. Mid May–Jun.

Blennosperma nanum (Hook.) S.F. Blake var. *nanum* – YELLOW-CARPET. Abundant and widespread in open grassland (Oswald & Ahart 6492: SW¼ NW¼ Sec. 26, near the north cluster of pools). This is one of the first flowers to bloom on the reserve, coloring large areas yellow on sunny days. Occasional white morphs are seen. Late Jan–May.

Centaurea melitensis L. – TOCALOTE. Annual weed in a localized population in a pile of basalt boulders between Manton Rd. and the reserve fence east of the Old Hwy. Pool (Oswald & Ahart 6865: NW¼ SW¼ Sec. 26). Native to southern Europe. Mid Jun–Jul.

Centaurea solstitialis L. – YELLOW STAR-THISTLE. Common and locally abundant annual weed in thicker soils of disturbed places (Oswald 6951: NE¼ NE¼ Sec. 26, along the old highway at the northeast corner of the reserve). Native to southern Europe. Mid Jun–Sep.

Chamomilla suaveolens (Pursh) Rydb. – COMMON PINEAPPLE-WEED. Weedy annual growing in disturbed gravel along roads (Oswald & Ahart 6557: NE¼ SW¼ Sec. 26, south gate of the old highway). Mid Mar–Jun. [*Matricaria suaveolens* (Pursh) Buchenau; *M. matricarioides* (Less.) Porter]

Conyza canadensis (L.) Cronquist – CANADIAN HORSEWEED. Summer and fall annual along roads and in other disturbed places (Oswald 7221: NW¼ NW¼ Sec. 35, near the cattle guard in the west fence on Inks Creek Rd.). Late Aug–Sep.

Filago gallica L. – NARROW-LEAVED FILAGO. Weedy annual in gravelly soil of disturbed places (Oswald & Ahart 6697: NW¼ NW¼ Sec. 35, at the intersection of Manton and Inks Creek rds.) Native to the Mediterranean. Late Apr–Jun.

Gnaphalium palustre Nutt. – WESTERN MARSH CUDWEED. Annual growing on the margin of vernal pools (Oswald 6822: SE¼ NW¼ Sec. 26, along the edge of Pool 19). Late May–Jul.

Grindelia hirsutula Hook. & Arn. var. *davyi* (Jeps.) M.A. Lane – FOOTHILL GUMPLANT. Uncommon herbaceous perennial along the edge of Manton Rd. just south of Inks Creek Rd. (Oswald 6830: NW¼ NW¼ Sec. 35). Mid May–Jun. [*G. robusta* Nutt. var. *davyi* Jeps.; included in *G. camporum* Greene in Munz]

Hemizonia fitchii A. Gray – FITCH'S SPIKEWEED. Common and widespread annual in open grassland (Oswald 6749: NW¼ NW¼ Sec. 35, south side of Inks Creek Rd. near the west boundary). Early May–Sep. [*Centromadia fitchii* (A. Gray) Greene]

Hesperex acaulis (Kellogg) Greene var. *acaulis* – DWARF EVAX. Inconspicuous but common and widespread annual in stony grassland (Oswald & Ahart 6535: NW¼ NW¼ Sec. 35, along east fenceline just south of Inks Creek Rd.). Mid Mar–Apr. [*Evax acaulis* (Kellogg) Greene]

Holocarpha virgata (A. Gray) D.D. Keck – WAND TARWEED. A single waif was found on the edge of Manton Rd. near the south end of the reserve (not vouchered). In bud early Sep.

Hypochoeris glabra L. – SMOOTH CAT'S-EAR. Common and widespread annual along roads and in grassy upland (Oswald & Ahart 6655: SW¼ SW¼ Sec. 26, east side of Dales Lake). Native to Europe. Early Apr–Jun.

Lactuca serriola L. – PRICKLY LETTUCE. Weedy annual along roads and in grassy upland (Oswald & Ahart 7147: NW¼ SW¼ Sec. 35, between Manton Rd. and the reserve fence near the south tip of the reserve). Native to Europe. Late Jul–Sep. [Includes var. *integrata* Gren. & Godr. (forma *integrifolia* Bogenh.), a variant with strap-shaped rather than pinnatifid leaves]

Lagophylla glandulosa – GLANDULAR HARELEAF. Locally abundant annual in dry grassy places. One large population is found between the borrow pit and Manton Rd. (Oswald & Ahart 6734: SE¼ NW¼ Sec. 26). It also grows on both Tuscan loam and basalt at the south end of the reserve and on Tuscan loam at the junction of the two intermittent streams on the south side of the basalt ridge crossing the northwest corner of the reserve. Mid May–Sep. [Includes the spring-flowering ecotype, ssp. *serrata* (Greene) D.D. Keck].

Lasthenia californica Lindl. – CALIFORNIA GOLDFIELDS. Locally abundant and widespread annual in upland on the open grassland of the reserve (Oswald & Ahart 6560: NE¼ SW¼ Sec. 26, junction of the old highway and the unimproved road south of the Old Hwy. Pool). This is one of the plants that adds to the spectacular floral displays on the reserve in the spring. Early Mar–Jun. [*Baeria chrysostoma* Fisch. & C.A. Mey., including ssp. *gracilis* (DC.) Ferris]

Lasthenia fremontii (Torr. ex A. Gray) Greene – FREMONT'S GOLDFIELDS. Widespread and locally abundant annual forming bright-yellow patches in shallow pools and ditches and yellow rings on the margins of

deeper pools during dry-down (*Oswald & Ahart 6650*: SW¼ SW¼ Sec. 26, shallow swale between Dales Lake and the west boundary). Early Apr–Jun. [*Baeria fremontii* (Torr. ex A.Gray) A.Gray]

Lasthenia glaberrima DC. – SMOOTH GOLDFIELDS. Locally abundant in shallow water and on the drying margin of Dales Lake (*Oswald 6705*: SW¼ SW¼ Sec. 26). Early May–Jun.

Layia fremontii (Torr. & A.Gray) A.Gray – FREMONT'S TIDYTIPS. Common and widespread annual in open grassland on both alluvial fan deposits and basalt substrates and another member of the springtime floral display (*Oswald & Ahart 6532*: SW¼ NW¼ Sec. 35, south tip of the reserve). Early Mar–Jun.

Lessingia virgata A.Gray – WAND LESSINGIA. Locally abundant summer annual in hard, dry soils of roadsides and grassy fields (*Oswald 6954*: NW¼ NW¼ Sec. 35, edge of Inks Creek Rd.). Late Jun–Sep.

Leontodon taraxacoides (Vill.) Mérat ssp. *longirostris* Finch & P.D.Sell – LONG-BEAKED HAWKBIT. Uncommon weedy annual along roads and in grassy places (*Oswald & Ahart 6722*: NW¼ NW¼ Sec. 35, in gravel along Inks Creek Rd.). Native to Europe. Early May–Jun. [*L. leysseri* (Wallr.) Beck, in part; *L. nudicaulis* (L.) Mérat ssp. *nudicaulis*]

Micropus californicus Fisch. & C.A.Mey. var. *californicus* – SLENDER COTTONWEED. Common annual in open grassland and rocky places (*Oswald & Ahart 6666*: SE¼ NW¼ Sec. 26, west side of borrow pit). Early Apr–May.

Microseris acuminata Greene – SIERRA FOOTHILLS MICROSERIS. Common and widespread annual on the grassy and rocky plains of the reserve (*Oswald & Ahart 6611*: SW¼ NW¼ Sec. 35, near the west boundary ca. 300 ft south of Pool 4). The plants are fairly inconspicuous until the akenes ripen and form a dandelion-like head. Mid Mar–May.

Microseris douglasii (DC.) Sch.Bip. ssp. *douglasii* – DOUGLAS' MICROSERIS. Locally abundant annual in upland on the margin of the adobe wetland just west of Pool 20, the only known location on the reserve (*Oswald & Ahart 6719*: NE¼ NW¼ Sec. 26). Mid Apr–May.

Psilocarphus brevissimus Nutt. var. *brevissimus* – DWARF WOOLLYHEADS. Locally abundant annual on the drying beds of pools and drainages (*Oswald & Ahart 6649*: SW¼ SW¼ Sec. 26, between Dales Lake and the west boundary; *Oswald & Ahart 6716*: NE¼ NW¼ Sec. 26, drying strand of Pool 20). Early Apr–Jun.

Psilocarphus oregonus Nutt. – OREGON WOOLLYHEADS. Locally common annual on the drying beds of pools and wetlands (*Oswald & Ahart 6717*: NE¼ NW¼ Sec. 26, strand of Pool 20). Early Apr–Jul.

Psilocarphus tenellus Nutt. var. *tenellus* – SLENDER WOOLLYHEADS. Uncommon annual growing in dry soil, often along roads and in parking areas (*Oswald & Ahart 6636*: NW¼ NW¼ Sec. 35, gravel on the edge of Inks

Creek Rd. between Dales Lake and the west boundary). Early Apr–May.

Psilocarphus tenellus var. *globiferus* (Bertero ex DC.) Morefield – ROUND WOOLLYHEADS. Common and fairly widespread annual in drying soil of shallow pools, swales, and ditches (*Oswald & Ahart 6644*: NW¼ NE¼ Sec. 26, drying bed of a ditch that held standing water on the west side of the old highway south of the basalt ridge; *Oswald & Ahart 6651*: NW¼ SW¼ Sec. 26, near the west boundary just south of the unimproved road; also noted at several locations near Dales Lake). Early Apr–May. CNPS List 4. [*P. tenellus* var. *tenuis* (Eastw.) Cronquist; *P. globiferus* Nutt., misapplied]

Rigiopappus leptocladus A.Gray – RIGIOPAPPUS. Slender-stemmed annual in bare, rocky places (*Oswald & Ahart 6669*: SE¼ NW¼ Sec. 26, exposed alluvium on the west wall of the borrow pit). Mid Apr.

Senecio vulgaris L. – OLD-MAN-OF-SPRING. Occasional weed in grassy and disturbed places (*Oswald 6499*: NE¼ SW¼ Sec. 26, basalt outcrop on the west side of Manton Rd. east of the Old Highway Pool). Native to Eurasia. Mid Feb–Apr.

Silybum marianum (L.) Gaertn. – MILK-THISTLE. Weedy annual represented by several plants growing on the west side of the old highway on the south edge of the basalt ridge (*Oswald 6791*: NW¼ NE¼ Sec. 26). Native to the Mediterranean. Late May–Jun.

Sonchus asper (L.) Hill ssp. *asper* – SPINY-LEAVED SOW-THISTLE. Annual weed growing in gravelly soil between Manton Rd. and the east fence at the double culvert south of Inks Creek Rd. (*Oswald 6823*: SW¼ NW¼ Sec. 35). Native to Europe. Late May–Jun.

Taraxacum officinale Weber – COMMON DANDELION. Weedy perennial known only from a population growing under blue oaks near the east fenceline north of the borrow pit (*Oswald & Ahart 6695*: SW¼ NE¼ Sec. 26). Native to Europe. Late Apr–May.

Uropappus lindleyi (DC.) Nutt. – SILVERPUFFS. Common annual on the basalt ridges crossing the north side of the reserve (*Oswald 6707*: NW¼ NE¼ Sec. 26, among basalt boulders between Manton Rd. and the fence just south of the summit of the basalt ridge crossing the northeast corner of the reserve). Early Apr–May. [*U. linearifolius* (DC.) Nutt.; *Microseris linearifolia* (Nutt.) Sch.Bip.; *M. lindleyi* (DC.) A.Gray]

Xanthium strumarium L. – COCKLEBUR. A single seedling was noted on the dry bed of Pool 5 in mid June but it did not survive into summer. However, cocklebur is a common plant around the marshy borrow pit on the east side of Manton Rd. (not vouchered). Late Aug–Sep. [Includes vars. *canadense* (Mill.) Torr. & A.Gray & *glabratum* (DC.) Cronquist]

BORAGINACEAE – BORAGE FAMILY

1 Flowers white (sometimes with colored veins or central areas or crests).

2 Flowers sessile and barely separated in dense, one-sided, curved spikes, the older corollas with yellow- or purple-veined centers *Heliotropium europaeum*

- 2 Older flowers and fruits at least several mm apart in the inflorescence, corollas without colored veins.
- 3 Corolla very inconspicuous, with lobes ascending and barely as long as the sepals; nutlets flatish and somewhat diamond-shaped, widely spreading, with hooked hairs at their tips *Pectocarya pusilla*
- 3 Corolla usually conspicuous, the lobes spreading and exceeding the sepals; nutlets not very flattened, ovoid or lanceolate, erect, without hooked hairs at their tips.
- 4 Mature nutlet, when removed from the receptacle, with a straight or forked groove or slit running the entire length of the inner side; plants finely or coarsely stiff-pubescent, the calyx with recurved or hooked hairs *Cryptantha flaccida*
- 4 Mature nutlet with a ridge-like keel and a rounded to linear attachment scar on the inner side; plants glabrous or variously pubescent.
- 5 Upper stem and leaves with at least some spreading pubescence; basal rosette prominent and persisting into fruiting stage; nutlet attachment scar more or less centrally located on inner side; nutlets without spines or bristles; plants of "upland" (Section *Plagiobothrys*).
- 6 Sepals fused at the base, the upper portion forming a circumscissile cap over the nutlets *Plagiobothrys nothofulvus*
- 6 Sepals free, not forming a circumscissile cap
- 7 Sepals covered throughout with reddish hairs (not always persisting into fruit); mature calyx rounded at the base *Plagiobothrys fulvus*
- 7 Sepals not covered with reddish hairs throughout, but sometimes with lines of reddish hairs.
- 8 Nutlets ovoid, constricted into an abrupt beak at apex; mature calyx flattened at the base, resembling a "Hershey's chocolate kiss;" stem often forked near base, mostly over 20 cm long *Plagiobothrys canescens*
- 8 Nutlets a cross-shaped due to constrictions at both top and bottom; mature calyx rounded at the base; stem usually forked in inflorescence, sometimes unforked or forked near the base.
- 9 Spikes with bracts throughout *Plagiobothrys shastensis*
- 9 Spikes with bracts only at base (at Dales Lake?) *Plagiobothrys tenuis*
- 5 Upper stem and leaves either glabrous or with fine appressed pubescence only; basal rosette not prominent; nutlet attachment scar various but if centrally located on inner side, then nutlet with spines or bristles; plants of vernal moist or wet places (Section *Allocarya*).
- 10 Outer surfaces of nutlets with coarse, spine-like processes, these covered with small stiff hairs.
- 11 Back and sometimes sides of nutlets with ridge-like keels bearing spines, each spine with hooked hairs; nutlets narrow, about half as broad as long *Plagiobothrys austiniiae*
- 11 Entire back of nutlet covered with spines, the spines minutely hairy; nutlets broad, 2/3 or more as broad as long *Plagiobothrys greenei*
- 10 Outer surfaces of nutlets without coarse spines but covered with whitish teeth, knobs, or fine bristles.
- 12 Flowers present near base of stem, the pedicels stout, recurved in fruit, stems prostrate *Plagiobothrys scriptus*
- 12 Flowers usually not present near base of stem, the pedicels not stout, stems prostrate to erect.
- 13 Plants prostrate; calyx usually strongly bent, turning the corolla skyward; nutlets minutely bristled or not *Plagiobothrys leptocladus*
- 13 Plants ascending to erect, calyx not strongly bent, nutlets not bristled *Plagiobothrys stipitatus*
- 1 Flowers yellow to orange.
- 14 Stamens and stigma included about two-thirds of the way down the tube; top of tube with intruding hairy bumps *Amsinckia lycopsoides*
- 14 Stamens and stigma near the top of the tube, the anthers easily visible; top of tube without intruding hairy bumps
- 15 Corolla yellow, the tube almost or quite included in the calyx *Amsinckia menziesii* var. *menziesii*
- 15 Corolla orange, the tube distinctly exerted from the calyx *Amsinckia menziesii* var. *intermedia*

Amsinckia lycopsoides Lehm. – BUGLOSS FIDDLE-NECK. Scattered to locally abundant annual along roads, among cobbles, and in grassy places on both Tuscan loam and basalt substrates (*Oswald 6553*: SW¼ NW¼ Sec. 35, along Manton Rd. south of Inks Creek Rd.). This plant is similar to and often confused with *A. menziesii* var. *intermedia* (see below). Mid Mar–May.

Amsinckia menziesii (Lehm.) A. Nelson & J.F. Macbr. var. *menziesii* – MENZIES' FIDDLENECK. Occasional to locally abundant annual along roads and in thicker soils on the reserve (*Oswald 6544*: NW¼ NW¼ Sec. 35, intersection of Manton and Inks Creek rds.). Late Mar–May.

Amsinckia menziesii var. *intermedia* (Fisch. & C.A. Mey.) F.R. Ganders – COMMON FIDDLENECK. Occasional annual forming localized populations in disturbed places (*Oswald 6549*: SW¼ NE¼ Sec. 26, along fence line just

north of the Borrow Pit). Mid Mar–May. [*A. intermedia* Fisch. & C.A. Mey.]

Cryptantha flaccida (Douglas ex Lehm.) Greene – WEAK-STEMMED CRYPTANTHA. Locally abundant annual in open, grassy places (*Oswald & Ahart 6715*: NE¼ NW¼ Sec. 26, in the boulderfield just east of Pool 20). Early Apr–May.

Heliotropium europaeum L. – EUROPEAN HELIOTROPE. Annual weed growing in gravel brought into the parking area at the south end of the old highway (*Oswald & Ahart 7066*: NE¼ SW¼ Sec. 26). It was also noted along the margins of Pools 8 and 9 in the southern cluster. Native to southern and eastern Europe and northern Africa. Late Jun–Sep.

Pectocarya pusilla (A. DC.) A. Gray – LITTLE PECTOCARYA. Common and locally abundant annual growing on bare patches of stony loam and on eroded fanglomerate (*Oswald & Ahart 6526*: SW¼ NW¼ Sec. 35, near the west boundary between the southern cluster of pools and the basalt to the south). Mid Mar–Apr.

Plagiobothrys austiniiae (Greene) I.M. Johnst. – AUSTIN'S POPCORN-FLOWER. Common annual in shallow wetlands and in moist soil of open grassland (*Oswald 6552*: NE¼ SW¼ Sec. 26, south junction of Manton Rd. and the old highway). Mid Feb–May. [*Allocarya austiniiae* Greene]

Plagiobothrys canescens Benth. – VALLEY POPCORN-FLOWER. Locally abundant annual along roads and in other grassy places (*Oswald & Ahart 6631*: NW¼ NW¼ Sec. 35, cattle guard at the intersection of Manton and Inks Creek rds.). Late Mar–May.

Plagiobothrys fulvus (Hook. & Arn.) I.M. Johnst. – FULVOUS POPCORN-FLOWER. Locally abundant annual growing on the basalt outcrops and on drier parts of the grassy plain (*Oswald & Ahart 6571*: SW¼ NW¼ Sec. 26, between the northern cluster of pools and the unimproved road to the south). Mid Feb–May. [*P. campestris* Greene; *P. fulvus* var. *campestris* (Greene) I.M. Johnst.]

Plagiobothrys greenei (A. Gray) I.M. Johnst. – GREENE'S POPCORN-FLOWER. Scattered to locally abundant annual on the margins of wetlands and in vernal wet depressions (*Oswald & Ahart 6562*: NE¼ SW¼ Sec. 26, along the unimproved road between the old highway and the airstrip). Green's and Austin's popcorn-flowers often grow together. Early Mar–May. [*Allocarya greenei* (A. Gray) Greene]

Plagiobothrys leptocladus (Greene) I.M. Johnst. – ALKALI POPCORN-FLOWER. Uncommon annual on the drying beds of pools and wetlands (*Oswald & Ahart 6718*: NE¼ NW¼ Sec. 26, strand of Pool 20). Mid Apr–May. [*Allocarya leptoclada* Greene]

Plagiobothrys nothofulvus (A. Gray) A. Gray – COMMON POPCORN-FLOWER. Locally abundant annual in drier parts of the grassy upland (*Oswald & Ahart 6584*: NW¼ NW¼ Sec. 26, north slope of "Lone Oak Knoll"). Late Feb–Jun.

Plagiobothrys scriptus (Greene) I.M. Johnst. – SCRIBE'S POPCORN-FLOWER. Inconspicuous but common and widespread annual in thin soils of open grassland (Oswald & Ahart 6573: SW¼ NW¼ Sec. 26, just south of the northern cluster of pools on the service road used during their construction). This is the first of the popcorn-flowers to bloom at the reserve. Early Feb–Mar. [*Allocarya scripta* Greene]

Plagiobothrys shastensis Greene ex A. Gray – SHASTA POPCORN-FLOWER. Common annual forming scattered populations in grassland and in grassy openings on basalt (Oswald 6546: SW¼ NW¼ Sec. 26, bank of intermittent stream just downstream from Pool 19; Oswald & Ahart 6696: NE¼ NE¼ Sec. 26, between the old highway and the fence on top of the basalt ridge at the northeast corner of the reserve). Early Mar–Apr.

Plagiobothrys stipitatus var. *micranthus* (Piper) I.M. Johnst. – SMALL-FLOWERED STIPITATE POPCORN-FLOWER. Common annual in shallow water and later on the drying margins of pools and ditches (Oswald & Ahart 6555: NE¼ SW¼ Sec. 26, drying bed of a shallow ditch at the south gate of the old highway). Mid Mar–Jul. [*Allocarya stipitata* Greene ssp. *micrantha* Piper]

BRASSICACEAE – MUSTARD FAMILY
[Cruciferae]

- 1 Fruit indehiscent, 1-seeded.
 - 2 Fruit not winged..... *Athyanus pusillus*
 - 2 Fruit wing-margined all around.
 - 3 Fruiting pedicels straight or bent downward at the tip only; wing of silicle with almost thread-like rays, non-perforate..... *Thysanocarpus radians*
 - 3 Fruiting pedicels recurved their whole length; wing of silicle with broader rays and usually perforate..... *Thysanocarpus curvipes*
- 1 Fruit dehiscent by valves or breaking transversely into joints containing two or more seeds.
 - 4 Fruit less than 4 times longer than wide, not linear (a silicle).
 - 5 Fruit as wide as its dividing partition.
 - 6 Stems scapose, 1-flowered, silicles shaped like a coin..... *Idahoa scapigera*
 - 6 Stems not scapose, with more than 1 flower; silicles ± elongate, not coin-shaped.
 - 7 Silicles elliptic to elliptic-oblanccolate, about 3 times longer than broad..... *Draba verna* var. *verna*
 - 7 Silicles oval, about as long as broad..... *Draba verna* var. *aestivalis*
 - 5 Fruit much wider than its dividing partition.
 - 8 Fruit inverted-triangular, the cells with 2 or more seeds..... *Capsella bursa-pastoris*
 - 8 Fruit rounded, not inverted-triangular, the cells 1-seeded.
 - 9 Fruiting inflorescence dense and cylindrical..... *Lepidium strictum*
 - 9 Fruiting inflorescence open, not dense and cylindrical..... *Lepidium nitidum*
- 4 Fruit usually at least 4 times longer than wide, usually linear (a silique).
 - 10 Fruit breaking transversely into seed-bearing, indehiscent joints..... *Raphanus raphanistrum*
 - 10 Fruit not breaking into joints but dehiscent by valves.
 - 11 Basal leaves forming a rosette; plants small, usually less than 1 dm tall..... *Cardamine oligosperma*
 - 11 Basal leaves not forming definite rosettes; plants usually over 1 dm tall.
 - 12 Plants biennial to perennial, fruits with a relatively long indehiscent beak..... *Hirschfeldia incana*
 - 12 Plants annual; fruits without a beak, dehiscent to the tip..... *Sisymbrium officinale*

Athyanus pusillus (Hook.) Greene – PETTY ATHYSANUS. Locally abundant delicate annual in thin rocky soils and on outcrops (Oswald & Ahart 6479: NW¼ NE¼ Sec. 26, basalt cobbles in the northeast corner of the reserve). Early Feb–Apr.

Capsella bursa-pastoris (L.) Medik. – SHEPHERD'S-PURSE. Weedy annual in grassy and disturbed places (Oswald & Ahart 6500: NE¼ NE¼ Sec. 26, in open gray pine-oak woodland on the basalt ridge in the northeast corner of the reserve). Native to Eurasia. Early Feb–Apr.

Cardamine oligosperma Nutt. – WESTERN BITTER-CRESS. Common annual forb in more or less shaded places on basalt, around boulders, and in moist places on open alluvial fan deposits (Oswald & Ahart 6501: NE¼ NE¼ Sec. 26, floor of woodland on the basalt ridge in the northeast corner of the reserve). Late Feb–Apr.

Draba verna L. var. *aestivalis* Lej. – SPRING WHITFLOW-GRASS. Locally abundant annual in open grassland, on basalt outcrops, and in grassy openings in brush and woodland (Oswald & Ahart 6483: NE¼ NE¼ Sec. 26, along the old roadway on the high point of the basalt ridge at the north end of the reserve). Early Feb–Mar.

Draba verna var. *verna* – SPRING WHITFLOW-GRASS. Less common than the var. *aestivalis*, differing only in having much longer silicles (Oswald & Ahart 6542: SW¼ NE¼ Sec. 26, locally abundant in grass near a band of blue oaks along the east boundary just northeast of the borrow pit). Collected mid Mar.

Hirschfeldia incana (L.) Lagr.-Foss. – MEDITERRANEAN HOARY-MUSTARD. Biennial to perennial weed in gravel along the edge of Inks Creek Rd. (Oswald 6827: NW¼ NW¼ Sec. 35) and in gravel hauled into the parking area at the south end of the old highway. Native to the Mediterranean. Mid May–Sep. [*Brassica geniculata* (Desf.) Ball; *Sinapis incana* L.]

Idahoa scapigera (Hook.) A. Nelson & J.F. Macbr. – FLATPOD. Uncommon annual forming a localized population in a small gravelly spot in grassland just east of Pool 20 (Oswald & Ahart 6505). In fruit in early Mar.

Lepidium nitidum Nutt. var. *nitidum* – SHINING PEPPER-GRASS. Widespread and locally abundant annual in grassy upland (Oswald & Ahart 6508: NE¼ NW¼ Sec. 26, grassy slope along a drainage southwest of Pool 20). Late Jan–Mar.

Lepidium strictum (S. Watson) Rattan – UPRIGHT PEPPER-GRASS. Weedy annual in hard-packed gravel on the edge of Inks Creek Rd. (Oswald & Ahart 6632: NW¼ NW¼ Sec. 35). In fruit when collected in early Apr.

Raphanus raphanistrum L. – JOINTED CHARLOCK. Annual weed growing along the edge of Manton Rd. (Oswald & Ahart 6623: SW¼ NW¼ Sec. 35). Most plants have pale yellow petals, but white-flowered individuals are also found. Native to Mediterranean Europe. Mid Mar–May.

Sisymbrium officinale (L.) Scop. – HEDGE-MUSTARD. Locally common annual in thicker soils, often growing in the shade of blue oak (Oswald & Ahart 6641: NW¼ NE¼ Sec. 26, south edge of the basalt ridge crossing the northeast corner of the reserve). Native to Europe. Early Apr–Jun.

Thysanocarpus curvipes Hook. var. *curvipes* – CLASPING-LEAVED FRINGEPOD. Scattered to locally abundant annual on outcrops and roadcuts, less common

in open grassland (*Oswald & Ahart 6504* (silicles perforate): NW¼ NE¼ Sec. 26, basalt outcrop in open gray pine-oak woodland on the ridge in the northeast corner of the reserve; *Oswald & Ahart 6684* (silicles imperforate): NW¼ NE¼ Sec. 26, in basalt cobbles in the northeast corner of the reserve). Plants that flower early in the season have perforate pods; plants flowering late in the season have imperforate pods. However, pod size is similar in both types. Early Feb–May.

Thysanocarpus radians Benth. – SPOKEPOD. Locally abundant annual in patches of wet loamy soil in open grassland (*Oswald & Ahart 6519*: SW¼ SW¼ Sec. 26, near the northeast end of Dales Lake). Late Feb–Mar.

CALLITRICHACEAE – WATER-STARWORT FAMILY

Callitriche marginata Torr. – WINGED WATER-STARWORT. Common and locally abundant annual in most of the vernal pools and ditches on the reserve. The aquatic phase has floating rosettes of leaves. As the pools and ditches dry, the plant often becomes terrestrial, forming green cushions on wet mud (*Oswald & Ahart 6570*: NW¼ SW¼ Sec. 26, on drying mud of a vernal wet drainage along the unimproved road near the west boundary). Early Feb–Jun. [Includes *C. longipedunculata* Morong, the aquatic phase]

CAMPANULACEAE – BELLFLOWER FAMILY

- 1 Corolla regular, anthers and filaments distinct..... *Githopsis specularioides*
- 1 Corolla irregular, filaments and anthers united into a tube.
 - 2 Flowers pedicelled (mostly cleistogamous)..... *Legenere limosa*
 - 2 Flowers sessile in the axils of leaf-like bracts, the ovary linear and simulating a pedicel; corollas conspicuous.
 - 3 Pair of bristles at the apex of the anther tube usually tightly twisted together before the anthers erupt; base of lower lip with a pair of dark purple nipple-like projections..... *Downingia bicornuta* var. *bicornuta*
 - 3 Bristles of anther tube, if present, divergent before the anthers erupt, not twisted together; purple spots at base of lower lip, if present, not strongly nipple-like.
 - 4 Upper corolla lobes reflexed, curving backward into a ring (at Dales Lake?)..... *Downingia ornativissima*
 - 4 Upper corolla lobes more or less erect, not curving backward into a ring..... *Downingia cuspidata*

Downingia bicornuta A. Gray var. *bicornuta* – DOUBLE-HORNED DOWNINGIA. Common annual on the drying margin of Dales Lake (*Oswald 6704*: SW¼ SW¼ Sec. 26). Mid Apr–Aug.

Downingia cuspidata (Greene) Greene ex Jeps. – TOOTHED DOWNINGIA. Widespread and locally abundant annual on the drying beds of pools and shallow wetlands that held standing water (*Oswald & Ahart 6648*: SW¼ SW¼ Sec. 26, between Dales Lake and the west boundary). Mid Apr–Jul.

Githopsis specularioides Nutt. – COMMON BLUECUP. Inconspicuous annual forb in vernal wet places in open grassland and in rocky places (*Oswald & Ahart 6690*: NW¼ NW¼ Sec. 26, on the north edge of the basalt flow crossing the northwest corner of the reserve). Mid Apr.

Legenere limosa (Greene) McVaugh – LEGENERE. Annual forb in shallow water and on the drying margin of Dales Lake (*Oswald & Ahart 6739*: NW¼ NW¼ Sec.

35, southeast edge of lake). Our plants seem to be totally cleistogamous. Late Apr–Jun. CNPS List 1B.

CAPRIFOLIACEAE – HONEYSUCKLE FAMILY

- 1 Climbing vine; leaves simple..... *Lonicera interrupta*
- 1 Many-stemmed shrub; leaves compound..... *Sambucus mexicana*

Lonicera interrupta Benth. – CHAPARRAL HONEYSUCKLE. Woody vine on the basalt outcrop crossing the northwest corner of the reserve. Vegetative in 1995; voucher not collected.

Sambucus mexicana C. Presl ex DC. – BLUE ELDERBERRY. Tall shrub known from a single individual growing on the basalt ridge near the northeast corner of the reserve (*Oswald 6708*: NE¼ NE¼ Sec. 26). Early May–Jul. [*S. cerulea* Raf.; *S. glauca* Nutt.; *S. velutina* Durand & Hilg.]

CARYOPHYLLACEAE – PINK FAMILY

- 1 Fruit a 1-seeded indehiscent utricle; petals absent.
 - 2 Stipules lacking; leaves awl-shaped; flowers clustered, greenish..... *Scleranthus annuus*
 - 2 Stipules present (sometimes minute), scarious.
 - 3 Stems much-branched, prostrate or spreading, forming mats 5–20 cm across; stipules minute..... *Herniaria hirsuta*
 - 3 Plant inconspicuous, stem short, less than 1 cm tall, topped with a silvery cluster of stipules, bracts, and sepals..... *Paronychia ahartii*
- 1 Fruit a several to many seeded capsule; petals usually present.
 - 4 Sepals distinct or nearly so; petals without claws and borne on a basal disk or at the base of a sessile ovary, or petals absent.
 - 5 Scarious stipules present.
 - 6 Leaves fascicled; stipules lance acuminate..... *Spergularia rubra*
 - 6 Leaves not fascicled; stipules deltoid..... *Spergularia bocconei*
 - 5 Stipules absent.
 - 7 Capsule cylindrical..... *Cerastium glomeratum*
 - 7 Capsule ovoid or ellipsoid.
 - 8 Styles 4–5, alternate with sepals.
 - 9 Leaf bases minutely ciliate, flowers without petals, usually 4-parted..... *Sagina apetala*
 - 9 Leaf bases not ciliate; flowers with petals, 5-parted..... *Sagina decumbens*
 - 8 Styles usually 3, opposite sepals.
 - 10 Petals notched or deeply cleft.
 - 11 Internodes with a longitudinal line of hairs; leaves ovate..... *Stellaria media*
 - 11 Internodes lacking line of hairs; upper leaves lance-linear..... *Stellaria nitens*
 - 10 Petals entire or nearly so.
 - 12 Petals exceeding calyx by one-half or more; sepals green-tipped..... *Minuartia californica*
 - 12 Petals equal to or exceeding the calyx by about one-fourth; sepals sharply hyaline tipped (at Dales Lake?)..... *Minuartia cismontana* Meinke & Zika
 - 4 Sepals united into a tubular or cup-like calyx; petals clawed and borne on the stalk of the ovary.
 - 13 Styles 3..... *Silene gallica*
 - 13 Styles 2.
 - 14 Calyx subtended by 1–3 pairs of involucre-like bracts; petals conspicuous, reddish-pink..... *Petrorhagia dubia*
 - 14 Calyx without involucre-like bracts at its base; petals inconspicuous, purple tipped (at Dales Lake?)..... *Veletia rigida* L.

Cerastium glomeratum Thuill. – MOUSE-EARED CHICKWEED. Locally common annual in rocky places in open grassland (*Oswald & Ahart 6512*: SW¼ NW¼ Sec. 26, just east of Pool 12). Native to Europe. Late Feb–May. [*C. viscosum* L., misapplied]

Herniaria hirsuta L. ssp. *hirsuta* – HERNIARIA. Mat-forming annual in gravelly places along roads and in other disturbed places (*Oswald & Ahart 6634*: NW¼ NW¼ Sec. 35; edge of Inks Creek Rd.). Native to southern Europe, northern Africa, and southwest Asia. Early Apr–Aug.

Minuartia californica (A. Gray) Mattf. – CALIFORNIA SANDWORT. Common and widespread annual in more or less bare, gravelly soils in open grassland (*Oswald & Ahart 6494*: SW¼ NE¼ Sec. 26, along the

abandoned road at the north end of the borrow pit). Mid Feb–Jun. [*Arenaria californica* (A. Gray) W.H. Brewer; *A. pusilla* S. Watson, including var. *diffusa* Maguire].

***Paronychia ahartii* Ertter** – AHART'S PARONYCHIA. Diminutive annual forming localized populations in more or less bare places in rocky and grassy upland (*Oswald & Ahart* 6612: SW¼ NW¼ Sec. 35, near the west boundary ca 400 ft south of Pool 4). Mid Mar–May. CNPS List 1B.

***Petrorhagia dubia* (Raf.) G. López & Romo** – GRASS-PINK. Common annual in grassy openings (*Oswald & Ahart* 6579: SW¼ NW¼ Sec. 26, bank of eroded fanlomerate between Pool 19 and the pile of insulators). Native to southern Europe. Late Mar–Jun. [*Kohlruschia velutina* (Guss.) Reichenb.; *Tunica prolifera* (L.) Scop., misapplied]

***Sagina apetala* Ard.** – DWARF PEARLWORT. Inconspicuous annual growing in cracks in the pavement and in dry gravelly soil along the old highway (*Oswald & Ahart* 6559: NE¼ SW¼ Sec. 26, south gate of the old highway). Mid Mar–Jun.

***Sagina decumbens* (Elliott) Torr. & A. Gray ssp. *occidentalis* (S. Watson) G.E. Crow** – WESTERN PEARLWORT. Uncommon annual along the edge of the ditch on the north side of Inks Creek Rd. (*Oswald & Ahart* 6635: NW¼ NW¼ Sec. 35). Early Apr. [*Sagina occidentalis* S. Watson]

Scleranthus annuus* L. ssp. *annuus – KNAWE. Weedy annual in disturbed places and in gravelly spots in open grassland (*Oswald* 6548: NW¼ NE¼ Sec. 26, along edge and in cracks in pavement of the old highway on the south side of the basalt ridge). Native to Europe. Early Mar–Jun.

***Silene gallica* L.** – WINDMILL-PINK. Weedy annual in grassy and disturbed places (*Oswald & Ahart* 6738: NW¼ NW¼ Sec. 35, in gravel on the edge of Inks Creek Rd.). Native to Europe. Mid May.

***Spergularia bocconeii* (Scheele) Foucaud ex Merino** – BOCCONE'S SANDSPURRY. Locally abundant annual on both sides of Inks Creek Rd. at the cattleguard in the west fence (*Oswald & Ahart* 6662: NW¼ NW¼ Sec. 35). Native to southwest Europe. Mid Apr–Jun.

***Spergularia rubra* (L.) J. & C. Presl** – RUBY SANDSPURRY. Locally common annual in dry gravelly soil along roads (*Oswald & Ahart* 6597: NW¼ SW¼ Sec. 26, near the south gate of the old highway). Native to Europe. Early Apr–Aug.

***Stellaria media* (L.) Vill.** – COMMON CHICKWEED. Common weed in many places on the reserve (*Oswald & Ahart* 6490: NW¼ NW¼ Sec. 26, north edge of the basalt outcrop near the west boundary). Native to southwest Europe. Mid Feb–May.

***Stellaria nitens* Nutt.** – SHINING STARWORT. Uncommon and easily overlooked annual in stony places (*Oswald & Ahart* 6529: SW¼ NW¼ Sec. 35, along the

edge of a basalt outcrop near the south tip of the reserve). Late Feb–Mar.

CHENOPODIACEAE – GOOSEFOOT FAMILY

- 1 Plants more or less glandular-pubescent or resinous-glandular, especially about the calyx..... *Chenopodium botrys*
- 1 Plants mealy, not glandular-pubescent..... *Chenopodium album*

***Chenopodium album* L.** – LAMB'S-QUARTERS. Waif on a pile of gravel hauled into the parking area at the south end of the old highway (*Oswald & Ahart* 7151: NE¼ SW¼ Sec. 26). Native to Europe. Late Jun–Aug.

***Chenopodium botrys* L.** – JERUSALEM-OAK. Annual weed growing on a pile of gravel hauled into the parking area at the south end of the old highway (*Oswald & Ahart* 7065: NE¼ SW¼ Sec. 26). Native to Europe. Late Jun–Sep.

CONVOLVULACEAE – MORNING-GLORY FAMILY

***Convolvulus arvensis* L.** – BINDWEED. Waif growing on a pile of gravel hauled into the parking area at the south end of the old highway (not vouchered). This is a common weed along Manton Rd. south of the reserve. Native to Europe. Mid Jun–Aug.

CRASSULACEAE – STONECROP FAMILY

- 1 Flowers yellow, in definite terminal clusters..... *Parvisedum pumilum*
- 1 Flowers inconspicuous, 1–several in the axils.
- 2 Carpels (1)2-seeded; plants of moist to dry places.
 - 3 Leaves and sepals blunt or gradually narrowed to a slender tip; flowers 3–5 merous..... *Crassula connata*
 - 3 Leaves and sepals obviously hair-tipped, the plant mossy looking; flowers 3-merous..... *Crassula tillaea*
- 2 Carpels 3 or more-seeded; plants of shallow water and wet places.
 - 4 Seed surface wrinkled, dull..... *Crassula aquatica*
 - 4 Seed surface smooth, shiny (at Dales Lake?)..... *Crassula solieri* (Gay) F. Meigen

***Crassula aquatica* (L.) Schönl.** – WATER PIGMY-WEED. Locally abundant annual on the drying beds of vernal flooded depressions (*Oswald & Ahart* 6561: NE¼ SW¼ Sec. 26, drying ditch along the south end of the old highway). Mid Mar–Apr. [*Tillaea aquatica* L.]

***Crassula connata* (Ruiz & Pav.) A. Berger** – PYGMY-WEED. Common but inconspicuous annual forming localized populations in thin, bare soils along roads and in open grassland (*Oswald & Ahart* 6615: SW¼ NW¼ Sec. 35, on the basalt flow at the south tip of the reserve). Mid Feb–Apr. [*Tillaea erecta* Hook & Arn.]

***Crassula tillaea* Lest.-Garl.** – MOSSY PIGMYWEED. Diminutive annual typically growing in dense masses in thin stony soils and on outcrops (*Oswald & Ahart* 6531: SW¼ NW¼ Sec. 35, on basalt in the south tip of the reserve). Native to the Mediterranean. Late Feb–Mar. [*Tillaea muscosa* L.]

***Parvisedum pumilum* (Benth.) R. T. Clausen** – DWARF-STONECROP. Widespread and locally abundant succulent annual in thin soils of bare openings on the grassy plains, including the basalt flow in the south tip of the reserve (*Oswald & Ahart* 6670: SE¼ NW¼ Sec. 26, between the borrow pit and the east fence). Early Apr–May. [*Sedella pumila* (Benth.) Britton & Rose]

CUCURBITACEAE – GOURD FAMILY

Marah fabaceus (Naudin) Greene var. *agrestis* (Greene) Stocking – CALIFORNIA MANROOT. Herbaceous vine from a large perennial root climbing on rocks and shrubs along Manton Road near the northeast corner of the reserve (Oswald & Ahart 6601: NW¼ NE¼ Sec. 26). Early Feb–Apr. [*Echinocystis fabacea* Naudin var. *agrestis* Greene]

CUSCUTACEAE – DODDER FAMILY

- 1 Flowers usually 4-merous; parasites of vernal pool plants *Cuscuta howelliana*
 1 Flowers 5-merous; parasites of upland plants such as *Hemizonia* *Cuscuta californica*

Cuscuta californica Hook. & Arn. var. *californica* – CALIFORNIA DODDER. A parasite of various annual and perennial herbs. On the reserve, it is found on *Hemizonia fitchii* in dry upland (Oswald 6952: NW¼ NW¼ Sec. 35, near the gate to the section south of Inks Creek Rd.). Mid Jun–Aug.

Cuscuta howelliana P. Rubtzov – BOGGS LAKE DODDER. Occasional to locally abundant on the drying beds of vernal pools where it parasitizes *Eryngium castrense*, *Navarretia leucocephala*, and *Epilobium* (sect. *Boisduvalia*). The flowers of the dodder are inserted among the flowers of the host, perhaps an adaptation to maximize pollination of the parasite by pollinators visiting the host plant. Plants have been found in the Old Hwy. Pool and at Dales Lake (Oswald 6953: NW¼ NW¼ Sec. 35). Mid Jun–Jul.

ELATINACEAE – WATERWORT FAMILY

- 1 Stamens 3–6, when 3 opposite the carpels *Elatine heterandra*
 1 Stamens 3, alternate with carpels *Elatine chilensis*

Elatine chilensis Gay – CHILEAN WATERWORT. Locally common in shallow water of Dales Lake (Oswald & Ahart 7153.1: SW¼ SW¼ Sec. 26). Mid Jul–Aug. [*E. gracilis* H. Mason]

Elatine heterandra H. Mason – VARIABLE-STAMENED WATERWORT. Small annual growing in pools, at first submersed but continuing to grow and flower at dry-down (Oswald & Ahart 6848B: NE¼ SW¼ Sec. 26, dry margin of the Old Hwy. Pool; Oswald & Ahart 7079: SW¼ SW¼ Sec. 26, drying bed of Dales Lake). Late May–Jul.

ERICACEAE – HEATH FAMILY

- 1 Leaves appearing green, not gray-green; pedicels not glandular pubescent *Arctostaphylos manzanita*
 1 Leaves white-glaucous and glabrous; pedicels glandular-pubescent *Arctostaphylos viscida*

Arctostaphylos manzanita Parry ssp. *manzanita* – BIG MANZANITA. Although not found within the reserve, mature shrubs grow along the east side of Manton Rd. near the northeast corner of the reserve (Oswald & Ahart 6484: NE¼ NE¼ Sect. 26). Jan (probably earlier)–Feb.

Arctostaphylos viscida Parry ssp. *viscida* – WHITE-LEAVED MANZANITA. Less common than big manzanita but growing with it on the east side of Manton Road

(Oswald & Ahart 6515: NE¼ NE¼ Sect. 26). This species has not been found within the boundaries of the reserve. Late Feb–Mar.

EUPHORBIACEAE – SPURGE FAMILY

- 1 Plant silvery-hairy; flowers with a calyx, not borne within an involucre (cyathium) *Eremocarpus setigerus*
 1 Plant green, flowers lacking a true calyx, borne within a cup-shaped involucre (cyathium) surrounding several reduced male flowers and a female flower with a 3-lobed pistil.
 2 Ovary and capsule hairy *Chamaesyce maculata*
 2 Ovary and capsule glabrous.
 3 Glands of cyathium without petal-like appendages *Chamaesyce ocellata*
 3 Glands of cyathium with petal-like appendages.
 4 Appendages of glands deeply parted into 3–5 ligule-like structures 1 mm long; plants in and about drying vernal pools (at Dales Lake?) *Chamaesyce hooveri*
 4 Appendages entire to slightly lobed (at Dales Lake?) *Chamaesyce serpyllifolia*

Chamaesyce maculata (L.) Small – SPOTTED SPURGE. Weedy annual growing along the edge of Manton Rd. at several locations (Oswald & Ahart 6872: SW¼ NW¼ Sec. 35, ca. 0.2 mi south of Inks Creek Rd.). A few plants also grow in gravel along the drying margin of the borrow pit. Native to the eastern U. S. Early Jun–Sep. [*Euphorbia maculata* L.; *E. supina* Raf.]

Chamaesyce ocellata (Durand & Hilg.) Millsp. ssp. *ocellata* – VALLEY SPURGE. Common late spring and summer annual in dry upland (Oswald & Ahart 6861: NE¼ NE¼ Sec. 26, on the dirt road near its junction with the old highway on the basalt ridge crossing the northeast corner of the reserve). Mid May–Sep.

Eremocarpus setigerus (Hook.) Benth. – TURKEY-MULLEIN. Common and widespread summer and fall annual along roads, dry pools, and in dry upland (Oswald & Ahart 6852: NE¼ NW¼ Sec. 26, stony Tuscan loam near Pool 20). Late May–Sep.

FABACEAE – LEGUME FAMILY [Leguminosae]

- 1 Shrub with simple, round to kidney-shaped leaves *Cercis occidentalis*
 1 Herbs with compound leaves.
 2 Leaves trifoliate or palmately compound.
 3 Leaves trifoliate.
 4 Flowers in ovoid to oblong heads; corolla persistent after flowering.
 5 Heads without an involucre at base of flowers (or closely subtended by a reduced leaf which may appear involucre-like)
 6 Corolla inflated in age (cowbag clover) *Trifolium depauperatum*
 6 Corolla not noticeably inflated in age.
 7 Plants perennial *Trifolium repens*
 7 Plants annual.
 8 Flowers on pedicels, reflexed in age.
 9 Flowers pinkish or whitish.
 10 Calyx lobes not ciliate, strongly reflexed in fruit *Trifolium retusum*
 10 Calyx lobes minutely ciliate with short flat appendages, not reflexed in fruit (at Dales Lake?) *Trifolium ciliolatum*
 9 Flowers yellow.
 11 Banner dilated and conspicuously veined, not closely folded over the pod (at Dales Lake?) *Trifolium campestre*
 11 Banner not dilated nor as conspicuously veined, closely folded over the pod *Trifolium dubium*
 8 Flowers sessile, not reflexed in age.
 12 Heads sessile or immediately above a reduced involucre-like leaf.
 13 Plant glabrous; heads sessile in a succession of leaf axis *Trifolium glomeratum*
 13 Plant hairy; heads terminal, each immediately above a reduced involucre-like leaf *Trifolium hirtum*
 12 Head peduncled.
 14 Corolla crimson, the head elongated and showy *Trifolium incarnatum*
 14 Corolla whitish and purplish, the head round to oval.
 15 Corolla exceeding or about equaling the calyx; heads with a purplish hue *Trifolium albopurpureum* var. *albopurpureum*
 15 Corolla much shorter than the calyx and quite obscured by it; heads with an olive-green hue (at Dales Lake?) *Trifolium albopurpureum* var. *olivaceum*
 5 Heads with an involucre at the base of the flowers.

- 16 Corolla conspicuously inflated in age (cowbag clovers).
 17 Involucre with obvious lobes *Trifolium depauperatum* var. *amplectens*
 17 Involucre reduced to a mere ring *Trifolium depauperatum* var. *depauperatum*
 16 Corolla not or only slightly inflated in age; involucre conspicuous.
 18 Involucre bell- to bowl-shaped
 19 Calyx hairy, the teeth about as long as the tube, their margins entire *Trifolium microcephalum*
 19 Calyx glabrous, the teeth distinctly shorter than the tube, irregularly toothed on the margins *Trifolium microdon*
 18 Involucre flat, rotate.
 20 Calyx teeth dilated and 3-toothed to simple, flowers usually purple with paler tips; plants usually in drier upland *Trifolium willdenovii*
 20 Calyx teeth awl-shaped and mostly entire; plants usually in wet places *Trifolium variegatum*
- 4 Flowers in spikes or racemes; corolla deciduous.
 21 Pods curved or spirally coiled; style awl-shaped.
 22 Flowers many, in dense elongate spike-like racemes; pods kidney-shaped, 1-seeded (at Dales Lake?) *Medicago lupulina*
 22 Flowers few, not in spikes; pods spirally coiled.
 23 Leaflets 2-4 mm long; flowers 2 mm long; spines on fruit always present *Medicago praecox*
 23 Leaflets 8-20 mm long; flowers 4-5 mm long; spines on fruit sometimes lacking *Medicago polymorpha*
 21 Pods ovoid, straight; style thread-like *Melilotus indica*
- 3 Leaves palmately compound, the leaflets more than 3.
 24 Keel ciliate on the upper and lower margins near the claws *Lupinus succulentus*
 24 Keel ciliate on the upper margins near the apex or not ciliate at all.
 25 Pedicels 1-3 mm long; flowers 4-8 mm long
 26 Almost no space (less than 1 mm) between upright portion of banner and tip of keel, tip of keel glabrous *Lupinus polycarpus*
 26 Distinct space (2-4 mm) between upright portion of banner and tip of keel.
 27 Keel essentially glabrous, occasionally with a few isolated hairs on the upper edges toward the apex; pods 6-9 mm wide, with 3-5 seeds *Lupinus pachylobus*
 27 Keel distinctly ciliate on the upper edges toward the apex; pods 3-5 mm wide, with 5-9 seeds *Lupinus bicolor*
- 25 Pedicels 4-10 mm long; flowers 6-10 mm long
 28 Tip of banner bent upward $\pm 45^\circ$ (\pm vertical), its tip only 2-3 mm from tip of wings *Lupinus nanus* var. *vallicola*
 28 Tip of banner bent upward $\pm 90^\circ$ (nearly vertical), its tip ± 3 mm from tip of wings *Lupinus nanus* var. *apricus*
- 2 Leaves pinnately compound or sometimes 2-foliate with a terminal tendril or seta.
 29 Axis of leaf prolonged into a tendril or a short seta *Vicia villosa*
 29 Axis of leaf without a tendril or seta.
 30 Flowers solitary in the axils.
 31 Flowers yellow.
 32 Calyx teeth about as long as the tube *Lotus wrangelianus*
 32 Calyx teeth twice as long as the tube *Lotus humistratus*
 31 Flowers whitish or reddish or pinkish.
 33 Flowers subsessile, red: RED-FLOWERED LOTUS, CNPS List 1B (at Dales Lake?) *Lotus rubriflorus* H. Sharsm.
 33 Flowers peduncled.
 34 Calyx teeth longer than the tube; corolla whitish, tinged with rose; pods bent downward *Lotus purshianus*
 34 Calyx teeth shorter than the tube; corolla pinkish or pale salmon, tinged or turning red; pods not bent downward *Lotus micranthus*
- 30 Flowers in racemes.
 35 Pods broadly ovate, 3-4 mm long (at Dales Lake?) *Astragalus gambelians*
 35 Pods hunate, over 1 cm long *Astragalus pauperculus*

Astragalus pauperculus Greene – DEPAUPERATE MILK-VETCH. Scattered to locally abundant annual in thin, bare, rocky soils (Oswald & Ahart 6626: NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 35, rocky cutbank along Manton Rd. just south of Inks Creek Rd.). Late Mar–May. CNPS List 4.

Cercis occidentalis Torr. ex A. Gray – WESTERN REDBUD. Scattered shrubs grow on the basalt ridge in the northeast corner of the reserve (Oswald & Ahart 6503: NW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 26). Early Mar–Apr. [*C. canadensis* L. var. *orbiculata* (Greene) Barneby]

Lotus humistratus Greene – FOOTHILL LOTUS. Locally abundant annual on gravelly and stony banks (Oswald & Ahart 6698: NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 35, roadcut along Manton Rd. just south of Inks Creek Rd.). Late Mar–May: [*Hosackia brachycarpa* Benth.]

Lotus micranthus Benth. – SMALL-FLOWERED LOTUS. Common and widespread annual in open woodland along the north end of the reserve (Oswald & Ahart

6681: NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 26, northeast corner of the reserve). Early Apr–Jun.

Lotus purshianus (Benth.) Clem. & E.G. Clem. var. *purshianus* – SPANISH LOTUS. Common summer-flowering annual along roads and in dry upland (Oswald & Ahart 7074: NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 26, along the old highway near the north gate). Mid Jun–Sep.

Lotus wrangelianus Fisch. & C.A. Mey. – WRANGEL LOTUS. Common and widespread annual in grassy and gravelly places (Oswald & Ahart 6664: NE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 26, old highway south of the Old Hwy. Pool). Early Apr–Jun. [*L. subpinnatus* Lag., misapplied; *Hosackia subpinnata* (Lag.) Torr. & A. Gray, misapplied]

Lupinus bicolor Lindl. – BICOLORED LUPINE. Widespread and locally abundant annual on grassy flats (Oswald & Ahart 6583: NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 26, north slope of “Lone Oak Knoll,” Oswald & Ahart 6627: NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 35, top of roadcut just south of Inks Creek Rd.). Although varieties are not recognized in *The Jepson Manual*, our plants correspond to var. *tridentatum* Eastw. ex C.P. Sm. Mid Mar–Jun.

Lupinus nanus Douglas ex Benth. var. *apricus* (Greene) C.P. Sm. – SKY LUPINE. Annual lupine known only from a small population in grassy upland at the north end of Dales Lake (Oswald & Ahart 6654: SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 26). Although subspecific taxa of *L. nanus* are not segregated in *The Jepson Manual*, three recognizable forms of this lupine occur in the foothills bordering the North Valley (see next also). Early Apr. [*L. vallicola* A. Heller ssp. *apricus* (Greene) D.B. Dunn].

Lupinus nanus var. *vallicola* (A. Heller) C.P. Sm. – VALLEY LUPINE. Locally abundant annual lupine along Manton Rd. and on the basalt ridges crossing the north side of the reserve (Oswald & Ahart 6599: NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 26, roadcut along Manton Rd. in the northeast corner of the reserve). Late Mar–Jun. [*L. vallicola* A. Heller]

Lupinus pachylobus Greene – BIG-PODDED LUPINE. Annual lupine forming localized populations in grassy upland (Oswald & Ahart 6694: SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 26, south side of the intermittent stream between the insulators and the intermittent stream coming from Pool 20). Mid Mar–May.

Lupinus polycarpus Greene – SMALL-FLOWERED LUPINE. Common and widespread annual along roads and in open grassland (Oswald 6545: NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 35, Manton Rd. just south of Inks Creek Rd.). Early Mar–May. [*L. micranthus* Guss. misapplied. This lupine is included in *L. bicolor* Lindl. in *The Jepson Manual*, but it appears to be clearly distinct in our range.]

Lupinus succulentus Douglas ex W.D.J. Koch – SUCCULENT LUPINE. Annual lupine typically found along roads and in other disturbed places. Within the reserve it is known from a single waif along the edge of Inks Creek Rd. (Oswald 6744: NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 35), but it is

more common along the road to the west. Mid Apr–May.

Medicago polymorpha L. – COMMON BUR-CLOVER. Weedy annual in thicker soils and in disturbed places (*Oswald & Ahart* 6660: NW¼ NW¼ Sec. 35, gravel along Inks Creek Rd. near the west boundary; *Oswald & Ahart* 6683: NW¼ NE¼ Sec. 26, on top of the basalt ridge west of the old highway). Pods are typically spiny, but smooth-podded plants also occur on the reserve. Native to the Mediterranean. Late Mar–May. [*M. polymorpha* var. *brevispina* (Benth.) Heyn; *M. hispida* Gaertn., including var. *confinis* (W.D.J.Koch) Burnat]

Medicago praecox DC – MEDITERRANEAN BUR-CLOVER. Weedy annual in thin rocky soils (*Oswald & Ahart* 6617: NW¼ SW¼ Sec. 35, between the fence line and Manton Rd. at the south tip of the reserve). Native to the Mediterranean. Early Mar–Apr.

Melilotus indica (L.) All. – INDIAN SWEET-CLOVER. Common annual weed in gravel along the edge of Inks Creek Rd. (*Oswald & Ahart* 6659: NW¼ NW¼ Sec. 35). Native to the Mediterranean. Mid Apr–Jun.

Trifolium alboburpureum Torr. A. Gray var. *alboburpureum* – INDIAN CLOVER. Widespread annual forming localized populations in drier uplands (*Oswald & Ahart* 6576: SW¼ NW¼ Sec. 26, on an eroded bank of fanglomerate downstream from Pool 19 at the pile of insulators; *Oswald & Ahart* 6589: NW¼ NW¼ Sec. 26, north slope of “Lone Oak Knoll;” *Oswald & Ahart* 6610: SW¼ NW¼ Sec. 35, near the west boundary south of Pool 4). Late Mar–May.

Trifolium depauperatum Desv. var. *depauperatum* – COWBAG CLOVER. Common annual in grassy woodland and in open grassland (*Oswald & Ahart* 6507: NE¼ NW¼ Sec. 26, drainage southwest of Pool 20). Rose-purple and whitish color variants occur, the former being more common. Late Feb–May.

Trifolium depauperatum var. *amplectens* (Torr. & A. Gray) McDermott – INVOLUCRATE COWBAG CLOVER. Annual clover known only from a population in thin soil between basalt cobbles at the very south tip of the reserve (*Oswald & Ahart* 6616: NW¼ SW¼ Sec. 35). Late Mar–Apr. [*T. amplectens* Torr. & A. Gray]

Trifolium dubium Sibth. – LITTLE HOP CLOVER. Weedy annual along roads, on grassy flats, and on basalt along the north end of the reserve (*Oswald & Ahart* 6622: SW¼ NW¼ Sec. 35, edge of Manton Rd. south of Inks Creek Rd.). Native to Europe. Early Apr–Jun.

Trifolium glomeratum L. – SESSILE-HEADED CLOVER. Weedy annual forming a large population in gravel at the south junction of the old highway and Manton Rd. (*Oswald & Ahart* 6663: NE¼ SW¼ Sec. 26). Native to Europe. Mid Apr–May.

Trifolium hirtum All. – ROSE CLOVER. Common and widespread annual throughout the reserve (*Oswald & Ahart* 6679: NE¼ SW¼ Sec. 26, edge of Manton Rd.

near the Old Hwy. Pool). Native to Eurasia. Mid Apr–Jun.

Trifolium incarnatum L. – CRIMSON CLOVER. Uncommon annual in grassland on the south side of the basalt ridge crossing the northwest corner of the reserve (*Oswald & Ahart* 6687: NE¼ NW¼ Sec. 26). This clover is often seeded along roads, but it usually dies out after several years. Native to southern Europe. Mid Apr–May.

Trifolium microcephalum Pursh – SMALL-HEADED CLOVER. Common and widespread annual in drier grassland on both the basalt ridges and the Tuscan fan deposits (*Oswald & Ahart* 6581: SW¼ NW¼ Sec. 26, along the intermittent stream coming from Pool 20). Late Mar–Jun.

Trifolium microdon Hook. & Arn. – SQUARE-HEADED CLOVER. Annual known from a localized population in basalt cobbles on the edge of the dirt road on the basalt ridge crossing the northeast corner of the reserve (*Oswald & Ahart* 6733: NW¼ NE¼ Sec. 26). Mid May. [Includes var. *pilosum* Eastw.]

Trifolium repens L. – WHITE CLOVER. Waif in gravel on the edge of Inks Creek Rd. (*Oswald & Ahart* 6870: NW¼ NW¼ Sec. 35). Native to Eurasia. Mid Jun.

Trifolium retusum L. – RETUSE CLOVER. A patch of dry clover was found at the junction of the dirt road and old highway on the basalt ridge in the northeast corner of the reserve (seed sample collected by Ahart on 17 Jul.; dry plants vouchered on 29 Aug; *Oswald* 7223, det. Randall Morgan; NE¼ NE¼ Sec. 26). According to Morgan (pers. com., 1995), this European clover has not previously been recorded for California, and it may represent the first record for the United States. [For description, see *Flora Europaea* 2:163.]

Trifolium variegatum Nutt. – WHITE-TIPPED CLOVER. Locally abundant annual in wet soil along pools, streams, and other wetlands (*Oswald & Ahart* 6591: NW¼ NW¼ Sec. 26, intermittent stream on the north side of the basalt ridge in the northwest corner of the reserve). Late Mar–Jun.

Trifolium willdenovii Spreng. – TOMCAT CLOVER. Common annual on gravelly banks, in grassy upland, and on the basalt ridges (*Oswald & Ahart* 6575: SW¼ NW¼ Sec. 26, eroded bank of fanglomerate downstream from Pool 19 at the pile of insulators). Mid Mar–May. [*T. tridentatum* Lindl., including var. *aciculare* (Nutt.) McDermott]

Vicia villosa Roth ssp. *varia* (Host) Corb. – WINTER VETCH. Locally abundant annual along roads but less common in open grassland (*Oswald & Ahart* 6600: NE¼ NE¼ Sec. 26, Manton Rd. near the northeast corner of the reserve). Native to Europe. Early Apr–Jun. [*V. villosa* var. *glabrescens* W.D.J.Koch; *V. dasy-carpa* Ten.]

FAGACEAE – OAK FAMILY

- 1 Leaves more or less thick and leathery, present throughout the year..... *Quercus wislizenii*
 1 Leaves usually thinner, deciduous..... *Quercus douglasii*

Quercus douglasii Hook. & Arn. – BLUE OAK. Common deciduous tree on the basalt ridges on the north side of the reserve, following the basalt southward along the edge of Manton Road to the barrow pit. Not vouchered. Late Mar–Apr.

Quercus wislizenii A.D.C. var. *wislizenii* – INTERIOR LIVE OAK. Common live oak on the basalt ridge crossing the northeast corner of the reserve (*Oswald & Ahart 6604*: NW¼ NE¼ Sec. 26, along Manton Rd.). Mid Mar–Apr.

GENTIANACEAE – GENTIAN FAMILY

- 1 Flowers pink, anthers coiled or spirally twisted after the flower opens.
 2 Flowers small, the corolla lobes 3–5 mm long; tips of stigma lobes = tips of the anthers..... *Centaureum muehlenbergii*
 2 Flowers larger, the corolla lobes ca. 8 mm long; tips of stigma lobes obviously surpassing the tips of the anthers..... *Centaureum venustum*
 1 Flowers yellow, anthers not coiled or twisted..... *Cicendia quadrangularis*

Centaureum muehlenbergii (Griseb.) W. Wight ex Piper – JUNE CENTAURY. Locally common annual on the drying beds of shallow wetlands and in dry upland on both alluvial fan and basalt substrates (*Oswald 6790*: NE¼ NW¼ Sec. 26, grassy flat along the north boundary about midway between the two basalt ridges). Early May–Jul. [*C. floribundum* (Benth.) B.L. Rob.]

Centaureum venustum (A. Gray) B.L. Rob. – CANCHALAGUA. Superficially similar to *C. muehlenbergii* but differing by the traits listed in the key. It is known only from along the bank of the intermittent stream on the south side of the basalt ridge near the west boundary (*Oswald & Ahart 6855*: NW¼ NW¼ Sec. 26). Early Jun–Jul. [Includes var. *abramsii* Munz]

Cicendia quadrangularis (Lam.) Griseb. – TIMWORT. Tiny but widespread and often locally abundant annual growing along the margins of wetlands and intermittent streams (*Oswald & Ahart 6590*: NW¼ NW¼ Sec. 26, edge of stream on the south side of the basalt ridge at the west boundary; *Oswald & Ahart 6673*: SE¼ NW¼ Sec. 26, margin of a drying wetland between the fence and Manton Rd. east of the borrow pit). Early Apr–May. [*Microcala quadrangularis* (Lam.) Griseb.]

GERANIACEAE – GERANIUM FAMILY

- 1 Leaves palmately veined or divided; stamens all bearing anthers..... *Geranium molle*
 1 Leaves pinnately veined or divided; outer stamens without anthers, consisting of filaments only.
 2 Leaves simple, shallowly to deeply lobed.
 3 Sepals lacking fine glandular pubescence between the lines of stiff hairs and with a prominent reddish-pointed tip; concavities at top of fruit subtended by 2 folds.....
 *Erodium botrys*
 3 Sepals with fine glandular pubescence between the lines of hairs and with a short green tip; concavities at top of fruit subtended by a single fold..... *Erodium brachycarpum*
 2 Leaves pinnately compound.
 4 Leaves pinnately lobed or divided into sharp-pointed divisions; tips of sepals with bristles..... *Erodium cicutarium*
 4 Leaves oval, toothed but not lobed or divided; tips of sepals lacking bristles.....
 *Erodium moschatum*

Erodium botrys (Cav.) Bertol. – LONG-BEAKED FILAREE. Common annual in open grassland (*Oswald &*

Ahart 6554: NE¼ SW¼ Sec. 26, south gate of the old highway). Native to southern Europe. Mid Mar–Jun.

Erodium brachycarpum (Godr.) Thellung – SHORT-FRUITED FILAREE. Common annual forb throughout the reserve (*Oswald & Ahart 6516*: NE¼ NE¼ Sec. 26, along a roadcut through basalt on the west side of Manton Rd. near the northeast tip of the reserve). Native to southern Europe. Early Feb–May.

Erodium cicutarium (L.) L'Hér. – RED-STEMMED FILAREE. Common and widespread annual in thin soils and in disturbed places (*Oswald & Ahart 6517*: NE¼ NE¼ Sec. 26, roadcut through basalt on the west side of Manton Rd. near the northeast tip of the reserve). Native to Eurasia. Mid Feb–May.

Erodium moschatum (L.) L'Hér. – WHITE-STEMMED FILAREE. Occasional to locally common weed in thicker soils, often in disturbed places (*Oswald & Ahart 6588*: NW¼ NW¼ Sec. 26, on "Lone Oak Knoll" where cattle formerly congregated; also noted at the west cattle guard on Inks Creek Rd. and on the margin of Dales Lake). Native to Europe. Late Feb–May.

Geranium molle L. – DOVE'S-FOOT GERANIUM. Locally abundant annual growing in the shade of blue oak (*Oswald & Ahart 6587*: NW¼ NW¼ Sec. 26, under the blue oak on "Lone Oak Knoll"). Native to Europe. Early Mar–Jun.

HIPPOCASTANACEAE – BUCKEYE FAMILY

Aesculus californica (Spach) Nutt. – CALIFORNIA BUCKEYE. Two shrubs grow on the basalt ridge crossing the northeast corner of the preserve (*Oswald 6755*: NE¼ NE¼ Sec. 26, north boundary just west of Manton Rd.). It is more common in oak woodland just north of the boundary. Early May–Jun.

HYDROPHYLLACEAE – WATER-LEAF FAMILY

- 1 Perennials.
 2 Shrub with woody, leaf-bearing stems; flowers pale blue..... *Eriodictyon californicum*
 2 Herbaceous perennial, the leaves arising from a basal caudex; flowers white.....
 *Phacelia egeana*
 1 Annuals.
 3 Leaves opposite on lower stem, alternate above..... *Nemophila heterophylla*
 3 Leaves all opposite..... *Nemophila pedunculata*

Eriodictyon californicum (Hook. & Arn.) Torr. – CALIFORNIA YERBA-SANTA. Evergreen shrub forming a large colony in basalt cobbles along Manton Rd. north of the borrow pit (*Oswald 6706*: NW¼ NE¼ Sec. 26). Late Apr–Jun.

Nemophila heterophylla Fisch. & C.A. Mey. – VARIABLE-LEAVED NEMOPHILA. Common in moist or shaded places on basalt outcrops crossing the north side of the reserve (*Oswald & Ahart 6539*: NW¼ NE¼ Sec. 26, in basalt cobbles along the south rim of the basalt ridge in the northeast corner of the reserve). Early Mar–May.

Nemophila pedunculata Douglas ex Benth. – MEADOW NEMOPHILA. Common annual in moist soils of open grassland, along drainages, and along the edge of

the basalt ridges (*Oswald & Ahart 6511*: SW¼ NW¼ Sec. 26, along the drainage coming from the borrow pit just east (upstream) of the pile of powerline insulators). Early Feb–May.

Phacelia egea (Greene ex Brand) J.T. Howell – ROCK PHACELIA. Localized population on a basalt outcrop on the edge of Manton Rd. east of the borrow pit (*Oswald & Ahart 6674*: NE¼ SW¼ Sec. 26). Early Apr–Jun.

HYPERICACEAE – ST. JOHN’S-WORT FAMILY

Hypericum perforatum L. – KLAMATHWEED. Locally abundant herbaceous perennial at several locations along Manton Rd. (*Oswald 6756*: NE¼ NE¼ Sec. 26, east of the borrow pit). Native to Europe. Mid May–Aug.

LAMIACEAE – MINT FAMILY [Labiatae]

- 1 Ovary of 4 united nutlets that are laterally attached; plants with a strong vinegar-like odor when crushed..... *Trichostema lanceolatum*
- 1 Ovary of 4 separate nutlets that are basally attached.
 - 2 Corolla regular or nearly so, the lobes nearly equal..... *Mentha pulegium*
 - 2 Corolla strongly 2-lipped.
 - 3 Calyx with 10 more or less spiny, hooked teeth at the tip..... *Marrubium vulgare*
 - 3 Calyx teeth not hooked at tip.
 - 4 Upper lip of corolla concave; plants of uplands..... *Lamium amplexicaule*
 - 4 Upper lip of corolla plane; plants of drying wetlands..... *Pogogyne zizyphoroides*

Lamium amplexicaule L. – GIRAFFEHEAD. Occasional weedy annual in grassy, rocky, and disturbed places (*Oswald & Ahart 6518*: NE¼ NE¼ Sec. 26, roadcut through basalt along Manton Rd. at the northeast corner of the reserve). Native to Eurasia. Early Mar–Apr.

Marrubium vulgare L. – HOREHOUND. Known only from the skeletonized remains of several plants formerly growing in basalt rubble on the top of the ridge in the northwest corner of the reserve. Native to Europe.

Mentha pulegium L. – PENNYROYAL. Several seedlings were found on the drying margin of Pool 7 in July, but they did not survive to maturity. However, pennyroyal is a common weed in moist gravel along the edge of the borrow pit on the east side of Manton Rd. adjacent to the reserve (*Oswald & Ahart 7068*: NE¼ SW¼ Sec. 26). Native to Europe. Early Jul–Sep.

Pogogyne zizyphoroides Benth. – SACRAMENTO POGOGYNE. Common and widespread annual of vernal wet upland soils and shallow wetlands (*Oswald & Ahart 6646*: SW¼ SW¼ Sec. 26, between Dales Lake and the west boundary; *Oswald & Ahart 6867*: NW¼ NW¼ Sec. 35, on the dry bed of Pool 5). Early Apr–Jun.

Trichostema lanceolatum Benth. – VINEGAR-WEED. Common and widespread summer and fall annual in open grassland (*Oswald & Ahart 6868*: NW¼ NW¼ Sec. 35, on the edge of Pool 5). Mid Jun–Sep.

LIMNANTHACEAE – MEADOWFOAM FAMILY

- 1 Flowers showy, the petals spreading-reflexed and obviously exceeding the sepals; nutlets exposed during maturation..... *Limnanthes douglasii* var. *rosea*

- 1 Flowers not showy, the petals more or less erect and barely exceeding the sepals; nutlets covered by the petals and sepals during maturation, not exposed..... *Limnanthes floccosa* ssp. *floccosa*

Limnanthes douglasii R.Br. ssp. *rosea* (Hartw. ex Benth.) C.T. Mason – ROSY MEADOWFOAM. Locally abundant annual in wet soil bordering pools and drainages which held standing water (*Oswald & Ahart 6536*: NW¼ NW¼ Sec. 35, wet depression near the corner of Manton and Inks Creek rds.). Early Mar–May.

Limnanthes floccosa Howell ssp. *floccosa* – WOOLLY MEADOWFOAM. Common, widespread, and locally abundant in vernal wet soils along drainages, swales, and on upland flats, usually where water has not been standing for long periods of time (*Oswald & Ahart 6527*: SW¼ NW¼ Sec. 35, near the west boundary at the broad swale between the southern cluster of pools and the basalt flow to the south). Early Mar–Apr. CNPS List 2. This plant could more realistically be assigned to List 4 since it is quite common in the foothills bordering the North Valley, and it does quite well in disturbed habitats such as roadside drainages.

LYTHRACEAE – LOOSESTRIFE FAMILY

- 1 Flower tube more or less cylindrical..... *Lythrum hyssopifolium*
- 1 Flower tube short, bell-shaped to globular..... *Rotala ramosior*

Lythrum hyssopifolium L. – HYSSOP LOOSESTRIFE. Locally abundant annual on the drying beds of intermittent streams and vernal pools (*Oswald & Ahart 6847*: NE¼ SW¼ Sec. 26, Old Hwy. Pool). Native to Europe. Late May–Aug.

Rotala ramosior (L.) Koehne – LOWLAND TOOTH-CUP. This herbaceous perennial has not been found on the reserve, but it is locally abundant on the inuddy margin of the borrow pit on the east side of Manton Rd. (*Oswald 7222*: NE¼ SW¼ Sec. 26). Late Aug–Sep.

MALVACEAE – MALLOW FAMILY

Sidalcea hirsuta A. Gray – HAIRY CHECKERBLOOM. Locally common annual on the drying margin of Dales Lake (*Oswald 6746*: SW¼ SW¼ Sec. 26). Scattered plants are also found along the margins of other pools. Mid May–Jun.

MOLLUGINACEAE – CARPET-WEED FAMILY

Mollugo verticillata L. – INDIAN-CHICKWEED. Common summer annual along roads, and in other disturbed places (*Oswald & Ahart 6848A*: NE¼ SW¼ Sec. 26, dry margin of the Old Hwy. Pool). Native to tropical America. Mid Jun–Sep.

ONAGRACEAE – EVENING-PRIMROSE FAMILY

- 1 Petals absent; prostrate plant rooting at the nodes in wet places..... *Ludwigia palustris*
- 1 Petals present; plants erect, not rooting at the nodes.
 - 2 Seeds with a tuft of hairs (coma) at one end.
 - 3 Plants tall, glabrous below, generally glandular-hairy above; leaves usually alternate (at Dales Lake?)..... *Epilobium brachycarpum*
 - 3 Plants less than 3 dm tall, usually strigose throughout; leaves mostly opposite.
 - 4 Ripe seeds with a net-like pattern at 30X (at Dales Lake?)..... *Epilobium miratum*
 - 4 Ripe seeds minutely papillate at 30X, without a net-like pattern..... *Epilobium foliosum*
 - 2 Seeds lacking a coma.

- 5 Petals yellow, sometimes reddish in age; filaments attached near center of anthers..... *Camissonia contorta*
- 5 Petals pink to lavender or rose, sometimes whitish; filaments attached to base of anthers.
- 6 Sepals erect; petals small.
- 7 Plants usually not conspicuously hairy; seeds in 2 rows in each cavity of ovary (section with a razor blade to see)..... *Epilobium cleistogamum*
- 7 Plants distinctly hairy; seeds in a single row in each cavity of ovary.
- 8 Capsule not conspicuously beaked, the central axis holding together at maturity, 4-winged..... *Epilobium densiflorum*
- 8 Capsule ± beaked, the central axis readily disintegrating at maturity..... *Epilobium torreyi*
- 6 Sepals reflexed or the tips remaining united and turned to one side at flowering; petals large and showy.
- 9 Buds erect..... *Clarkia purpurea*
- 9 Buds, at least the older ones, pendulous or bent down..... *Clarkia lasseensis*

Camissonia contorta (Douglas ex Hook.) Raven – TWISTED SUNCUP. Common annual forb on patches of bare, gravelly soil (Oswald & Ahart 6578: SW¼ NW¼ Sec. 26, eroded bank of fanglomerate at the pile of insulators downstream from Pool 19). Early Mar–Apr. [*Oenothera contorta* Douglas ex Hook.; *O. contorta* var. *strigulosa* (Fisch. & C.A.Mey.) Munz, misapplied; *P. cruciata* (S. Watson) Munz]

Clarkia lasseensis (Eastw.) F.H. & M.R. Lewis – MT. LASSEN CLARKIA. Attractive annual forming localized populations in basalt cobbles on the ridge crossing the northeast corner of the reserve (Oswald & Ahart 6732: NW¼ NE¼ Sec. 26, near the west end of the ridge). Late Apr–May. [*Godetia lasseensis* Eastw.]

Clarkia purpurea (Curtis) A. Nelson & J.F. Macbr. ssp. *quadrivulnera* (Douglas) F.H. Lewis & M.R. Lewis – PURPLE CLARKIA. Common and widespread annual in grassy upland (Oswald & Ahart 6713: NE¼ NW¼ Sec. 26, boulder-field between the Borrow Pit and Pool 20). Late Apr–Jul. [*C. quadrivulnera* (Douglas) A. Nelson & J.F. Macbr.]

Epilobium cleistogamum (Curran) P. Hoch & Raven – CLEISTOGAMOUS SPIKE-PRIMROSE. Herbaceous annual on the drying beds of vernal pools (Oswald & Ahart 6869: NW¼ NW¼ Sec. 35, south margin of Dales Lake). Usually cleistogamous; in fruit mid Jun. [*Boisduvalia cleistogama* Curran]

Epilobium densiflorum (Lindl.) P. Hoch & Raven – DENSE-FLOWERED SPIKE-PRIMROSE. Locally abundant annual in wet places along ponds and ditches (Oswald 6826: NW¼ NW¼ Sec. 35, margin of Dales Lake). Mid May–Jul. [*Boisduvalia densiflora* (Lindl.) S. Watson, including var. *pallescens* Suksd., var. *salicina* (Torr. & A. Gray) Munz, & forma *imbricata* (Greene) Munz]

Epilobium foliosum (Nutt. ex Torr. & A. Gray) Suksd. – SMALL-FLOWERED WILLOWHERB. Uncommon annual growing in rocky places (Oswald & Ahart 6691: NW¼ NW¼ Sec. 26, on the north edge of the basalt ridge crossing the northwest corner of the reserve; Oswald & Ahart 6866: NW¼ SW¼ Sec. 26, in a pile of basalt boulders between Manton Rd. and the fence east of the Old Hwy. Pool). Late Apr–Jun.

Epilobium torreyi (S. Watson) P. Hoch & Raven – TORREY'S SPIKE-PRIMROSE. Common annual in shallow wetlands and vernal wet uplands (Oswald & Ahart 6724: NE¼ NW¼ Sec. 26, upland bordering the adobe

wetland west of Pool 20). Late Apr–Jul. [*Boisduvalia stricta* (A. Gray) Greene]

Ludwigia palustris (L.) Elliott – MARSH-PURSLANE. Uncommon annual in shallow water and on the drying beds of pools and drainages (Oswald 6745: SW¼ SW¼ Sec. 26, mud in the bottom of a deeper pool along a drainage north of Dales Lake). In bud mid May. [Includes vars. *americana* (DC.) Fernald & Griscom and *pacifica* Fernald & Griscom]

PAPAVERACEAE – POPPY FAMILY

Eschscholzia lobbii Cham. – FRYINGPANS. Locally abundant annual in open grassland (Oswald & Ahart 6510: NE¼ NW¼ Sec. 26, slope along a secondary drainage southwest of Pool 20). Mid Feb–Jun.

PLANTAGINACEAE – PLANTAIN FAMILY

- 1 Leaves sharply and deeply toothed except in depauperate individuals... *Plantago coronopus*
- 1 Leaves entire.
- 2 Leaves narrow, linear to almost thread-like; spring annuals.
- 3 Sepals glabrous; stamens 2..... *Plantago elongata*
- 3 Sepals long hairy; stamens 4..... *Plantago erecta*
- 2 Leaves lanceolate to lance-oblong; plants perennial..... *Plantago lanceolata*

Plantago coronopus L. – CUT-LEAVED PLANTAIN. Annual weed in gravel on the edge of Inks Creek Rd. (Oswald & Ahart 6657: NW¼ NW¼ Sec. 35). Native to Europe. Mid Apr.

Plantago elongata Pursh – ELONGATE PLANTAIN. Inconspicuous annual in shallow wetlands (Oswald & Ahart 6609: NW¼ NW¼ Sec. 35, drying wetland near the west boundary south of Pool 4). Early Mar–Apr. [*P. bigelovii* A. Gray, including ssp. *californica* (Greene) Bassett]

Plantago erecta E. Morris – ERECT PLANTAIN. Common annual on outcrops and in open grassland (Oswald & Ahart 6530: NW¼ SW¼ Sec. 35, on basalt near the south tip of the reserve). Mid Mar–May. [*P. hookeriana* Fisch. & C.A. Mey. var. *californica* (Greene) Poe]

Plantago lanceolata L. – ENGLISH PLANTAIN. Uncommon perennial known only from two young plants near the west boundary just south of Inks Creek Rd. These plants dried up in mid June without flowering. Native to Europe.

POLEMONIACEAE – PHLOX FAMILY

- 1 Leaves mostly opposite.
- 2 Leaves entire..... *Phlox gracilis*
- 2 Leaves palmately cleft into linear segments.
- 3 Calyx with a conspicuous hyaline membrane in the sinuses, either forming a pseudotube or present on the margins of the lobes..... *Linanthus bolanderi*
- 3 Calyx not membranous in sinuses or on margins of lobes or very inconspicuously so..... *Linanthus bicolor*
- 1 Leaves mostly alternate, entire to pinnately dissected.
- 4 Calyx lobes almost equal; leaves and bracts without rigidly spined lobes..... *Gilia tricolor*
- 4 Calyx lobes unequal; leaves and bracts usually with rigidly spined lobes.
- 5 Flowers white, without colored areas or spots.
- 6 Stigma minutely 2-lobed; lobes of bracts at base of head soft-herbaceous when fresh; plants of drying vernal pools and wetlands..... *Navarretia leucocephala*
- 6 Stigma deeply 2-3-cleft; lobes of bracts at base of head rigidly needle-pointed; plants of drier uplands (at Dales Lake?)..... *Navarretia subuligera*
- 5 Flowers bluish, purplish, or, if white, with some colored areas or spots.
- 7 Stigma capitate or 2-cleft.
- 8 Corolla whitish or bluish, the throat with dark purple blotches within, these often extending down into the tube..... *Navarretia heterandra*
- 8 Corolla throat without dark-purple blotches.
- 9 Corolla pale blue..... *Navarretia interlecta*
- 9 Corolla purple with dark blue lobes..... *Navarretia pubescens*

- 7 Stigma 3-cleft.
 10 Corolla pale blue; stem recurved-hairy below the heads..... *Navarretia tagetina*
 10 Corolla red-purple; stems glandular-hairy..... *Navarretia viscidula*

Gilia tricolor Benth. ssp. *tricolor* – BIRD’S-EYE GILIA. Common and locally abundant annual in open grassland and on outcrops (Oswald & Ahart 6534: SW¼ NW¼ Sec. 35, edge of a basalt outcrop in south end of reserve). Mid Mar–May.

Linanthus bicolor (Nutt.) Greene – BICOLORED LINANTHUS. Common and widespread annual forb in open grassland, sometimes forming dense stands on decomposed “cow-pies” (Oswald & Ahart 6566: NW¼ SW¼ Sec. 26, along the unimproved road west of the airstrip). Early Mar–Apr.

Linanthus bolanderi (A. Gray) Greene – BOLANDER’S LINANTHUS. Slender annual on gravelly banks and outcrops (Oswald & Ahart 6577: SW¼ NW¼ Sec. 26, eroded fanglomerate at the pile of insulators downstream from Pool 19; also noted on basalt at the south end of the reserve and on exposed fanglomerate on the west bank of the borrow pit). Mid Mar–Apr. [*L. bakeri* H. Mason]

Navarretia leucocephala Benth. ssp. *leucocephala* – WHITE-FLOWERED NAVARRETIA. Locally abundant annual on the drying beds of intermittent streams, vernal pools, and other wetlands (Oswald & Ahart 6688: NE¼ NW¼ Sec. 26, intermittent stream along the south side of the basalt ridge crossing the northwest corner of the reserve). Early Apr–Jul.

Navarretia heterandra H. Mason – TEHAMA NAVARRETIA. Locally abundant and widespread annual in vernal wet upland and on the dry beds of shallow wetlands (Oswald & Ahart 6725: NW¼ NW¼ Sec. 26, at the pile of discarded powerline poles west of Pool 20). Early May–Jun. CNPS List 4.

Navarretia intertexta (Benth.) Hook. ssp. *intertexta* – NEEDLE-LEAVED NAVARRETIA. Annual forb in localized populations along ponds and in vernal wet upland (Oswald 6742: SW¼ NW¼ Sec. 35, near the west fence on the north edge of the basalt flow at the south end of the reserve; Oswald 6747: SW¼ SW¼ Sec. 26, on southeast end of Dales Lake). Mid May–Jun.

Navarretia pubescens (Benth.) Hook. & Arn. – DOWNY NAVARRETIA. Locally abundant annual forb in dry, grassy upland (Oswald 6788: SW¼ NW¼ Sec. 26, north side of intermittent stream just upstream from the pile of insulators). Late May–Jun.

Navarretia tagetina Greene – MARIGOLD NAVARRETIA. Abundant and widespread annual in grassy upland (Oswald & Ahart 6710: NE¼ SW¼ Sec. 26, northwest side of the Old Hwy. Pool). Early May–Jul.

Navarretia viscidula Benth. ssp. *purpurea* (Greene ex Brand) H. Mason – STICKY NAVARRETIA. Locally abundant annual in dry gravelly and grassy places (Oswald 6753: NE¼ SW¼ Sec. 26, at the south end of the old highway). Mid May–Jul.

Phlox gracilis (Hook.) Greene – SLENDER PHLOX. Locally common annual in gravelly spots in open grassland and on the banks of intermittent drainages (Oswald & Ahart 6509: NE¼ NW¼ Sec. 26, along the drainage southwest of Pool 20). Late Feb–Apr. [*Microsteris gracilis* (Hook.) Greene, including ssp. *humilis* (Greene) V.E. Grant & var. *humilior* (Hook.) Cronquist]

POLYGONACEAE – BUCKWHEAT FAMILY

- 1 Leaves without stipules.
- 2 Flowers subtended by 2-lobed bracts that become enlarged, net-veined, and sac-like in fruit; an involucre lacking..... *Pterostegia drymarioides*
- 2 Flowers enclosed in a tubular to bell-shaped involucre.
- 3 Minute prostrate annual; involucre with spine or bristle-tipped teeth..... *Chorizanthe polygonoides*
- 3 Tall, erect, herbaceous perennial; involucre with teeth or lobes that lack bristles or spines..... *Eriogonum nudum*
- 1 Leaves with evident stipular sheaths.
- 4 Slender stemmed annuals, the leaves sessile, linear, < 2 cm long.
- 5 Plants ± erect; stems more or less sharply angled, especially below the nodes, not regularly ribbed; stipules cut into stiff, bristle-like segments.. *Polygonum californicum*
- 5 Plants mostly spreading to prostrate; stems cylindrical, regularly ribbed but not sharply angled; stipules segments not stiff and bristle-like..... *Polygonum arenastrum*
- 4 Thick-stemmed perennials, the leaves petioled, broadly lanceolate, >> 2 cm long.
- 6 Plant with basal leaves; stem(s) erect..... *Rumex crispus*
- 6 Plant without basal leaves even when young; stems numerous, ascending to decumbent..... *Rumex salicifolius*

Chorizanthe polygonoides Torr. & A. Gray var. *polygonoides* – KNOTWEED SPINEFLOWER. Small annual in more or less bare, stony places in open grassland (Oswald & Ahart 6668: SE¼ NW¼ Sec. 26, bank of exposed fanglomerate on the west wall of the borrow pit). Mid Apr–Jun.

Eriogonum nudum Douglas ex Benth. var. *pubiflorum* Benth. – HAIRY-FLOWERED BUCKWHEAT. Locally common herbaceous perennial on basalt near the old highway in the northeast corner of the reserve (Oswald & Ahart 7075: NE¼ NE¼ Sec. 26). Mid Jul–Sep.

Polygonum arenastrum Jord. ex Boreau – COMMON KNOTWEED. Weedy annual in gravel along the edge of Inks Creek Rd. (Oswald 6829: NW¼ NW¼ Sec. 35). Native to Europe. Late Apr–Jun. [*P. aviculare* L. of Calif. authors, a similar plant that has not been documented in California]

Polygonum californicum Meisn. – CALIFORNIA KNOTWEED. Inconspicuous annual in more or less bare patches of gravelly soil on both Tuscan fan deposits and basalt (Oswald 6743: NW¼ SW¼ Sec. 35, basalt at the south tip of the reserve; Oswald & Ahart 6844: NE¼ SW¼ Sec. 26, on the gravelly bed of the old highway south of the Old Hwy. Pool). Early May–Jul.

Pterostegia drymarioides Fisch. & C.A. Mey. – PTEROSTEGIA. Occasional sprawling annual in rubble and shaded crevices on outcrops on the ridge in the northeast corner of the reserve (Oswald & Ahart 6540: NW¼ NE¼ Sec. 26). Early Mar–Jun.

Rumex crispus L. – CURLY DOCK. Herbaceous perennial along ditches, drainages, and in wet lowland on the open grassland of the reserve (Oswald 6703: NW¼ NW¼ Sec. 35, at the cattleguard on Inks Creek Rd. at the west boundary). Native to Eurasia. Mid Apr–Jun.

Rumex salicifolius Weinm. var. *salicifolius* – WILLOW DOCK. Many-stemmed herbaceous perennial known only from among basalt boulders along Manton Rd. east of the borrow pit (Oswald 6821: SE¼ NW¼ Sec. 26). Mid May–Jun.

PORTULACACEAE – PURSLANE FAMILY

- 1 Calyx fused with the lower part of the ovary, its lobes coming off the summit of the capsule. *Portulaca oleracea*
- 1 Calyx and ovary free
 - 2 Flowers red, in leafy racemes. *Calandrinia ciliata*
 - 2 Flowers pink to white.
 - 3 Stem leaves 1 pair, grown together.
 - 4 Stem leaves fused into a 2-toothed disk, not forming a round to somewhat angled disk. *Claytonia exigua* ssp. *exigua*
 - 4 Stem leaves united on both sides, forming a flattish rounded to somewhat angled disk.
 - 5 Basal leaves ovate to deltoid. *Claytonia perfoliata* ssp. *perfoliata*
 - 5 Basal leaves largely linear to inversely lanceolate or spatulate. *Claytonia parviflora* ssp. *parviflora*
 - 3 Stem leaves 2–several pairs, opposite.
 - 6 Sepals ca. 1.5 mm long; seeds 1.0–1.4 mm, the tubercles not sharply pointed; more robust plants of shallow water and wet mud. *Montia fontana* ssp. *chondrosperma*
 - 6 Sepals ca. 1 mm long; seeds 0.6–0.9 mm, the tubercles sharply pointed; more slender and delicate plants of moist upland soils & rocky places, usually not in places where water has stood. *Montia fontana* ssp. *amportitana*

Calandrinia ciliata (Ruiz & Pav.) DC. – REDMAIDS. Annual forb scattered in open grassland and in disturbed places (Oswald & Ahart 6520: NW¼ NW¼ Sec. 35, gravel on the south edge of Inks Creek Rd.). Mid Feb–May. [Includes var. *menziesii* (Hook.) J.F. Macbr., *C. caulescens* Humb., Bonpl. & Kunth var. *menziesii* A. Gray]

Claytonia exigua Torr. & A. Gray ssp. *exigua* – LITTLE MINER'S-LETTUCE. Locally abundant annual on cutbanks along drainages and in stony and gravelly places on eroded fanglomerate (Oswald & Ahart 6506: NE¼ NW¼ Sec. 26, just east of Pool 20). The fused pair of cauline leaves is quite variable in size and shape. Early Mar. [*Montia spathulata* (Douglas ex Hook.) Howell, including var. *exigua* (Torr. & A. Gray) B.L. Rob., var. *rostellata* (Eastw.) J.T. Howell, & var. *tenuifolia* (Torr. & A. Gray) Munz]

Claytonia parviflora Douglas ex Hook. ssp. *parviflora* – SMALL-FLOWERED MINER'S-LETTUCE. Locally abundant in moist, shaded places on the basalt ridge crossing the northeast corner of the reserve (Oswald & Ahart 6602: NW¼ NE¼ Sec. 26, among large basalt boulders between Manton Rd. and the old highway in the northeast corner of the reserve). Mid Mar–May. [*Montia perfoliata* (Donn ex Willd.) Howell in part; *M. perfoliata* var. *parviflora* (Douglas ex Hook.) Jeps.; *M. perfoliata* forma *parviflora* (Douglas ex Hook.) J.T. Howell]

Claytonia perfoliata Donn ex Willd. ssp. *perfoliata* – COMMON MINER'S-LETTUCE. Locally abundant annual in shaded places and under trees (Oswald & Ahart 6502: NE¼ NE¼ Sec. 26, basalt ridge in the northeast corner of the reserve). Mid Feb–Apr. [*Montia perfoliata* (Donn ex Willd.) Howell]

Montia fontana L. ssp. *amportitana* Sennen – WATER MONTIA. Locally abundant annual in vernal wet soil of uplands (Oswald & Ahart 6482, NW¼ NE¼

Sec. 26, mossy cracks in the old highway just south of the basalt ridge). Early Feb–Apr. [*M. fontana* var. *tenerima* (A. Gray) Fernald & Wiegand; *M. hallii* (A. Gray) Greene]

Montia fontana L. ssp. *chondrosperma* (Fenzl) Walters – WATER MONTIA. Common succulent annual growing in places where water is (or has been) standing (Oswald & Ahart 6493: SE¼ NW¼ Sec. 26, intermittent drainage west of the borrow pit; Oswald & Ahart 6496: SW¼ SW¼ Sec. 26, shallow rocky pool north of Inks Creek Rd. near the west boundary fence). Mid Feb–May. [*M. verna* Neck; *M. minor* C.C. Gmel.]

Portulaca oleracea L. – COMMON PURSLANE. Annual weed known from a single waif growing on the dry bed of Pool 13 (not vouchered). Native to Europe. Mid Jul–Aug.

PRIMULACEAE – PRIMROSE FAMILY

- 1 Plant with leafy stems and salmon-red flowers. *Anagallis arvensis*
- 1 Leaves basal, the flowers white and borne on a leafless scape. *Dodecatheon clevelandii*

Anagallis arvensis L. – SCARLET PIMPERNEL. Attractive weedy annual growing in gravel on the edge of Inks Creek Rd. (Oswald & Ahart 6737: NW¼ NW¼ Sec. 35). Native to Europe. Mid May.

Dodecatheon clevelandii Greene ssp. *patulum* (Greene) H.J. Thoms. – LOWLAND SHOOTINGSTAR. Widespread and locally abundant herbaceous perennial in open grassland (Oswald & Ahart 6491: SW¼ NW¼ Sec. 26). This is one of the early wildflowers to bloom on the reserve. Mid Feb–Apr. [*D. patulum* Greene]

RANUNCULACEAE – BUTTERCUP FAMILY

- 1 Pistil few- to several-ovuled, becoming a follicle. *Delphinium nudicaule*
- 2 Flowers red. *Delphinium nudicaule*
- 2 Flowers blue
 - 3 Raceme loose, 4–11(15)-flowered; leaves green at anthesis; seed winged but not prickly on the faces. *Delphinium variegatum*
 - 3 Raceme compact, 9–35-flowered; leaves beginning to whither at anthesis; seed finely prickly on the faces (at Dales Lake?) *Delphinium harsenii*
- 1 Pistil 1-ovuled, becoming an akene.
 - 4 Petals white; plants aquatic or growing in wetlands.
 - 5 Petals conspicuous; sepals not spurred; aquatic plants (sometimes persisting on mud at dry-down) with highly dissected stem leaves (terminal sometimes only lobed) *Ranunculus aquatilis*
 - 5 Petals inconspicuous or sometimes absent; sepals spurred; small annuals with basal linear leaves growing in wetlands *Myosurus minimus*
 - 4 Petals yellow (may be small and inconspicuous); plants growing in uplands.
 - 6 Petals usually 2, 1, or absent, inconspicuous; akenes covered with small hooked bristles *Ranunculus hebecarpus*
 - 6 Petals 5–12 or more, conspicuous; akenes not covered with hooked bristles.
 - 7 Petals 5–12 (or more); body of akene 4–5 mm long, the beak with a broad thin base 0.6–1 mm wide. *Ranunculus canus*
 - 7 Petals usually 5; body of akene 2–3 mm long, the base of the beak < 0.5 mm wide (at Dales Lake?) *Ranunculus occidentalis*

Delphinium nudicaule Torr. & A. Gray – RED LARKSPUR. Scattered to locally common herbaceous perennial in basalt cobbles on the ridge crossing the north end of the reserve (Oswald & Ahart 6594: NW¼ NW¼ Sec. 26, basalt ridge on the west side of reserve). Mid Mar–Apr.

Delphinium variegatum Torr. & A. Gray ssp. *variegatum* – ROYAL LARKSPUR. Scattered to locally abundant herbaceous perennial in open grassland and rocky places (Oswald & Ahart 6605: NE¼ NW¼ Sec. 26, between Manton Rd. and the reserve fence opposite the

Old Hwy. Pool). Our plants are the large-flowered forma *superbum* Ewan. Late Mar–Jun.

***Myosurus minimus* L.** – TINY MOUSETAIL. Locally abundant annual in shallow depressions where water has been standing (*Oswald & Ahart 6607*: NW¼ NW¼ Sec. 35, drying wetland between the northwest edge of Pool 8 and the west fence; *Oswald & Ahart 6630*: NW¼ NW¼ Sec. 35, small pool on the south side of the fence at the intersection of Manton and Inks Creek rds.). Late Feb–Apr. [Includes var. *filiformis* Greene & ssp. *major* (Greene) G.R.Camp.]

***Ranunculus aquatilis* L. var. *hispidulus* Drew** – WATER BUTTERCUP. Locally abundant annual in a pool receiving water from the double culvert under Manton Rd. east of the borrow pit (*Oswald & Ahart 6672*: SE¼ NW¼ Sec. 26). Mid Apr–Jun, probably first blooming much earlier.

***Ranunculus canus* Benth.** – SACRAMENTO VALLEY BUTTERCUP. Herbaceous perennial in a localized population under blue oak on the east edge of the reserve north of the borrow pit (*Oswald 6524*: SW¼ NE¼ Sec. 26). Flowers with up to 11 or even 12 petals are common in this population. Mid Feb–May. [Includes var. *laetus* (Greene) L.D.Benson & var. *ludovicianus* (Greene) L.D.Benson]

***Ranunculus hebecarpus* Hook. & Arn.** – PUBESCENT-FRUITED BUTTERCUP. Locally abundant annual on the basalt outcrops (*Oswald & Ahart 6640*: NW¼ NE¼ Sec. 26, south edge of the basalt ridge crossing the northeast corner of the reserve). Mid Mar–May.

RHAMNACEAE – BUCKTHORN FAMILY

- 1 Leaves present throughout the year; fruit a dry capsule..... *Ceanothus cuneatus*
1 Leaves deciduous; fruit fleshy and drupe-like..... *Rhamnus tomentella*

Ceanothus cuneatus* (Hook.) Nutt. var. *cuneatus – BUCKBRUSH. Common evergreen shrub on the basalt outcrops along the north side of the reserve (*Oswald & Ahart 6487*: NW¼ NW¼ Sec. 26). Mid Feb–Mar. [Includes var. *dubius* J.T.Howell, var. *ramulosus* Greene & var. *submontanus* (Rose) McMinn; *C. ramulosus* (Greene) McMinn var. *ramulosus*]

Rhamnus tomentella* Benth. ssp. *tomentella – HOARY COFFEEBERRY. – A single shrub grows on an outcrop on the south rim of the basalt ridge crossing the northeast corner of the reserve (*Oswald & Ahart 6858*: NW¼ NE¼ Sec. 26). This plant was very unthrifty and without leaves when first seen in early spring of 1995, but by the beginning of summer, it was covered with abundant new growth. However, none of the few flowers that were present developed fruit. Late Apr–May. [*R. californica* Eschsch. ssp. *tomentella* (Benth.) C.B.Wolf]

ROSACEAE – ROSE FAMILY

- 1 Fruit a dry achene; small, inconspicuous annuals..... *Aphanes occidentalis*
1 Fruit a cluster of drupelets forming a "berry;" perennials with thorny canes..... *Rubus discolor*

***Aphanes occidentalis* (Nutt.) Rydb.** – WESTERN LADY'S-MANTLE. Locally abundant diminutive annual in

gravelly soil on the basalt ridges on the north side of the reserve. It also grows in open grassland (*Oswald & Ahart 6525*: SW¼ NW¼ Sec. 35, in stony Tuscan loam south of the southern cluster of pools). Mid Feb–Apr. [*Alchemilla arvensis* (L.) Scop.; *Alchemilla occidentalis* Nutt.]

***Rubus discolor* Weihe & Nees** – HIMALAYAN BLACKBERRY. A patch of this noxious bramble grows in a depression on the east side of Manton Rd. on the basalt ridge at the north end of the reserve (not vouchered). Native to Asia. In fruit when found in late Jul. [*R. procerus* P.J.Müll.]

RUBIACEAE – MADDER FAMILY

- 1 Flowers several on each side branch, the whole upper part of plant forming an open panicle; fruit about 1 mm broad..... *Galium parisiense*
1 Flowers 2–5 in small axillary cymes; fruit larger (at Dales Lake?)..... *Galium aparine*

***Galium aparine* L.** – CLEAVERS. Common annual among cobbles on the basalt ridges along the north end of the reserve (*Oswald & Ahart 6595*: NW¼ NW¼ Sec. 26, northwest corner of reserve). Mid Mar–May.

***Galium parisiense* L.** – WALL BEDSTRAW. Weedy annual along roads, on the stony beds of intermittent streams, and in rocky upland (*Oswald & Ahart 6728*: NW¼ NW¼ Sec. 26, intermittent stream west of "Lone Oak Knoll"). Native to the Mediterranean. Early May–Jun.

SALICACEAE – WILLOW FAMILY

- 1 Buds with numerous bud scales; scales of catkins cut into narrow lobes... *Populus fremontii*
1 Buds with a single bud scale; scales of catkins entire.
2 Leaves pubescent; capsule villous-tomentose..... *Salix exigua*
2 Leaves glabrous although lighter colored below; capsule glabrous..... *Salix laevigata*

Populus fremontii* S. Watson ssp. *fremontii – FREMONT'S COTTONWOOD. Nine small trees grow in the borrow pit (*Oswald & Ahart 6735*: SE¼ NW¼ Sec. 26). Mid Mar–Apr.

***Salix exigua* Nutt.** – SANDBAR WILLOW. Although not known on the reserve, this shrubby willow grows on the west bank of the marshy borrow pit on the east side of Manton Rd. (not vouchered).

***Salix laevigata* Bebb** – RED WILLOW. Several small, heavily browsed trees are adjacent to the reserve on the east bank of the marshy borrow pit on the east side of Manton Rd. (not vouchered).

SAXIFRAGACEAE – SAXIFRAGE FAMILY

- 1 Styles 3.
2 Basal leaves not lobed to near their base; petals white..... *Lithophragma bolanderi*
2 Basal leaves lobed almost to their base; petals usually pink..... *Lithophragma parviflorum*
1 Styles 2.
3 Leaf blade usually strongly serrate, rarely only denticulate, throughout; styles elongate, usually more than 2 mm long when stigmas developed; inflorescence loosely branched, the flowers not in head-like clusters..... *Saxifraga californica*
3 Leaf blade entire or almost entire, rarely denticulate distally; styles short, usually less than 2 mm long when stigmas developed; inflorescence branched but some of the flowers in head-like clusters..... *Saxifraga integrifolia*

***Lithophragma bolanderi* A. Gray** – BOLANDER'S WOODLANDSTAR. Common herbaceous perennial on the basalt outcrops (*Oswald & Ahart 6538*: NW¼ NE¼ Sec. 26, in basalt cobbles near the south rim of the basalt

ridge in the northeast corner of the reserve). Early Mar–May.

Lithophragma parviflorum (Hook.) Nutt. ex Torr. & A. Gray var. *trifoliatum* (Eastw.) Jeps. – BOLANDER'S WOODLANDSTAR. Locally abundant herbaceous perennial on the north-facing side of the basalt outcrop in the northwest corner of the reserve. It is less common around large boulders on alluvial fan deposits (Oswald & Ahart 6541: SE¼ NW¼ Sec. 26, boulder field between the Borrow Pit and Pool 20). Mid Mar–Apr.

Saxifraga californica Greene – CALIFORNIA SAXIFRAGE. Locally abundant herbaceous perennial on the north-facing side of the basalt outcrop in the northwest corner of the reserve (Oswald & Ahart 6489: NW¼ NW¼ Sec. 26). Mid Feb–Mar.

Saxifraga integrifolia Hook. – HOOKER'S SAXIFRAGE. Common to locally abundant herbaceous perennial in blue oak savanna along the south edge of the basalt ridges (Oswald & Ahart 6481: NW¼ NE¼ Sec. 26). Also common on the treeless conglomerate throughout the reserve, especially next to rocks. Late Jan–Mar. [Confused with *S. oregana* Howell in some California floras]

SCROPHULARIACEAE – FIGWORT FAMILY

- 1 Fertile stamens 5; corolla nearly regular.
 - 2 Plants very woolly; leaves entire..... *Verbascum thapsus*
 - 2 Plants with green herbage; leaves sinuate-dentate..... *Verbascum blattaria*
- 1 Fertile stamens 4 or 2; corolla more or less 2-lipped.
 - 3 Plants without a stem; corolla 1.5 mm long, nearly rotate; anther cells wholly confluent..... *Limosella aquatica*
 - 3 Plants mostly with stems; corolla usually not rotate, larger; anther cells distinct.
 - 4 Stigmas distinct, flattened or plate-like.
 - 5 Connective of stamens wider than the parallel anther cells; corolla whitish with a yellow tube; on muddy bottoms of drying vernal pools and wetlands.
 - 6 Sepals lanceolate, attenuate, essentially separate to base; corolla white..... *Gratiola ebracteata*
 - 6 Sepals oblong, obtuse and emarginate, the upper 3 joined for 1/3 of their length or more; corolla yellow except for the 2 white lower lobes..... *Gratiola heterosepala*
 - 5 Connective not expanded, the anther cells not parallel.
 - 7 Anther-bearing stamens 2..... *Lindernia dubia*
 - 7 Anther-bearing stamens 4.
 - 8 Flowers yellow; pedicels mostly longer than the calyx.
 - 9 Mature calyx strongly inflated, the lowermost lobes tending to curve up against the upper..... *Mimulus guttatus*
 - 9 Mature calyx not inflated, the lobes straight or nearly so..... *Mimulus floribundus*
 - 8 Flowers purple to rose or magenta; pedicels shorter than the calyx.
 - 10 Lower lip of corolla less than 1/3 as long as upper lip; plants of vernal moist upland..... *Mimulus douglasii*
 - 10 Lower lip of corolla about as long as the upper lip; plants of drying vernal pools, drainages, and wetlands..... *Mimulus tricolor*
 - 4 Stigmas united, head-like or dot-like.
 - 11 Upper lip of corolla narrowly arched, forming a beak-like extension that encloses the anthers.
 - 12 Flowers yellow, showy..... *Triphysaria eriantha*
 - 12 Flowers whitish, inconspicuous..... *Castilleja attenuata*
 - 11 Upper lip of corolla flattened or widely arched, not forming a beak.
 - 13 Stamens 2; upper lip of corolla appearing 1-lobed by fusion of the 2 lobes..... *Veronica peregrina*
 - 13 Stamens 4; upper lip of corolla 2-lobed..... *Collinsia sparsiflora*

Castilleja attenuata (Gray) T.I. Chuang & Heckard – VALLEY-TASSELS. Common annual forb on the basalt ridge and in open grassland (Oswald & Ahart 6580: SW¼ NW¼ Sec. 26, upland along the intermittent stream heading toward Pool 20). Mid Mar–Jun. [*Orthocarpus attenuatus* A. Gray]

Collinsia sparsiflora Fisch. & C.A. Mey. var. *collina* (Jeps.) Newsom – FEW-FLOWERED COLLINSIA. Locally

abundant annual on eroded fanglomerate and in grassy upland (Oswald 6551: NE¼ SW¼ Sec. 26, among basalt boulders between the fence and Manton Rd. near the south end of the Old Hwy. Pool.). Mid Mar–May. [*C. bruceae* M.E. Jones; *C. sparsiflora* var. *bruceae* (M.E. Jones) Newsom]

Gratiola ebracteata Benth. – BRACKETLESS HEDGE-HYSSOP. Locally common on the receding margins of vernal pools and in wet mud of drainages and shallow wetlands (Oswald & Ahart 6572: SW¼ NW¼ Sec. 26, just south of the northern cluster of pools in a rut in the service road used during their construction). Late Mar–Jul.

Gratiola heterosepala Mason & Bacig. – BOGGS LAKE HEDGE-HYSSOP. Locally abundant annual in shallow water and on the drying margin of Dales Lake (Oswald 6825: NW¼ NW¼ Sec. 35) and the borrow pit (Oswald & Ahart 6851: SE¼ NW¼ Sec. 26). Late Apr–Jun. CNPS List 1B; CE (endangered in California).

Lindernia dubia (L.) Pennell var. *anagallidea* (Michx.) Coopert. – FALSE PIMPERNEL. A small population of this annual herb was found in moist gravel along the southeast margin of the borrow pit (Oswald & Ahart 7067: SE¼ NW¼ Sec. 26). However, it is locally abundant in wet gravel on the receding margin of the borrow pit on the east side of Manton Rd. adjacent to the reserve (Oswald 6950: NE¼ SW¼ Sec. 26). Late Jun–Jul. [*L. anagallidea* (Michx.) Pennell]

Limosella aquatica L. – BROAD-LEAVED MUDWORT. Locally abundant submersed annual with floating leaves growing in shallow water of the Old Hwy. Pool (Oswald & Ahart 6709: NE¼ SW¼ Sec. 26). Mid Apr–Jun.

Mimulus douglasii (Benth.) A. Gray – PURPLE MOUSE-EARS. Occasional annual in rocky upland (Oswald & Ahart 6533: SW¼ NW¼ Sec. 35, on basalt in the south section of the reserve; also near the borrow pit). Mid Mar–Apr. [*M. cleistogamus* J.T. Howell]

Mimulus floribundus Douglas ex Lindl. – FLORIFEROUS MONKEY-FLOWER. Uncommon annual known only from shaded grottos and crevices on the north-facing edge of the basalt ridge crossing the northwest corner of the reserve (Oswald & Ahart 6689: NW¼ NW¼ Sec. 26). Late Apr–May. [*M. arenarius* A.L. Grant; *M. dudleyi* A.L. Grant; *M. subulatus* (A.L. Grant) Pennell; *M. floribundus* var. *subulatus* A.L. Grant]

Mimulus guttatus Fisch. ex DC. – SEEP MONKEY-FLOWER. Occasional to locally abundant annual in moist soil bordering streams and ponds and in moist places on outcrops (Oswald & Ahart 6642: NW¼ NE¼ Sec. 26, outcrop on south edge of the basalt ridge crossing the northeast corner of the reserve; Oswald & Ahart 6653: SW¼ SW¼ Sec. 26, margin of Dales Lake). This is a highly variable taxon as circumscribed in *The Jepson Manual* (see their list of synonyms). Plants on the reserve vary in vegetative features, flower size, spotting on

the lower lip, and length of the upper calyx lobe. Plants with long upper calyx lobes in fruit (*Oswald & Ahart 6700*: NE¼ NW¼ Sec. 26, along the intermittent stream on the south side of the basalt ridge crossing the northwest corner of the reserve), probably correspond to *M. nasutus* Greene [= *M. guttatus* var. *nasutus* (Greene) Jeps.]. Mid Mar–Jun.

Mimulus tricolor Hartw. ex Lindl. – TRICOLORED MONKEY-FLOWER. Scattered to abundant annual on the drying beds of shallow wetlands (*Oswald 6550*: NE¼ SW¼ Sec. 26, along fenceline at the north end of the Old Hwy. Pool). Late Mar–Jul.

Triphysaria eriantha (Benth.) T.I. Chuang & Heckard var. *eriantha* – JOHNNYTUCK. Common and widespread annual in open grassland (*Oswald 6497*: northwest corner Sect. 35, south side of Inks Creek Rd. at the west boundary). This is one of the showy springtime plants. Flowers vary from bright yellow (typical) to pale cream (not uncommon) to dark maroon (rare). Mid Feb–May. [*Orthocarpus erianthus* Benth. var. *erianthus*; *O. bidwelliae* A. Gray]

Verbascum blattaria L. – MOTH MULLEIN. Weedy biennial scattered along Manton Rd. (*Oswald & Ahart 6873*: SW¼ NW¼ Sec. 35, south of Inks Creek Rd.) Native to Eurasia. Late May–Jun.

Verbascum thapsus L. – WOOLLY MULLEIN. Weedy biennial represented by the old flowering stem of a plant that is located between Manton Rd. and the fence east of the Old Hwy. Pool. No living plants were found during 1995. Native to Eurasia.

Veronica peregrina L. ssp. *xalapensis* (Humb., Bonpl., & Kunth) Pennell – PURSLANE SPEEDWELL. Widespread annual on the drying beds of streams, on the receding margins of vernal pools, and in other wetlands (*Oswald & Ahart 6608*: NW¼ NW¼ Sec. 35, wetland between Pool 7 and the west fence). Late Mar–Jun.

SOLANACEAE – NIGHTSHADE FAMILY

Solanum parishii A. Heller – PARISH'S NIGHTSHADE. Small shrub on basalt outcrops and in stony places (*Oswald & Ahart 6606*: NE¼ NW¼ Sec. 26, one shrub in a pile of boulders between Manton Rd. and the fence east of the Old Hwy. Pool). Early Apr–Jun.

VALERIANACEAE – VALERIAN FAMILY

- 1 Corolla strongly 2-lipped, pink to light red with 2 red spots at the base of the ventral lip, the spur slender..... *Plectritis ciliosa*
 1 Corolla essentially regular, white or light pink, lacking red spots at the base of the ventral lip, the spur club-shaped..... *Plectritis macrocera*

Plectritis ciliosa (Greene) Jeps. ssp. *insignis* (Suksd.) D.H. Morey – SHORT-SPURRED PINK PLECTRITIS. Locally abundant annual in stony Tuscan loam, on eroded fanglomerate, and in basalt cobbles (*Oswald 6521*: NW¼ SW¼ Sec. 35, basalt along Manton Rd. at the south tip of the reserve). Mid Mar–Apr. [Includes var. *davyana* (Jeps.) Dyal; *P. californica* (Suksd.) Dyal

var. *rubens* (Suksd.) Dyal; *P. macrocera* (Suksd.) Rydb. var. *patelliformis* (Suksd.) Dyal]

Plectritis macrocera Torr. & A. Gray – WHITE PLECTRITIS. Locally abundant annual in cobbles on the basalt outcrops on the north side of the reserve (*Oswald & Ahart 6537*: NW¼ NE¼ Sec. 26, basalt ridge in northeast corner of reserve). Early Mar–May. [Includes var. *collina* (A. Heller) Dyal, var. *grayi* (Suksd.) Dyal & var. *mamillata* (Suksd.) Dyal; *P. eichleriana* (Suksd.) A. Heller; *P. jepsonii* (Suksd.) Burt Davy]

VIOLACEAE – VIOLET FAMILY

Viola douglasii Steud. – DOUGLAS' VIOLET. Herbaceous perennial, sometimes growing in open grassland but mostly found under or near blue oak on the edge of the grassy plain in the northeast corner of the reserve (*Oswald & Ahart 6486*: NW¼ NE¼ Sec. 26). Mid Feb–Apr.

VISCAEAE – MISTLETOE FAMILY

- 1 Leaves foliaceous, parasitic on oak (*Quercus* spp.)..... *Phoradendron villosum*
 1 Leaves scale-like, parasitic on gray pine (*Pinus sabiniana*)..... *Arceuthobium occidentale*

Arceuthobium occidentale Engelm. – GRAY PINE DWARF MISTLETOE. Uncommon parasite of *Pinus sabiniana* on the basalt ridge crossing the northeast corner of the reserve (*Oswald & Ahart 6860*: NE¼ NE¼ Sec. 26). [*A. campylopodium* Engelm., in part]

Phoradendron villosum (Nutt.) Nutt. – OAK MISTLETOE. A common parasite of *Quercus* spp. but apparently not presently found within the boundaries of the reserve. However, several blue oaks on both sides of Manton Rd. about 100 ft south of the reserve are infested (not vouchered). [*P. flavescens* (Pursh) Nutt. var. *villosum* (Nutt.) Engelm.]

MONOCOT FLOWERING PLANTS

KEY TO FAMILIES

- 1 Perianth well-developed, petal-like in color and texture.
 2 Carpels more or less free, 1-chambered, maturing into a bunch or whorl of akenes; plants aquatic or on drying mud..... *Alismataceae*
 2 Carpels united into a 3-chambered ovary maturing into a capsule or berry; plants terrestrial..... *Liliaceae*
 1 Perianth wanting or reduced, its parts often bristles or scales, not petal-like in color or texture.
 3 Flowers in the axils of chaffy or husk-like scales, these in spikes, spikelets or heads.
 4 Leaf-sheaths split lengthwise on the side opposite the blade; leaves usually two-ranked; stems mostly hollow and cylindrical; filaments attached near the middle of anthers..... *Poaceae*
 4 Leaf-sheaths continuous around the stem; leaves mostly 3-ranked; stems often triangular and pithy; filaments attached to bottom of anthers..... *Cyperaceae*
 3 Flowers not concealed in the axils of chaffy or husk-like scales.
 5 Plants terrestrial or if growing in wet places, the leaves and flowers well above the water.
 6 Inflorescence a dense, elongate spike..... *Typhaceae* (in part)
 6 Inflorescence of racemes or open clusters..... *Juncaceae*
 5 Plants aquatic, floating or below the surface, the flowers sometimes barely above the surface.
 7 Flowers and fruits in non-leafy spikes..... *Potamogetonaceae*
 7 Flowers and fruits in the axils of leaves..... *Hydrocharitaceae*

ALISMATACEAE – WATER-PLANTAIN FAMILY

- 1 Akenes arranged in a ring on the receptacle; petals toothed..... *Damasonium californicum*
 1 Akenes densely packed over the surface of the receptacle, not forming a ring; petals entire..... *Sagittaria sanfordii*

Damasonium californicum Torr. ex Benth. –

FRINGED WATER-PLANTAIN. Locally common herbaceous perennial growing in water and later on the drying beds of deeper ponds (Oswald & Ahart 6656: SW¼ SW¼ Sec. 26, east edge of Dales Lake; also common in the borrow pit and the Old Hwy. Pool). Vegetative plants can be recognized by their floating, broadly linear leaf-blades. Mid Apr–Aug. [*Machaerocarpus californicus* (Torr. ex Benth.) Small]

Sagittaria sanfordii Greene – SANFORD'S ARROW-HEAD. Emergent perennial forming large colonies in deeper water of Dales Lake, becoming terrestrial at dry-down (Oswald & Ahart 7152: SW¼ SW¼ Sec. 26). Late May–Aug. CNPS List 1B.

CYPERACEAE – SEDGE FAMILY

- 1 Scales of spikelet 2-ranked.
- 2 Plants > 2 dm tall; scales of spikelet without awned tips *Cyperus eragrostis*
- 2 Plants >> 1 dm tall; scales of spikelet awned, the tip bent backwards *Cyperus squarrosus*
- 1 Scales of spikelet overlapping spirally.
- 3 Culms > 1 m tall; spikelets 3–many in a subterminal, panicle-like inflorescence..... *Scirpus acutus*
- 3 Culms < 1 m tall; spikelet solitary, terminal, erect.
- 4 Culms > 2 dm tall; style 2-branched; akenes flattened..... *Eleocharis macrostachya*
- 4 Culms < 1 dm tall; style 3-branched; akenes plump or triangular *Eleocharis acicularis*

Cyperus eragrostis Lam. – TALL CYPERUS. Common perennial in shallow ditches and on the margins of pools (Oswald & Ahart 6845: NE¼ SW¼ Sec. 26, edge of the Old Hwy. Pool). Early Jun.

Cyperus squarrosus L. – AWNED CYPERUS. Small annual forming a localized population in damp, stony soil on the drying margin of the borrow pit (Oswald 6787: SE¼ NW¼ Sec. 26). Late May. [*Cyperus aristatus* Rottb.]

Eleocharis acicularis (L.) Roem. & Schult. var. *acicularis* – NEEDLE SPIKE-RUSH. Common perennial forming dense colonies in wet soil along intermittent streams and along ponds (Oswald & Ahart 6846: NE¼ SW¼ Sec. 26, Old Hwy. Pool; also noted along Dales Lake and along the stream bordering the south side of the basalt ridge crossing the northwest corner of the reserve). Late Apr.

Eleocharis macrostachya Britton – PALE SPIKE-RUSH. Common rhizomatous perennial forming localized populations in ditches and ponds (Oswald 6792: SE¼ NW¼ Sec. 26, ditch along the east side old highway at the borrow pit; abundant in Dales Lake). Mid Apr. [*E. palustris* (L.) Roem. & Schult., in part]

Scirpus acutus Muhl. ex Bigelow var. *occidentalis* (S. Watson) Beetle – HARD-STEMMED TULE. A small colony is established in the marshy borrow pit on the east side of Manton Rd. (not vouchered).

HYDROCHARITACEAE – WATERWEED FAMILY

Najas graminea Delile – RICEFIELD WATER-NYMPH. A submersed annual growing adjacent to the reserve in the marshy borrow pit on the east side of Manton Rd. (not vouchered). Native to tropical Asia.

JUNCACEAE – RUSH FAMILY

- 1 Plants perennial.
- 2 Leaf blades cylindrical and with internal partitions (pull leaf between thumb and finger to feel)..... *Juncus articulatus*
- 2 Leaf blades = flat, without internal partitions..... *Juncus tenuis*
- 1 Plants annual.
- 3 Flowers or flower clusters scattered along a branching inflorescence.
- 4 Flowers inserted individually on the inflorescence..... *Juncus bufonius* var. *bufonius*
- 4 Flowers borne in small head-like clusters on the branches of the inflorescence..... *Juncus bufonius* var. *congestus*
- 3 Flowers at the tip of slender leafless stems.
- 5 Lowest bract of the inflorescence leaf-like and extending beyond the head; plants of moist to wet places, but usually not where water has been standing.. *Juncus capitatus*
- 5 Lowest bract not leaf-like, shorter than the head; plants in places that held standing water.
- 6 Heads normally 1-flowered..... *Juncus uncialis*
- 6 Heads normally 2–several-flowered..... *Juncus kelloggii*

Juncus articulatus L. – JOINTED RUSH. Perennial rush growing along the dry margins of pools in the southern cluster (Oswald & Ahart 7077: NW¼ NW¼ Sec. 35, Pool 9). In fruit mid Jul.

Juncus bufonius L. var. *bufonius* – COMMON TOAD RUSH. Common and widespread annual in vernal wet soils in grassy uplands and on the margins of wetlands (Oswald & Ahart 6633: NW¼ NW¼ Sec. 35, gravel along the edge of Inks Creek Rd). Late Mar.

Juncus bufonius var. *congestus* Wahlenb. – CONGESTED TOAD RUSH. Uncommon annual on the drying beds of pools, often growing near the var. *bufonius* (Oswald & Ahart 7076: NW¼ NW¼ Sec. 35, Pool 9 south of Inks Creek Rd.) In fruit mid Jul.

Juncus capitatus Weigel – LEAFY-BRACTED DWARF RUSH. Uncommon but sometimes locally abundant annual in shallow wetlands and on bare, vernal moist, disturbed places (Oswald & Ahart 6624: SW¼ NW¼ Sec. 35, between the fence and Manton Rd. just north of the culvert located south of Inks Creek Rd). Native to Eurasia. Early Apr.

Juncus kelloggii Engelm. – KELLOGG'S DWARF RUSH. Widespread annual forming small tufts on the drying beds of shallow wetlands and in other vernal wet places (Oswald & Ahart 6613: SW¼ NW¼ Sec. 35, shallow depression bordering the north edge of the basalt flow in the south tip of the reserve; Oswald & Ahart 6665: SE¼ NW¼ Sec. 26, in vernal wet, mossy soil on the west side of the borrow pit). Late Mar.

Juncus tenuis Willd. – SLENDER RUSH. Uncommon perennial found on the dry margin of Pool 7 (Oswald & Ahart 7078: NW¼ NW¼ Sec. 35). In fruit mid Jul.

Juncus uncialis Greene – INCH-HIGH RUSH. Inconspicuous but locally abundant and widespread annual on the drying beds of vernal flooded depressions in grassland (Oswald & Ahart 6566: NE¼ SW¼ Sec. 26, depression along the unimproved road between the old highway and the airstrip). Mid Mar.

LILIACEAE – LILY FAMILY

- 1 Flowers in a scape-like umbel.
- 2 Perianth segments separate or nearly so; plants with an onion-like odor and taste..... *Allium amplectens*
- 2 Perianth segments united into a definite basal tube; plants without an onion-like odor and taste.
- 3 Anthers 0.

- 4 Inflorescence congested, the flower stalks much shorter than the flowers.....
Dichelostemma capitatum
- 4 Inflorescence openly umbellate, the flower stalks longer than the flowers.
 5 Flowers blue.
 6 Filaments alternately attached at two levels (at Dales Lake?)..... *Triteleia laxa*
 6 Filaments attached on only one level..... *Triteleia bridgesii*
- 5 Flowers white.
 7 Filaments linear; stamens lilac..... *Triteleia lilacina*
 7 Filaments broadly or narrowly triangular; stamens pale yellow to whitish.....
Triteleia hyacinthina
- 3 Anthers 3.
 8 Perianth tube funnel-shaped, not at all inflated, the segments widely spreading; stigma with 3 long wings that bend downward; flowers in open umbels.
 9 Top of the floral tube noticeably constricted; flowers usually under 24 mm long, the segments widely spreading (approaching a right angle) when fully open (i.e., by the middle of the day)..... *Brodiaea minor*
- 9 Top of floral tube not constricted; flowers usually over 24 mm long, the segments ascending when fully open (i.e., by the middle of the day).
 10 Sterile stamens slender and obviously longer than the tube.....
Brodiaea californica
- 10 Sterile stamens equaling or shorter than the tube.
 11 Sterile stamens approaching or pressed to the style, their margins rolled inward, their tips blunt to emarginate..... *Brodiaea coronaria*
 11 Sterile stamens directed outward toward the segments, their margins not rolled inward, their tips ± pointed..... *Brodiaea elegans*
- 8 Perianth tube tubular and more or less inflated, the segments erect or little spreading; stigma with 3 short lobes; flowers in dense umbels.
 12 Flowers pink; scape long and twining (at Dales Lake?)..... *Dichelostemma volubile*
 12 Flowers blue; scape erect, not twining.
 13 Coronal projections on petals rounded at the apex.....
Dichelostemma multiflorum
 13 Coronal projections on petals forked at the apex (at Dales Lake?).....
Dichelostemma congestum
- 1 Flowers not in a scape-like umbel.
 14 Stems leafy; flowers large, yellow or cream.
 15 Petals ciliate and densely hairy..... *Calochortus monophyllus*
 15 Petals not ciliate, hairy only near the nectary.
 16 Petals pale cream to white, sometimes with a violet tinge; gland typically shaped like an inverted "V"..... *Calochortus superbis*
 16 Petals yellow; gland lunate (at Dales Lake?)..... *Calochortus luteus*
- 14 Stems scape-like, with leaves mostly at the base; flowers smaller, white to cream.
 17 Perianth segments united basally into a tube, the free tips of the corolla segments at length turned backward..... *Odontostomum hartwegii*
 17 Perianth segments not united basally, not folding backward.
 18 Leaves strongly undulate, 6–25 mm wide, not completely dried at flowering; perianth segments 15–23 mm long..... *Chlorogalum pomeridianum*
 18 Leaves plane or nearly so, 2–5 mm wide, typically dried at flowering; perianth segments 8–12 mm long..... *Chlorogalum angustifolium*

Allium amplexans Torr. – CLASPING ONION. Common and widespread herbaceous perennial in grassy upland (Oswald & Ahart 6618: NW¼ SW¼ Sec. 35, thin stony soils between the fence line and Manton Rd. at the south tip of the reserve). A densely caespitose form of this onion grows in shallow water in the southwest corner of Dales Lake, some clumps bearing typical white flowers while others have attractive pink flowers. Early Apr–May.

Brodiaea californica Lindl. var. *californica* – CALIFORNIA BRODIAEA. Widespread and locally abundant herbaceous perennial in grassy upland (Oswald 6751: SE¼ NW¼ Sec. 26, east side of the borrow pit). Mid May–Jul.

Brodiaea coronaria (Salisb.) Engl. ssp. *coronaria* – HARVEST BRODIAEA. Locally abundant herbaceous perennial in clay soils of drying wetlands and pond margins (Oswald & Ahart 6854: NE¼ NW¼ Sec. 26, adobe wetland just west of Pool 20; also found at Dales Lake). Early Jun–Jul.

Brodiaea elegans Hoover ssp. *elegans* – ELEGANT BRODIAEA. Common and widespread herbaceous perennial in dry upland (Oswald 6752: SE¼ NW¼ Sec. 26, east side of the borrow pit). Mid May–Jun. [Includes vars. *mundula* (Jeps.) Hoover and *australis* Hoover]

Brodiaea minor (Benth.) S. Watson – BLUESTARS. Common and widespread perennial in open grassland

on the reserve (Oswald & Ahart 6652: NW¼ SW¼ Sec. 26, near the west boundary between Dales Lake and the northern cluster of pools). Early Apr–Jun.

Calochortus monophyllus (Lindl.) Lem. – YELLOW STAR-TULIP. Locally common herbaceous perennial in cobbles on the basalt ridge crossing the northeast corner of the reserve (Oswald & Ahart 6682: NE¼ NE¼ Sec. 26). Late Apr–May.

Calochortus superbis Purdy ex J.T. Howell – SUPERB MARIPOSA-LILY. Scattered to locally abundant herbaceous perennial in open grassland (Oswald & Ahart 6726: NW¼ NW¼ Sec. 26, near the pile of discarded powerline poles west of Pool 20). Some of the plants have a lunate-shaped gland, indicating an ingression of genes from *C. luteus*, which is a common species at lower elevations along the east edge of the North Valley. Early May–Jun. [*C. luteus* Douglas ex Lindl. var. *citrinus* S. Watson]

Chlorogalum angustifolium Kellogg – NARROW-LEAVED SOAP-PLANT. Common and widespread perennial in open grassland (Oswald 6748: NW¼ NW¼ Sec. 35, north side Inks Creek Rd. near the west boundary). Mid May–Jun.

Chlorogalum pomeridianum (DC.) Kunth var. *pomeridianum* – WAVY-LEAVED SOAP-PLANT. Common perennial on the basalt ridges crossing the north end of the reserve (Oswald & Ahart 6857: NW¼ NW¼ Sec. 26, northwest corner of the reserve). Late May–Jun.

Dichelostemma capitatum A. W. Wood ssp. *capitatum* – BLUEDICKS. Common herbaceous perennial throughout the reserve (Oswald & Ahart 6513: NW¼ NW¼ Sec. 26, on the basalt ridge in the northwest corner of the reserve). Early Mar–May. [*D. pulchellum* (Salisb.) A. Heller; *D. lacuna-vernalis* L. W. Lenz; *Brodiaea capitata* Benth.; *Brodiaea pulchella* (Salisb.) Greene]

Dichelostemma multiflorum (Benth.) A. Heller – ROUND-TOOTHED OOKOW. Perennial from a deep-seated bulb found in brushy, rocky, and grassy places on much of the reserve (Oswald & Ahart 6625: SW¼ NW¼ Sec. 35, between the fence and Manton Rd. south of Inks Creek Rd.). White-flowered plants are sometimes found. Early Apr–Jun.

Odontostomum hartwegii Torr. – HARTWEG'S ODONTOSTOMUM. Common and widespread perennial on the open grassland of the reserve (Oswald & Ahart 6692: NW¼ NW¼ Sec. 26, along the intermittent stream on the west side of "Lone Oak Knoll"). Mid Apr–May–Jun.

Triteleia bridgesii (S. Watson) Greene – BRIDGES' TRITELEIA. Known only from scattered plants along the intermittent stream on the west side of "Lone Oak Knoll" (Oswald & Ahart 6692: NW¼ NW¼ Sec. 26). Late Apr–May. [*Brodiaea bridgesii* S. Watson]

Triteleia hyacinthina (Lindl.) Greene – WILD HYACINTH. Two morphologically distinct variants of

hyacinth are found on the reserve. One type is characterized by narrowly deltoid filaments, their bases only about 1/3 as wide as the tepal to which they are attached. This is an early-flowering upland form common in thin, stony, vernal wet soils (Oswald & Ahart 6620: SW¼ NW¼ Sec. 35, along the lower edge of the broad swale draining under Manton Rd. at the culvert south of Inks Creek Rd.). On basalt at the south tip of the reserve, this upland plant can be confused with *T. lilacina*, which grows nearby (see key characters).

A second variant begins to flower later. The flowers are larger, and the filaments are broadly deltoid, their bases as wide as the tepal to which they are attached. It is found along the edge of pools, along drainages, and in deeper upland soils (Oswald & Ahart 6740: NW¼ NW¼ Sec. 35, along the margin of Dales Lake). Munz (*Calif. Flora*, p. 1383) mentions these variants but states that "[they] seem too indefinite to merit names." Late Mar-early May for the small-flowered variant; early May-June for the large-flowered variant. [*Brodiaea hyacinthina* (Lindl.) Baker, *Hesperoscordum hyacinthinum* Lindl.]

Triteleia lilacina Greene - GLASSY WILD HYACINTH. Common herbaceous perennial on the basalt flow at the south tip of the reserve (Oswald & Ahart 6614: SW¼ NW¼ Sec. 35). Late Mar-May. [*Hesperoscordum lilacinum* (Greene) A. Heller ex Abrams; *Brodiaea hyacinthina* (Lindl.) Baker var. *greenii* (Hoover) Munz]

POACEAE - GRASS FAMILY
[Gramineae]

- 1 Spikelets with the glumes persistent, the spikelet axis jointed above them, 1 to many-flowered; upper lemmas frequently empty; spikelet axis often prolonged beyond the upper lemma.
 - 2 Spikelets sessile or nearly so.
 - 3 Spikes usually more than one, spikelets on one side of the axis, forming 1-sided spikes (Tribe Chlorideae).
 - 4 Panicle of many slender spikes that are arranged racemously on an elongate axis *Leptochloa fascicularis*
 - 4 Panicle of many slender spikes that are arranged digitately *Cynodon dactylon*
 - 3 Spike terminal, single; spikelets alternating on opposite sides of the axis (Tribe Hordeae).
 - 5 Spikelets solitary at each node of the spike axis.
 - 6 Spikelets 1-flowered, sunken in hollows in the spike axis *Scribneria bolanderi*
 - 6 Spikelets 2-several flowered, not sunken into the spike axis.
 - 7 Spikelets placed edgewise to the spike axis *Lolium multiflorum*
 - 7 Spikelets placed flatwise to the spike axis
 - 8 Plants annual *Triticum aestivum*
 - 8 Plants perennial *Elymus multisetus*
 - 5 Spikelets 2 or more at each node.
 - 9 Spikelets 2 at each node, all alike; awn 3-7 cm long *Taeniatherum caput-medusae*
 - 9 Spikelets 3 at each node of the spike axis, the lateral pair pedicelled, usually reduced to awns.
 - 10 Glumes of central spikelet and the inner ones of the lateral spikelets with ciliate margins *Hordeum marinum* ssp. *leporinum*
 - 10 Glumes not ciliate.
 - 11 Top of leaf sheath with long lobes; all 3 spikelets sessile, fertile *Hordeum vulgare*
 - 11 Top of leaf sheath without evident lobes, lateral spikelets on pedicels, infertile *Hordeum marinum* ssp. *gussonianum*
 - 2 Spikelets usually upon distinct pedicels, borne in an open or spike-like raceme or panicle.
 - 12 Spikelets 1-flowered (Tribe Agrostideae).
 - 13 Axis of spikelet jointed below the glumes, these falling with the spikelet.
 - 14 Glumes long-awned.
 - 15 Glume awn length less than 3.4 mm *Polygogon interruptus*
 - 15 Glume awn length greater than 3.4 mm.
 - 16 Lemma awnless; glumes lobed, the lobes longer than 0.6 mm and ciliate-fringed *Polygogon maritimus*
 - 16 Lemma awned; glume lobes either absent or less than 0.6 mm long and not ciliate-fringed *Polygogon monspeliensis*
 - 14 Glumes awnless.
 - 17 Mature panicle well-exserted *Alopecurus saccatus*

- 17 Mature panicle usually at least partially enclosed in the enlarged leaf sheaths *Crypsis schoenoides*
- 13 Axis of spikelet jointed above the glumes.
 - 18 Awns 3-branched.
 - 19 Branched summer annual, not noticeably tufted *Aristida oligantha*
 - 19 Tufted perennial.
 - 20 Inflorescence branches widely spreading *Aristida termpes*
 - 20 Inflorescence branches appressed to main axis *Aristida purpurea*
 - 18 Awns not branched.
 - 21 Glumes longer than the lemma.
 - 22 Glumes sac-like at base *Gastridium ventricosum*
 - 22 Glumes not sac-like at base *Agrostis hendersonii*
 - 21 Glumes not longer than the lemma, usually shorter.
 - 23 Panicle dense, head-like, partly enclosed by the enlarged sheaths *Crypsis schoenoides*
 - 23 Panicle elongated, not head-like, either free or (at Dales Lake) remaining enclosed in the upper sheath *Sporobolus cryptandrus*
- 12 Spikelets 2-many-flowered.
 - 24 Lemma usually shorter than the empty glumes; the awn dorsal and usually bent (Tribe Aveneae).
 - 25 Spikelets nodding; glumes 2-3.5 cm long.
 - 26 Teeth of lemmas awned or bristly; pedicels capillary *Avena barbata*
 - 26 Teeth of lemmas acute, not bristly; pedicels stoutish.
 - 27 Lemmas pubescent with long brown hairs; spikelets usually 3-flowered; awn present, strongly bent *Avena fatua*
 - 27 Lemmas almost glabrous; spikelets mostly 2-flowered, awn usually absent or if present, weakly bent *Avena sativa*
 - 25 Spikelets not nodding; glumes less than 1 cm long.
 - 28 Lemmas keeled, short-awned from the tip *Koeleria phleoides*
 - 28 Lemmas convex, awned from below the middle.
 - 29 Axis of spikelet prolonged behind the upper floret; lemmas squared and irregularly toothed at the summit *Deschampsia danthonioides*
 - 29 Axis of spikelet not prolonged; lemmas tapering into 2 slender teeth *Aira caryophylla*
 - 24 Lemma usually longer than the empty glumes; the awn terminal and straight or none (Tribe Festuceae).
 - 30 Lemmas divided at the top into 5 rather long, pointed teeth or awns *Orcuttia tenuis*
 - 30 Lemmas awnless or 1 to 3-awned.
 - 31 Spikelets of 2 forms, sterile and fertile intermixed, the panicle dense, erect, spike-like *Cynosurus echinatus*
 - 31 Spikelets all alike in the same inflorescence.
 - 32 Lemmas 3-nerved, the nerves prominent.
 - 33 Plants glandular or warty along the leaf-margins, keel of lemmas, or on panicle branches *Eragrostis ciliaris*
 - 33 Plants not glandular on lemmas, panicle-branches, or leaf-margins.
 - 34 Surface of fruit checkered, with an evident groove on the side opposite the embryo *Eragrostis mexicana*
 - 34 Surface of fruit smooth, without a groove on the side opposite the embryo *Eragrostis pectinacea*
 - 32 Lemmas 5 to many-nerved, the nerves sometimes obscure.
 - 35 Lemmas as broad as long; florets closely overlapping and resembling a snake rattle *Biza minor*
 - 35 Lemmas longer than broad; florets not resembling a snake rattle.
 - 36 Glumes papery; upper florets sterile, often reduced to rudiments enclosed by the broad upper lemmas *Melica californica*
 - 36 Glumes not papery; upper florets like the others.
 - 37 Lemmas awnless; spikelets small.
 - 38 Plants annual *Poa annua*
 - 38 Plants perennial.
 - 39 Florets mostly converted into dark purple bulblets; stems with a bulb-like base *Poa bulbosa*
 - 39 Florets normal; stems not bulb-like at base.
 - 40 Culms capillary; leaves filiform; panicle open, the lower branches at right angles to the axis; plants of thin soils of vernal wet flats *Poa tenerrima*
 - 40 Culms thicker; leaves not filiform; panicle contracted to open, plants of drier places *Poa secunda*
 - 37 Lemmas awned; spikelets larger.
 - 41 Lemmas awned or awn-tipped from a minutely cleft apex.
 - 42 Lemmas broad, rounded apically, not acuminate, the teeth mostly less than 1 mm long; first glume 3-5 nerved *Bromus hordeaceus*
 - 42 Lemmas narrow, elongate, tapering at the tip, the teeth 2-5 mm long; 1st glume 1-nerved.
 - 43 Panicle erect, contracted, purplish; awns 1-2 cm long.
 - 44 Stems pubescent below the dense panicle *Bromus madriensis* ssp. *rubens*
 - 44 Stems glabrous below the slightly open panicle *Bromus madriensis* ssp. *madriensis*
 - 43 Panicle open, with spreading or drooping branches.
 - 45 Panicle conspicuously drooping to one side; spikelets 1-2 cm long; awn 12-14 mm long *Bromus tectorum*
 - 45 Panicle from more or less erect to spreading or, if drooping, not conspicuously one-sided; spikelets 2.5-4 cm long; awns 20-50 mm long.
 - 46 Lemmas 2.5-3.0 mm long; awns 3.5-5 cm long; 1st glume 16-20 mm long *Bromus diandrus*
 - 46 Lemmas 1.7-2.0 mm long; awns 2-3 cm long; 1st glume 7-9 mm long *Bromus sterilis*
- 41 Lemmas entire, pointed, awned from the tip.
 - 47 Inflorescence narrow, branches ascending or appressed-ascending.
 - 48 Lemmas not ciliate.

- 49 Lower glume more than half as long as the second....
Vulpia bromoides
- 49 Lower glume less than half as long as the second (at
Dales Lake?)..... *Vulpia myuros* var. *myuros*
- 48 Lemmas conspicuously long-ciliate at the apex.....
Vulpia myuros var. *hirsuta*
- 47 Inflorescence broader, the principal branches spreading.
50 Spikelets glabrous or scabrous but without long hairs.....
Vulpia microstachys var. *pauciflora*
- 50 Spikelets with long hairs.
51 Glumes glabrous, lemmas hairy (at Dales Lake?).....
Vulpia microstachys var. *microstachys*
- 51 Glumes hairy.
52 Both glumes and lemmas hairy.....
Vulpia microstachys var. *ciliata*
- 52 Glumes hairy but lemmas glabrous.....
Vulpia microstachys var. *confusa*
- 1 Spikelets falling from the pedicels entire, jointed below the glumes, naked or enclosed in
bristles or bur-like involucre, 1-flowered or, if 2-flowered, the lower flower male; no lemmas
empty; spikelet axis not extending beyond the upper lemma.
- 53 Lemma and palea leathery or papery, very different in color and appearance from the
glumes (Tribe *Panicaceae*).
54 Spikelets subtended by bristles..... *Setaria viridis*
- 54 Spikelets not subtended by bristles.
55 Glumes abruptly pointed; apex of palea not enclosed by lemma.....
Echinochloa colona
- 55 Glumes awnless; apex of palea usually enclosed by the lemma.
56 Inflorescence of 1-sided, spike-like racemes.
57 Racemes more than a pair per culm, slender..... *Digitaria sanguinalis*
- 57 Racemes a single pair per culm, stout..... *Paspalum distichum*
- 56 Inflorescence not of 1-sided, spike-like racemes..... *Panicum dichotomiflorum*
- 53 Lemma and palea thin, transparent, much more delicate in texture than the glumes (Tribe
Andropogoneae)..... *Sorghum halepense*

***Agrostis hendersonii* Hitchc.** – HENDERSON'S BENT-GRASS. Locally common annual on the drying beds of shallow wetlands (*Oswald & Ahart 6712*: SE¼ NW¼ Sec. 26, in the boulder-field between the Borrow Pit and Pool 20). This grass is identical to populations of Henderson's bentgrass discovered in 1995 on the east side of Redding (specimens and correspondence supplied by Donald Burk, ENPLAN, Redding, CA.). However, M.J. Harvey (*in* The Jepson Manual, p. 1229) indicates that Henderson's bentgrass may be identical to the more common *A. microphylla* Steud. Late Apr. CNPS List 3. [*A. microphylla* Steud. var. *hendersonii* (Hitchc.) Beetle]

***Aira caryophyllaea* L.** – SILVER EUROPEAN HAIR-GRASS. Common annual on open grassland and in disturbed places (*Oswald 6523*: NE¼ SW¼ Sec. 26, near the gate at the south end of the old highway). Native to Europe. Mid Mar.

***Alopecurus saccatus* Vasey** – PACIFIC MEADOW-FOXTAIL. Common annual on the drying beds of vernal pools and vernal wet depressions (*Oswald & Ahart 6556*: NE¼ SW¼ Sec. 26, shallow ditch at the south gate of the old highway). Late Apr.

***Aristida oligantha* Michx.** – OLDFIELD THREE-AWN. Locally common summer annual in hard, dry soil (*Oswald & Ahart 7063*: NE¼ SW¼ Sec. 26, at the south end of the old highway). Late Jun.

***Aristida purpurea* Nutt. var. *wrightii* (Nash) Allred** – WRIGHT'S THREE-AWN. Tufted perennial growing on an outcropping of basalt at the northeast corner of the reserve (*Oswald & Ahart 6862*, det. K. W. Allred: NE¼ NE¼ Sec. 26). This grass is entirely out of range since all of the varieties of *A. purpurea* are native to the southern desert areas of California and elsewhere in the southwestern U.S. Mid Jun. [*A. wrightii* Nash]

***Aristida ternipes* (Cav. var. *hamulosa* (Henrard) J.S. Trent** – HOOK THREE-AWN. Uncommon tufted per-

ennial growing in a crack in the old highway just north of the borrow pit (*Oswald & Ahart 6863*: SW¼ NE¼ Sec. 26). Mid Jun. [*A. hamulosa* Henrard]

***Avena barbata* Brot.** – BARBED OAT. Occasional to locally common weedy annual (*Oswald & Ahart 6593*: NW¼ NW¼ Sec. 26, in basalt cobbles on the ridge in the northwest corner of the reserve). Native to southern Europe. Late Mar.

***Avena fatua* L.** – WILD OAT. Weedy annual along roads, on the basalt ridges, and in thicker soils on the open grassland of the reserve (*Oswald & Ahart 6676*: NE¼ SW¼ Sec. 26, along Manton Rd. paralleling the Old Hwy. Pool). Native to Europe. Early Apr.

***Avena sativa* L.** – CULTIVATED OAT. Represented by a waif growing along Manton Rd. paralleling the Old Hwy. Pool (*Oswald & Ahart 6677*: NE¼ SW¼ Sec. 26). Origin in Europe. Early Apr.

***Briza minor* L.** – LESSER QUAKING-GRASS. Occasional grass in vernal moist upland soils (*Oswald & Ahart 6596*: NW¼ NW¼ Sec. 26, just south of the intermittent stream bordering the south side of the basalt ridge). Native to southern and western Europe. Late Mar.

***Bromus diandrus* Roth** – RIPGUT BROME. Weedy annual along roads, on the basalt ridges, and in thicker soils of open grassland (*Oswald & Ahart 6621*: SW¼ NW¼ Sec. 35, edge of Manton Rd. south of Inks Creek Rd.). Native to Europe. Early Apr. [*B. rigidus* Roth, including var. *gussonei* (Parl.) Coss. & Durieu, misapplied]

***Bromus hordeaceus* L.** – SOFT CHESS. Weedy annual on the basalt ridges and in thicker soils along roads and in open grassland (*Oswald & Ahart 6629*: NW¼ NW¼ Sec. 35, intersection of Manton and Inks Creek rds.). A variant with glabrous spikelets, referred to *B. racemosus* L. in Munz, is common on the rocky beds of intermittent streams (*Oswald & Ahart 6727*: NW¼ NW¼ Sec. 26, intermittent stream west of Lone Oak Knoll). Native to Eurasia. Early Apr. [*B. mollis* L.; *B. scoparius* L.]

Bromus madritensis* L. ssp. *madritensis – FOXTAIL CHESS. Annual grass forming localized colonies in upland (*Oswald & Ahart 6711*: SE¼ NW¼ Sec. 26, on the southwest side of the Borrow Pit). Native to Europe. Mid Apr.

***Bromus madritensis* ssp. *rubens* (L.) Husn.** – RED BROME. Weedy annual grass in disturbed places and on mima mounds (*Oswald & Ahart 6598*: NE¼ NE¼ Sec. 26, on top of the roadcut along Manton Rd. in the northeast corner of the reserve; *Oswald & Ahart 6645*: SW¼ SW¼ Sec. 26, between Dales Lake and the west boundary). Native to Europe. Mid Mar. [*B. rubens* L.]

***Bromus tectorum* L.** – CHEATGRASS. Weedy annual on the basalt ridge crossing the northeast corner of the reserve (*Oswald & Ahart 6686*: NW¼ NE¼ Sec. 26). Native to Eurasia. Late Apr.

Bromus sterilis L. – POVERTY BROME. Annual brome known only from a localized population growing in the shade of blue oak on the south side of the basalt ridge at the west boundary (Oswald & Ahart 6856: NW¼ NW¼ Sec. 26). Native to Eurasia. In ripe fruit when collected in mid Jun.

Crypsis schoenoides (L.) Lam. – SWAMP PRICKLE GRASS. Fairly common summer annual growing on the dry beds of pools (Oswald & Ahart 7078A: NW¼ NW¼ Sec. 35, Pool 3 south of Inks Creek Rd.). Native to Europe. Late Jun. [*Heleochoa schoenoides* (L.) Host]

Cynodon dactylon (L.) Pers. – BERMUDA-GRASS. Weedy perennial growing on the dry margin of pools (Oswald & Ahart 6849: SE¼ NW¼ Sec. 26, in a pile of rocks at the south end of the borrow pit). Native to Africa. Mid Jun.

Cynosurus echinatus L. – HEDGEHOG DOGTAIL. Locally abundant annual in more or less shaded places on the basalt ridges crossing the north side of the reserve (Oswald & Ahart 6637: NE¼ NE¼ Sec. 26, northeast corner of the reserve). It is less common along intermittent streams in the open grassland of the reserve. Native to Europe. Early Apr.

Deschampsia danthonioides (Trin.) Munro ex Benth. – ANNUAL HAIRGRASS. Common and widespread annual on the drying margins of vernal pools and wetlands (Oswald & Ahart 6574: SW¼ NW¼ Sec. 26, depression near the west boundary just south of the northern cluster of pools). Late Mar.

Digitaria sanguinalis (L.) Scop. – HAIRY CRAB-GRASS. Occasional weedy annual on the dry beds of pools and along roads (Oswald & Ahart 7080: NW¼ NW¼ Sec. 35, Inks Creek Rd.). Native to Europe. Mid Jul.

Echinochloa colona (L.) Link – JUNGLE-RICE. Summer annual growing on the dry beds of drainages and pools (Oswald 6949: NE¼ SW¼ Sec. 26, shallow ditch along the old highway just south of the Old Hwy. Pool). Native to Eurasia. Late Jun.

Elymus multisetus (J.G.Sm.) Burt Davy – BIG SQUIRRELTAIL. Locally abundant tufted perennial growing in rocky grassland between Manton Rd. and the fence east of the Old Hwy. Pool. (Oswald & Ahart 6864: NW¼ SW¼ Sec. 26). Mid Jun. [*Sitanion jubatum* J.G. Sm.]

Eragrostis cilianensis (All.) Vign. ex Janchen – STINKGRASS. Occasional weed along the edge of roads (Oswald & Ahart 7081: NW¼ NW¼ Sec. 35, Inks Creek Rd.). Native to Europe. Mid Jul.

Eragrostis mexicana (Hornem.) Link ssp. *virescens* (C.Presl) Koch & E.A.Sánchez – GREEN LOVEGRASS. Uncommon in dry gravel on the edge of Inks Creek Rd. (Oswald 6828: NW¼ NW¼ Sec. 35). It has also been seen on the dry bed of Pool 13. Late May. [*E. orcuttiana* Vasey]

Eragrostis pectinacea (Michx.) Nees var. *pectinacea* – PURPLE LOVEGRASS. Annual grass growing on the edge of Manton Rd. (Oswald & Ahart 7149: NW¼ SW¼ Sec. 35, near the south end of the reserve). Late Jul.

Gastridium ventricosum (Gouan) Schinz & Thell. – NITGRASS. Locally common annual in upland (Oswald & Ahart 6723: NE¼ SW¼ Sec. 26, ca. 300 ft west of the Old Hwy. Pool). Native to Europe. Mid May.

Hordeum marinum Huds. ssp. *gussoneanum* (Parl.) Thell. – MEDITERRANEAN BARLEY. Common and often locally abundant annual in vernal wet upland soils (Oswald & Ahart 6568: NW¼ SW¼ Sec. 26, edge of a drainage along the unimproved road between the airstrip and the west boundary). Native to Europe. Late Mar. [*H. hystrix* Roth; *H. geniculatum* All.]

Hordeum murinum L. ssp. *leporinum* (Link) Arcang. – HARE BARLEY. Common and locally abundant annual grass on the basalt ridges and in deeper soils of weedy and disturbed places (Oswald & Ahart 6586: NW¼ NW¼ Sec. 26, under the blue oak on “Lone Oak Knoll”). Native to Europe. Late Mar. [*H. leporinum* Link]

Hordeum vulgare L. – COMMON BARLEY. Represented by a waif growing on the edge of Manton Rd. near the Old Hwy. Pool (Oswald & Ahart 6678: NE¼ SW¼ Sec. 26). Mid Apr.

Koeleria phleoides (Vill.) Pers. – BRISTLY KOELER'S-GRASS. Locally common in gravel on the edge of Inks Creek Rd. (Oswald & Ahart 6661: NW¼ NW¼ Sec. 35). Native to the Mediterranean. Mid Apr.

Leptochloa fascicularis (Lam.) A.Gray – BEARDED SPRANGLETOP. Annual grass found adjacent to the reserve on the moist margin of the borrow pit on the east side of Manton Rd. (Oswald & Ahart 7071: SE¼ SW¼ Sec. 26). Mid Jul.

Lolium multiflorum Lam. – ANNUAL RYEGRASS. Locally abundant annual along roads and pools (Oswald & Ahart 6628: NW¼ NW¼ Sec. 35, along Manton Rd. just south of Inks Creek Rd.). Native to Europe. Late Mar.

Melica californica Scribn. – CALIFORNIA MELIC. Uncommon perennial in rocky places (Oswald & Ahart 6639: NW¼ NE¼ Sec. 26, in cobbles on the basalt ridge crossing the northeast corner of the reserve). Late Mar.

Orcuttia tenuis Hitchc. – SLENDER ORCUTTIA. Locally abundant annual on the drying bed of Dales Lake (Oswald 6824: NW¼ NW¼ Sec. 35). It is also found in the Old Hwy. Pool, in the borrow pit, in the pool at the culvert under Manton Rd. east of the borrow pit, and in Pools 1, 2, 3, 4, 5, 7, 8, & 11. Late May. CNPS List 1B, CE, PT.

Panicum dichotomiflorum Michx. – SMOOTH WITCHGRASS. Annual grass growing on the edge of Manton Rd. (Oswald & Ahart 7150: NW¼ SW¼ Sec. 35, near the south end of the reserve). Native to the eastern U.S. Late Jul.

Paspalum distichum L. – KNOTGRASS. Locally abundant perennial found adjacent to the reserve in shallow water on the edge of the marshy borrow pit on the east side of Manton Rd. (Oswald & Ahart 7069) SE¼ SW¼ Sec. 26). Mid Jul.

Poa annua L. – ANNUAL BLUEGRASS. Locally common annual along roads and in other disturbed places (Oswald & Ahart 6497: NW¼ NW¼ Sec. 35, south edge of Inks Creek Rd. near the west boundary). Native to Europe. Early Feb.

Poa bulbosa L. – BULBOUS BLUEGRASS. Common herbaceous perennial along roads and in other disturbed places (Oswald 6522: NW¼ NW¼ Sec. 35, junction of Manton and Inks Creek rds.). Native to Europe. Early Mar.

Poa secunda J.Presl ssp. *secunda* – ONE-SIDED BLUEGRASS. Locally common perennial bunch grass on the basalt ridges, along intermittent streams, and in stony and drier upland soils on the open grassland of the reserve (Oswald & Ahart 6592: NW¼ NW¼ Sec. 26, in basalt cobbles on top of the ridge crossing the northwest corner of the reserve). Early Mar. [*P. canbyi* (Scribn.) Howell, *P. gracillima* Vasey, *P. incurva* Scribn. & T.A. Williams, *P. sandbergii* Vasey, *P. scabrella* (Thurb.) Benth. ex Vasey]

Poa tenerrima Scribn. – DELICATE BLUEGRASS. Locally abundant tufted perennial in shallow, vernal wet depressions (Oswald & Ahart 6528: SW¼ NW¼ Sec. 35, on basalt near the south tip of the reserve). Early Mar. [*P. gracillima* Vasey]

Polypogon interruptus Humb., Bonpl. & Kunth – DITCH BEARDGRASS. Annual grass growing in wet gravel along the edge of Inks Creek Rd. (Oswald & Ahart 6736: NW¼ NW¼ Sec. 35). Native to S. America. Mid May. [*P. lutosus* (Poir.) Hitchc., misapplied]

Polypogon maritimus Willd. – MEDITERRANEAN BEARDGRASS. Annual grass growing on the drying beds of ponds and intermittent streams (Oswald 6789: NW¼ NW¼ Sec. 26, intermittent stream on the south side of the basalt ridge crossing the northwest corner of the reserve). Native to Mediterranean Europe. Mid May.

Polypogon monspeliensis (L.) Desf. – ANNUAL BEARDGRASS. Locally abundant in moist places along ponds and drainages (Oswald 6702: NW¼ NW¼ Sec. 35, moist gravel along Inks Creek Rd.). Native to southern Europe. Late Apr.

Scribneria bolanderi (Thurb.) Hack. – SCRIBNER'S GRASS. Annual grass in open grassland and disturbed places (Oswald & Ahart 6558: NE¼ SW¼ Sec. 26, in dry gravelly soil of the roadbed at the south gate of the old highway). Mid Mar.

Setaria viridis (L.) P.Beauv. – GREEN BRISTLEGRASS. Annual grass growing on the edge of Manton Rd. (Oswald & Ahart 7148: NW¼ SW¼ Sec. 35, near the south end of the reserve). Native to Eurasia. Late Jul.

Sorghum halepense (L.) Pers. – JOHNSONGRASS. Weedy perennial growing along the edge of Manton Rd. (Oswald & Ahart 6871: SW¼ NW¼ Sec. 35, south of Inks Creek Rd.). Native to the Mediterranean. Early Jun.

Sporobolus cryptandrus (Torr.) A.Gray – SAND DROPSEED. Common tufted perennial growing in cracks in the old highway and along the edge of Manton Rd. (Oswald & Ahart 7073: NE¼ NE¼ Sec. 26, north gate of the old highway). This grass is native to Southern California but is now naturalized along highways in Northern California. Mid Jun.

Taeniatherum caput-medusae (L.) Nevski – MEDUSA-HEAD. Locally abundant weedy annual in thicker soils on mima mounds, grassy slopes, and in moist depressions (Oswald & Ahart 6582: NW¼ NW¼ Sec. 26, north slope of "Lone Oak Knoll"). This is probably the most noxious weed on the reserve. In the absence of grazing, it forms a thick thatch which prevents any other plants from growing in the area. Native to Europe. Late Mar. [*Elymus caput-medusae* L.]

Triticum aestivum L. – WHEAT. A beardless waif was found on the berm of Pool 1, which was stabilized with wheat straw (Oswald 6741: NW¼ NW¼ Sec. 35). Native to the Old World. Collected late May.

Vulpia bromoides (L.) S.F.Gray – SIX-WEEKS FESCUE. Common and widespread annual on the basalt ridges, along roads, and in the open grassland (Oswald 6547: NW¼ NE¼ Sec. 26, edge of the old highway on south side of basalt ridge). Native to Europe. Mid Mar. [*Festuca bromoides* L.]

Vulpia microstachys (Nutt.) Munro var. *ciliata* (Beal) Lonard & Gould – FRINGED FESCUE. Common and widespread annual on the basalt ridges and in open grassland (Oswald & Ahart 6619: NW¼ SW¼ Sec. 35, stony soil between the fence line and Manton Rd. at the south tip of the reserve). Early Apr. [*Festuca eastwoodae* Piper; *F. grayi* (Abrams) Piper]

Vulpia microstachys var. *confusa* (Piper) Lonard & Gould – HAIRY-LEAVED FESCUE. Uncommon or overlooked annual in open grassland where it grows with other varieties of *Vulpia* (Oswald 6701: NW¼ NW¼ Sec. 35, near the west fence just south of Pool 4). Mature plants collected in early May. [*Festuca confusa* Piper, *F. tracyi* Hitchc.]

Vulpia microstachys var. *pauciflora* (Scribn. ex Beal) Lonard & Gould – FEW-FLOWERED FESCUE. Common annual on the basalt ridges, in vernal wet upland soils, and on mima mounds (Oswald & Ahart 6647: SW¼ SW¼ Sec. 26, between Dales Lake and the west boundary). Mid Apr. [*Festuca pacifica* Piper; *F. reflexa* Buckl.]

Vulpia myuros (L.) C.C.Gmel. var. *hirsuta* Hack. – FOXTAIL FESCUE. Annual grass along roads and in open grassland (Oswald & Ahart 6567: NW¼ SW¼ Sec. 26, deeper soil of a mima mound along the unimproved road between the airstrip and the west boundary;

Oswald & Ahart 6638; NW¼ NE¼ Sec. 26, basalt cobbles on the basalt ridge crossing the northeast corner of the reserve). Native to Europe. Late Mar. [*Festuca megalura* Hack.]

POTAMOGETONACEAE – PONDWEED FAMILY

- 1 Leaves linear, all submerged and similar.
 - 2 Stipules joined to the base of the leaf and forming a sheath around the stem; fruits in sessile or short-pedunculate clusters *Potamogeton diversifolius*
 - 2 Stipules not joined to the leaf; fruits in pedunculate, more or less elongated spikes *Potamogeton pusillus*
- 1 At least some of the leaves broad and floating on the surface.
 - 3 Submersed leaves linear with the stipules joined to the base of the leaf and forming a sheath around the stem; fruits submersed in axillary, capitate clusters *Potamogeton diversifolius*
 - 3 Submersed leaves broad with long petioles, the stipules not forming a sheath around the stem; fruits on emerged, elongated spikes *Potamogeton nodosus*

Potamogeton diversifolius Raf. – DIVERSE-LEAVED PONDWEED. Aquatic perennial found in shallow water of Dales Lake nearing dry-down (Oswald & Ahart 7153; SW¼ SW¼ Sec. 26). These plants had only linear, submersed leaves. The more typical plant with both linear,

submersed leaves and broad, floating leaves was not seen. In fruit in late Jul.

Potamogeton nodosus Poir. – LONG-LEAVED PONDWEED. Large-leaved aquatic perennial in the marshy borrow pit adjacent to the reserve on the east side of Manton Rd. (Oswald & Ahart 7072; SE¼ SW¼ Sec. 26). In fruit mid Jul. [*P. americanus* Cham. & Schldl.]

Potamogeton pusillus L. var. *pusillus* – SMALL PONDWEED. Small-leaved aquatic perennial in the marshy borrow pit adjacent to the reserve on the east side of Manton Rd. (not vouchered). In fruit mid Jul.

TYPHACEAE – CATTAIL FAMILY

Typha sp. – CATTAIL. Seedling plants were noted on the drying beds of pools in the southern cluster, in the Old Hwy. Pool, and in Pool 20 in late May and June. However, none survived into summer.

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