
APPENDIX C

BOTANICAL SURVEYS

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Plant communities were mapped and quantified within each reservoir site for broad-scale resource inventory and assessment. Rare plant surveys were conducted in the project inundation areas according to established regulatory agency guidelines and protocols. Under these guidelines, focused habitat-specific surveys were conducted, using wandering transect methodology, between February and October in 1998 and 1999.

Sites

Acreage estimates of mapped dominant vegetation types are presented in Table C-1. California annual grassland was dominant at the Sites Reservoir. Less than 10% of the vegetation in this reservoir area is woodland (*Quercus* sp. or *Pinus sabiniana*), chaparral, or riparian or vegetated wetland (*Eleocharis* sp.). Only 6% (923 acres) of the total inundation area of the Sites Reservoir area supports oak woodland; this would be lost if the project were constructed.

Table C-1

Acreage Estimates of the Dominant Vegetation Communities Mapped Within the Four Offstream Storage Reservoir Alternatives

Vegetation	Acreage by Reservoir			
	Sites	Colusa Cell	Thomes-Newville	Red Bank
Grassland	12,602	13,540	14,492	565
Woodland (Oak)	923	20	1,839	899
Woodland (Foothill Pine)	0	0	0	2,826
Chaparral	5	0	363	98
Riparian	52	37	64	73
Vegetated Wetland	23	15	0	1
Cultivated Grain	277	0	0	0
Vegetation Subtotal	13,882	13,612	16,758	4,462
Other^a	280	51	315	142
Total Reservoir Acreage	14,162	13,663	17,073	4,604

^a "Other" refers to disturbed/developed acreage within the inundation elevations.

Colusa Cell

California annual grassland was dominant in the Colusa Cell (Table C-1). Twenty acres of oak woodland was mapped at the Colusa Cell; this would be lost if the project were constructed.

Thomes-Newville Reservoir

Acreage estimates of mapped dominant vegetation types are presented in Table C-1. California annual grassland was dominant at the proposed Thomes-Newville Reservoir site. The Thomes-Newville Reservoir site supports valley and blue oak woodland vegetation in more than 11% (1,839 acres) of the

inundation area. There are good quality vernal pools with representation of common vernal pool flora; however, all of the pools were grazed. No high priority species were found in any of the vernal pool habitat.

Thirty-one total occurrences of 4 low priority species and 23 occurrences of 5 priority species were identified in the Thomes-Newville Reservoir site (Table C-2).

Red Bank Reservoir

Foothill pine woodland is the dominant vegetation in the proposed Red Bank Reservoir area. Oak woodland represents approximately 20% (899 acres) of the project area. The total amount of woodland habitat, including foothill pine woodland and oak woodland, constitutes 83% of the vegetative cover. At this site, only 2% of the cover is chaparral scrub, and 12% (565 acres) is annual grassland. Potential habitat exists at this site for the chaparral, valley and foothill woodland, and valley and foothill grassland prioritized species. No vernal pool or alkaline wetland habitat was observed in the Red Bank Reservoir site. In this project area, 10 prioritized plant species were found; 73 populations were found, including 39 priority species populations and 34 populations of low priority species (Table C-2).

**Table C-2
Summary of Prioritized Plant Species Found in the Potential Offstream
Storage Reservoirs, 1998-1999**

Reservoir	Common Name (Scientific Name)^a	Number of Occurrences^b	Status^c USFWS/CNPS
Sites	Fairy candelabra (<i>Androsace elongata</i> ssp. <i>acuta</i>)	3	- / List 4
	Hogwallow evax (<i>Hesper-evax caulescens</i>)	3	-- / List 4
	Hoary navarretia (<i>Navarretia eriocephala</i>)	1	-- / List 4
	Tehama navarretia (<i>Navarretia heterandra</i>)	3	-- / List 4
Colusa Cell	Fairy candelabra (<i>Androsace elongata</i> ssp. <i>acuta</i>)	2	- / List 4
	Hogwallow evax (<i>Hesper-evax caulescens</i>)	2	-- / List 4
	Hoary navarretia (<i>Navarretia eriocephala</i>)	1	-- / List 4
	Tehama navarretia (<i>Navarretia heterandra</i>)	1	-- / List 4
Thomes-Newville	Fairy candelabra (<i>Androsace elongata</i> ssp. <i>acuta</i>)	13	- / List 4
	Dimorphic snapdragon (<i>Antirrhinum subcordatum</i>)	7	-- / 1B
	Jepson's milk-vetch (<i>Astragalus rattanii</i> var. <i>Jepsonianus</i>)	1	-- / 1B
	Stony Creek spurge (<i>Chamaesyce ocellata</i> ssp. <i>rattanii</i>)	7	- / List 4
	Adobe lily (<i>Fritillaria pluriflora</i>)	12	SC / 1B
	Hogwallow evax (<i>Hesper-evax caulescens</i>)	4	-- / List 4
	Tehama dwarf flax (<i>Hesperolinon tehamense</i>)	2	SC / 1B
	N. California black walnut (<i>Juglans californica</i> var. <i>hindsii</i>)	1	SC / 1B
Tehama navarretia (<i>Navarretia heterandra</i>)	7	-- / List 4	

**Table C-2
(CONTINUED)**

Reservoir	Common Name (Scientific Name) ¹	Number of Occurrences ²	Status ³ USFWS/CNPS
Red Bank	Fairy candelabra (<i>Androsace elongata</i> ssp. <i>acuta</i>)	1	- / List 4
	Dimorphic snapdragon (<i>Antirrhinum subcordatum</i>)	23	-- / 1B
	Jepson's milkvetch (<i>Astragalus rattanii</i> var. <i>jepsonianus</i>)	8	-- / 1B
	Stony Creek spurge (<i>Chamaesyce ocellata</i> ssp. <i>rattanii</i>)	9	- / List 4
	Brandegee's eriastrum (<i>Eriastrum brandegeae</i>)	3	SC / 1B
	Adobe lily (<i>Fritillaria pluriflora</i>)	5	SC / 1B
	Woolly meadowfoam (<i>Limnanthes floccosa</i> ssp. <i>floccosa</i>)	1	-- / List 4
	Jepson's navarretia (<i>Navarretia jepsonii</i>)	8	- / List 4
	Tehama navarretia (<i>Navarretia heterandra</i>)	11	- / List 4
	Sickle-fruit jewel-flower (<i>Streptanthus drepanoides</i>)	4	- / List 4

^a Nomenclature corresponds to Skinner and Pavlik, 1994.

^b Occurrences are defined per California Native Plant Society, 1999, as population findings separated by at least 0.25 mile.

^c USFWS 1998: SC (species of concern); Skinner and Pavlik, 1994; CNPS 1B; (Plants Rare, Threatened, or Endangered in California and Elsewhere); CNPS List 4 (Plants of Limited Distribution).

Wetlands Delineation

The following subsections summarize wetlands delineation at the four inundation areas.

Sites Reservoir

Only 1.4% of the inundation area was identified as jurisdictional wetlands. Of these jurisdictional wetlands identified within the Sites Reservoir footprint (Table C-3), more than 76% are seasonal wetlands. Most of the alkaline wetlands also are “seasonal,” but they differ vastly in plant species composition. The alkaline wetlands within the Sites Reservoir are located along a linear zone of deformation potentially associated with the Salt Lake Fault. A small quantity (2 acres) of emergent wetland was identified within the Sites Reservoir area.

**Table C-3
Jurisdictional Wetlands And Waters of the U.S. Delineation**

Wetlands Type	Acreage by Reservoir			
	Sites Reservoir	Colusa Cell Reservoir	Thomes-Newville Reservoir	Red Bank Reservoir
Alkaline	19	35	3	0
Emergent	2	0	6	included with seasonal
Riparian	22	11	77	76
Seasonal	153	263	304	7
Total Jurisdictional Wetlands	196	309	390	83
Streams	159	111	165	118
Ponds	16	24	66	34
Other Waters	175	135	231	152
Total Waters of U.S.	371	444	621	235
Reservoir Area	14,162	13,664	17,073	4,905

The riparian areas found in the Sites Reservoir area are rarely well developed or large. The largest concentration of riparian habitat is located within the southern portion of the Sites Reservoir.

Many of the vernal pools found within the Sites and Colusa Reservoir areas are manmade (e.g., drainages blocked by roads, stock ponds, or disturbed areas within heavy clay soils) and have very low plant species diversities. Pools occurring along the northeastern edge of the Sites Reservoir tend to be larger and higher in plant species diversity than elsewhere.

Colusa Cell Reservoir

Seasonal wetlands account for more than 84% of the Colusa Cell wetlands (Table C-3). Most of the alkaline wetlands also are “seasonal,” but they differ vastly in the plant species composition. The alkaline wetlands within the Colusa Cell are located along a linear zone of deformation potentially associated with the Salt Lake Fault. Emergent wetlands were present within the Colusa Cell in several small areas, but these were not measurable by interpreting aerial photographs.

The riparian areas found in the Colusa Cell were not well developed or large. One large pool with higher plant species diversity occurs within the Colusa Cell.

Thomes-Newville Reservoir

Seasonal wetlands dominate (74%) the wetlands of the Thomes-Newville Reservoir site (Table C-3). Some of the wetland areas are very large and may form complexes with other types of wetlands, including riparian areas. This site also has significant quantities of other wetland types.

Riparian areas account for more than 18% of the Thomes-Newville Reservoir wetlands. Well-developed riparian habitat occurs along several of the main tributaries, though patches of the invasive non-native *Ailanthus altissima* (tree of heaven) occur within some of these stands. Construction of the Thomes-Newville Reservoir would result in the loss of 77 acres of good quality riparian habitat.

One small area of alkaline wetland was identified within the Salt Creek drainage. Other areas adjacent to Salt Creek and some of its tributaries supported alkaline species but were too narrow to map.

Vernal pool complexes, which are areas of concentrated pools and connecting swales, were found in several locations within the reservoir site. These pools were of an overall higher quality when compared to the pools in the Sites and Colusa Reservoir areas.

Red Bank Reservoir

Seasonal and emergent wetlands make up less than 9% of the wetland total for the Red Bank Reservoir (Table C-3). Many of these wetlands are located within or adjacent to small stockponds or are associated with saturated spring-fed areas. Clay soils are relatively rare within the steep terrain that dominates both the Schoenfield and Dippingvat Reservoirs.

Riparian areas dominate (92%) the wetlands of this area. Riparian areas can be found throughout the two reservoirs but are best developed along South Fork Cottonwood Creek and South Fork Red Bank Creek.

No state or federally threatened or endangered plants were found in the four potential reservoir areas during the two-year study. Populations of federal Species of Concern were identified in the Thomes-Newville and Red Bank Reservoir areas. Several rare or limited distribution species also were found in all

of the alternative reservoir areas. The Thomes-Newville and Red Bank sites yielded the greatest number of populations of sensitive plant species.

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