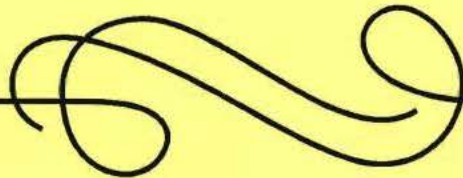


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**Vascular Plants  
of  
Vina Plains Preserve,  
Wurlitzer Unit**

**Vernon H. Oswald**

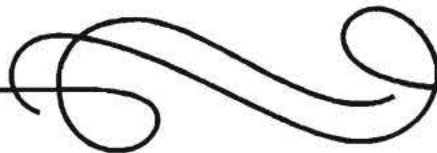


**Vascular Plants  
of  
Vina Plains  
Preserve,  
Wurlitzer Unit**

Vernon H. Oswald

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Chico, California 95929-0515

1997 Revision



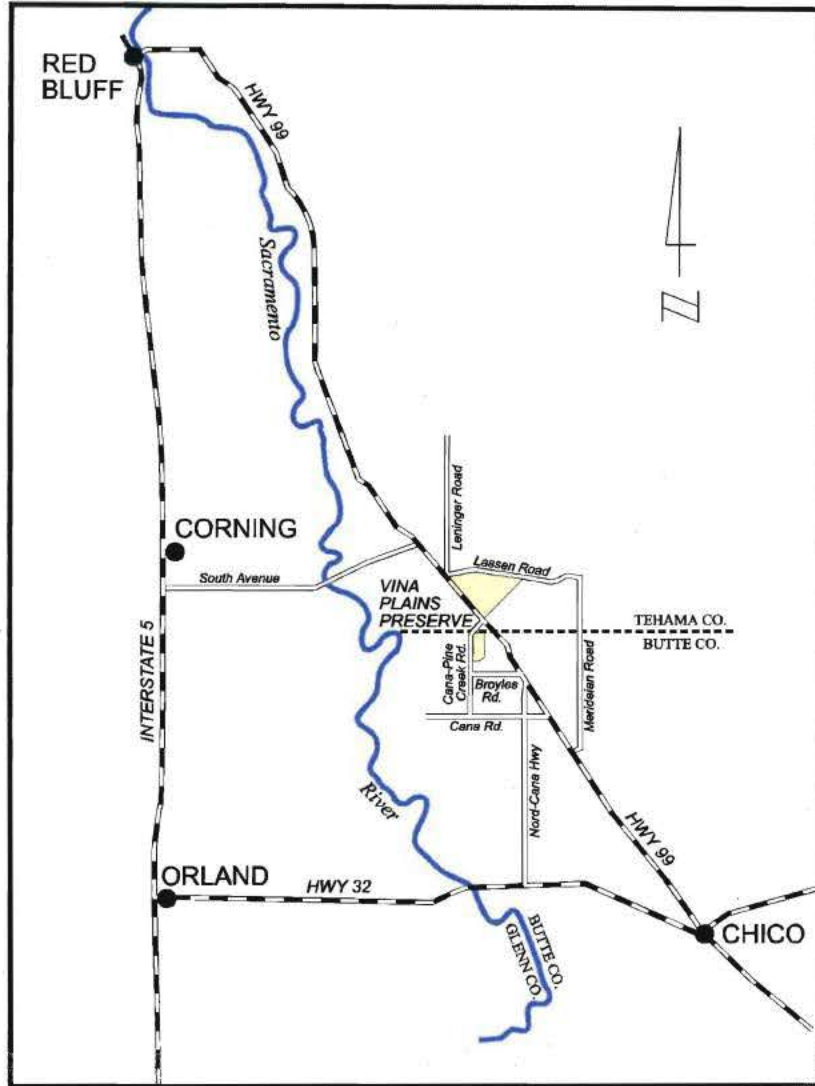


FIGURE 1. Location of Vina Plains Preserve, Main Unit on the north, Wurlitzer Unit on the south.

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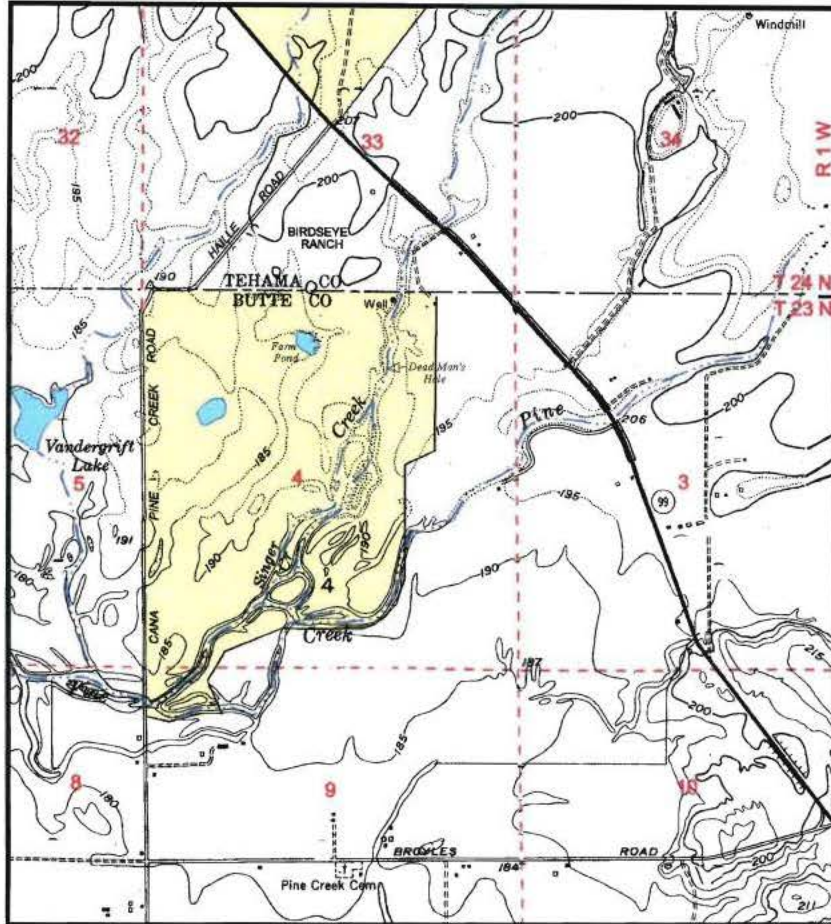


FIGURE 2. Wurlitzer Unit, Vina Plains Preserve (in yellow), with a small corner of the Main Unit showing on the north. Modified from USGS 7.5' topographic maps, Richardson Springs NW & Nord quadrangles.

## INTRODUCTION<sup>1</sup>

A survey of the vascular flora of the Wurlitzer Unit of the Vina Plains Preserve was carried out between October 23, 1988 and October 10, 1989. My interest in this project was two-fold: 1) to prepare an inventory of the plants growing on the Wurlitzer Unit, which might be of use in the management of the area and serve as a base for future studies, and 2) to gather data for continuing study of the vascular flora of Butte County.<sup>2</sup>

The Wurlitzer Unit was purchased by The Nature Conservancy in 1984. It is a 425 acre parcel located in northern Butte County about one-half mile south of the Main Unit of the Preserve (see Figures 1 and 2). It consists of portions of Sections 4 and 9 in T23N R1W and is bounded on the north by the Butte-Tehama county line and the west end of Haille Rd, on the west by Cana-Pine Creek Rd, on the south by portions of Pine Creek and its former channel, and on the east by a fence line located somewhat east of Singer Creek. The land has never been tilled and was formerly used for grazing, which continued through the spring of 1988. The Nature Conservancy has now been discontinued grazing at Vina Plains, although the Wurlitzer Unit was plagued in 1989 by periodic incursions of cattle from the neighboring Birdseye Ranch.<sup>3</sup>

The land, which lies on an upper terrace of the Sacramento Valley, is gently contoured, varying in elevation from about 195 ft in the northeast corner to about 180 ft at the Pine Creek Bridge. The entire area is underlain by Tuscan fanglomerate. The fanglomerate has been deeply dissected by Singer and Pine creeks resulting in steep cutbanks, eroded flats, standing columns, and several deep holes along the streams. A meandering drainage runs in a southwesterly direction from about the center of the north boundary to the middle of the west boundary. A farm pond was constructed on the east side of this drainage near the north fence in the late 1950's. For a number of years, the pond was filled by run-off from winter storms and would dry down during the summer. Later, a well and pump were added to the system in order to maintain the pond during the summer months.

The major plant community at the Wurlitzer Unit is valley grassland. The farm pond, although artificial, has developed into a typical freshwater marsh, and the creeks support a riparian zone of vegetation with a remnant of valley oak woodland in the southwest corner.

Soils, except for some deposits of Vina loam along Pine and Singer Creeks, are similar to those on the Main Unit of the preserve and support similar assemblages of plants (see Vina Plains Preserve Handbook, 1994). The upland consists mostly of thin Tuscan soils with the parent fanglomerate near or sometimes exposed at the surface. The upland vegetation consists of herbaceous annuals, scattered grasses, and scattered perennial forbs—this is the spectacular “wildflower grassland” that carpets

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<sup>1</sup> This flora was originally written in October 1989. In this revision, the nomenclature has been brought in line with *The Jepson Manual* (Hickman 1993) and rare plants follow the 5<sup>th</sup> Edition of the *CNPS Inventory* (Skinner & Pavlik 1994).

<sup>2</sup> The Butte County flora is now published (Oswald & Ahart 1994).

<sup>3</sup> The Wurlitzer Unit has taken on a decidedly weedy appearance since grazing was discontinued. Grazing was reestablished on portions of the Main Unit of Vina Plains Preserve in the spring of 1996.

the Vina Plains during the spring months. Shallow depressions and drainages have accumulated deeper soils with a high clay content and typically support a good stand of taller grasses such as annual rye (*Lolium multiflorum*) and medusa-head (*Taeniatherum caput-medusae*), together with a number of annual forbs and herbaceous perennials such as zigadene (*Zigadenus fremontii*).

Shallow vernal pools of the "hogwallow" type are scattered in grassy upland and along drainages. During the 1988–89 rainy season, several of these pools held water on a continuous basis from early January into late April. They support a typical assemblage of vernal pool plants. The farm pond also supports many vernal pool plants on its margin as it begins to dry down in the spring.

The deposits of Vina loam along the creeks support a dense stand of weedy annual grasses (*Bromus* spp., *Hordeum murinum* ssp. *leporinum*, and *Avena fatua*) during the spring and yellow star-thistle (*Centaurea solstitialis*) during the summer. Valley oak (*Quercus lobata*) and its associates are also restricted for the most part to these thicker loam soils.

TABLE 1. Numerical analysis of the vascular flora of Vina Plains Preserve, Wurlitzer Unit.

FAMILIES	GENERA	SPECIES	VARIETIES*	TOTAL	NON-NATIVE	CNPS LISTED
74	246	369	7	376	115 (30.6%)	5

\*Includes both varieties and subspecies.

The late Pauleen Broyles, who published a flora of the Main Unit of the Vina Plains Preserve (Broyles 1987a), had begun work on the flora of the Wurlitzer Unit. In a preliminary list dated September 1987, she listed 183 plant taxa and had written in an additional 12 species discovered during 1988. During 1989, I have been able to find all but five of the plants in her list and have added considerably to it. A total of 376 plant taxa in 74 families and 246 genera is now recorded (Table 1). No survey of this kind is ever complete. Additional resident plants will be found, and waifs will undoubtedly show up along the creeks in the future.

Non-native species comprise about 30 percent of the flora of the Wurlitzer Unit. This agrees well with the Main Unit where 33 percent of the plants are aliens. In some other recent surveys, 22 percent of the plants in the total Butte County flora, 30 percent of the plants in Upper Bidwell Park, 42 percent of the plants at Harter's Cherokee Ranch in central Butte County, and 45 percent of the plants in the Butte Creek Canyon Ecological Reserve are non-native species.

Five of the plants found on the Wurlitzer Unit are in the CNPS *Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1994). Sanford's arrowhead (*Sagittaria sanfordii*), adobe lily (*Fritillaria pluriflora*) and Greene's tuctoria (*Tuctoria greenei*) are in List 1B, plants considered rare and endangered in California and elsewhere. Tehama navarretia (*Navarretia heterandra*), and shield-bracted monkey flower (*Mimulus glaucescens*) are in List 4, a "watch list" of plants of limited distribution that are not endangered at the present time.

The farm pond merits special mention. It is essentially a freshwater marsh although it has been artificially maintained as a small, marshy, freshwater lake. San

ford's arrowhead (*Sagittaria sanfordii*) is very abundant here; it is otherwise known in Butte County only at Vandergrift Lake just to the west of the Wurlitzer Unit and at Lake Madrone near Berry Creek. Horned-pondweed (*Zannichellia palustris*) was collected in the Wurlitzer pond in 1988, our first Butte County record. The other tules, cattails, sedges, and pondweeds are common plants in Butte County, but our freshwater marshes are gradually being destroyed through drainage, land leveling, and urbanization. The pond at the preserve is also a haven for waterfowl during the winter and spring, and other species of birds and mammals are attracted to the area.

Should the water level of the Wurlitzer pond be artificially maintained during the summer? Mr. Angelo Andreini has kindly allowed me to examine Vandergrift Lake, a similar marshy pond on private property just west of the Wurlitzer Unit. This pond dries completely during the summer, yet in the spring it is a luxuriant marsh supporting many of the same plants, including Sanford's arrowhead, as those growing at the Wurlitzer pond. If the Wurlitzer pond were allowed to dry during the summer, the fish, which have been stocked in the lake, would obviously perish. However, the marsh vegetation would probably at least in part survive.<sup>4</sup>

The riparian zone along the creeks is also floristically interesting. In addition to the typical riparian species associated with valley streams in Butte County, a significant number of plants that typically grow in the foothills are also found. Some of these are isolated waifs such as rock phacelia (*Phacelia egena*), Purdy's beardtongue (*Penstemon heterophyllus* var. *purdyi*), and California ash (*Fraxinus dipetala*). Others, such as Shelton's coyote-mint (*Monardella sheltonii*) and Hansen's bird's-beak (*Cordylanthus pilosus* ssp. *hansenii*), are well established along the creeks. The appearance of these foothill species on the Wurlitzer Unit is probably correlated to the eroded fanglomerate along the creeks, which mimics the Tuscan Formation volcanics in the foothills to the east.

Nomenclature in the plant list is based upon *The Jepson Manual* (Hickman 1993), although author abbreviations follow Brummit and Powell (1992). Some synonyms used in *A California Flora and Supplement* (Munz 1973) are included in brackets. Common names are mostly those of Abrams (1923–1960). The date(s) associated with each plant indicate the flowering interval for the plant at the study site, in so far as it could be determined from limited observations. *Early* is applied to days 1 through 10, *mid* to days 11 through 20, and *late* to days 21 through the end of the month. The flowering intervals, together with locations and habitats in which the plants were found, should be considered to be positive but not inclusive statements. Thus, a particular plant might be found at some location other than the ones mentioned in the plant list, or the plant might be found blooming before or after the date or interval indicated. Words such as rare, common, abundant, etc., are entirely subjective.

Some voucher specimens have been collected. They are indicated by collection number and are deposited in the herbarium at California State University, Chico (CHSC).

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<sup>4</sup> Pumping was discontinued in 1991, and the farm pond again relies on runoff for its water supply. Some of the aquatic and marsh plants found in the 1989 survey have undoubtedly disappeared.



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In the plant list, names printed in **boldface** are plants listed in the CNPS *Inventory*. Names in a non-serif typeface, e.g., *Taraxacum officinale*, are not native to the California flora.

## THE PLANT LIST

### FERNS AND FERN ALLIES

#### ISOETACEAE – QUILLWORT FAMILY

*Isoetes nuttallii* A.Braun ex Engelm. – NUTTALL'S QUILLWORT. Inconspicuous perennial found on the drying beds of several of the larger wallows.

#### MARSILEACEAE – MARSILEA FAMILY

*Marsilea vestita* Hook. & Grev. ssp. *vestita* – HAIRY PEPPERWORT. Herbaceous perennial that is locally abundant in shallow water on the margin of the creeks and at the farm pond. It was also grows in some of the vernal pools. Plants readily adapt to a terrestrial life when ponds and streams dry during the summer.

*Pilularia americana* A.Braun – AMERICAN PILLWORT. Inconspicuous herbaceous perennial in mud on the drying margin of the farm pond and on the beds of several of the wallows.

#### POLYPODIACEAE – FERN FAMILY

*Pellaea andromedifolia* (Kaulf.) Fée – COFFEE FERN. Represented by a single young plant on an eroded fanglomerate bank of Pine Creek downstream from the mouth of Singer Creek.

*Pentagramma triangularis* (Kaulf.) Yatsk., Windham, & E.Wollenw. ssp. *triangularis* – GOLD-BACKED FERN. Locally common on shaded cut banks of both Singer and Pine creeks (Broyles 1115). [*Pityrogramma triangularis* (Kaulf.) Maxon]

*Polystichum californicum* (D.C.Eaton) Diels – CALIFORNIA SWORD FERN. Represented by a single waif tucked into an overhanging cutbank through fanglomerate on the south side of Pine Creek between the bridge and the mouth of Singer Creek (Oswald 3932).

*Woodwardia fimbriata* Sm. – GIANT CHAIN FERN. Several plants are located on eroded fanglomerate on the north bank of Pine Creek upstream from the bridge (Broyles 1114).

#### SELAGINELLACEAE – SPIKE-MOSS FAMILY

*Selaginella hansenii* Hieron. – HANSEN'S SPIKE-MOSS. Locally abundant on fanglomerate along Pine Creek at the east boundary and along an eroded swale between Singer and Pine creeks.

### ANTHOPHYTA – FLOWERING PLANT DIVISION

#### DICOTYLEDONES – DICOT CLASS

#### AMARANTHACEAE – AMARANTH FAMILY

*Amaranthus albus* L. – TUMBLEWEED. Scattered to fairly abundant annual in disturbed soil at the farm pond and along the creeks. Mid May.

*Amaranthus blitoides* S.Watson – MAT AMARANTH. Occasional annual observed on the bed of Singer Creek. Early May. [*A. graecizans* L. misapplied]

*Amaranthus retroflexus* L. – RED-ROOTED AMARANTH. Uncommon annual found on a sand bar along Singer Creek. Early May.

ANACARDIACEAE – SUMAC FAMILY

*Toxicodendron diversilobum* (Torr. & A.Gray) Greene – WESTERN POISON-OAK. Scattered shrub along the creeks and in the oak woodland at the southwest corner of the preserve. Early Apr. [*Rhus diversiloba* Torr. & A.Gray]

APIACEAE – CARROT FAMILY

[Umbelliferae]

*Anthriscus caucalis* M.Bieb. – BUR-CHEVIL. Common annual in shaded and brushy places in the riparian area at the southwest corner of the reserve. Early Apr. [*A. scandicina* (G.Weber) Mansf.]

*Eryngium castrense* J.M.Coult. & Rose – COYOTE-THISTLE. Locally common herbaceous perennial in wallows and vernal pools, along drainages, on gravel bars along the creeks and in vernal wet upland soils throughout the preserve. Mid Jun. [*E. vaseyi* J.M.Coult. & Rose var. *vallicola* (Jeps.) Munz]

*Lomatium caruifolium* (Hook. & Arn.) J.M.Coult. & Rose var. *denticulatum* Jeps. – FOOTHILL LOMATIUM. Inconspicuous but common herbaceous perennial in grassy upland. It becomes easier to see when in fruit. Mid Mar. [*L. humile* (J.M.Coult. & Rose) Hoover ex Mathias & Constance]

*Lomatium dasycarpum* (Torr. & A.Gray) J.M.Coult. & Rose ssp. *tomentosum* (Benth.) W.L.Theob. – WOOLLY LOMATIUM. Known only from a moderate-sized population along a dry wash through fanglomerate in the section of open grassland between Pine and Singer Creeks. Early Apr.

*Lomatium utriculatum* (Nutt. ex Torr. & A.Gray) J.M.Coult. & Rose – BLADDER LOMATIUM. Known from a small population growing among grasses under an isolated valley oak in the open field between Singer and Pine creeks. These plants are minutely pubescent throughout, giving them a slightly gray color. Mid Apr.

*Perideridia kelloggii* (A.Gray) Mathias – KELLOGG'S YAMPAH. A single small clump of this herbaceous perennial grows on the lower terrace of the south bank of Pine Creek just upstream from the Pine Creek Bridge. Mid June.

*Sanicula bipinnata* Hook. & Arn. – POISON SANICLE. Locally abundant herbaceous perennial under valley oak near the junction of Singer and Pine creeks and under interior live oak in the riparian woodland near Cana-Pine Creek Rd. Late Mar.

*Sanicula bipinnatifida* Douglas ex Hook. – PURPLE SANICLE. Scattered to locally abundant herbaceous perennial in thin soils of grassy upland. Late Mar.

*Torilis arvensis* (Huds.) Link ssp. *purpurea* (Ten.) Hayek – PURPLE HEDGE-PARSLEY. Scattered annual in riparian habitat along Singer and Pine creeks and in some of the deeper washes between the creeks. Two forms of this subspecies occur in Butte County. In one both mericarps of the fruit have long bristles; in the second the outer mericarp has long bristles while the inner mericarp has rounded knobs. All plants examined on the preserve are of the former kind. Early May.

*Torilis nodosa* (L.) Gaertn. – KNOTTED HEDGE-PARSLEY. Uncommon annual in the first wash south of Singer Creek near the north boundary. Early May (already in fruit).

## ARISTOLOCHIACEAE – PIPEVINE FAMILY

*Aristolochia californica* Torr. – CALIFORNIA PIPEVINE. Occasional woody vine in the riparian woodland along Pine Creek. Early Mar.

## ASCLEPIADACEAE – MILKWEED FAMILY

*Asclepias eriocarpa* Benth. – INDIAN MILKWEED. Common herbaceous perennial forming localized colonies in grassy upland. It is also very abundant on eroded fan-glomerate along Singer and Pine creeks. Late May.

*Asclepias fascicularis* Decne. – NARROW-LEAVED MILKWEED. Uncommon herbaceous perennial on the margin of the farm pond and in a wash on the north side of Pine Creek just below the mouth of Singer Creek. Mid Jun.

## ASTERACEAE – SUNFLOWER FAMILY

[Compositae]

*Achyrachaena mollis* Schauer – BLOW-WIVES. Common annual in upland and along the creeks. Early Apr.

*Agoseris heterophylla* (Nutt.) Greene – ANNUAL AGOSERIS. Uncommon annual on a gravelly bank of Pine Creek at the mouth of Singer Creek. Late Apr.

*Anthemis cotula* L. – MAYWEED. Locally common annual in a gravelly wash located between Pine and Singer Creeks and in a dry wash near the Pine Creek bridge (Broyles 1112). Early May.

*Artemisia douglasiana* Besser – DOUGLAS' MUGWORT. Common herbaceous perennial along the creeks. Late Aug.

*Aster chilensis* Nees var. *chilensis* – CALIFORNIA ASTER. Rare herbaceous perennial known only from a plant on the lower bank of Pine Creek at the bridge. Mid July.

*Aster subulatus* Michx. var. *ligulatus* Shinnery – ANNUAL SALTMARSH ASTER. Locally common annual on rock piles at the farm pond. Mid Oct. [*A. exilis* S.Elliott]

*Baccharis salicifolia* (Ruiz & Pav.) Pers. – MULE'S-FAT. Abundant shrub on the beds and edges of the creeks. Early Mar–Apr; blooming again in late summer. [*B. viminea* DC., *B. glutinosa* Pers.]

*Bidens frondosa* L. – STICKTIGHT. Occasional annual in moist places along Singer Creek. Mid May–Nov.

*Blennosperma nanum* (Hook.) S.F.Blake var. *nanum* – YELLOW-CARPET. Common annual on grassy upland. This is probably the first composite to bloom at the preserve in the spring. Mid Jan.

*Brickellia californica* (Torr. & A.Gray) A.Gray – CALIFORNIA BRICKELLBUSH. Occasional perennial with a shrubby base on the banks of the creeks. Early Aug–Oct.

*Calycadenia ciliosa* Greene – KLAMATH CALYCADENIA. Occasional summer- and fall-flowering annual on grassy upland near the farm pond but locally abundant along creeks and dry washes (Broyles 1091). Mid Jun–Dec.

*Calycadenia fremontii* A.Gray – FREMONT'S CALYCADENIA. A fairly large but localized population is located near the north boundary between Singer and Pine creeks where the plants grow in thin soils on exposed fan-glomerate along an eroded wash (Wurlitzer 89; Oswald 3751 & 3762). These plants have heads with only 1–2



ray flowers and 1–4 disk flowers, differing from the other known Butte County population located on the south side of Broyles Rd. Late Apr–Jun.

*Calycadenia truncata* DC. – ROSINWEED. Occasional summer- and fall-flowering annual scattered along the creeks. Mid Jun–Dec. [Includes ssp. *scabrella* (E.Drew) D.D.Keck]

*Centaurea solstitialis* L. – YELLOW STAR-THISTLE. Common summer- and fall-flowering annual in dry fields and waste places. It is especially abundant on deep alluvial soils in the southwest portion of the preserve. Late May–Oct.

*Chamomilla suaveolens* (Pursh) Rydb. – COMMON PINEAPPLE-WEED. Weedy annual in disturbed places. Mid Apr. [*Matricaria matricarioides* (Less.) Porter]

*Conyza bonariensis* (L.) Cronquist – SOUTH AMERICAN HORSEWEED. Locally abundant annual on rock piles on the margin of the farm pond. Early Sep–Oct.

*Conyza canadensis* (L.) Cronquist – CANADIAN HORSEWEED. Occasional weedy annual along the creeks and at the farm pond. Early Sept–Oct.

*Conyza floribunda* Humb., Bonpl. & Kunth – MANY-FLOWERED HORSEWEED. Rare weedy annual on eroded fanglomerate along Singer Creek. Mid Sept.

*Erigeron philadelphicus* L. – PHILADELPHIA DAISY. Herbaceous perennial represented by a single plant growing at the base of a north-facing outcrop of eroded fanglomerate at Pine Creek just downstream from the mouth of Singer Creek. Early May–Jun.

*Eriophyllum lanatum* (Pursh) J.Forbes var. *grandiflorum* (A.Gray) Jeps. – LARGE-FLOWERED WOOLLY-SUNFLOWER. Common on eroded banks of fanglomerate along the creeks. Late Apr.

*Filago gallica* L. – NARROW-LEAVED FILAGO. Common annual in thin soils of grassy upland. Early Apr. [*Logfia gallica* (L.) Coss. & Germ.]

*Gnaphalium luteo-album* L. – WEEDY CUDWEED. Locally abundant weedy annual on piles of rock at the farm pond and occasional in washes south of Singer Creek. Early May–Oct.

*Gnaphalium palustre* Nutt. – LOWLAND CUDWEED. Scattered annual in moist soils along the edges of the creeks. Mid May–Jun.

*Grindelia hirsutula* Hook. & Arn. var. *davyi* (Jeps.) M.A.Lane – FOOTHILL GUMPLANT. Common herbaceous perennial along the creeks. Early May–Jan.

*Hedypnois cretica* (L.) Dum.Cours. – HEDYPNOIS. Annual weed known from a single population on a cut bank of Singer Creek. Early Apr.

*Helianthus bolanderi* A.Gray – BOLANDER'S SUNFLOWER. Annual forb in sandy places along the margins of Pine and Singer creeks. Mid Jul.

*Hemizonia congesta* DC. ssp. *clevelandii* (Greene) Babc. & H.M.Hall – CLEVELAND'S TARWEED. A late spring-flowering annual restricted to a small area of grassy upland in the northwest corner of the preserve opposite the corral on Nord-Cana Road (*Oswald 3794*). This would appear to be a new Butte County record of a plant that normally ranges through the foothills of the Coast Ranges to the west. Late May–Jun.

*Hemizonia congesta* ssp. *luzulifolia* (DC.) Babc. & H.M.Hall – HAYFIELD TARWEED. Locally abundant annual along the north boundary from the pump at Singer Creek westward to the first rise. Mid Jul–Nov. [*H. luzulifolia* DC. including ssp. *rudis* (Benth.) D.D.Keck]

*Hemizonia fitchii* A.Gray – FITCH'S SPIKEWEED. Common annual in thin soils of summer-dry grassy upland. Late Jun–Oct.

*Hesperovax caulescens* (Benth.) A.Gray – HOGWALLOW EVAX. Common and locally abundant annual on vernal wet clay soils of shallow wallows, edges of vernal pools, and drainages. Early Apr. [*Evax caulescens* (Benth.) A.Gray]

*Heterotheca oregona* (Nutt.) Shinnery var. *rudis* (Greene) Semple – OREGON GOLDEN-ASTER. Herbaceous perennial from a woody base that is abundant on gravel bars and eroded conglomerate along the creeks. Mid Jun–Dec.

*Hypochoeris glabra* L. – SMOOTH CAT'S-EAR. Common annual on the banks and lower flood plains of Singer and Pine creeks. Late Mar–May.

*Lactuca saligna* L. – WILLOW LETTUCE. Occasional plants on clay soils surrounding the wallow located northwest of the farm pond. These plants grow with *L. serriola*, which is more common on the preserve. Mid Oct. (when identified, probably flowering much earlier),

*Lactuca serriola* L. – PRICKLY LETTUCE. Common annual in grassy upland and along creeks. The var. *integrata* Gren. & Godr. (forma *integrifolia* Bogenh.) with strap-shaped leaves appears to be the more common type on the preserve, but plants with pinnatifid leaves (var. *serriola*) are also found. Mid Jul–Oct.

*Lagophylla glandulosa* A.Gray – GLANDULAR HARELEAF. Very common and locally abundant annual in gravel along both creeks. Mid Apr–Dec. [Includes the spring-flowering ecotype ssp. *serrata* (Greene) D.D.Keck]

*Lasthenia californica* DC. ex Lindl. – CALIFORNIA GOLDFIELDS. Common annual in thin soils of grassy upland. Mid Mar. [*Baeria chrysostoma* Fisch. & C.A.Mey. including ssp. *gracilis* (DC.) Ferris]

*Lasthenia fremontii* (Torr. ex A.Gray) Greene – FREMONT'S GOLDFIELDS. Locally abundant annual in vernal wet depressions and drainages. It tends to form rings around the margins of the deeper wallows and the farm pond as they dry down. Late Mar. [*Baeria fremontii* (Torr. ex A.Gray) A.Gray]

*Lasthenia glaberrima* DC. – SMOOTH GOLDFIELDS. Inconspicuous but locally abundant annual in some of the larger wallows (*Oswald 3750*), where it is found mostly central to the ring of *L. fremontii*. It also forms localized patches of plants along the receding margin of the farm pond. Late Apr–May.

*Lasthenia platycarpha* (A.Gray) Greene – ALKALI GOLDFIELDS. Common annual on thin soils of grassy upland. Mid Mar.

*Layia fremontii* (Torr. & A.Gray) A.Gray – FREMONT'S TIDYTIPS. Abundant annual on thin soils of grassy upland. Mid Mar.

*Lessingia nana* A.Gray – DWARF LESSINGIA. Common and widespread summer- and fall-flowering woolly annual on thin soils of grassy upland. The pappus bristles have a conspicuous rose color. Mid Jul–Oct.

*Micropus californicus* Fisch. & C.A.Mey. var. *californicus* – SLENDER COTTONWEED. Locally abundant annual in grassy upland. Early Apr.

*Microseris acuminata* Greene – SIERRA FOOTHILLS MICROSERIS. Locally common annual in grassy upland. Mid Apr.

*Microseris douglasii* (DC.) Sch.Bip. – DOUGLAS' MICROSERIS. Locally abundant annual in grassy upland. Plants on clay soils of vernal wet depressions and drainages with a pappus consisting of awns without an expanded basal scale or with scales

1/3 to 1/2 as long as the awn may be referable to the ssp. *tenella* (A.Gray) Chambers. Mid Apr–May.

*Psilocarphus brevissimus* Nutt. var. *brevissimus* – DWARF WOOLLY-MARBLES. Locally abundant annual on the drying beds of vernal pools, wallows, and drainages. It is also common on the receding margin of the farm pond. Mid Apr.

*Psilocarphus oregonus* Nutt. – OREGON WOOLLY-MARBLES. Uncommon annual in washes (*Broyles 1121*) and drainages. Late Apr.

*Senecio vulgaris* L. – OLD-MAN-OF-SPRING. Weedy annual recorded from the edge of the farm pond but probably more widespread. Early Jan.

*Silybum marianum* (L.) Gaertn. – MILK-THISTLE. Common weedy annual in moist, disturbed places. Early May.

*Taraxacum officinale* Weber – COMMON DANDELION. Uncommon herbaceous perennial recorded from near Pine Creek at the bridge. Late May.

*Wyethia angustifolia* (DC.) Nutt. – NARROW-LEAVED MULE-EARS. Herbaceous perennial known from a single plant growing in deep loam of a weedy opening in the wooded southwest corner of the preserve. Late May–Jun.

*Xanthium strumarium* L. – COCKLEBUR. Common annual along the creeks and locally abundant at the farm pond. Early Jul–Oct. [Includes var. *canadense* (Mill.) Torr. & A.Gray]

#### BETULACEAE – BIRCH FAMILY

*Alnus rhombifolia* Nutt. – WHITE ALDER. Deciduous tree growing on the edges of the creeks. Flowering period not recorded.

#### BORAGINACEAE – BORAGE FAMILY

*Amsinckia menziesii* (Lehm.) A.Nelson & J.F.Macbr. var. *menziesii* – MENZIES' FIDDLENECK. Scattered groups of plants grow in thicker soils along Pine and Singer creeks. Late Mar–Apr.

*Amsinckia menziesii* var. *intermedia* (Fisch. & C.A.Mey.) F.R.Ganders – COMMON FIDDLENECK Occasional to locally abundant annual in thicker soils along the creeks. The flowers are variable in size, attachment of the stamens, and length of the style. Late Mar–Apr.

*Cryptantha flaccida* (Douglas) Greene – FLACCID CRYPTANTHA Scattered to locally abundant in gravelly soil of washes and along the creeks. Early Apr–May.

*Heliotropium europaeum* L. – EUROPEAN HELIOTROPE. Very abundant weedy annual growing in sand and gravel on the dry beds of Pine and Singer creeks. It also grows on the margins of the farm pond. Early May–Nov.

*Plagiobothrys austiniae* (Greene) I.M.Johnst. – AUSTIN'S POPCORN-FLOWER. Common annual in thin soils of grassy upland. Mid Mar.

*Plagiobothrys bracteatus* (Howell) I.M.Johnst. var. *aculeolatus* (Piper) I.M.Johnst. – BRACKETED POPCORN-FLOWER. Annual forb collected in a shallow depression on fanglomerate along Pine Creek just south of the mouth of Singer Creek (*Oswald 3739*) and noted in a shallow depression in thin soils along the north boundary between Singer and Pine creeks. Mid Apr.

*Plagiobothrys canescens* Benth. – VALLEY POPCORN-FLOWER. Common annual in grassy upland, especially along the creeks. Late Mar.

*Plagiobothrys fulvus* (Hook. & Arn.) I.M.Johnst. – FULVOUS POPCORN-FLOWER. Common annual in grassy upland. Late Mar. [Includes var. *campestris* (Greene) I.M. Johnst.]

*Plagiobothrys greenii* (A.Gray) I.M.Johnst. – GREENE'S POPCORN-FLOWER. Common upland annual in shallow depressions and localized areas of vernal wet, thin soils. Late Mar.

*Plagiobothrys nothofulvus* (A.Gray) A.Gray – COMMON POPCORN-FLOWER. Uncommon annual along the creeks. Late Mar–Apr.

*Plagiobothrys scriptus* (Greene) I.M.Johnst. – SCRIBE'S POPCORN-FLOWER. Fairly common on thin, vernal wet soils of the grassy upland habitat. This appears to be the first popcorn flower to bloom on the preserve. Mid Feb–Mar.

*Plagiobothrys stipitatus* (Greene) I.M.Johnst. var. *stipitatus* – LARGE-FLOWERED STIPITATE POPCORN-FLOWER. Annual on vernal wet clay soils along the margins of some of the larger wallows. This large-flowered variety is much less common than the var. *micranthus*, with which it grows. Mid Mar.

*Plagiobothrys stipitatus* var. *micranthus* (Piper) I.M.Johnst. – SMALL-FLOWERED POPCORN-FLOWER. A small-flowered but much more common variety of the previous plant. It grows in vernal wet depressions, drainages, and pools and is locally abundant on the drying margin of the farm pond. Mid Mar.

#### BRASSICACEAE – MUSTARD FAMILY

[Cruciferae]

*Athysanus pusillus* (Hook.) Greene – PETTY ATHYSANUS. Occasional annual on thin soils of upland grassland. Mid Feb.

*Capsella bursa-pastoris* (L.) Medik. – SHEPHERD'S-PURSE. Occasional weedy annual along the creeks and in the woodland in the southwest portion of the preserve. Mid Feb.

*Cardamine oligosperma* Nutt. – WESTERN BITTERCRESS. Annual forb along the creeks. Early Apr.

*Draba verna* L. – SPRING WHITLOW-GRASS. Locally abundant annual on crumbly, decomposed fanglomerate along the creeks. Most plants have the silicles about as long as broad and correspond to the var. *aestivalis* Lej.; however, occasional patches of the var. *verna*, characterized by silicles distinctly longer than broad, grow in the same habitat. Mid Feb–Mar.

*Hirschfeldia incana* (L.) Lagr.-Foss. – MEDITERRANEAN-MUSTARD. Occasional herbaceous perennial in gravelly soils along Singer Creek. Early May. [*Brassica geniculata* (Desf.) Ball]

*Lepidium nitidum* Nutt. var. *nitidum* – SHINING PEPPER-GRASS. Common annual in thin soils of grassy upland. Mid Feb.

*Raphanus raphanistrum* L. – JOINTED CHARLOCK. Occasional weedy annual along the west fence and near the creeks. Although most plants have the pale yellow flowers associated with this species, some plants have white or violet flowers, indicating an introgression of genes from the radish, *R. sativus* L. Late Mar.

*Rorippa curvisiliqua* (Hook.) Besser var. *occidentalis* (Greene) Stuckey – WESTERN YELLOWCRESS. Uncommon annual in shallow water and on the rock piles at the farm pond. Mid May, also Oct.

*Sinapis arvensis* L. – FIELD CHARLOCK. Uncommon annual along the west fence line. One plant was also noted on the bank of Pine Creek upstream from the mouth of Singer Creek. Late Mar–May. [*Brassica kaber* (DC.) L.C.Wheeler var. *pinnatifida* (Stokes) L.C.Wheeler]

*Sisymbrium officinale* (L.) Scop. – HEDGE-MUSTARD. Occasional annual in alluvial soils in the southwest corner of the preserve. Mid Apr.

*Thysanocarpus curvipes* Hook. var. *curvipes* – CLASPING-LEAVED FRINGEPOD. Locally common annual along the south edge of Singer Creek, rare in silt along Pine Creek just upstream from the mouth of Singer Creek. Early Apr.

#### CALLITRICHACEAE – WATER-STARWORT FAMILY

*Callitriche heterophylla* Pursh – BOLANDER'S WATER-STARWORT. Aquatic annual that is fairly common at the farm pond, later becoming stranded on mud as the water recedes. It has also been recorded in shallow water and on wet gravel bordering Singer Creek and in a shallow wallow on the southwest side of Pine Creek. Based upon the size of the fruits, our plants would be assigned to the poorly defined var. *bolanderi* (Hegelm.) Fassett. Late Oct–May.

#### CAMPANULACEAE – BELLFLOWER FAMILY

*Downingia bicornuta* A.Gray var. *bicornuta* – DOUBLE-HORNED DOWNINGIA. Common annual growing in clay soils on the drying beds of wallows. Late Apr.

*Downingia cuspidata* (Greene) Greene ex Jeps. – CUSPIDATE DOWNINGIA Annual forb on the drying beds of some of the wallows. It sometimes forms mixed populations with *D. bicornuta*. Late Apr.

*Downingia ornatissima* Greene var. *ornatissima* – ORNATE DOWNINGIA Common annual in vernal wet depressions, along drainages, and on the beds of drying wallows. Mid Apr.

*Githopsis specularioides* Nutt. – COMMON BLUECUP. Inconspicuous annual recorded from near the large vernal pool (wallow) north of the farm pond. Mid Apr.

*Heterocodon rariflorum* Nutt. – HETEROCODON. Uncommon plant collected from undercut fanglomerate of an eroded bank along Pine Creek (*Broyles 1116*). Mid May.

#### CAPRIFOLIACEAE – HONEYSUCKLE FAMILY

*Sambucus mexicana* C.Presl ex DC. – BLUE ELDERBERRY. Woody shrub along the creeks and in the riparian woodland at the southwest corner of the preserve. After the initial spring flowering, the plants commonly bloom and set fruit a second time during the summer. Late Apr–May; late Jun–Jul. [*S. cerulea* Raf.]

#### CARYOPHYLLACEAE – PINK FAMILY

*Cerastium glomeratum* Thuill. – MOUSE-EARED CHICKWEED. Common annual in fields and along the creeks. Mid Mar.

*Minuartia californica* (A.Gray) Mattf. – CALIFORNIA SANDWORT. Annual in thin soils in grassy upland. Mid Mar. [*Arenaria californica* (A.Gray) W.H.Brewer]



*Petrorhagia dubia* (Raf.) G.López & Romo – GRASS PINK. Abundant annual in grassy upland. Mid Apr. [*Kohlruschia velutina* (Guss.) Reichenb., *Tunica prolifera* (L.) Scop.]

*Sagina apetala* Ard. – DWARF PEARLWORT. Inconspicuous annual in gravelly soil of upland and on eroded fanglomerate along Pine Creek. Late Mar–May.

*Scleranthus annuus* L. ssp. *annuus* – KNAWEL. Locally abundant weedy annual in a barren area on the high bank of Pine Creek just downstream from the mouth of Singer Creek. Early Apr.

*Silene gallica* L. – WINDMILL-PINK. Annual forb scattered along the creeks and along washes eroded in fanglomerate in the field between Pine and Singer creeks. Mid Apr.

*Spergularia bocconeii* (Scheele) Foucaud ex Merino – BOCCONE'S SAND-SPURRY. Annual in disturbed soils at the gate on Haille Rd. Late Apr–May.

*Stellaria media* (L.) Vill. – COMMON CHICKWEED. Locally abundant annual in the oak woodland at the southwest corner of the preserve. Late Feb.

#### CHENOPODIACEAE – GOOSEFOOT FAMILY

*Chenopodium album* L. – LAMB'S-QUARTERS. Annual scattered in disturbed soils along the creeks. Mid May–Jul.

*Chenopodium ambrosioides* L. – MEXICAN-TEA. Locally abundant annual along creeks and washes and at the farm pond. Mid Sept.

*Chenopodium berlandieri* Moq. – PIT-SEEDED GOOSEFOOT. Uncommon annual on the dry bed of Singer Creek. Late Oct. (in fruit).

*Chenopodium botrys* L. – JERUSALEM-OAK. Annual on gravel bars and drying beds of the creeks. Early May.

*Chenopodium pumilio* R.Br. – TASMANIAN GOOSEFOOT. A single plant was noted in silty sand along the edge of Pine Creek upstream from the mouth of Singer Creek. Early May.

*Salsola tragus* L. – RUSSIAN-THISTLE. Locally common annual weed in silty soil along the creeks near the mouth of Singer Creek. Mid Jun–Aug. [*S. kali* L. var. *tenuifolia* Tausch; *S. pestifer* A.Nelson]

#### CONVOLVULACEAE – MORNING-GLORY FAMILY

*Convolvulus arvensis* L. – BINDWEED. Common vine from a perennial root in alluvial soils along the creeks. Late Apr.

#### CRASSULACEAE – STONECROP FAMILY

*Crassula aquatica* (L.) Schönl. – WATER PIGMYWEED. Occasional to locally common annual in vernal wet drainages and depressions. Early Mar. [*Tillaea aquatica* L. in part]

*Crassula connata* (Ruiz & Pav.) A.Berger – PIGMYWEED. Delicate annual from thin soil near an outcrop of fanglomerate (*Broyles 1100*). Mid Mar. [*Tillaea erecta* Hook. & Arn.]

*Crassula tillaea* Lest.-Garl. – MOSSY PIGMYWEED. Locally common annual in thin, gravelly soils of grassy upland. [*Tillaea muscosa* L.]

*Parvisedum pumilum* (Benth.) R.T.Clausen – DWARF-STONECROP Common and locally abundant annual in thin soil on exposed patches of fanglomerate. Early Apr.

#### CUCURBITACEAE – GOURD FAMILY

*Marah fabaceus* (Naudin) Greene var. *agrestis* (Greene) Stocking – CALIFORNIA MANROOT. Occasional herbaceous vine from a large perennial root that grows along the creeks and in the riparian woodland in the southwest corner of the preserve. Mid Mar–Apr.

*Marah watsonii* (Cogn.) Greene – TAW MANROOT. Uncommon vine from a perennial root on an alluvial flat on the north side of Singer Creek near its confluence with Pine Creek. Late Mar.

#### CUSCUTACEAE – DODDER FAMILY

*Cuscuta howelliana* P.Rubtzov – BOGGS LAKE DODDER. Locally abundant parasite of *Eryngium*, *Navarretia* (Oswald 3774), and *Boisduvalia* in a number of deeper wallows on the preserve. Early May–Jun.

#### ELATINACEAE – WATERWORT FAMILY

*Bergia texana* (Hook.) Walp. – TEXAS BERGIA Occasional annual on the drying edges of the farm pond. Mid Jul–Oct.

*Elatine californica* A.Gray – CALIFORNIA WATERWORT. Annual on mud along the edge of the farm pond (Oswald 3776) and on the drying bottom of the large wallow just north of the farm pond. Late Apr–May.

*Elatine chilensis* Gay – CHILEAN WATERWORT. Locally abundant annual on wet mud on the west side of the farm pond (Oswald 3724). Mid Dec.

*Elatine rubella* Rydb. – RED WATERWORT. Common annual in shallow water and on wet mud along the edge of the farm pond (Oswald 3719). Late Apr–Oct.

#### EUPHORBIACEAE – SPURGE FAMILY

*Chamaesyce maculata* (L.) Small – SPOTTED SPURGE. Common annual on the dry beds of the creeks. Mid May–Oct. [*Euphorbia maculata* L., *E. supina* Raf.]

*Chamaesyce ocellata* (Durand & Hilg.) Millsp. ssp. *ocellata* – VALLEY SPURGE. Common summer annual on hard, dry soil in upland grassland. Early May–Oct. [*Euphorbia ocellata* (Durand & Hilg.) Millsp.]

*Chamaesyce serpyllifolia* (Pers.) Small ssp. *serpyllifolia* – THYME-LEAVED SPURGE. Common annual on the dry beds of the creeks. Mid Jun–Oct. [*Euphorbia serpyllifolia* Pers.]

*Eremocarpus setigerus* (Hook.) Benth. – TURKEY-MULLEIN. Common and widespread summer annual on dry upland. Mid Jun–Oct.

#### FABACEAE – PEA FAMILY

[Leguminosae]

*Cercis occidentalis* Torr. ex A.Gray – WESTERN REDBUD. Uncommon shrub in riparian woodland in the southwest corner of the preserve. Mid Mar.

*Lotus corniculatus* L. – BIRD'S-FOOT-TREFOIL. Perennial that is found along the creeks and on one of the stony islands at the farm pond. Mid Jun.

*Lotus purshianus* (Berth.) Clem. & E.G.Clem. var. *purshianus* – PURSH'S LOTUS. Common annual along the creeks. Mid Jul–Oct.

*Lotus wrangelianus* Fisch. & C.A.Mey. – WRANGEL LOTUS. Occasional to locally common annual growing in clay soils of vernal drainages and depressions. Mid Apr. [*Lotus subpinnatus* Lag. misapplied]

*Lupinus bicolor* Lindl. var. *pipersmithii* (A.Heller) C.P.Sm. – BICOLORED LUPINE. Locally abundant in thick loam on the upper edge of the north bank of Pine Creek upstream from the mouth of Singer Creek (*Oswald 3739*). This variety is rare in Butte County. Early Apr. [Varieties not recognized in the Jepson Manual]

*Lupinus bicolor* var. *tridentatus* Eastw. ex C.P.Sm. – BICOLORED LUPINE. Occasional to fairly abundant annual in the grassy upland and along the creeks. Late Mar. [Varieties not recognized in the Jepson Manual]

*Lupinus microcarpus* Sims var. *microcarpus* – CHICK LUPINE. Locally common annual in clay soils of drainages and depressions. Early Apr. [*L. subvexus* C.P.Sm.]

*Lupinus nanus* Douglas var. *latifolius* Berth. ex Torr. – DOUGLAS' LUPINE. Common annual in gravelly soils on the flood plain of Singer Creek. Early Mar. [Varieties not recognized in the Jepson Manual]

*Lupinus pachylobus* Greene – BIG-PODDED LUPINE. Annual forb along the creeks. Early Apr.

*Lupinus polycarpus* Greene – SMALL-FLOWERED LUPINE. Common annual along the creeks and occasional in moist depressions in the grassy upland. Late Mar–Apr. [Included in *L. bicolor* in The Jepson Manual, *L. micranthus* Douglas]

*Medicago polymorpha* L. – COMMON BUR-CLOVER. Annual forb in the grassy upland and along streams. Occasional plants lack spines on their fruits and are referable to var. *brevispina* (Benth.) Heyn. Mid Mar.

*Medicago praecox* DC. – MEDITERRANEAN BUR-CLOVER. Occasional along Singer Creek. It is similar to the preceding species but has smaller flowers and leaflets. Mid Mar.

*Melilotus alba* Medik. – WHITE SWEET-CLOVER. Scattered annual in moist places along the creeks. Mid Jun–Oct.

*Trifolium bifidum* A.Gray var. *decepiens* Greene – DECEPTIVE CLOVER. Fairly common annual in clay soils of vernal wet pools and drainages. Mid Apr.

*Trifolium depauperatum* Desv. var. *depauperatum* – DWARF COWBAG CLOVER. Common annual in the grassy upland. Both reddish- and white-flowered plants are found. Late March.

*Trifolium depauperatum* var. *amplectens* (Torr. & A.Gray) McDermott – INVOLUCRATE COWBAG CLOVER. Annual forb in grassland near the vernal pool north of the farm pond. Mid Apr.

*Trifolium dubium* Sibth. – LITTLE HOP CLOVER. Locally abundant annual in moist places along the creeks. Mid Apr.

*Trifolium hirtum* All. – ROSE CLOVER. Common annual and one of the dominant plants on deep loam soils between Singer and Pine Creeks. Mid Apr–May.

*Trifolium microcephalum* Pursh – SMALL-HEADED CLOVER. Occasional annual in grassy upland. Mid Apr.

*Trifolium subterraneum* L. – SUBTERRANEAN CLOVER. Uncommon annual clover in the grassy upland west of the creeks. Late Mar.



*Trifolium variegatum* Nutt. – WHITE-TIPPED CLOVER. Locally abundant annual in wet soils around vernal pools and depressions and along the edges of the creeks. Early Apr–May.

*Trifolium willdenovii* Spreng. – TOMCAT CLOVER. Common annual clover in grassy upland. Mid Apr. [*T. tridentatum* Lindl. including var. *aciculare* (Nutt.) McDermott]

*Vicia sativa* L. ssp. *sativa* – GARDEN VETCH. Uncommon annual along Pine Creek just upstream from the mouth of Singer Creek. Early Apr.

*Vicia villosa* Roth var. *varia* (Host) Corb. – WINTER VETCH. Common annual in fields with deep alluvial soils. Mid Apr. [Includes var. *glabrescens* W.D.J.Koch, *V. dasycarpa* Ten.]

#### FAGACEAE – BEECH FAMILY

*Quercus lobata* Née – VALLEY OAK. Scattered trees in the riparian zones along Singer and Pine creeks.

*Quercus wislizeni* A.DC. – INTERIOR LIVE OAK. Scattered trees along the creeks and in the woodlot in the southwest corner of the preserve.

#### GENTIANACEAE – GENTIAN FAMILY

*Centaurium muehlenbergii* (Griseb.) W.Wight ex Piper – JUN CENTAURY. Common annual in moist places along the creeks and at the farm pond. Mid Jun–Oct. [*C. floribundum* (Benth.) B.L.Rob.]

*Centaurium venustum* (A.Gray) B.L.Rob. – CANCHALAGUA. Uncommon in moist soil on the edge of Singer Creek just downstream from Dead-man's Hole (*Oswald* 3860). Mid Jul. [Includes ssp. *abramsii* Munz]

#### GERANIACEAE – GERANIUM FAMILY

*Erodium botrys* (Cav.) Bertol. – LONG-BEAKED STORK'S-BILL. Common annual on the banks of the creeks. Mid Mar.

*Erodium brachycarpum* (Godr.) Thell. – SHORT-FRUITED STORK'S-BILL. Common annual in grassy upland. Mid Feb. [*E. obtusiplicatum* (Maire, Weiller & Wilczek) J.T.Howell]

*Erodium cicutarium* (L.) L'Hér. – RED-STEMMED FILAREE. Common annual in fields and disturbed places. Mid Feb.

*Erodium moschatum* (L.) L'Hér. – WHITE-STEMMED FILAREE. Occasional annual along Pine Creek. Early Apr.

*Geranium molle* L. – DOVE'S-FOOT GERANIUM. Common annual in the wooded riparian area along Pine Creek. Late Mar.

#### HIPPOCASTANACEAE – BUCKEYE FAMILY

*Aesculus californica* (Spach) Nutt. – CALIFORNIA BUCKEYE. scattered to fairly common shrubby tree along the creeks and in the riparian woodland in the southwest corner of the preserve. Late Apr.

## HYDROPHYLLACEAE – WATERLEAF FAMILY

*Eriodictyon californicum* (Hook. & Arn.) Torr. – CALIFORNIA YERBA-SANTA A localized population of this woody shrub grows on a high bank of Pine Creek just downstream from the mouth of Singer Creek. Mid Apr.

*Nemophila heterophylla* Fisch. & C.A.Mey. – VARIABLE-LEAVED NEMOPHILA Listed by Broyles (1987b) but not relocated during this survey. It should be looked for on shaded banks and under brush in the southwest corner of the preserve.

*Nemophila pedunculata* Douglas ex Benth. – MEADOW NEMOPHILA A small population of this annual was found in open grassland just north of the woodland in the southwest corner of the preserve. Mid Feb.

*Phacelia egea* (Greene ex Brand) J.T.Howell – ROCK PHACELIA A tufted perennial represented by a single plant growing on eroded fanglomerate on the high northwest bank of Pine Creek downstream from the mouth of Singer Creek. This species is common on volcanic outcrops in the foothills east of the preserve. Late Mar–Apr.

## HYPERICACEAE – ST. JOHN'S-WORT FAMILY

*Hypericum perforatum* L. – KLAMATHWEED. Occasional herbaceous perennial along the creeks. Mid May.

## JUGLANDACEAE – WALNUT FAMILY

*Juglans californica* S.Watson var. *hindsii* Jeps. – NORTHERN CALIFORNIA BLACK WALNUT. Represented by a single depauperate tree on eroded fanglomerate on the north side of Pine Creek. [*Juglans hindsii* (Jeps.) R.E.Sm.]

## LAMIACEAE – MINT FAMILY

[Labiatae]

*Lamium amplexicaule* L. – GIRAFFEHEAD. Annual forb scattered along the creeks and in the riparian woodland in the southwest corner of the preserve. Mid Mar.

*Marrubium vulgare* L. – HOREHOUND. Locally common weedy perennial in the riparian woodland in the southwest corner of the preserve. Mid Apr.

*Monardella sheltonii* Torr. – SHELTON'S COYOTE-MINT. Perennial from a woody base that is scattered on eroded fanglomerate banks of Pine Creek downstream from the mouth of Singer Creek. Late May. [*M. villosa* Benth. var. *sheltonii* (Torr.) Jeps.]

*Pogogyne douglasii* Benth. – DOUGLAS' POGOGYNE. Locally abundant annual in clay soils of drainages and vernal wet depressions (Broyles 1101). Early Apr.

*Pogogyne zizyphoroides* Benth. – SACRAMENTO POGOGYNE. Common annual in and about wallows and vernal drainages. Mid Apr.

*Trichostema lanceolatum* Benth. – VINEGAR-WEED. Common annual of dry grassy upland. Mid Aug–Oct.

## LIMNANTHACEAE – MEADOWFOAM FAMILY

*Limnanthes douglasii* R.Br. ssp. *rosea* (Hartw. ex Benth.) C.T.Mason – ROSY MEADOWFOAM. Common annual along drainages, borders of vernal pools, and on wet flats. Early Mar.

## LINACEAE – FLAX FAMILY

*Hesperolinon californicum* (Benth.) Small – CALIFORNIA WESTERN-FLAX. Annual forb known from a single population located in upland grassland between the farm pond and the pump on Singer Creek. Late Apr.

## LOASACEAE – LOASA FAMILY

*Mentzelia laevicaulis* (Douglas ex Hook.) Torr. & A.Gray – GIANT BLAZING-STAR. Common biennial in gravelly soil on or along the dry beds of the creeks. Mid Jul–Nov.

## LYTHRACEAE – LOOSESTRIFE FAMILY

*Ammannia robusta* Heer & Regel – ROBUST REDSTEM Uncommon annual on the drying margin of the farm pond (Oswald 3976). Mid Jul–Oct.

*Lythrum hyssopifolia* L. – HYSSOP LOOSESTRIFE. Annual forb at the farm pond and along the creeks. Mid May.

## MALVACEAE – MALLOW FAMILY

*Sidalcea diploscypha* (Torr. & A.Gray) A.Gray ex Benth. – FRINGED CHECKERBLOOM. Scattered to locally common annual in grassy upland, often in clay soils or in areas worked by gophers. Late Apr–May.

*Sidalcea hartwegii* A.Gray ex Benth. – HARTWEG'S CHECKERBLOOM. Scattered annual in thin soils in grassy upland. Mid Apr.

*Sidalcea hirsuta* A.Gray – HAIRY CHECKERBLOOM. Known from a single colony growing on the margin of the vernal pond (wallow) just northwest of the farm pond. The plants grow in slightly wetter soil than an adjacent population of *S. diploscypha*. Early May.

## MARTYNIACEAE – UNICORN-PLANT FAMILY

*Proboscidea louisianica* (Mill.) Thell. ssp. *louisianica* – COMMON UNICORN-PLANT. Uncommon annual in disturbed gravel along the creeks. It is also a roadside weed on the north boundary of the preserve. Mid Jul–Aug.

## MOLLUGINACEAE – CARPET-WEED FAMILY

[Aizoaceae in part]

*Mollugo verticillata* L. – INDIAN-CHICKWEED. Abundant annual on gravel bars along the creeks: Early May–Oct.

## MORACEAE – MULBERRY FAMILY

*Ficus carica* L. – EDIBLE FIG. Represented by several small trees scattered along the creeks. Mid Apr.

*Morus alba* L. – WHITE MULBERRY. Represented by a single small, shrubby tree on the bed of Pine Creek at the mouth of Singer Creek.

## OLEACEAE – OLIVE FAMILY

*Fraxinus dipetala* Hook. & Arn. – CALIFORNIA ASH. A single small tree grows in the wooded area on the north side of Pine Creek near the bridge (*Oswald 3738*). This plant typically is found in brushy places in the foothills. Early Apr.

*Fraxinus latifolia* Benth. – OREGON ASH. Common tree along the creeks. It is often parasitized by mistletoe (*Phoradendron macrophyllum*). Mid Mar.

## ONAGRACEAE – EVENING-PRIMROSE FAMILY

*Clarkia purpurea* (Curtis) A. Nelson & J.F. Macbr. ssp. *quadrivulnera* (Douglas) F.H. Lewis & M.R. Lewis – PURPLE CLARKIA. Scattered annual in the grassy upland. Mid Apr.

*Epilobium brachycarpum* C. Presl – TALL ANNUAL WILLOWHERB. Common annual along the creeks. Mid Aug–Oct. [*E. paniculatum* Nutt. ex Torr. & A. Gray]

*Epilobium ciliatum* Raf. ssp. *ciliatum* – FRINGED WILLOWHERB. Herbaceous perennial recorded from a single plant on the bed of Singer Creek. Late Oct. [*E. adeno-caulon* Hausskn.]

*Epilobium cleistogamum* (Curran) P. Hoch & Raven – CLEISTOGAMOUS SPIKE-PRIMROSE. Common annual on clay soils on the bottoms of wallows and on the margin of the farm pond (*Broyles 1089*). Early May. [*Boisduvalia cleistogama* Curran]

*Epilobium densiflorum* (Lindl.) P. Hoch & Raven – DENSE-FLOWERED SPIKE-PRIMROSE. Common annual on moist gravel bars along the creeks. Late May to Jun. [*Boisduvalia densiflora* (Lindl.) S. Watson]

*Epilobium pygmaeum* (Speg.) P. Hoch & Raven – SMOOTH SPIKE-PRIMROSE. Annual on the margin of the farm pond and on the beds of vernal depressions and wallows (*Broyles 1090*). Mid May. [*Boisduvalia glabella* (Nutt.) Walp.]

*Epilobium torreyi* (S. Watson) P. Hoch & Raven – TORREY'S SPIKE-PRIMROSE. Fairly common annual in wet drainages and along the creeks. Mid Apr–Jun. [*Boisduvalia stricta* (A. Gray) Greene]

*Ludwigia palustris* (L.) Elliott – MARSH-PURSLANE. Occasional herbaceous perennial in wet soil on the margin of the farm pond and along Singer Creek. Mid Jun–Jul.

## PAPAVERACEAE – POPPY FAMILY

*Eschscholzia californica* Cham. – CALIFORNIA-POPPY. Scattered to locally common herbaceous annual or short-lived perennial along the creeks and in gravelly washes. Late Mar–Apr., sometimes blooming again in the fall.

*Eschscholzia lobbii* Greene – FRYINGPANS. Scattered to locally abundant annual near the creeks. Late Mar–Apr.

## PHILADELPHACEAE – MOCK ORANGE FAMILY

*Philadelphus lewisii* Pursh ssp. *californicus* (Benth.) Munz – MOCK ORANGE. Occasional shrubs are scattered in the riparian zone along the creeks. Early May.

## PLANTAGINACEAE – PLANTAIN FAMILY

*Plantago elongata* Pursh – ANNUAL PLANTAIN. Inconspicuous annual in vernal moist depressions in grassy upland. Late Mar. [*P. bigelovii* A.Gray ssp. *californica* (Greene) Bassett, *P. heterophylla* Nutt. misapplied]

*Plantago erecta* E.Morris – ERECT PLANTAIN. Locally abundant annual in grassy places along the creeks. Late Mar. [*P. hookeriana* Fisch. & C.A.Mey. var. *californica* (Greene) Poe]

*Plantago lanceolata* L. – ENGLISH PLANTAIN. Weedy perennial on the edge of Singer Creek. Mid Oct. (in fruit when seen).

*Plantago major* L. – COMMON PLANTAIN. Listed by Broyles (1987b) but not relocated during my visits to the preserve. It would be expected to grow in moist soils along the margins of the creeks.

## PLATANACEAE – SYCAMORE FAMILY

*Platanus x acerifolia* (Aiton) Willd. – LONDON PLANE-TREE. Several small trees, one bearing fruits, grow along Singer Creek. This escaped exotic is now found along most of the streams on the valley floor. [*P. hybrida* Brot.]

*Platanus racemosa* Nutt. – WESTERN SYCAMORE. Fairly common small to large tree along the creeks. None of these set fruit in 1989.

## POLEMONIACEAE – PHLOX FAMILY

*Gilia tricolor* Benth. ssp. *tricolor* – BIRD'S-EYE GILIA Occasional to locally abundant annual in gravelly washes and along the creeks. Late Mar.

*Linanthus bicolor* (Nutt.) Greene – BICOLORED LINANTHUS. Scattered to locally common annual in grassy upland. Late Mar.

*Navarretia heterandra* H.Mason – TEHAMA NAVARRETIA Abundant annual in upland where it prefers clay soils and gopher workings. Late Apr. CNPS List 4.

*Navarretia leucocephala* Benth. ssp. *leucocephala* – WHITE-HEADED NAVARRETIA. Locally abundant annual in vernal wet places. It is one of the plants typically associated with vernal pools. Mid Apr.

*Navarretia pubescens* (Benth.) Hook. & Arn. – DOWNY NAVARRETIA Common and locally abundant annual in well-drained upland. Early May.

*Navarretia tagetina* Greene – MARIGOLD NAVARRETIA Locally abundant annual in grassy upland. Mid Apr.

*Phlox gracilis* (Hook.) Greene – SLENDER PHLOX. Annual in sandy soil along Pine Creek. Late Mar. [*Microsteris gracilis* (Hook.) Greene]

## POLYGONACEAE – BUCKWHEAT FAMILY

*Chorizanthe polygonoides* Torr. & A.Gray var. *polygonoides* – KNOTWEED SPINEFLOWER. Uncommon annual in thin soils of exposed fanglomerate (*Oswald* 3734), where it grows with *Parvisedum pumilum*. Mid Apr–May.

*Eriogonum nudum* Douglas ex Benth. var. *pubiflorum* Benth. – HAIRY-FLOWERED BUCKWHEAT. Common perennial along the creeks. Early Sep–Dec.

*Polygonum arenastrum* Jord. ex Boreau – COMMON KNOTWEED. Fairly common annual weed along the margins of the farm pond. Mid Sep–Oct.



*Polygonum californicum* Meisn. – CALIFORNIA KNOTWEED. Scattered to locally abundant annual in thin soils of grassy upland. The plants show renewed growth and flowering in the fall of the year. Mid May–Jun, Sep–Oct.

*Polygonum hydropiper* L. – WATER-PEPPER. Uncommon annual in wet gravel on the bed of Singer Creek. Early Nov.

*Polygonum lapathifolium* L. – WILLOW-WEED. Common annual at the farm pond and occasional on the beds of the creeks. Mid Oct–Nov.

*Polygonum persicaria* L. – LADY'S-THUMB. Common annual at the farm pond (Broyles 1092) and occasional along Singer Creek. Early May–Nov.

*Rumex conglomeratus* Murray – GREEN DOCK. Occasional herbaceous perennial along the creeks. Mid Apr.

*Rumex crispus* L. – CURLY DOCK. Scattered to common herbaceous perennial at the farm pond, along the creeks, and in the wooded southwest corner of the preserve. Mid Apr.

*Rumex pulcher* L. – FIDDLE DOCK. Herbaceous perennial on the alluvial flat between Singer and Pine creeks. Early May.

*Rumex salicifolius* Weinm. var. *triangulivalvis* (Danser) C.L.Hitchc. – CALLOSE-VALVED WILLOW DOCK. A few plants of this herbaceous perennial were found in moist gravel at the mouth of Singer Creek. Early May. [*R. triangulivalvis* (Danser) Rech.f. var. *oreolapathum* Rech.f.]

#### PORTULACACEAE – PURSLANE FAMILY

*Calandrinia ciliate* (Ruiz & Pav.) DC. – REDMAIDS. Occasional annual along the creeks. Late Mar. [Includes var. *menziesii* (Hook.) J.F.Macbr.]

*Claytonia parviflora* Douglas ex Hook. – SMALL-FLOWERED MINER'S-LETTUCE. Uncommon annual from a shaded bank along Pine Creek. Early Apr. [*Montia perfoliata* (Donn ex Willd.) Howell in part, *M. perfoliata* forma *parviflora* (Douglas ex Hook.) J.T.Howell]

*Claytonia perfoliata* Donn ex Willd. ssp. *perfoliata* – COMMON MINERS-LETTUCE. Herbaceous annual in the riparian woodland in the southwest corner of the preserve. Mid Mar. [*Montia perfoliata* (Donn ex Willd.) Howell]

*Portulaca oleracea* L. – COMMON PURSLANE. Locally abundant succulent annual along the ditch leading into the farm pond. It was also found along Pine Creek. Mid Jun–Oct.

#### PRIMULACEAE – PRIMROSE FAMILY

*Anagallis arvensis* L. – SCARLET PIMPERNEL. Annual forb recorded from one of the stony waste areas at the farm pond, along a wash between Singer and Pine Creeks, and along both creeks. Early May–Jun.

*Dodecatheon clevelandii* Greene ssp. *patulum* (Greene) H.J.Thomps. – LOWLAND SHOOTINGSTAR. Common herbaceous perennial and one of the early wildflowers in the grassy upland. Mid Feb–Mar.

#### RANUNCULACEAE – BUTTERCUP FAMILY

*Clematis ligusticifolia* Nutt. – WESTERN VIRGIN'S-BOWER. Woody vine climbing on brush in the riparian woodland in the southwest corner of the preserve. Mid Jun.

*Delphinium variegatum* Torr. & A.Gray ssp. *variegatum* – ROYAL LARKSPUR. Common herbaceous perennial in grassy upland. Plants typically have sepals over 15 mm long and are referable to forma *superbum* Ewan. Mid Apr.

*Myosurus minimus* L. – COMMON MOUSETAIL. Annual forb in clay soil on the bottom of a dry vernal depression between Singer and Pine Creeks (Oswald 3741). A single plant of a much smaller and more delicate mousetail with the akenes bearing divergent beaks was collected in a vernal depression on the south side of Singer Creek (Oswald 3742). Mid Apr.

*Ranunculus aquatilis* L. var. *capillaceus* (Thuill.) DC. – WATER BUTTERCUP. Herbaceous perennial that is typically a submerged aquatic in the farm pond, but it can continue to grow and flower if stranded on mud at dry-down. Late Apr–May.

*Ranunculus canus* Benth. – SACRAMENTO VALLEY BUTTERCUP. Herbaceous perennial in grassy upland and along Singer Creek (Broyles 1095). Late Feb.

*Ranunculus muricatus* L. – PRICKLE-SEEDED BUTTERCUP. Annual forb in the ditch leading into the farm pond and in a drainage on the east side of Singer Creek. Early Apr–May.

#### RHAMNACEAE – BUCKTHORN FAMILY

*Ceanothus cuneatus* (Hook.) Nutt. var. *cuneatus* – BUCKBRUSH. Occasional shrubs are scattered along the creeks (Broyles 1097) and in the woodland in the southwest corner of the preserve. Late Mar.

*Rhamnus tomentella* Benth. ssp. *tomentella* – HOARY COFFEEBERRY. Woody shrub scattered on the banks of Singer Creek and in the wooded area in the southwest corner of the preserve. Mid Apr. [*R. californica* Eschsch. ssp. *tomentella* (Benth.) C.B.Wolf]

#### ROSACEAE – ROSE FAMILY

*Aphanes occidentalis* (Nutt.) Rydb. – WESTERN LADY'S-MANTLE. A small population of this inconspicuous annual was recorded from open grassland near Pine Creek just north of the wooded southwest corner of the preserve. Mid Feb. [*Alchemilla occidentalis* Nutt.]

*Cercocarpus betuloides* Nutt. ex Torr. & A.Gray var. *betuloides* – CALIFORNIA MOUNTAIN-MAHOGANY. Uncommon shrubby tree in the wooded southwest corner of the preserve. A single shrub was also recorded on the bank of Singer Creek. Late Mar.

*Potentilla glandulosa* Lindl. ssp. *glandulosa* – STICKY CINQUEFOIL. Locally common perennial on the banks of Pine Creek at the bridge. Mid Apr.

*Prunus dulcis* (Mill.) D.A.Webb – ALMOND. Occasional seedlings are scattered along the creeks and in the wooded southwest corner of the preserve. [*P. amygdalus* Batsch]

*Rubus discolor* Weihe & Nees – HIMALAYAN BLACKBERRY. Perennial with woody canes scattered along the creeks. Early May. [*R. procerus* P.J.Müll.]

#### RUBIACEAE – MADDER FAMILY

*Cephalanthus occidentalis* L. var. *californicus* Benth. – CALIFORNIA BUTTON-WILLOW. Common shrub along the creeks. Mid Jun.

*Galium aparine* L. – CLEAVERS. Uncommon weedy annual under oaks near Singer Creek. Mid May (in fruit).

*Galium parisiense* L. – WALL BEDSTRAW. Common annual along the creeks. Early May.

#### SALICACEAE – WILLOW FAMILY

*Populus fremontii* S.Watson ssp. *fremontii* – FREMONT'S COTTONWOOD. Common tree along the creeks. A single seedling, which was damaged by grazing, was also recorded at the farm pond. Late Mar.

*Salix exigua* Nutt. – SANDBAR WILLOW. Common small tree forming small thickets along the creeks. [*Salix hindsiana* Benth.]

*Salix gooddingii* C.R.Ball – BLACK WILLOW. Common small to medium-sized tree along the creeks. Mid Apr.

*Salix laevigata* Bebb – RED WILLOW. This willow, which can become a large tree, is recorded from two small individuals along the edges of the creeks.

*Salix lasiolepis* Benth. – ARROYO WILLOW. Occasional shrubby willow forming thickets along the creeks.

*Salix melanopsis* Nutt. – DUSKY WILLOW. Occasional small, shrubby willow on gravel bars along the creeks. Early May.

#### SAXIFRAGACEAE – SAXIFRAGE FAMILY

*Lithophragma bolanderi* A.Gray – BOLANDER'S WOODLANDSTAR. Herbaceous perennial in a small, localized population on the brushy south bank of Pine Creek near the bridge. Mid Apr.

*Saxifraga integrifolia* Hook. – HOOKER'S SAXIFRAGE. Herbaceous perennial in a small localized population in grassland along Pine Creek just downstream from the mouth of Singer Creek. Late Mar.

#### SCROPHULARIACEAE – FIGWORT FAMILY

*Bacopa rotundifolia* (Michx.) Wettst. – ROUND-LEAVED WATER-HYSSOP. Uncommon submerged aquatic in the farm pond. Late Oct. [*B. nobisiana* H.Mason]

*Castilleja attenuata* (A.Gray) T.I.Chuang & Heckard – VALLEY-TASSELS. Occasional annual in grassy fields and along the creeks. Mid Apr. [*Orthocarpus attenuatus* A.Gray]

*Collinsia heterophylla* Buist ex Graham – CHINESE-HOUSES. Annual forb found in a single location on the sloping south bank of Pine Creek near the bridge. Mid Apr.

*Cordylanthus pilosus* A.Gray ssp. *hansenii* (Ferris) T.I.Chuang & Heckard – HANSEN'S BIRD'S-BEAK. Common annual along the banks of the creeks, mostly south of the mouth of Singer Creek (*Oswald* 3933). Mid Jul–Aug.

*Lindernia dubia* (L.) Pennell var. *anagallidea* (Michx.) Coopert. – FALSE PIMPERNEL. Occasional annual in moist gravel on the edge of Pine Creek. Mid Jun.

*Mimulus bicolor* Hartw. ex Benth. – YELLOW AND WHITE MONKEY-FLOWER. Occasional annual in moist soil on the edge of Singer Creek. Mid May.

*Mimulus cardinalis* Douglas ex Benth. – SCARLET MONKEY-FLOWER. Uncommon herbaceous perennial along the creeks. Mid Jul.



*Mimulus floribundus* Douglas ex Lindl. – FLORIFEROUS MONKEY-FLOWER. Occasional to locally abundant annual in shaded places along the lower banks of the creeks (Oswald 3793). Late May–Oct.

*Mimulus glaucescens* Greene – SHIELD-BRACTED MONKEY-FLOWER. Occasional annual in moist gravel and on cut banks of the creeks (Broyles 1117). Mid Apr–May. CNPS List 4.

*Mimulus guttatus* Fisch. ex DC. – SEEP MONKEY-FLOWER. Annual forb growing in wet soil and on cut banks along the creeks. Some plants have small flowers and correspond to the ssp. *micranthus* (A.Heller) Munz. Mid Apr–Jun.

*Mimulus nasutus* Greene – SNOUTED MONKEY-FLOWER. Locally abundant annual on cut banks through stony fanglomerate along a drainage flowing into Singer Creek. Early Apr. [Included in *M. guttatus* Fisch. ex DC. in some floras.]

*Mimulus pilosus* (Benth.) S.Watson – DOWNY MIMETANTHE. Fairly common summer annual in moist gravel along the creeks. Mid Jun–Oct. [*Mimetanthe pilosa* (Benth.) Greene]

*Mimulus tricolor* Hartw. ex Lindl. – TRICOLORED MONKEY-FLOWER. Fairly common annual on the drying clay beds of vernal pools and drainages. Early Apr–May.

*Triphysaria eriantha* (Benth.) T.I.Chuang & Heckard – JOHNNYTUCK. Common and widespread annual in the grassy upland. Mid Feb. [*Orthocarpus erianthus* Benth.]

*Penstemon heterophyllus* Lindl. var. *purdyi* (D.D.Keck) McMinn – PURDY'S BEARDTONGUE. A perennial with the vegetative characteristics of this species grew on the stony bottom of a shallow draw on the north side of Pine Creek near the bridge in 1989. Although the identification is tentative, this is the common beardtongue in the foothills to the east. Howard Wurlitzer remembers a penstemon that bloomed for a number of years on the east bank of Singer Creek at Dead-man's Hole, which we could not relocate in 1989.

*Verbascum blattaria* L. – MOTH MULLEIN. Herbaceous biennial scattered along the creeks (Broyles 1118). Early May–Oct.

*Verbascum thapsus* L. – COMMON MULLEIN. Occasional herbaceous biennial along the creeks. Flowering interval not determined.

*Veronica peregrina* L. ssp. *xalapensis* (Humb., Bonpl. & Kunth) Pennell – PURSLANE SPEEDWELL. Common annual in drying vernal pools, puddles, and drainages. Early Apr.

*Veronica persica* Poir. – PERSIAN SPEEDWELL. Listed by Broyles (1987b) but not encountered during this study. It might be expected in the wooded southwest corner of the preserve.

#### SIMAROUBACEAE – QUASSIA FAMILY

*Ailanthus altissima* (Mill.) Swingle – TREE-OF-HEAVEN. Small weedy tree scattered in the riparian zone in the southwest corner of the preserve.

#### SOLANACEAE – NIGHTSHADE FAMILY

*Physalis acutifolia* (Miers) Sandwith – SHARP-LEAVED GROUND-CHERRY. Annual represented by a single plant on the bed of Singer Creek near its mouth. Mid Jun. [*P. wrightii* A.Gray]

*Physalis lanceifolia* Nees – LANCE-LEAVED GROUND-CHERRY. Smaller flowered but otherwise similar to the preceding species. Several plants were found along the ditch leading into the farm pond. Early Nov. [*P. angulata* L. var. *lanceifolia* (Nees) Waterf.]

#### VALERIANACEAE – VALERIAN FAMILY

*Plectritis* sp. – PLECTRITIS. Listed by Broyles (1987b) but not encountered during the 1989 survey. It might be expected in brushy places along the creeks.

#### VIOLACEAE – VIOLET FAMILY

*Viola douglasii* Steud. – DOUGLAS' VIOLET. Uncommon annual scattered among grasses and forbs between the north gate on Haille Rd and the farm pond. Late Mar–Apr.

#### VISCACEAE – MISTLETOE FAMILY [Loranthaceae]

*Phoradendron macrophyllum* (Engelm.) Cockerell – BIG-LEAVED MISTLETOE. Common parasite of cottonwood (*Populus fremontii*) and Oregon ash (*Fraxinus latifolia*) along the creeks (Broyles 1996). [*P. tomentosum* (DC.) Engelm. ex A.Gray ssp. *macrophyllum* (Engelm.) Wiens]

#### VITACEAE – GRAPE FAMILY

*Vitis californica* Benth. – CALIFORNIA WILD GRAPE. Woody vine along the creeks and in the wooded southwest corner of the preserve. Mid May.

#### ZYGOPHYLLACEAE – CALTROP FAMILY

*Tribulus terrestris* L. – PUNCTURE-VINE. Uncommon prostrate annual in gravel on the beds of the creeks. Early May.

### ANTHOPHYTA – FLOWERING PLANT DIVISION MONOCOTYLEDONES – MONOCOT CLASS

#### ALISMATACEAE – WATER-PLANTAIN FAMILY

*Alisma plantago-aquatica* L. – WATER-PLANTAIN. Several small plants were found along the drying edge of the farm pond in mid June 1989. They were in an area badly damaged by cattle and were not seen again, presumably having been grazed. [Includes var. *americana* Schult. & Schult.f., *A. triviale* Pursh]

*Echinodorus berteroi* (Spreng.) Fassett – BUR-HEAD. A single small plant was found on the muddy edge of the farm pond. Mid Aug. [*E. rostratus* (Nutt.) Engelm. ex A.Gray]

*Sagittaria montevidensis* Cham. & Schldl. ssp. *calycina* (Engelm.) Bogin – MONTEVIDEO ARROWHEAD. Uncommon annual in shallow water and on mud along the edge of the farm pond. Mid Jul.

*Sagittaria sanfordii* Greene – SANFORD'S ARROWHEAD. Abundant emergent perennial in the farm pond, later persisting on mud as the pond dries down (*Oswald*

3709 & 3716). The plant is also found in Vandergrift Lake just west of the Preserve. Mid May–Oct. CNPS List 1B.

#### CYPERACEAE – SEDGE FAMILY

*Cyperus bipartitus* Torr. – TWO-PARTED CYPERUS. Recorded from a single plant on the dry bed of Singer Creek. Mid Oct. [*C. rivularis* Kunth, *C. niger* Ruiz & Pav. var. *rivularis* (Kunth) V.E. Grant & var. *castaneus* (Pursh) Kük.]

*Cyperus difformis* L. – SMALL-FLOWERED CYPERUS. Uncommon annual in wet soil on the bed of Singer Creek just downstream from Dead-man's Hole. Mid Jul.

*Cyperus eragrostis* Lam. – TALL CYPERUS. Perennial sedge found in scattered locations along the creeks. Early May.

*Cyperus niger* Ruiz & Pav. – BLACK CYPERUS. Perennial sedge on the bed of Singer Creek just downstream from Dead-man's Hole. Mid Jul. [Includes var. *capitatus* (Britton) O'Neill]

*Cyperus squarrosus* L.. – AWNED CYPERUS. Fairly common annual in moist, sandy soil along the edges of the creeks. Mid May–Jun. [*Cyperus aristatus* Rottb.]

*Cyperus strigosus* L. – FALSE NUTSEGE. Occasional perennial in gravel on the drying beds of the creeks. Mid Jun.

*Eleocharis macrostachya* Britton ex Small – PALE SPIKE-RUSH. Common and locally abundant perennial in wet and marshy places. It grows in the farm pond, along the creeks, and in some of the deeper wallows. Mid Apr. [*E. palustris* (L.) Roem. & Schult.]

*Lipocarpa aristulata* (Coville) G.C. Tucker – AWNED LIPOCARPHA. Annual sedge represented by a single tuft in moist gravel along the edge of Pine Creek. Late May. [*Hemicarpha aristulata* (Coville) Smyth, *H. micrantha* (Vahl) Pax var. *aristulata* Coville, *H. drummondii* Nees]

*Scirpus acutus* Muhl. ex Bigelow var. *occidentalis* (S. Watson) Beetle – HARD-STEMMED TULE. Perennial forming extensive colonies on the margin of the farm pond. Mid Apr.

*Scirpus tuberosus* Desf. – TUBEROUS BULRUSH. Perennial sedge recorded from a single colony on the margin of the farm pond. Mid May. [*S. maritimus* L. var. *tuberosus* (Desf.) Roem. & Schult.]

#### HYDROCHARITACEAE – WATERWEED FAMILY

[Includes *Najadaceae*]

*Najas graminea* Delile – RICE-FIELD WATER-NYMPH. Submerged annual at the farm pond in late October (*Oswald 3714*).

*Najas guadalupensis* (Spreng.) Magnus – COMMON WATER-NYMPH. Similar to the preceding and found in the farm pond in late October (*Oswald 3715*).

#### JUNCACEAE – RUSH FAMILY

*Juncus bufonius* L. var. *bufonius* – COMMON TOAD RUSH. Fairly common annual in moist places along the creeks. Early May.

## LILIACEAE – LILY FAMILY

*Allium amplexans* Torr. – CLASPING ONION. Fairly common bulbous perennial in grassy upland. Mid Apr.

*Brodiaea californica* Lindl. var. *californica* – CALIFORNIA BRODIAEA. Common bulbous perennial in grassy upland. Late Apr.

*Brodiaea coronaria* (Salisb.) Engl. ssp. *coronaria* – HARVEST BRODIAEA. Locally abundant bulbous perennial in clay soils along wallows and drainages in grassy upland. Early May.

*Brodiaea elegans* Hoover – ELEGANT BRODIAEA. Common and abundant bulbous perennial in grassy upland. Early May.

*Brodiaea minor* (Benth.) S. Watson – BLUESTARS. Abundant bulbous perennial in grassy upland. Mid Apr. [Includes var. *nana* (Hoover) Hoover]

*Calochortus luteus* Douglas ex Lindl. – YELLOW MARIPOSA-LILY. Scattered bulbous perennial in the grassy upland. Occasional plants have pale cream flowers typical of *C. superbus* Purdy ex J.T. Howell, but all plants with this flower type had the “U”-shaped gland typical of *C. luteus*. Late Apr.

*Chlorogalum angustifolium* Kellogg – NARROW-LEAVED SOAP-PLANT. Abundant bulbous perennial in the grassy upland. Early May.

*Dichelostemma capitatum* A.W. Wood ssp. *capitatum* – BLUEDICKS. Locally abundant bulbous perennial in grassy upland. Late Mar. [*D. pulchellum* (Salisb.) A. Heller. *Brodiaea pulchella* (Salisb.) Greene]

*Dichelostemma congestum* (Sm.) Kunth – FORK-TOOTHED OOKOW. Uncommon brodiaea growing in loam soils on the sloping north bank of Pine Creek upstream from the mouth of Singer Creek. Late Apr. [*Brodiaea congesta* Sm.]

*Dichelostemma multiflorum* (Benth.) A. Heller – ROUND-TOOTHED OOKOW. Occasional bulbous perennial in grassy upland. Mid Apr. [*Brodiaea multiflora* Benth.]

*Dichelostemma volubile* (Kellogg) A. Heller – TWINING OOKOW. Occasional bulbous perennial climbing on brush and grasses along Pine and Singer creeks. Mid Apr. [*Brodiaea volubilis* (Kellogg) Baker]

*Fritillaria pluriflora* Torr. ex Benth. – ADOBE-LILY. Two localized populations of this bulbous perennial grow in gray clay soils. One group of plants is located on a wet flat between the farm pond and the pump on the edge of Singer Creek (NW¼ NE¼ Section 4). A second group of plants is located in the northwest corner of the preserve (NW¼ NW¼ Section 4). Mid Mar. CNPS List 1B.

*Odontostomum hartwegii* Torr. – HARTWEG’S ODONTOSTOMUM. Occasional bulbous perennial in loamy soil on the banks of the creeks. Mid Apr.

*Triteleia hyacinthina* (Lindl.) Greene – WILD HYACINTH. Two varieties are found on the Wurlitzer Unit of the Preserve. Typical *T. hyacinthina* has large flowers and broadly deltoid filaments with the filament bases essentially touching. These plants are locally common in wet swales and drainages, and they have also been found along the edge of Singer Creek. A different variety grows in thin, better drained soils of the grassy upland. These plants have smaller flowers and narrowly deltoid filaments with the filament bases separated by at least the width of the base. Munz (1973) mentions these two varieties but states that they “seem too indefinite to merit names. Early Apr. (upland form), late Apr. (wetland form). [*Brodiaea hyacinthina* (Lindl.) Baker]

*Triteleia laxa* Benth. – ITHURIEL'S-SPEAR. Locally common bulbous perennial in deeper soils. Early Apr. [*Brodiaea laxa* (Benth.) S. Watson]

*Zigadenus fremontii* (Torr.) Torr. ex S. Watson – FREMONT'S ZIGADENE. Locally abundant herbaceous perennial in thick clay soils of drainages and poorly drained flats in the grassy upland. Late Mar.

POACEAE – GRASS FAMILY  
[Gramineae]

*Aegilops triuncialis* L. – JOINTED GOATGRASS. Locally abundant annual on the banks of the creeks (*Broyles 1113*). Early May.

*Atopocurus saccatus* Vasey – VERNAL POOL FOXTAIL. Locally common annual in vernal pools and depressions. Mid Apr.

*Aristida oligantha* Michx. – OLDFIELD THREE-AWN. Scattered annual along summer-dry washes and along the creeks. Mid Jun.

*Avena barbata* Pott ex Link. – SLENDER WILD OAT. Common annual in grassy upland. Mid Apr.

*Avena fatua* L. – WILD OAT. Annual grass in areas of thicker alluvial soils along the creeks. Early Apr.

*Brachypodium distachyon* (L.) P. Beauv. – FALSE BROME. Scattered annual along the creeks (*Broyles 1119*). Late May.

*Briza minor* L. – SMALL QUAKING GRASS. Uncommon annual along the creeks. Mid Apr.

*Bromus diandrus* Roth – RIPGUT BROME. Coarse annual on thicker alluvial soils along the creeks. Early Mar. [*B. rigidus* Roth]

*Bromus hordeaceus* L. – SOFT CHESS. Common annual grass in grassy upland. Early Apr. [*B. mollis* L.]

*Bromus madritensis* L. ssp. *madritensis* – FOXTAIL CHESS. Occasional annual on gravel bars along Singer Creek. Mid Apr.

*Bromus madritensis* ssp. *rubens* (L.) Husn. – RED BROME. Locally common annual in grassy upland. Early Apr.

*Crypsis schoenoides* (L.) Lam. – SWAMP PRICKLEGRASS. Occasional annual on the beds of wallows, on the edge of the farm pond, and along the creeks. Mid Jul. [*Heleochoa schoenoides* (L.) Host]

*Cynodon dactylon* (L.) Pers. – BERMUDA-GRASS. Perennial forming localized colonies on the beds of the creeks. Early May.

*Cynosurus echinatus* L. – HEDGEHOG DOGTAIL. Common annual on alluvial soils along the creeks (*Broyles 1111*). Mid Apr.

*Deschampsia danthonioides* (Trin.) Munro – ANNUAL HAIRGRASS. Locally abundant annual in vernal wet drainages and pools. Late Mar.

*Digitaria sanguinalis* (L.) Scop. – HAIRY CRABGRASS. Annual along the creeks and bordering the ditch leading into the farm pond. Mid Jun.

*Echinochloa colona* (L.) Link – JUNGLE-RICE. Annual grass with distinctive purple-banded leaves recorded from the ditch leading into the farm pond. Mid Jul.



*Echinochloa crus-galli* (L.) P.Beauv. – BARNYARD GRASS. Annual in shallow water and on mud along the edge of the farm pond. Late May. [Includes var. var. *zelayensis* (Humb., Bonpl. & Kunth) Hitchc.]

*Eragrostis cilianensis* (All.) Vign. ex Janchen – STINKGRASS. Locally abundant along the ditch leading into the farm pond. Mid Jul.

*Eragrostis pectinacea* (Michx.) Nees var. *pectinacea* – PURPLE LOVEGRASS. Growing along the drier edges of the ditch leading into the farm pond. Mid Sept.

*Eragrostis pilosa* (L.) P.Beauv. var. *pilosa* – TUFTED LOVEGRASS. Similar to and growing with the previous species along the ditch leading into the farm pond where it forms shorter tufts and grows in wetter soils on the bed of the ditch. It is also found in moist places along the creeks. Mid Jun.

*Gastridium ventricosum* (Gouan) Schinz & Thell. – NITGRASS. Recorded by Broyles (1987b) but not relocated during my visits to the preserve.

*Hordeum marinum*. Huds. ssp. *gussoneanum* (Parl.) Thell. – MEDITERRANEAN BARLEY. Common annual in grassy upland. Mid Apr. [*H. geniculatum* All.]

*Hordeum murinum* L. ssp. *leporinum* (Link) Arcang. – HARE WALL BARLEY. Common coarse annual in deeper alluvial soils along the creeks. Mid Mar. [*H. leporinum* Link]

*Koeleria phleoides* (Vill.) Pers. – BRISTLY KOELER'S-GRASS. Occasional annual in the grassy upland. Mid Apr.

*Leptochloa fascicularis* (Lam.) A.Gray – BEARDED SPRANGLETOP. Common annual in shallow water and on mud at the farm pond. Mid Jul.

*Lolium multiflorum* Lam. – ANNUAL RYEGRASS. Common and widespread annual that is often the dominant grass in clay soils along drainages and ponds. Late Mar.

*Muhlenbergia rigens* (Benth.) Hitchc. – DEERGRASS. Common perennial forming large tufts on the banks of the creeks. Late Apr.

*Nassella pulchra* (Hitchc.) Barkworth – PURPLE NEEDLEGRASS. Locally abundant perennial bunch grass in the field between Singer and Pine creeks. A fair-sized population also grows on upland bordering the meandering drainage in the main part of the preserve northwest of the creeks. Mid Apr. [*Stipa pulchra* Hitchc.]

*Panicum acuminatum* Sw. var. *acuminatum* – WESTERN PANICGRASS. Perennial scattered on the beds of the creeks. Late May. [*P. occidentale* Scribn., *P. pacificum* Hitchc. & Chase]

*Panicum capillare* L. – WITCHGRASS. Locally common annual along creeks and washes. Late May.

*Paspalum dilatatum* Poir. – DALLISGRASS. Locally common perennial at the farm pond. Mid Jul.

*Paspalum distichum* L. – KNOTGRASS. Creeping perennial covering extensive areas at the farm pond where it first grows as an emergent, later becoming stranded as the water recedes. It also grows on the bed of Singer Creek. Mid Jul.

*Phalaris paradoxa* L. – PARADOX CANARY-GRASS. Occasional annual on clay soils along vernal drainages. Early May.

*Poa annua* L. – ANNUAL BLUEGRASS. Occasional annual recorded from along the ditch leading into the farm pond. Mid Feb.

*Poa bulbosa* L. – BULBOUS BLUEGRASS. Common introduced perennial on the banks of Singer Creek. Late Mar.

*Poa secunda* J.Presl ssp. *secunda* – ONE-SIDED BLUEGRASS. Tufted perennial scattered on thin soils in grassy upland. Mid Apr. [*P. scabrella* (Thurb.) Benth. ex Vasey]

*Poa tenerrima* Scribn. – DELICATE BLUEGRASS. Perennial forming small tufts on thin soils of vernal wet upland flats. Late Mar.

*Polypogon maritimus* Willd. – MEDITERRANEAN BEARDGRASS. Common annual along Singer Creek. Mid May.

*Polypogon monspeliensis* (L.) Desf. – ANNUAL BEARDGRASS. Locally abundant annual along the ditch leading into the farm pond. Mid May.

*Scribneria bolanderi* (Thurb.) Hack. – SCRIBNER'S-GRASS. Inconspicuous annual represented by a single sighting along the north fence line near Singer Creek. Late Mar.

*Setaria viridis* (L.) P.Beauv. – GREEN BRISTLEGRASS. Annual recorded from a localized population on the south side of Pine Creek near the east boundary of the preserve. Mid Jul.

*Taeniatherum caput-medusae* (L.) Nevski – MEDUSA-HEAD. Locally abundant weedy annual with a preference for wetter, deeper, clay soils along drainages and swales. Mid Apr. [*Elymus caput-medusae* L.]

*Triticum aestivum* L. – WHEAT. Represented by a single waif found in the field between Singer and Pine Creeks. Mid Apr.

*Tuctoria greenei* (Vasey) Reeder – GREENE'S TUCTORIA. A population of perhaps 50–100 individuals of this rare annual grows in an area of 10–15 square meters on the dry bed of the large wallow located northwest of the farm pond (Oswald 3775). Mid May. CNPS List 1B. [*Orcuttia greenei* Vasey]

*Vulpia microstachys* (Nutt.) Munro var. *ciliata* (Beal) Lonard & Gould – FRINGED FESCUE. Occasional spring annual in grassy upland. Late Mar. [*Festuca eastwoodiae* Piper, *F. grayi* (Abrams) Piper]

*Vulpia microstachys* var. *pauciflora* (Scribn. ex Beal) Lonard & Gould – FEW-FLOWERED FESCUE. Annual grass recorded from the upper bank of Pine Creek downstream from the mouth of Singer Creek. Mid Apr. [*Festuca pacifica* Piper, *F. reflexa* Buckley]

*Vulpia myuros* (L.) C.C.Gmel. var. *hirsuta* (Hack.) Asch. & Graebn. – FOXTAIL FESCUE. Locally abundant annual along the creeks. Late Mar. [*Festuca megalura* Nutt.]

#### POTAMOGETONACEAE – PONDWEED FAMILY

*Potamogeton foliosus* Raf. var. *foliosus* – LEAFY PONDWEED. Submerged herbaceous perennial in shallow water of the farm pond (Oswald 3978). Early Sep.

*Potamogeton pectinatus* L. – FENNEL-LEAVED PONDWEED. Submerged herbaceous perennial in shallow water of the farm pond (Oswald 3977). Early Sep.

**TYPHACEAE – CATTAIL FAMILY**

*Typha domingensis* Pers. – NARROW-LEAVED CATTAIL. Abundant perennial in shallow water and later on the dry margin of the farm pond. Cattails with interrupted spikes, the female portion light-brown, are referable to this species. Mid Jun.

*Typha latifolia* L. – BROAD-LEAVED CATTAIL. Some of the cattails at the farm pond have large, dark-brown, non-interrupted spikes characteristic of this species. Mid Jul.

**ZANNICHELLIACEAE – HORNED-PONDWEED FAMILY**

*Zannichellia palustris* L. – HORNED-PONDWEED. Submersed perennial in shallow water of the farm pond (*Oswald 3710*). Late Oct.



