Chapter 15

Recreation Resources

15.1 Introduction

This chapter describes recreational resources in the Study Area; and potential changes that could occur as a result of implementing the alternatives evaluated in this Environmental Impact Statement (EIS). Implementation of the alternatives could affect recreation resources through potential changes in operation of the Central Valley Project (CVP) and State Water Project (SWP) and ecosystem restoration.

15.2 Regulatory Environment and Compliance Requirements

Potential actions that could be implemented under the alternatives evaluated in this EIS could affect recreational resources at reservoirs and lands served by CVP and SWP water supplies. Actions located on public agency lands; or implemented, funded, or approved by Federal and state agencies would need to be compliant with appropriate Federal and state agency policies and regulations, as summarized in Chapter 4, Approach to Environmental Analyses.

15.3 Affected Environment

This section describes recreational resources that could be potentially affected by the implementation of the alternatives considered in this EIS. Changes in recreation opportunities due to changes in CVP and SWP operations may occur in the Trinity River, Central Valley, San Francisco Bay Area, Central Coast, and Southern California regions. Recreational fishing in San Francisco Bay and along the Pacific Coast also may be affected by changes in CVP and SWP operations.

There are extensive recreational opportunities within this study area. However, the recreational opportunities that could be directly or indirectly affected through implementation of the alternatives analyzed in this EIS are related to water-related recreation activities at CVP and SWP reservoirs and in the rivers downstream of those reservoir, fishing opportunities in the Delta and the Pacific Ocean that are affected by the water flows managed by CVP and SWP operations, and bird watching, wildlife viewing, and hunting activities at wildlife refuges that use CVP water supplies. Therefore, the following description of the affected environment is limited to these recreational aspects. The wildlife refuges identified to receive CVP water supplies are shown on Figure 15.1.

15.3.1 Trinity River Region

The Trinity River Region includes the area along the Trinity River from Trinity Lake to the confluence with the Klamath River; and along the lower Klamath River from the confluence with the Trinity River to the Pacific Ocean. Major recreational opportunities occur at Trinity Lake, Lewiston Reservoir, along the Trinity River between Lewiston Reservoir and the confluence with the Klamath River, and along the lower Klamath River.

15.3.1.1 Trinity Lake

Trinity Lake is a CVP facility on the Trinity River that is located approximately 50 miles northwest of Redding, as described in Chapter 5, Surface Water Resources and Water Supplies. Trinity Lake is part of the Whiskeytown-Shasta-Trinity National Recreation Area and part of the Shasta-Trinity National Forest. Recreational facilities and activities at Trinity Lake are administered by the U.S. Forest Service (USFS). When the water storage in the reservoir is at full capacity (water elevation at 2370 feet mean sea level (msl), Trinity Lake has a surface area of 17,222 acres and 147 miles of shoreline (USFS 2014).

Boating, windsurfing, and fishing primarily occur in the northern part of the lake near Trinity Center. Houseboats, motorboats, water skiing primarily occur in the southern part of the lake. There are six public boat ramps on Trinity Lake as summarized in Table 15.1.

Table 15.1 Trinity Lake Boat Ramps

Location	Boat Ramp	Comments	Useable Elevations (feet, msl)
Trinity Lake	Bowerman	–	2,370 to 2,323
Trinity Lake	Clark Spring	–	2,370 to 2,313
Trinity Lake	Fairview	–	2,370 to 2,313
Trinity Lake	Minersville	–	2,305 to 2,170
Trinity Lake	Stuart Fork	–	2,370 to 2,338
Trinity Lake	Trinity Center	–	2,370 to 2,300

Source: USFS 2014

Three major marinas are located at Trinity Lake, as summarized in Table 15.2. The USFS can permit up to 1,000 boat slips at the Trinity Lake marinas (USFS 2014). Many commercial houseboats are available for rent at the marinas. Trinity Lake shoreline includes approximately 32 miles of prime houseboating areas and 18.5 miles of secondary houseboating areas. The USFS issues permits for houseboats and privately-owned recreational occupancy vehicles that use the water overnight. At Trinity Lake, up to 99 permits for privately-owned vessels and 85 permits for commercially-owned vessels may be issued each year.

Table 15.2 Trinity Lake Marinas and Moorage Facilities

Location	Marina and Moorage Facility	Number
Trinity Lake	Cedar Stock Resort & Marina	31 Commercial and 220 Private Slips, including 10 Commercial Houseboats
Trinity Lake	KOA Campground	15 Commercial and 110 Private Slips
Trinity Lake	Pinewood Cove Docks	52 Private Slips
Trinity Lake	Trinity Alps Marina	31 Commercial and 63 Private Slips, including 25 Commercial Houseboats
Trinity Lake	Trinity Center Marina	80 Private Slips

Source: USFS 2014

The Trinity Unit of the Whiskeytown-Shasta-Trinity National Recreation Area includes many campground sites, including campgrounds for group camping opportunities (USFS 2014), as summarized in Table 15.3. There are other campgrounds within the upper elevations of the Trinity Lake watershed that are not directly or indirectly affected by changes in surface water elevations.

Table 15.3 Trinity Lake Major Campgrounds

Location	Campground	Comments	Number of Campsites
Trinity Lake	Alpine View	–	53
Trinity Lake	Bushytail	–	11
Trinity Lake	Captain's Point	Boat-In Campground	3
Trinity Lake	Clark Springs	–	21
Trinity Lake	Fawn	Group Campground	60
Trinity Lake	Hayward Flat	–	98
Trinity Lake	Jackass Springs	–	10
Trinity Lake	Mariner's Roost	Boat-In Campground	7
Trinity Lake	Minersville	–	14
Trinity Lake	Ridgeville	Boat-In Campground	10
Trinity Lake	Ridgeville Island	Boat-In Campground	3
Trinity Lake	Stoney Creek	Group Campground	10
Trinity Lake	Stoney Point	–	15
Trinity Lake	Tannery Gulch	–	82

Source: USFS 2014

Trinity Lake recreational areas also include day use areas for picnicking, swimming, and other recreational opportunities, as summarized in Table 15.4. The locations for shoreline day use areas are limited due to the steep and rocky elevations at the shorelines. To develop two swimming beaches at Trinity Lake, the rocky shorelines were covered with sand and/or decomposed granite at a specific elevation. Uses of these locations are less desirable when the water elevations decline.

Table 15.4 Trinity Lake Major Day Use Areas

Location	Day Use Area	Comments	Number
Trinity Lake	Clark Springs Day Use and Beach	Picnic and Swimming	34 picnic sites
Trinity Lake	North Shore Vista	Vistas and Interpretative Site	–
Trinity Lake	Osprey Info Site	Vistas and Interpretative Site	–
Trinity Lake	Stoney Creek	Picnic and Swimming	4 picnic sites
Trinity Lake	Tanbark Picnic	Picnic and Swimming	8 picnic sites
Trinity Lake	Trail of Trees	Interpretative Trail at Tannery Gulch Campground	0.5 miles
Trinity Lake	Trinity Lakeshore Trail	Trail	4 miles
Trinity Lake	Trinity Vista	Vistas and Interpretative Site	–

Source: USFS 2014

Trinity Lake fishing opportunities include Smallmouth Bass, Largemouth Bass, Rainbow Trout, Brown Trout, Chinook Salmon, and Kokanee Salmon (USFS 2014). White Catfish, Brown Bullhead, Green Sunfish, Bluegill, Klamath Smallscale Sucker, and Pacific Lamprey also are present but are not generally considered as part of the recreational fishing opportunities. Wildlife viewing opportunities extend throughout the Trinity Lake area, including viewing of Bald Eagles, Black-tailed Deer, Black Bear, Gray Squirrel, rabbit, turkey, and California Quail.

15.3.1.2 Lewiston Reservoir

Lewiston Reservoir is a CVP facility on the Trinity River that is located immediately downstream of the Trinity Dam, as described in Chapter 5, Surface Water Resources and Water Supplies. Lewiston Reservoir is part of the Whiskeytown-Shasta-Trinity National Recreation Area and part of the Shasta-Trinity National Forest. Recreational facilities and activities are administered by the USFS. When the water storage in the reservoir is at full capacity (water

elevation at 1,874 feet msl), the reservoir has a surface area of 759 acres and 15 miles of shoreline (USFS 2014).

The water elevation is generally stable in Lewiston Reservoir because it is used as regulating reservoir for releases to downstream uses. Water is diverted from the lower outlets in Trinity Lake to Lewiston Reservoir to provide cold water to Trinity River and Whiskeytown Lake. Therefore, recreational opportunities in Lewiston Reservoir include boating and fishing; however, there are fewer opportunities for swimming and water skiing. Lewiston Reservoir does not support houseboats. There is one primary boat ramp and two marinas in Lewiston Reservoir, as summarized in Tables 15.5 and 15.6.

Table 15.5 Lewiston Reservoir Boat Ramps

Location	Boat Ramp	Comments	Useable Elevations (feet, msl)
Lewiston Lake	Pine Cove	Open all year	Around 1870

Source: USFS 2014

Table 15.6 Lewiston Lake Marinas and Moorage Facilities

Location	Marina and Moorage Facility	Number
Lewiston Lake	Lakeview Terrace Docks	14 Commercial and 7 Private Slips
Lewiston Lake	Pine Cove Marina	20 Commercial and 34 Private Slips

Source: USFS 2014

The Whiskeytown-Shasta-Trinity National Recreation Area includes campground sites near the Lewiston Reservoir shoreline, including campgrounds for group camping opportunities (USFS 2014), as summarized in Table 15.7. Lewiston Reservoir recreational areas also include day use areas for picnicking, swimming, and other recreational opportunities, as summarized in Table 15.8. Because the water surface elevations are more stable in Lewiston Reservoir than Trinity Lake, the day use areas have more vegetation along the shoreline.

Table 15.7 Lewiston Lake Major Campgrounds

Location	Campground	Comments	Number of Campsites
Lewiston Lake	Ackerman	–	51
Lewiston Lake	Cooper Gulch	–	5
Lewiston Lake	Mary Smith	–	17
Lewiston Lake	Tunnel Rock	–	6

Source: USFS 2014

Table 15.8 Lewiston Major Lake Day Use Areas

Location	Day Use Area	Comments	Number
Lewiston Lake	Baker Gulch Trail	Trail	0,2 miles
Lewiston Lake	Lewiston Vista	Vistas and Interpretative Site	–
Lewiston Lake	North Lakeshore Trail	Trail	2 miles
Lewiston Lake	Pine Cove	Picnic	2 picnic sites
Lewiston Lake	South Lakeshore Trail	Trail	1 mile

Source: USFS 2014

Lewiston Reservoir fishing opportunities include Smallmouth Bass, Rainbow Trout, Brown Trout, Three-spine Stickleback, Golden Shiner, and Kokanee Salmon (USFS 2014). Klamath Smallscale Sucker, and Pacific Lamprey also are present but are not generally considered as part of the recreational fishing opportunities. Wildlife viewing opportunities extend throughout the Lewiston Reservoir area, including viewing of Bald Eagles, Black-tailed Deer, River Otter, ring-tailed cats, raccoon, and California Quail. Waterfowl use Lewiston Reservoir throughout the year with increased populations in the winter.

15.3.1.3 Trinity River from Lewiston Dam to the Klamath River

The Trinity River flows approximately 112 miles from Lewiston Dam to the Klamath River (NCRWQCB et al. 2009) through Trinity, Humboldt, and Del Norte counties.

The first mile of the river below the Lewiston Dam is located within the Whiskeytown-Shasta-Trinity National Recreation Area. Portions of the Trinity River downstream of Lewiston Dam and Junction City to the confluence with North Fork Trinity River are under the jurisdiction of the Department of the Interior, Bureau of Land Management (BLM) (USFWS et al. 1999). Between the confluence with the North Fork Trinity River and the confluence of New River, the area along the Trinity River is located within the USFS Shasta-Trinity National Forest. Between the confluence with the New River and the Hoopa Indian Reservation, most of the area along the Trinity River is located within the USFS Six Rivers National Forest. The remaining portions of the Trinity River to the confluence with the Klamath River are located within the Hoopa Indian Reservation.

On January 19, 1981, the Secretary of the Interior designated the Trinity River starting 100 yards downstream of the Lewiston Dam to the confluence with the Klamath River as part of the National Wild and Scenic Rivers System. The designation also included portions of the South Fork, North Fork, and New River (BLM et al 2012). However, because the flows in the South Fork, North Fork, and New River are not affected by the alternatives considered in this EIS, these rivers are not evaluated in this EIS.

There are approximately 35 developed recreation sites and more than 200 access points along the Trinity River corridor within a half mile of the river, and numerous river access sites between Lewiston Dam and Weitchpec (NCRWQCB et al. 2009; USFWS et al. 1999).

Recreation occurs year-round in the Trinity River area. Water-related activities include boating, kayaking, canoeing, whitewater rafting, inner tubing, fishing, swimming, wading, gold panning, camping, and picnicking (NCRWQCB et al. 2009). Fishing opportunities include steelhead, Rainbow Trout, Brown Trout, and Chinook Salmon.

15.3.1.4 Lower Klamath River from Trinity River Confluence to the Pacific Ocean

The Klamath River continues for 43.5 miles from the Trinity River confluence to the Pacific Ocean (NCRWQCB et al. 2009).

Downstream of the Trinity River, the Klamath River flows through the Hoopa Indian Reservation, Yurok Indian Reservation, and Resighini Indian Reservation as well as lands owned by local agencies and private entities (DOI and DFG 2012). Near the confluence with the Pacific Ocean, the Klamath River flows through the Redwood National Park. These reaches are primarily within Humboldt and Del Norte counties.

The portion of the Klamath River from the confluence with the Trinity River to the Pacific Ocean is part of the Klamath River designated by the Secretary of the Interior to be part of the National Wild and Scenic Rivers System on January 19, 1981. The State of California also designated this reach of Klamath River as wild and scenic under Public Resources Code sections 5093.54 and 5093.545.

Recreation along the Klamath River downstream of the Trinity River is limited (DOI and DFG 2012). Canoeing, kayaking, and whitewater boating occurs along this reach. Whitewater rafting generally requires a minimum flow of 1,800 cfs in this portion of the Klamath River. Four campgrounds, picnic areas, and water access at public lands are located along the Klamath River near the confluence with the Pacific Ocean. Fishing opportunities in the lower Klamath River are primarily related to Chinook Salmon. Del Norte County operates two public boat ramps along the Klamath River. The Redwood National and State Parks operate Lagoon Creek near the confluence of the Klamath River and the Pacific Ocean (RNSP 2013; Del Norte County 2003). There are other trails near the Pacific Ocean, including the California Coastal Trail which is generally located along the northern and eastern banks of the Klamath River at the Pacific Ocean (California Coastal Trail 2014).

15.3.2 Central Valley Region

The Central Valley Region extends from above Shasta Lake to the Tehachapi Mountains, and includes the Sacramento Valley, San Joaquin Valley, Delta, and Suisun Marsh.

15.3.2.1 Sacramento Valley

Recreational opportunities in the Sacramento Valley upstream of the Delta that are influenced by CVP and SWP operations occur at Shasta Lake, Keswick Reservoir, Whiskeytown Lake, Clear Creek, Sacramento River between Keswick Dam and the Delta, Lake Oroville and Thermalito Afterbay, Yuba River from between New Bullards Bar and Feather River, Bear River between Camp Far West Reservoir and Feather River, Feather River between Thermalito Dam and the Sacramento River, Folsom Lake and Lake Natoma, American River between Nimbus Dam and the Sacramento River, and refuges that use CVP water supplies.

15.3.2.1.1 Shasta Lake

Shasta Lake is a CVP facility on the Sacramento River that is located near Redding, as described in Chapter 5, Surface Water Resources and Water Supplies. Shasta Lake is part of the Whiskeytown-Shasta-Trinity National Recreation Area and part of the Shasta-Trinity National Forest. Recreational facilities and activities at Shasta Lake are administered by the USFS. When the water storage in the lake is at full capacity (water elevation at 1067 feet msl), Shasta Lake has a surface area of approximately 30,000 acres and 365 miles of shoreline (Reclamation 2013a; USFS 2014).

Boating, water skiing, other water sports, and fishing occur in many locations in the lake. Many types of boats are used, including fishing boats, deck boats, houseboats, cabin cruisers, pontoon boats, personal watercraft, runabouts, and ski boats (Reclamation 2013a; USFS 2014). There are seven public boat ramps on Shasta Lake, as summarized in Table 15.9.

Table 15.9 Shasta Lake Boat Ramps

Location	Boat Ramp	Comments	Useable Elevations (feet, msl)
Shasta Lake	Antlers	–	1,067 to 992
Shasta Lake	Bailey Cove	–	1,067 to 1,017
Shasta Lake	Centimudi	–	1,067 to 857
Shasta Lake	Hirz Bay	–	1,067 to 972
Shasta Lake	Jones Valley	–	1,067 to 857
Shasta Lake	Packers Bay	–	1,067 to 952
Shasta Lake	Sugar Loaf	–	992 to 907

Source: USFS 2014

A boating safety issue that arises with fluctuations in water level is the associated fluctuation of the pattern of submerged obstacles. When the water level decreases, many rocks, shoals, and islands are much closer to the water surface, and can be easily struck by boats. When the water level rises, debris and obstacles that were previously easily visible may be dangerously out of sight and struck by boats (Reclamation 2013a).

Nine major marinas are located at Shasta Lake, as summarized in Table 15.10. The USFS can permit up to 3,000 boat slips at the Shasta Lake marinas (USFS 2014). Many commercial houseboats are available for rent at the marinas. Shasta Lake shoreline includes approximately 109 miles of prime houseboating areas and 153 miles of secondary houseboating areas. The USFS issues permits for houseboats and privately-owned recreational occupancy vehicles that use the water overnight. At Shasta Lake, up to 613 permits for privately-owned vessels and 450 permits for commercially-owned vessels may be issued each year.

Table 15.10 Shasta Lake Marinas and Moorage Facilities

Location	Marina and Moorage Facility	Number
Shasta Lake	Antlers Resort and Marina	101 Commercial and 200 Private Slips, including 35 Commercial Houseboats
Shasta Lake	Bridge Bay Resort	140 Commercial and 7,773 Private Slips, including 92 Commercial Houseboats
Shasta Lake	Digger Bay Marina	75 Commercial and 145 Private Slips, including 50 Commercial Houseboats
Shasta Lake	Holiday Harbor	95 Commercial and 330 Private Slips, including 70 Commercial Houseboats
Shasta Lake	Jones Valley Marina	90 Commercial and 99 Private Slips, including 64 Commercial Houseboats
Shasta Lake	Packers Bay Marina	51 Commercial Slips, including 26 Commercial Houseboats
Shasta Lake	Shasta Lake RV Resort	22 Private Slips
Shasta Lake	Shasta Marina	54 Commercial and 139 Private Slips, including 24 Commercial Houseboats
Shasta Lake	Silverthorn Resort Marina	59 Commercial and 113 Private Slips, including 35 Commercial Houseboats
Shasta Lake	Sugarloaf Cottages	16 Private Slips
Shasta Lake	Sugarloaf Marina	41 Commercial and 40 Private Slips, including 21 Commercial Houseboats
Shasta Lake	Tsasdi Resort	30 Private Slips

Source: USFS 2014

The Shasta Unit of the Whiskeytown-Shasta-Trinity National Recreation Area includes many campground sites, including campgrounds for group camping opportunities (USFS 2014), as summarized in Table 15.11. There are other campgrounds within the upper elevations of the Shasta Lake watershed that are not directly or indirectly affected by changes in surface water elevations.

Campers are also affected by declining water elevations because this increases the distance from the campsites to the shoreline. Drawdown of the reservoir has an aesthetic effect on users because the land exposed during drawdown is generally composed of bare earth and rock.

Table 15.11 Shasta Lake Major Campgrounds

Location	Campground	Comments	Number of Campsites
Shasta Lake	Antlers	–	59
Shasta Lake	Arbuckle Flat	Boat-In Campground	11
Shasta Lake	Beehive	Shoreline Campground	No specified number
Shasta Lake	Bailey Cove	–	7
Shasta Lake	Dekkas Rock	Group Campground	60
Shasta Lake	Ellery Creek	–	19
Shasta Lake	Gooseneck Cove	Boat-In Campground	8
Shasta Lake	Green's Creek	Boat-In Campground	9
Shasta Lake	Gregory Creek	Shoreline Campground	18
Shasta Lake	Hirz Bay	Individual and Group Campground	48 Individual Sites and 200 Group Sites
Shasta Lake	Jones Valley (Upper & Lower)	Includes Shoreline Campground at Inlet	21
Shasta Lake	Lakeshore East	–	26
Shasta Lake	Lower Salt Creek	Shoreline Campground	No specified number
Shasta Lake	Mariners Point	Shoreline Campground	No specified number
Shasta Lake	McCloud Bridge	–	14
Shasta Lake	Moore Creek	Individual and Group Campground	12 Individual Sites and 90 Group Sites
Shasta Lake	Nelson Point	Individual and Group Campground	8 Individual Sites and 60 Group Sites
Shasta Lake	Oak Grove	–	45
Shasta Lake	Pine Point	Individual and Group Campground	14 Individual Sites and 100 Group Sites
Shasta Lake	Ski Island	Boat-In Campground	23

Source: USFS 2014

Shasta Lake recreational areas also include day use areas for picnicking, swimming, and other recreational opportunities, as summarized in Table 15.12. The locations for shoreline day use areas are limited due to the steep and rocky elevations at the shorelines. Uses of these locations are less desirable when the water elevations decline.

Table 15.12 Shasta Lake Day Use Areas

Location	Day Use Area	Comments	Number
Shasta Lake	Bailey Cove	Picnic and Trail	9 picnic sites 3.1 miles
Shasta Lake	Clikapudi	Trail	8 miles with 1 mile advanced trail
Shasta Lake	Dekkas Rock	Picnic	5 picnic sites
Shasta Lake	Dry Fork Creek	Trail	4.7 miles
Shasta Lake	Fisherman's Point	Picnic and Trail	7 picnic sites 0.5 miles
Shasta Lake	Hirz Bay	Trail	1.6 miles
Shasta Lake	McCloud Bridge	Picnic	5 picnic sites
Shasta Lake	Packers Bay	Trail	Four Trails: 0.4 to 2.8 miles
Shasta Lake	Potem Falls	Trail	0.3 miles
Shasta Lake	Samwel Cave Nature Trail	Interpretative Trail	1 mile
Shasta Lake	Sugarloaf	Trail	1 mile

Source: USFS 2014

Additional recreational opportunities are provided at the Shasta Dam Visitors Center.

Fishing is also popular at Shasta Lake, performed mostly by boat as opposed to from the shoreline. Anglers can catch warmwater and coldwater fish species year-round due to the summer stratification of the lake into a warm layer above a coldwater pool (Reclamation 2013a). Shasta Lake warm water fishing opportunities include Black Bass, Smallmouth Bass, Largemouth Bass, Spotted Bass, Black Crappie, Channel Catfish, and Bluegill (USFS 2014). There are many bass tournaments at Shasta Lake each summer. The cooler water strata supports fishing for Rainbow Trout and Chinook Salmon.

15.3.2.1.2 Keswick Reservoir

Keswick Reservoir is a CVP afterbay that extends 9 miles along the Sacramento River from Shasta Dam to Keswick Dam, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreational facilities and activities at Keswick Reservoir are administered by BLM, Shasta County, and U.S. Forest Service for the Department of the Interior, Bureau of Reclamation (Reclamation). The maximum water storage elevation at the top of the Keswick Dam spillway is

587 feet msl (Reclamation 2009). The water level fluctuates frequently in Keswick Reservoir, depending on the operations of Shasta Dam.

Water-related activities include boating, fishing, and water sports. The Keswick Boat Launch, operated by BLM, is located on the western shoreline at the south end of the reservoir (BLM 2005).

There are several trails along Keswick Reservoir and areas for off highway vehicles (OHVs) with camping allowed at one of the locations (BLM 2005; BLM 2011). The Sacramento Rail Trail extends from Moccasin Creek below Shasta Dam to Redding along the western shoreline of Keswick Reservoir and the Sacramento River downstream of Keswick Dam. The Fisherman Trail extends along the shoreline from the lower Sacramento Rail Trail to Keswick Dam. The F.B. Trail extends from the Ribbon Bridge downstream of the Keswick Dam to Walker Mine Road along the eastern side of the Keswick Reservoir. There are several other trails at higher elevations above Keswick Reservoir, including the Hornbeck Tail, Upper and Lower Sacramento Ditch Trails, Flanagan Trail, and Chamise Peak Trail.

The Chappie-Shasta OHV Area provides over 200 miles of roads in approximately 52,000 acres (Reclamation 2013a). The area is accessed at two staging areas. The Chappie-Shasta OHV Staging Area and Shasta Campground includes a staging area for day use activities, including picnics, and 22 campsites (BLM 2005). This site is located along the western shoreline of Keswick Reservoir at the trailhead of the Sacramento Rail Trail at Moccasin Creek. The Copley Mountain OHV Staging Area is located along the western shoreline of Keswick Reservoir about midway between Shasta and Keswick dams. This site also provides a staging area for day use activities, including picnics.

Fishing opportunities are primarily for German Brown Trout and Rainbow Trout.

15.3.2.1.3 Whiskeytown Lake

Whiskeytown Lake is a CVP facility on Clear Creek that is located approximately 8 miles west of Redding on the eastern slope of the Coast Range, as described in Chapter 5, Surface Water Resources and Water Supplies. Whiskeytown Lake is part of the Whiskeytown-Shasta-Trinity National Recreation Area. Recreational facilities and activities administered by the National Park Service (NPS). When the water storage in the reservoir is at full capacity (water elevation at 1210 feet msl), Whiskeytown Lake has a surface area of 3,250 acres and 36 miles of shoreline (Reclamation 1997).

Boating, water skiing, sailing, kayaking, and canoeing, swimming, and fishing occur in many locations in the lake. Boat launches are available at Oak Bottom, Brandy Creek, and Whiskey Creek and at marinas at Oak Bottom and Brandy Creek (NPS 2012), as summarized in Table 15.13.

Table 15.13 Whiskeytown Lake Boat Ramps

Location	Boat Ramp	Comments	Useable Elevations (feet, msl)
Whiskeytown Lake	Brandy Creek	–	1210 to 1190
Whiskeytown Lake	Oak Bottom	–	1210 to 1195
Whiskeytown Lake	Oak Bottom Marina	–	1210 to 1198
Whiskeytown Lake	Whiskey Creek	–	1210 to 1195

Sources: NPS 2012; Reclamation 1997

The lake level is relatively stable and do not reduce the ability for boat launching until late summer or early fall.

The Whiskeytown Unit of the Whiskeytown-Shasta-Trinity National Recreation Area includes many campground sites, including campgrounds for group camping opportunities (NPS 2012), as summarized in Table 15.14.

Table 15.14 Whiskeytown Lake Major Campgrounds

Location	Campground	Comments	Number of Campsites
Whiskeytown Lake	Brandy Creek RV	–	37 RV Sites
Whiskeytown Lake	Brandy Creek	Primitive Campground	2 Sites
Whiskeytown Lake	Coggins Park	Primitive Campground	1 Site
Whiskeytown Lake	Crystal Creek	Primitive Campground near Crystal Creek	2 Sites
Whiskeytown Lake	Dry Creek	Group Campground	100 people
Whiskeytown Lake	Horse Camp	Primitive Campground	2 Sites
Whiskeytown Lake	Oak Bottom Tent and Recreation Vehicle (RV)	–	98 Tent Sites and 22 RV Sites
Whiskeytown Lake	Peltier Bridge	Primitive Campground near Clear Creek	9 Sites
Whiskeytown Lake	Sheep Camp	Primitive Campground	4 Sites

Source: NPS 2012

Whiskeytown Lake recreational areas also include day use areas for picnicking, swimming, and other recreational opportunities, as summarized in Table 15.15. Shoreline day use areas are limited at some locations due to the steep and rocky elevations at the shorelines.

Table 15.15 Whiskeytown Lake Day Use Areas

Location	Day Use Area	Comments	Number
Whiskeytown Lake	Boulder Creek Falls	Trail	1 mile with 2.75-mile advanced trail
Whiskeytown Lake	Brandy Creek Beach and Falls	Picnic, Swimming, and Trails	1.6 and 1.5 miles
Whiskeytown Lake	Buck Hollow	Trail	1 mile
Whiskeytown Lake	Camden Water Ditch	Trail	1.1 miles
Whiskeytown Lake	Clear Creek Canal and Vista	Picnic and Trails	2.4 and 4.5 miles
Whiskeytown Lake	Crystal Creek Water Ditch and Falls	Picnic and Trails	0.75 and 0.3 miles
Whiskeytown Lake	Davis Gulch	Trail	3.3 miles
Whiskeytown Lake	East Beach	Swimming	–
Whiskeytown Lake	Guardian Rock	Trail	0.25 miles
Whiskeytown Lake	James K. Carr Trail	Trail	1.7 miles
Whiskeytown Lake	Judge Francis Carr Powerhouse	Picnic	–
Whiskeytown Lake	Kanaka Peak	Trail	3.6 miles
Whiskeytown Lake	Logging Camp	Trail	1 mile
Whiskeytown Lake	Mill Creek	Trail	6.1 miles
Whiskeytown Lake	Mt. Shasta Mine	Trail	3.5 miles
Whiskeytown Lake	Mule Mountain Pass	Trail	4.4 miles
Whiskeytown Lake	Oak Bottom Beach	Picnic and Swimming	–
Whiskeytown Lake	Oak Bottom Ditch	Trail	2.75 miles
Whiskeytown Lake	Papoose Pass	Trail	5.5 miles
Whiskeytown Lake	Peltier	Trail	1.75 miles
Whiskeytown Lake	Rich Gulch	Trail	1.8 miles
Whiskeytown Lake	Salt Creek	Trail	1.8 miles
Whiskeytown Lake	Salt Gulch	Trail	1.6 miles
Whiskeytown Lake	Shasta Divide Nature Trail	Trail	0.4 miles
Whiskeytown Lake	Whiskey Creek	Group Picnic Area and Swimming	–

Source: NPS 2012

Additional recreational opportunities are provided at the Whiskeytown Visitors Center.

Fishing opportunities at Whiskeytown Lake include Brown Trout and Rainbow Trout; Kokanee Salmon; Smallmouth Bass, Largemouth Bass, and Spotted Bass; Bluegill; crappie; and Sacramento Pikeminnow (NPS No Date).

15.3.2.1.4 Clear Creek from Whiskeytown Dam to the Sacramento River

Whiskeytown Lake is operated to release most of the water through the Spring Creek Power Conduit into Keswick Reservoir, as described in Chapter 5, Surface Water Resources and Water Supplies. Flows are also released from Whiskeytown Lake to Clear Creek to be consistent with federal and state requirements. During high flow events, additional flows may be released into Clear Creek.

The initial reaches of Clear Creek downstream of the Whiskeytown Dam are located within the Whiskeytown-Shasta-Trinity National Recreation Area. The remaining portions of Clear Creek flow to the Sacramento River through lands owned by BLM and private owners. All of these reaches are located within Shasta County and the most eastern reaches are within the City of Redding.

BLM has established the Clear Creek Greenway along a large portion of the lower Clear Creek from within the Whiskeytown-Shasta-Trinity National Recreation Area to the Sacramento River (BLM n.d.). The area also includes the Horsetown-Clear Creek Preserve which is a private-public partnership recreation area.

Hiking, picnicking, kayaking, swimming, fishing, and gold panning occur along the lower Clear Creek (SRWP 2010). The Clear Creek Greenway includes ten trails and eight picnic areas (BLM n.d.). Hunting is allowed in the Swasey and Muletown Road areas of the Clear Creek Greenway. Fishing opportunities include steelhead, Chinook Salmon, carp, suckers, Bluegill, bass, and Sacramento Pikeminnow (SRWP 2010).

15.3.2.1.5 Sacramento River from Keswick Dam to the Delta

The Sacramento River from Keswick Dam to the Sacramento-San Joaquin Delta (Delta) is divided into three reaches for discussion in this section: Keswick Reservoir to Red Bluff, Red Bluff to the Feather River, and Feather River confluence to the Delta (near the City of West Sacramento).

Sacramento River from Keswick Dam to Red Bluff

The upper reach of the Sacramento River flows for approximately 60 miles from Keswick Dam to Red Bluff (Reclamation 1997). Water-related recreational activities include boating, picnicking, camping, and wildlife viewing. Boating opportunities include motor-boating, jet-skiing, kayaking, canoeing, and whitewater rafting in some locations (Reclamation 2013a, Reclamation et al. 2002). River flows can increase for short-term periods when water is being released from the CVP facilities and during and following storm events in the upper Sacramento River watershed. Flows in the late fall months may decrease to levels that are not favorable for boating. Water temperatures in this reach are generally cold throughout the year.

Much of the land along the Sacramento River between Balls Ferry and Red Bluff is owned and managed by BLM (Reclamation 2013a). Public access points are provided by the cities of Redding and Anderson and the BLM. Lake Redding Park, Turtle Bay, and the Anderson River Park are some of the prominent access areas. Boat launching can occur at eight public boat ramps and two smaller launch facilities, including at Turtle Bay, Caldwell Park, and South Bonneyview in the City of Redding; Ball Ferry; Battle Creek confluence with the Sacramento River; Bend Bridge; and Red Bluff River Park in the City of Red Bluff.

There are two whitewater river reaches, including between Keswick Dam and the Anderson-Cottonwood Irrigation District Diversion Dam and between Anderson River Park and William B. Ide Adobe State Historic Park.

Camping facilities include public campgrounds along the Sacramento River at Lake Red Bluff Recreation Area (Reclamation 2013a).

There are trails or trail access and picnicking facilities with access to the river in this reach of the Sacramento River (Reclamation 2013a). The trails include the 13-mile Sacramento River Trail between Keswick Dam to Turtle Bay Park in the City of Redding. Many of the picnicking locations are managed by local municipalities, including the cities of Redding, Anderson, and Red Bluff. Coleman National Fish Hatchery, located along Battle Creek near the Sacramento River, provides recreational and educational opportunities.

Fishing opportunities along the upper Sacramento River include Chinook Salmon, steelhead, Rainbow Trout, sunfish, and bass (Reclamation 2013a). Fishing can occur from boats along the Sacramento River and at four public fishing access points, including Turtle Bay East, Kapusta Property, Deschutes Road, Reading Island, Diestlehorst Pasture River Access, Jellys Ferry, and Sacramento River Island.

The Mouth of Cottonwood Creek Wildlife Area is operated by California Department of Fish and Wildlife (DFW). This area provides viewing opportunities for Swainson's Hawk, Bald Eagle, ringtail cat, River Otter, and other birds and wildlife (Reclamation 2013a). Hunting opportunities on BLM land occur at Inks Creek, Massacre Flat, Perry Rifle, Paynes Creek, Bald Hill and Iron Canyon. Commonly hunted game includes quail, dove, waterfowl, deer, pig, turkey, and bear (Reclamation 2013a).

Sacramento River from Red Bluff to Feather River

The middle reach of the Sacramento River flows approximately 160 miles from Red Bluff to the confluence with the Feather River (Reclamation 1997).

Water-dependent activities along the middle reach include boating, swimming, and fishing (Reclamation 2005a). Water-contact activities are popular in this section of the river due to relatively warm water. Public access points are provided along this reach by California Department of Parks and Recreations (State Parks); and Tehama, Glenn, Colusa, and Sutter counties (Reclamation 2005a; Reclamation 1997). River access in this reach is primarily provided at private fishing access points, marinas, and resorts.

The three major State Parks properties along the middle reach include the Woodson Bridge State Recreation Area, the Bidwell-Sacramento River State Park, and the Colusa-Sacramento River State Recreation area (DFG 2004; Reclamation 2013a). Public access for fishing, hunting, and wildlife viewing also is provided at the DFW Fremont Weir Wildlife Area (DFW 2014a).

Fishing opportunities include Chinook Salmon, steelhead, trout, American Shad, sturgeon, catfish, and Striped Bass (Reclamation 2005a).

Seasonal game includes Ring-necked Pheasants, California Quail, various species of ducks and geese, Mourning Doves, and Mule Deer (Reclamation 2013a).

Sacramento River from Feather River to the Northern Delta Boundary

The lower reach of the Sacramento River flows for approximately 20 river miles between the confluence with Feather River and immediately downstream of the confluence with the American River (USACE 1991). The major portion of this reach of the Sacramento River flows along private property.

Water-related activities in this reach include boating, swimming and beach use, picnicking, biking, sightseeing, and fishing. Public access is provided by Yolo County at Elkhorn Regional Park (Yolo County); Sacramento County and the City of Sacramento at Discovery Park and Miller Park, respectively (Sacramento County 2012; Reclamation 2005a); and by the City of West Sacramento at Broderick Boat Ramp (West Sacramento 2000).

Fishing opportunities in this area include Chinook Salmon, steelhead, American Shad, sturgeon, catfish, and Striped Bass (Reclamation 1997, 2005a).

15.3.2.1.6 Sacramento Valley Wildlife Refuges

Wildlife refuges in the Sacramento Valley that rely upon CVP water supplies include the Sacramento National Wildlife Refuge (NWR) Complex include Sacramento, Delevan, Colusa, and Sutter NWRs and Gray Lodge Wildlife Area, as described in Chapter 5, Surface Water Resources and Water Supplies, and Chapter 10, Terrestrial Biological Resources (Reclamation 2012). Water-related activities include wildlife viewing, hiking along the refuge wetlands, and waterfowl hunting. Shoreline fishing opportunities at Gray Lodge Wildlife Area include bass, sunfish, perch, catfish, and carp (DFW 2014b)

15.3.2.1.7 Feather River Watershed

Antelope Lake, Lake Davis, and Frenchman Lake located in the Upper Feather River; Lake Oroville and Thermalito Forebay and Afterbay; and the lower Feather River are located within areas in the Feather River watershed that could be affected by changes in CVP and/or SWP operations.

Upper Feather River Lakes

The Upper Feather River Lakes, including Antelope Lake, Lake Davis, and Frenchman Lake, are SWP facilities on the upper Feather River upstream of Lake Oroville. These lakes are part of the Plumas National Forest (DWR 2013a).

Recreational facilities and activities at all three lakes are managed by private concessionaires under contract with the Plumas National Forest.

For Antelope Lake, when the water storage in the lake is at full capacity (water elevation at 5,002 feet), the lake has a surface area of 930 acres and 15 miles of shoreline (DWR 2013a; USFS 2011). Water related activities include boating, water skiing, swimming, fishing, camping, and picnicking. There is a boat launching ramp, three fishing access sites, and a picnic area. There are three campgrounds at Antelope Lake, including Boulder Creek, Lone Rock, and Long Point. There are approximately 194 campsites and 4 group campsites at the three campgrounds for use between May through October. Fishing opportunities in Antelope Lake include Rainbow Trout, Brook Trout, crappie, Channel Catfish, and Smallmouth Bass, Largemouth Bass. Hunting opportunities around Antelope Lake include Mule Deer and Black-tailed Deer.

For Lake Davis, when the water storage in the lake is at full capacity (water elevation at 5,785 feet), the lake has a surface area of 4,030 acres and 32 miles of shoreline (DWR 2013a; USFS 2006a). Water related activities include boating, fishing, camping, and picnicking. There are boat launching ramps at Lightning and Honker Cove, car-top boat ramp at Mallard Cove, a fishing access site, and a picnic area. There are three campgrounds at Lake Davis, including Grizzly, Grasshopper, and Lightning Tree. There are approximately 180 campsites at the three campgrounds for use between May through October. Fishing opportunities in Lake Davis include Rainbow Trout, German Brown Trout, Eagle Lake trout, Brown Bullhead, and Largemouth Bass. Hunting opportunities around Lake Davis include Mule Deer and Black-tailed Deer.

For Frenchman Lake, when the water storage in the lake is at full capacity (water elevation at 5,588 feet), the lake has a surface area of 1,580 acres and 21 miles of shoreline (DWR 2013a; USFS 2006b). Water related activities include boating, water skiing, swimming, fishing, camping, picnicking, and ice fishing. There are two boat launching ramps (Frenchman and Lunker Point), six fishing access sites, and a picnic area. There are five campgrounds at Frenchman Lake, including Chilcoot, Cottonwood Springs, Frenchman, Spring Creek, and Big Cove. There are approximately 209 campsites and 2 group campsites at the five campgrounds for use between May through October. Fishing opportunities in Frenchman Lake include Rainbow Trout, Brown Trout, Eagle Lake trout, and Smallmouth Bass. Hunting opportunities around Frenchman Lake include deer and waterfowl.

Lake Oroville and Thermalito Forebay and Afterbay

Lake Oroville and Thermalito Forebay and Afterbay are SWP facilities on the Feather River, as described in Chapter 5, Surface Water Resources and Water Supplies. The upper North Fork arm of Lake Oroville is part of the Lassen National Forest; and the upper Middle Fork and South Fork arms of Lake Oroville are part of Plumas National Forest. The Middle Fork Feather River (from Beckwourth downstream of Lake Davis to Lake Oroville) was designated as part of Public Law 90-542 (Wild and Scenic Rivers Act) to be part of the National Wild and Scenic Rivers System on October 2, 1968. Recreational facilities and activities at the Lake Oroville Complex (including Lake Oroville and Thermalito

Forebay and Afterbay) are managed by State Parks as part of the Lake Oroville State Recreation Area. When the water storage in the lake is at full capacity (water elevation at 900 feet msl), Lake Oroville has a surface area of 15,810 acres and 167 miles of shoreline. Thermalito Forebay has a surface area of 630 acres. Thermalito Afterbay has a surface area of 4,300 acres and 26 miles of shoreline when the water elevation is at 136.5 feet msl (DWR 2007a, 2007c, 2013b).

Water-related activities include boating, whitewater boating, camping, picnicking, and fishing (DWR 2007a). Boating includes kayaking, canoeing, and fishing boats. Whitewater boating occurs on the Big Bend area of the North Fork Feather River when Lake Oroville elevations are sufficiently low to expose several miles of river. This portion of the North Fork Feather River forms the Upper North Fork arm of Lake Oroville. Generally, this area is exposed in the late fall months. Another whitewater area is located in the Bald Rock Canyon on the Middle Fork Feather River. This whitewater area is located upstream of the Middle Fork arm of Lake Oroville.

There are 11 boat ramps on Lake Oroville, as summarized in Table 15.16. Two of the boat ramps are located at marinas (DWR 2007a).

Table 15.16 Lake Oroville, Thermalito Forebay, and Thermalito Afterbay Boat Ramps

Location	Boat Ramp	Comments	Useable Elevations (feet, msl)
Lake Oroville	Bidwell Canyon	Day Use Area Marina with 280 berths and 400 mooring anchors	900 to 700
Lake Oroville	Dark Canyon	Car-Top Launching	900 to 765
Lake Oroville	Enterprise		900 to 835
Lake Oroville	Foreman Creek	Car-Top Launching	900 to approximately 800
Lake Oroville	Lime Saddle	Day Use Area Marina, including houseboat rentals	900 to 702
Lake Oroville	Loafer Creek	Boat-In Campground	900 to 775
Lake Oroville	Monument Hill	Day Use Area	900 to approximately 700
Lake Oroville	Nelson Bar	Car-Top Launching	900 to 825
Lake Oroville	Spillway	Day Use Area	900 to 695
Lake Oroville	Stringtown Creek	Car-Top Launching	900 to 866
Lake Oroville	Vinton Gulch	Car-Top Launching	900 to 825
Thermalito Forebay	North Thermalito Forebay	Day Use Area Also used by California State University, Chico	Water elevation does not vary substantially
Thermalito Forebay	South Thermalito Forebay	Day Use Area	Water elevation does not vary substantially
Thermalito Afterbay	Larkin Road	Car-Top Launching	Water elevation does not vary substantially
Thermalito Afterbay	Oroville Wildlife Area		Water elevation does not vary substantially
Thermalito Afterbay	Thermalito Afterbay Outlet		Water elevation does not vary substantially
Thermalito Afterbay	Wilbur Road		Water elevation does not vary substantially

Sources: DWR 2006, 2007a

There are 16 campgrounds at Oroville Lake and Thermalito complex (DWR 2007a), as summarized in Table 15.17. Campers are affected by declining water elevations because this increases the distance from the campsites to the shoreline, and makes it difficult to access shoreline campgrounds at Bidwell Canyon, Lime Saddle, and Loafer Creek when water elevations are lower than 850 feet msl.

Table 15.17 Lake Oroville, Thermalito Forebay, and Thermalito Afterbay Major Campgrounds

Location	Campground	Comments	Number of Campsites
Lake Oroville	Bidwell Canyon	Campground	75
Lake Oroville	Bloomer Cove	Boat-In Campground	5
Lake Oroville	Bloomer Group	Boat-In Group Campground	75
Lake Oroville	Bloomer Knoll	Boat-In Campground	6
Lake Oroville	Bloomer Point	Boat-In Campground	25
Lake Oroville	Craig Saddle	Boat-In Campground	18
Lake Oroville	Floating Campsites	Boat-In Campground	10 Different Locations with approximately 15 sites per location
Lake Oroville	Foreman Creek	Boat-In Campground	26
Lake Oroville	Goat Ranch	Boat-In Campground	5
Lake Oroville	Lime Saddle	Campground and Group Campground	45
Lake Oroville	Loafer Creek	Campground and Group Campground Horse Campground	137 6 15
Thermalito Forebay	North Thermalito Forebay “En Route”	Recreational Vehicle Campground	15
Thermalito Afterbay	Oroville Wildlife Area	Primitive Campground	Several

Sources: DWR 2006, 2007a

Lake Oroville recreational areas also include day use areas for picnicking, swimming, and other recreational opportunities, as summarized in Table 15.18. The locations for shoreline day use areas are limited due to the steep and rocky elevations at the shorelines. Uses of these locations are less desirable when the water elevations decline. It is difficult to access shoreline campgrounds at Bidwell Canyon and Loafer Creek when water elevations are lower than 850 feet msl.

Table 15.18 Lake Oroville, Thermalito Forebay, and Thermalito Afterbay Day Use Areas

Location	Day Use Area	Comments	Number
Lake Oroville	Bidwell Canyon With Saddle Dam trailhead	Trail and picnic	4.9 mile trail (hiking and bicycling) 21 picnic sites
Lake Oroville	Chaparral Trail	Interpretative Trail	0.2 miles
Lake Oroville	Dan Beebe Trail With Saddle Dam, Lakeland Boulevard, Oro Dam Boulevard, and visitor center trailheads	Trail	14.3 mile trail (equestrian and hiking)
Lake Oroville	Lake Oroville Visitors Center	Visitors Center and picnic	18 picnic sites
Lake Oroville	Lime Saddle	Picnic	13 picnic sites
Lake Oroville	Loafer Creek	Trail, swimming, and picnic	3.2 mile trail (equestrian and hiking) 1.7 mile trail (hiking and bicycling) 30 picnic sites
Lake Oroville	Model Aircraft Flying Facility	Aircraft staging and picnic	6 picnic sites
Lake Oroville	Oroville Dam Overlook and Spillway Day Use Area	Trail, picnic, and shoreline fishing	1 mile along Oroville Dam crest 8 picnic sites
Lake Oroville	Potter's Ravine	Trail	5.5 miles
Lake Oroville	Roy Rogers Trail	Trail	4 miles (equestrian and hiking)
Lake Oroville	Sewim Bo Trail	Trail and picnic	0.5 miles (equestrian and hiking) 1 picnic site
Lake Oroville	Wyk Island Trail	Trail	0.2 miles
Feather River downstream of Oroville Dam	Feather River Fish Hatchery	Hatchery and picnic	1 picnic site

Location	Day Use Area	Comments	Number
Oroville Dam Crest, Diversion Pool, Thermalito Forebay, and Thermalito Afterbay	Brad Freeman Trail Diversion Pool access road, East Hamilton Road, Powerhouse Road, Toland Road, and Tres Vias Road trailheads	Trail Loop	41 miles
Thermalito Forebay	North Thermalito Forebay	Picnic, swimming, and shoreline fishing	117 picnic sites
Thermalito Forebay	South Thermalito Forebay	Picnic, swimming, and shoreline fishing	10 picnic sites
Thermalito Afterbay	Monument Hill	Picnic, swimming, and shoreline fishing	10 picnic sites
Oroville Wildlife Area	Rabe Road Shooting Range	Range and target shooting and picnic	7 picnic sites
Oroville Wildlife Area	Clay Pit State Vehicular Recreation Area	Off-highway vehicle riding	–
Thermalito Afterbay	Thermalito Afterbay Outlet and Oroville Wildlife Area	Trail, picnic, shoreline fishing, and hunting	Several trails and day use areas

Sources: DWR 2006, 2007a

Fishing is popular at the Lake Oroville complex and is performed by boat and from the shoreline (DWR 2007a). Fishing opportunities in Lake Oroville include Smallmouth Bass, Largemouth Bass, Spotted Bass, red-eye bass, Black Crappie, Bluegill, Green Sunfish, Channel Catfish, and White Catfish, Coho Salmon, Rainbow Trout, and Brown Trout. In Thermalito Forebay, fish species include Brook Trout, Brown Trout, Rainbow Trout, and Chinook Salmon. In Thermalito Afterbay, fishing opportunities include Smallmouth Bass, Largemouth Bass, trout, Channel Catfish, White Catfish, and carp. Downstream in the Feather River, fishing opportunities include steelhead, Chinook Salmon, American Shad, Smallmouth Bass, Largemouth Bass, and White Sturgeon.

Hunting opportunities occur around Thermalito Afterbay and/or Oroville Wildlife Area for turkey (in the spring), dove, quail, waterfowl, pheasant, deer, squirrel, and rabbit.

Feather River from Thermalito Afterbay/Oroville Wildlife Area to Sacramento River

The Feather River flows from the Thermalito Dam to approximately 40 miles downstream to the confluence with the Sacramento River (Reclamation 1997).

The Feather River Wildlife Area, managed by DFW, is located along the Feather River near the confluence with the Bear River. The Feather River Wildlife Area includes the Abbott Lake, Star Bend, O'Connor Lakes, Lake of the Woods, and Nelson Slough units; and Bobelaine Audubon Ecological Reserve (DFG 2008a). The southern boundary of the wildlife area is located adjacent to the Sutter Bypass. In Sutter County, water-related recreation opportunities along the Feather River also include public access at Donahue Road Park, Tisdale Boat Ramp, Boyd's Pump boat launch, Feather River parkway, Yuba City Boat Ramp, Riverfront Park in Marysville, and Live Oak Park and Recreation Area (Sutter County 2010). There are several private facilities that offer camping, boating, and river access.

15.3.2.1.8 Yuba River Watershed

Portions of the Yuba River watershed along the North Yuba River between New Bullards Bar Reservoir and Englebright Lake and along the Lower Yuba River between Englebright Lake and the Feather River could be affected by operation of the Lower Yuba River Water Accord (DWR et al. 2007), as described in Chapter 5, Surface Water Resources and Water Supplies. New Bullards Bar Dam and Reservoir are owned and operated by the Yuba County Water Agency to provide flood control, water storage, and hydroelectric generation. The Harry L. Englebright Dam and Reservoir were constructed by the California Debris Commission downstream of New Bullards Bar Reservoir to trap and store sediment from historical hydraulic mining sites in the upper watershed, and provide recreation and hydroelectric generation opportunities (USACE 2013). Following decommissioning of the California Debris Commission in 1986, administration of Englebright Dam and Reservoir (Lake) was assumed by the U.S. Army Corps of Engineers.

Portions of the watershed along the Middle Yuba River between New Bullards Bar Reservoir and Englebright Reservoir are within the Plumas and Tahoe national forests. There are also lands owned and managed by the Bureau of Land Management and U.S. Army Corps of Engineers along this reach of the river. This reach also includes the confluence with the South Yuba River. Portions of the Lower South Yuba River is designated as a California Wild and Scenic River (USFS et al. No Date). Portions of the South Yuba River State Park located near the confluence along the South Yuba River and Yuba River provide recreational opportunities for swimming, fishing, bird watching, and gold panning (State Parks 2009).

New Bullards Bar Reservoir

The New Bullards Bar Reservoir has a storage capacity of 966,103 acre-feet when the water elevation is at 1,956 feet. When full, the lake has a surface area of 4,790 acres and 71.9 miles of shoreline (YCWA 2012). Recreational facilities and activities are the responsibility of Yuba County Water Agency. Water related activities include boating, fishing, camping from May through September, and picnicking (DWR et al. 2007). There are several campgrounds adjacent to the lake, including Schoolhouse and Dark Day campgrounds along the shoreline and

Madrone Cove and Garden Point that are only accessed by boat. Boat access is provided at Emerald Cove Resort and Marina, Cottage Creek, and Dark Day. The Cottage Creek and Dark Day boat ramps are not useable when the lake elevation declines below 1,822 and 1,798 feet, respectively. Fishing opportunities include Rainbow Trout, Brown Trout, Kokanee Salmon, Bluegill, crappie, Bullhead, Smallmouth Bass, and Largemouth Bass.

Englebright Reservoir

The Englebright Reservoir has a storage capacity of approximately 70,000 acre-feet when the water elevation is at 527 feet (USACE 2012, 2013, 2014). When full, the lake has a surface area of 815 acres and 24 miles of shoreline. Recreational facilities and activities are the responsibility of U.S. Army Corps of Engineers. Water related activities include boating, water-skiing, fishing, boat-access camping, and picnicking. There are 96 boat-access only camping sites. There are two boat ramps to provide access to the lower part of the lake. The upper portion of the lake is characterized by narrow canyons and sharp bends which limits boat access. Fishing opportunities include Rainbow Trout, Brown Trout, Kokanee Salmon, sunfish, catfish, Smallmouth Bass, and Largemouth Bass.

Lower Yuba River

Hiking and boating opportunities occur along the 24 miles of the Lower Yuba River between Englebright Reservoir and the Feather River (DWR et al. 2007). Public river access is provided at several locations to support fishing, picnicking, rafting, kayaking, tubing, and swimming. Fishing opportunities include American Shad, Chinook Salmon, steelhead, Smallmouth Bass, and Striped Bass.

15.3.2.1.9 American River Watershed

Folsom Lake and Lake Natoma on the American River and the lower American River are located within areas in the American River watershed that could be affected by changes in CVP and/or SWP operations.

Folsom Lake and Lake Natoma

Folsom Lake is a CVP facility on the American River, as described in Chapter 5, Surface Water Resources and Water Supplies. The El Dorado National Forest is located in the upper American River watershed upstream of Folsom Lake. The State of California designated the North Fork American River from the source to Iowa Hill Bridge upstream of Folsom Lake as wild and scenic. Recreational facilities and activities in the Folsom Lake area are within the Folsom Lake State Recreation Area or the Folsom Powerhouse State Historic Park that are managed by State Parks. Recreational activities upstream of Folsom Lake occur on or adjacent to many lands owned by the Bureau of Land Management, State Parks, and El Dorado County. When the water storage in the lake is at full capacity (466 feet msl), Folsom Lake has a surface area of 11,450 acres and 75 miles of shoreline (State Parks and Reclamation 2003, 2007).

The upper extent of Lake Natoma is located about 1 mile downstream of Folsom Dam. Lake Natoma continues from the Rainbow Bridge to Nimbus Dam, about a

4-mile distance (State Parks and Reclamation 2003, 2007). Recreational facilities and activities at the Lake Natoma area are part of the Folsom Lake State Recreation Area and managed by State Parks. When the water storage in the reservoir is at full capacity (132 feet msl), Lake Natoma has a surface area of 540 acres and 14 miles of shoreline.

Water-related activities at Folsom Lake include boating, jet skiing, water skiing, wind surfing, rafting, sailing, canoeing, kayaking, swimming, and fishing (Reclamation 2005b; State Parks and Recreation 2003, 2007). White water rafting occurs along the South Fork American River upstream of Folsom Lake and at Skunk Hollow and Salmon Falls.

Water-related activities at Lake Natoma generally only includes paddling, rowing, and fishing due to a 5 miles/hour speed limit for motorized watercraft. California State University Sacramento operates an aquatic center at Lake Natoma (Reclamation et al. 2006).

Folsom Lake Marina at Brown's Ravine is the only marina at Folsom Lake. There are six boat launch facilities at Folsom Lake and three boat launch facilities at Lake Natoma, as summarized in Table 15.19.

Table 15.19 Folsom Lake and Lake Natoma Boat Ramps

Location	Boat Ramp	Comments	Useable Elevations (feet, msl)
Folsom Lake	Beal's Point	Day Use Area Informal Boat Ramp	465 to 420
Folsom Lake	Brown's Ravine	Day Use Area Folsom Lake Marina with 685 wet slips and 175 dry storage slips	466 to 395
Folsom Lake	Folsom Point	–	466 to 406
Folsom Lake	Granite Bay	Day Use Area Largest Boat Launch Facility at Folsom Lake	466 to 360
Folsom Lake	Hobie Cove	–	426 to 375
Folsom Lake	Peninsula	Day Use Area	466 to 410
Folsom Lake	Rattlesnake Bar	–	466 to 425
Lake Natoma	Negro Bar	–	121 to 115
Lake Natoma	Nimbus Flat	Main Boat Ramp Informal Boat Ramp	128 to 115 128 to 120
Lake Natoma	Willow Creek	Informal Boat Ramp	125 to 115

Sources: Reclamation et al. 2006; State Parks and Reclamation 2003, 2007

Campgrounds are located at Folsom Lake and Lake Natoma, as summarized in Table 15.20. Campers are also affected by declining water elevations because this increases the distance from the campsites to the shoreline. Drawdown of the reservoir has an aesthetic effect on users because the land exposed during drawdown is generally composed of bare earth and rock.

Table 15.20 Folsom Lake and Lake Natoma Major Campgrounds

Location	Campground	Comments	Number of Campsites
Folsom Lake	Beal's Point	–	49 Camp Sites 20 Recreation Vehicles
Folsom Lake	Peninsula	Campground Boat-In Campground	104 Camp Sites
Lake Natoma	Negro Bar	Group Campground	3 Major Camp Sites

Note: State Parks and Reclamation 2003, 2007; Reclamation et al. 2006

Folsom Lake and Lake Natoma recreational areas also include day use areas for picnicking, swimming, and other recreational opportunities, as summarized in Table 15.21. The locations for shoreline day use areas are limited due to the steep and rocky elevations at the shorelines. Uses of these locations are less desirable when the water elevations decline. The Jedediah Smith Memorial Trail begins at Beal's Point and extends along Lake Natoma to the confluence of the American River and Sacramento River downstream of Nimbus Dam. The Pioneer Express Trail which extends from the Auburn State Recreation Area to Beal's Point is part of the Western States Pioneer Express Trail (a National Recreation Trail).

Table 15.21 Folsom Lake and Lake Natoma Day Use Areas

Location	Day Use Area	Comments	Number
Folsom Lake	Beal's Point	Picnic and Swimming Trailhead for Jedediah Smith Memorial Trail	53 picnic sites in Day Use area 69 at campground
Folsom Lake	Brown's Ravine Trail	Trail (to Old Salmon Falls)	12 miles
Folsom Lake	Darrington Trail	Trail	9 miles
Folsom Lake	Doton's Point ADA Trail	Trail	1 mile
Folsom Lake	Folsom Point	Picnic and water skiing Trail (to Brown's Ravine Trail)	50 picnic sites 4 miles
Folsom Lake	Folsom Powerhouse	Historic Site and Museum Trail	10 picnic sites 1 mile
Folsom Lake	Folsom Reservoir River Access Areas	Whitewater rafting (South Fork)	40 commercial rafting outfitters with 67 permits No permits for private boats
Folsom Lake	Granite Bay	Trail Picnic, Swimming, fishing, equestrian, and hiking	Several trails: 1 to 5 miles 100 picnic sites
Folsom Lake	Los Lagos Trail	Trail	1.5 miles
Folsom Lake	Old Salmon Falls	Swimming, equestrian, and hiking Trailhead for Brown's Ravine and Sweetwater trails	–
Folsom Lake	Peninsula	Trail Picnic	1 mile 6 picnic sites in Day Use area 104 at campground
Folsom Lake	Pioneer Express Trail	Trail	21 miles
Folsom Lake	Rattlesnake Bar	Equestrian	–
Folsom Lake	Skunk Hollow and Salmon Falls	Whitewater rafting (South Fork)	–

Location	Day Use Area	Comments	Number
Folsom Lake	Sweetwater Creek	Trailhead for Sweetwater Trail	–
Folsom Lake	Sweetwater Trail	Trail	2 miles
Lake Natoma	Lake Natoma Trails	Trail	Several trails: 1 to 10 miles
Lake Natoma	Lake Overlook	Trailhead for Lake Natoma Trail	–
Lake Natoma	Negor Bar	Picnic, fishing, and equestrian Trailhead for Lake Natoma Trail	32 picnic sites in Day Use area 17 at campground
Lake Natoma	Nimbus Fish Hatchery	Hatchery	–
Lake Natoma	Nimbus Flat	California State University, Sacramento Aquatic Center Trailhead for Lake Natoma Trail	37 picnic sites
Lake Natoma	Willow Creek	Trailhead for Lake Natoma Trail	4 picnic sites

Sources: Reclamation et al. 2006; State Parks and Reclamation 2003, 2007

Fishing is also popular at Folsom Lake and Lake Natoma from boats and the shoreline. Anglers can catch warmwater and coldwater fish species due to the summer stratification of the lake into a warm layer above a coldwater pool especially in Folsom Lake (State Parks and Reclamation 2007). Warm water fishing opportunities include Smallmouth Bass, Largemouth Bass, Spotted Bass, and black and White Crappie. The cooler water strata support fishing for Rainbow Trout, Brown Trout, and Chinook Salmon.

American River from Nimbus Dam to the Confluence with Sacramento River

The American River flows 14 miles between Nimbus Dam and the confluence with the Sacramento River was designated by the Secretary of the Interior to be part of the National Wild and Scenic Rivers System on January 19, 1981. The State of California also designated the Lower American River as wild and scenic under Public Resources Code sections 5093.54 and 5093.545.

The Jedediah Smith Memorial Trail (also known as the American River Bike Trail) continues along the American River from Beal's Point at Folsom Lake, along Folsom Lake and Lake Natoma, and along the Lower American River through Discovery Park to the confluence with the Sacramento River (Reclamation 2005b).

The American River Parkway is a 26-mile green space designated and managed by Sacramento County Parks and Recreation along the Lower American River from Nimbus Dam to the confluence with the Sacramento River at Discovery Park. This parkway provides extensive recreational opportunities, including boating rafting, kayaking, canoeing, swimming, and fishing (Reclamation 2005b; Sacramento County 2008). Pedestrian access is provided at 87 locations along the parkway. Bicycle access and equestrian access are provided at 65 and 37 locations, respectively. Boat launch ramps are provided at 7 locations and Car-top Boat Launch opportunities are provided at 17 locations. Picnic locations are located at numerous locations along the American River. Fishing opportunities along the Lower American River include Chinook Salmon, steelhead, trout, Striped Bass, American Shad, Largemouth Bass, Bluegill, crappie, sunfish, and catfish (Sacramento County 2008).

Sacramento Municipal Utility District – Rancho Seco Park and Lake

Rancho Seco Park and Lake, operated by Sacramento Municipal Utility District, is used to store CVP water (Reclamation 2005b). The lake has a surface are of 160 acres. Water-related activities include boating, camping, picnicking, bird watching and fishing. Facilities available for these activities are two boat ramps and a fish cleaning facility. Game fish species found at the lake include catfish, Bluegill, crappie, and trout. Birds that use the area include ducks, geese, hawks, Bald Eagles, blue heron, and migratory birds (SMUD 2013).

15.3.2.2 San Joaquin Valley

Recreational opportunities in the San Joaquin Valley upstream of the Delta that are influenced by CVP and SWP operations occur at Millerton Lake, San Joaquin River between Friant Dam and the Delta, New Melones Reservoir, Stanislaus River between Tulloch Dam and San Joaquin River, San Luis Reservoir complex, recreation areas along Delta Mendota Canal and California Aqueduct, and refuges that use CVP water supplies.

15.3.2.2.1 Millerton Lake

Millerton Lake is a CVP facility on the San Joaquin River, as described in Chapter 5, Surface Water Resources and Water Supplies. Millerton Lake is part of the Millerton State Recreation Area. Recreational facilities and activities at Millerton Lake are administered by State Parks. When the water storage in the lake is at full capacity (water elevation at 580.6 feet msl), Millerton Lake has a surface area of approximately 4,900 acres and 44 miles of shoreline (Reclamation and DWR 2011).

Boating, sailing, water skiing, jetskiing, swimming, tournament and recreational fishing, camping, and picnicking (Reclamation and DWR 2011; Reclamation and State Parks 2010). Whitewater rafting opportunities occur upstream of Millerton Lake. There are six public boat ramps on Millerton Lake, as summarized in Table 15.22.

Table 15.22 Millerton Lake Boat Ramps

Location	Boat Ramp	Comments	Useable Elevations (feet, msl)
Millerton Lake	Crow's Nest	On South Shore	580 to 487
Millerton Lake	Grange Cove	On South Shore	Several Boat Ramps: 580 to 500
Millerton Lake	McKenzie Point	On South Shore	580 to 472
Millerton Lake	North Shore	On North Shore	580 to 470
Millerton Lake	South Bay	On South Shore	580 to 500

Sources: Reclamation and DWR 2011; Reclamation and State Parks 2010

The marina at Millerton Lake is located at Winchell Cove on the South Shore (Reclamation and State Parks 2010). The marina includes 500 boat slips. There are also eight boat slips at Crow's Nest.

Campgrounds are located along the Millerton Lake North Shore, as summarized in Table 15.23. Many of these campsites are located along the shoreline. These campsites are affected by declining water elevations because this increases the distance from the campsites to the shoreline.

Table 15.23 Millerton Lake Major Campgrounds

Location	Campground	Comments	Number of Campsites
Millerton Lake	Dumna Strand	–	10
Millerton Lake	Fort Miller	Shoreline Campground	36
Millerton Lake	Group Campsites	Group Campground Amphitheater	Two sites with total of 120 sites
Millerton Lake	Meadows	Campsites Equestrian Campsites	59 4 corrals and campsites
Millerton Lake	Mono	–	16
Millerton Lake	North Fine Gold Campground	Boat-In Campground	15
Millerton Lake	Rocky Point	–	21
Millerton Lake	Temperance Flat Boat	Boat-In Campground	25
Millerton Lake	Valley Oak	–	6

Source: Reclamation and State Parks 2010

Millerton Lake recreational areas also include day use areas for picnicking, swimming, and other recreational opportunities, as summarized in Table 15.24 (Reclamation and State Parks 2010). The locations for shoreline day use areas are less desirable when the water elevations decline.

Table 15.24 Millerton Lake Day Use Areas

Location	Day Use Area	Comments	Number
Millerton Lake	Blue Oak	Picnic and Trail along the South Shore	3 sites 4 miles
Millerton Lake	Buzzard's Roost Trail	Picnic and Trail	2 sites 0.5 miles
Millerton Lake	Crow's Nest	Picnic	13 sites
Millerton Lake	Eagle's Nest	Picnic and Trailhead	2 sites
Millerton Lake	Fort Miller	Trail	0.25 miles
Millerton Lake	Grange Grove	Picnic	74 sites
Millerton Lake	La Playa	Picnic and Swimming	95 sites
Millerton Lake	McKenzie Point	Picnic	–
Millerton Lake	Meadows	Picnic	10 sites
Millerton Lake	Millerton Courthouse	Historic Site and Picnic	3 sites
Millerton Lake	San Joaquin River Trail	Portions along the Millerton Lake shoreline	14 miles
Millerton Lake	South Bay	Picnic	9 sites
Millerton Lake	South Fine Gold	Picnic and Trail	10 sites 11 miles

Sources: Reclamation and State Parks 2010; State Parks 2008

Fishing is also popular at Millerton Lake from boats and shoreline. Fishing opportunities include Striped Bass, Black Bass, Largemouth Bass, Green Sunfish, and American Shad (Reclamation and State Parks 2010).

15.3.2.2.2 San Joaquin River from Friant Dam to the Delta

The San Joaquin River flows 100 miles from Friant Dam to the Delta. Downstream of Friant Dam, the San Joaquin River flows 23 miles through lands within the San Joaquin River Parkway which includes parks, trails, and ecological reserve areas between Friant Dam and State Route 145 managed by the San Joaquin River Parkway and Conservation Trust (Reclamation and DWR 2011).

Water-related recreational activities include boating, canoeing, kayaking, whitewater rafting, camping, picnicking, fishing, and hunting (Reclamation and DWR 2011). Access and facilities for these activities are available at several locations along and adjacent to the San Joaquin River.

Between Friant Dam and the confluence with the Merced River, whitewater rafting occurs between Friant Dam to Skaggs Bridge Park at State Route 145. Public access locations are generally located within the San Joaquin River

Parkway. Seven boat launching locations along the San Joaquin River Parkway that are managed by the San Joaquin River Parkway and Conservation Trust and/or DFW, Fresno County, or private operators. Lost Lake Park, managed by the San Joaquin River Parkway and Conservation Trust and DFW, provides a non-powered car-top boat launch. Sycamore Island Park, managed by San Joaquin River Parkway and Conservation Trust offers a boat ramp for small boats. River access also is available at Skaggs Bridge Park, managed by Fresno County. Picnicking is provided at most of the public access locations and at several other locations within the parkway. Camping is provided at Scout Island and Lost Lake Park managed by Fresno County and the private Fort Washington Beach. Trails include the 5-mile long Lewis S. Eaton Trail.

Downstream of State Route 145, major recreational areas include the 85-acre Mendota Pool in Mendota; Dunkle and Maldonado parks in the City of Firebaugh; and Las Palmas Fishing Access and Laird Park in Stanislaus County. Public access is provided at all of these sites. A boat ramp is located upstream of Mendota Dam.

The majority of these areas permit fishing. Fishing opportunities in the San Joaquin River include sunfish, crappie, Bluegill, Striped Bass, Largemouth Bass, and catfish (Reclamation and DWR 2011).

15.3.2.2.3 San Joaquin Valley Refuges

Wildlife refuges in the San Joaquin Valley that rely upon CVP water supplies include the San Luis NWR (including the San Luis Unit, West Bear Creek Unit, East Bear Creek Unit, Freitas Unit, and Kesterson Unit); Merced NWR; Los Banos Wildlife Area; Volta Wildlife Area; Mendota Wildlife Area; North Grasslands Wildlife Area (including China Island Unit and Salt Slough Unit); and Grasslands Resource Conservation District, as described in Chapter 5, Surface Water Resources and Water Supplies, and Chapter 10, Terrestrial Biological Resources (Reclamation 2012). Water-related activities include wildlife viewing, and hunting. Hunting opportunities include waterfowl, shorebirds, and pheasants (Reclamation and DWR 2011).

Several wildlife areas along the San Joaquin River could be affected by CVP operations of Millerton Lake, including the West Hilmar Wildlife Area downstream of the confluence with the Merced River and the San Joaquin River NWR located between the Tuolumne and Stanislaus rivers (Reclamation and DWR 2011). West Hilmar Wildlife Area includes 340 acres of wildlife area accessible by boat. The San Joaquin River NWR includes over 7,000 acres of riparian woodlands, wetlands, and grasslands for native wildlife with limited access at Pelican Trail.

In the southern San Joaquin Valley, the Kern and Pixley NWRs provide wildlife viewing opportunities.

15.3.2.2.4 Stanislaus River Watershed

New Melones Reservoir and Tulloch Reservoir on the Stanislaus River and the lower Stanislaus River are located within areas in the Stanislaus River watershed that could be affected by changes in CVP operations.

New Melones Reservoir

New Melones Reservoir is a CVP facility on the Stanislaus River, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation activities and facilities at New Melones Reservoir area are managed by Reclamation. When the water storage in the reservoir is at full capacity, New Melones Reservoir has a surface area of approximately 12,500 acres and 105 miles of shoreline at a surface elevation of 1,088 feet msl (Reclamation 1997, 2010a).

Water-related activities include boating, waterskiing, camping, picnicking, wildlife viewing, spelunking, rock climbing, gold panning, and fishing (Reclamation 2010a). Float planes can land within the North, Middle, and South Bays of the reservoir. A model airplane club operates an airstrip near New Melones Dam. Cave exploration occurs in the Stanislaus River Canyon. Rock climbing occurs on Table Mountain. In years when the reservoir elevation is low, whitewater rafters launch at the Old Camp Nine Bridge.

There are five boat ramps at New Melones Reservoir, as summarized in Table 15.25.

Table 15.25 New Melones Reservoir Boat Ramps

Location	Boat Ramp	Comments	Useable Elevations (feet, msl)
New Melones Reservoir	Angels Creek	–	1,088 to 975
New Melones Reservoir	Glory Hole	Location of New Melones Lake Marina	Several Boat Ramps: 1,088 to 860
New Melones Reservoir	Mark Twain	Unimproved Ramp	1,088 to 760
New Melones Reservoir	Parrotts Ferry	Unimproved Ramp	Several Boat Ramps: 1,088 to 900

Source: Reclamation 2010a

The New Melones Marina is the only location with mooring facilities and houseboat rentals (Reclamation 2010a). Up to 50 private houseboats on mooring balls, 38 private houseboats in slips, and 20 rental houseboats may be maintained on the reservoir.

Campgrounds are located at Glory Hole and Tuttletown, as summarized in Table 15.26 (Reclamation 2010a). Some of the campsites are located along the shoreline. These campsites are affected by declining water elevations because this increases the distance from the campsites to the shoreline.

Table 15.26 New Melones Reservoir Major Campgrounds

Location	Campground	Comments	Number of Campsites
New Melones Reservoir	Glory Hole	Two campgrounds	144
New Melones Reservoir	Tuttletown	Three campgrounds Two Group campgrounds	161 16

Source: Reclamation 2010a

New Melones Reservoir recreational areas also include day use areas for picnicking, swimming, and other recreational opportunities, as summarized in Table 15.27 (Reclamation 2010a). The locations for shoreline day use areas are less desirable when the water elevations decline.

Table 15.27 New Melones Reservoir Day Use Areas

Location	Day Use Area	Comments	Number
New Melones Reservoir	Glory Hole	Picnic and Trails	61 sites Several trails: 0.25 to 2.5 miles
New Melones Reservoir	Mark Twain	Picnic and Norwegian Gulch Trail	0.5 miles
New Melones Reservoir	Natural Bridges	Trail	0.7 miles
New Melones Reservoir	Shoreline	Swimming and Recreational Gold Panning	–
New Melones Reservoir	Table Mountain	Trail	Several trails: 1.5 to 4.0 miles
New Melones Reservoir	New Melones Lake Visitor	Visitor Center	–
New Melones Reservoir	Tuttlettown	Picnic and Trail	52 sites Several trails: 0.4 to 1.7 miles

Sources: Reclamation 2010a, 2010b, 2014

Tulloch Reservoir

Tulloch Reservoir is a reservoir owned and operated by the Oakdale and South San Joaquin Irrigation Districts on the Stanislaus River downstream of New Melones Reservoir, as described in Chapter 5, Surface Water Resources and Water Supplies. When the water storage in the reservoir is at full capacity (water elevation at 510 feet msl), the reservoir has a surface area of 1,260 acres and 55 miles of shoreline (CBC 2013; Tri-Dam Project 2002).

Water-related activities include boating, sailing, windsurfing, jet and water skiing, camping, picnicking, and fishing. Most of the shoreline is privately owned with shoreline access and more than 400 private docks for residents (Tri-Dam Project 2012). Public access is provided at a DFW marina and campground with a boat ramp at South Shore.

Stanislaus River from Tulloch Dam to the San Joaquin River

Downstream of Tulloch Dam, the Stanislaus River flows to Goodwin Dam, and then continues approximately 40 miles to the confluence with the San Joaquin River. Water-related activities along the lower portion of the Stanislaus River include whitewater rafting, camping, picnicking, swimming, and fishing. Whitewater rafting begins at Goodwin Dam and continues almost 4 miles to Knights Ferry (Reclamation 1997). Downstream of Knights Ferry, there are seven parks, including Caswell Memorial State Park, a 258-acre park managed by State Parks (Stanislaus County 1987; State Parks 2006a). Fishing opportunities on the lower Stanislaus River include bass, catfish, and crappie.

15.3.2.2.5 San Luis Reservoir State Recreation Area

The San Luis Reservoir complex includes CVP and SWP offstream storage facilities located south of the Delta, as described in Chapter 5, Surface Water Resources and Water Supplies. The San Luis Reservoir complex includes San Luis Reservoir, O'Neill Forebay, and Los Banos Creek Reservoir. The San Luis Reservoir complex is located within the San Luis Reservoir State Recreation Area, and the recreational facilities are operated by State Parks (State Parks 2003). Los Banos Creek Reservoir is a flood detention basin to protect the community of Los Banos and San Luis Canal/California Aqueduct. This reservoir and a similar flood management reservoir that is not within the San Luis Reservoir State Recreation Area (Little Panoche Creek Reservoir) are not affected by CVP and SWP operations. Therefore, Los Banos Creek Reservoir and Little Panoche Creek Reservoir are not considered in detail in this EIS.

When the water storage in the San Luis Reservoir is at full capacity (water elevation at 540 feet msl), the reservoir has a surface area of 12,700 acres and 65 miles of shoreline (Reclamation and State Parks 2013; State Parks 2010).

The O'Neill Forebay is east of the San Luis Reservoir downstream of the San Luis Dam. When the water storage in the forebay is at full capacity (water elevation of 230 feet msl), the reservoir has a surface area of 2,210 acres and 14 miles of shoreline (Reclamation and State Parks 2013; State Parks 2010).

Water-related activities include boating, camping, picnicking, wildlife and scenic viewing, fishing, and hunting occur throughout the San Luis Reservoir State Recreation Area (Reclamation 2005c; State Parks 2010; Reclamation and State Parks 2013). Boat ramps are located at all three reservoirs, as summarized below.

- San Luis Reservoir: Boat ramps at Basalt Area and Dinosaur Point (operational to 340 feet and 360 feet msl, respectively).

- O'Neill Forebay: Boat ramps at Group Campground and Medeiros Campground.
- Los Banos Creek Reservoir: Boat ramp at Los Banos Creek Campground.

Camping occurs at Basalt Area at San Luis Reservoir (79 sites), O'Neill Forebay (50 sites), San Luis Creek Area (53 sites and two group campsites with 90 sites), and Los Banos Creek Area (14 sites) (Reclamation and State Parks 2013). Picnic sites, swimming, and/or trails occur at Basalt Area, Medeiros Area, and Los Banos Creek Area (Reclamation 2005c; State Parks 2010; Reclamation and State Parks 2013).

Fishing opportunities include Striped Bass, American Shad, and catfish (Reclamation and State Parks 2013). Hunting opportunities occur at San Luis Reservoir for waterfowl, deer, and wild pig (Reclamation 2005c; Reclamation and State Parks 2013).

15.3.2.2.6 Delta Mendota Canal

Delta Mendota Canal is a CVP facility, as described in Chapter 5, Surface Water Resources and Water Supplies. The Delta-Mendota Canal includes two fishing sites: one in Stanislaus County and the other in Fresno County (Reclamation 2005c). Fishing opportunities include Striped Bass and catfish (Reclamation 1997).

15.3.2.2.7 California Aqueduct/San Luis Canal

The California Aqueduct is a SWP facility, as described in Chapter 5, Surface Water Resources and Water Supplies. A portion of the canal is also co-located with the CVP San Luis Canal. Fishing is permitted at 12 sites along the California Aqueduct between Bethany Reservoir and Perris Lake in Southern California. Fishing opportunities include Striped Bass, Largemouth Bass, catfish, crappie, Green Sunfish, Bluegill, and starry flounder (Reclamation 1997).

15.3.2.3 Delta

The Delta is located at the terminus of the Sacramento River and the San Joaquin River. Water-related activities in the Delta include boating, sailing, water skiing, canoeing, kayaking, picnicking, fishing, and hunting. Recreational opportunities exist in many areas of the Delta; however, the analysis in this EIS is related to areas that could be affected by changes in CVP and/or SWP water supply operations and restoration in the Yolo Bypass. The following discussion describes recreation throughout the Delta followed by more specific discussions of recreation within the Yolo Bypass and Cache Slough.

15.3.2.3.1 Delta Recreational Opportunities

The primary recreational activities in the Delta are related to boating and fishing (DPC 2012). Public recreation facilities are limited within the Delta. Most recreational opportunities are provided by private enterprises, including marinas, restaurants, hunting venues, and wineries and farm visits. Public access is provided at DFW and U.S. Fish and Wildlife Service (USFWS) sites.

The most recent survey of boating opportunities in the Delta was completed in 2002 by the California Department of Boating and Waterways (DBW 2014; DPC 2012). The survey indicated that of the 95 marinas surveyed, three were publically-owned and 92 were privately-owned (including 87 that were open to the public and five that were for members). The survey indicated that within the Delta there were over 11,600 boat slips, 55 boat launches, 2,182 campsites, and 324 picnic sites.

Public access sites for boating and wildlife and scenic viewing in the Delta include:

- USFWS: Stone Lakes NWR, Antioch Dunes NWR.
- DFW: Calhoun Cut Ecological Reserve, Decker Island Wildlife Area, Lower Sherman Island Wildlife Area, Miner Slough Wildlife Area, Rhode Island Wildlife Area, White Slough Wildlife Area, Woodbridge Ecological Reserve, Fremont Weir Wildlife Area, Sacramento Bypass Wildlife Area, and Yolo Bypass Wildlife Area.
- State Parks: Brannan Island-Franks Tract State Recreation Areas, Delta Meadows State Recreation Area.
- Department of Water Resources: Clifton Court Forebay.
- The Nature Conservancy/DFW: Cosumnes River Preserve.
- Solano Land Trust: Jepson Prairie Preserve.
- East Bay Regional Park District: Big Break Regional Shoreline, Antioch/Oakley Regional Shoreline, Browns Island Regional Preserve, Bay Point Regional Shoreline, Martinez Regional Shoreline, Carquinez Strait Regional Shoreline-Crockett Hills Regional Park, and Contra Costa Canal Trail.
- Municipal Marinas, Boat Launching, and Fishing Access Facilities: City of Antioch Marina and Municipal Boat Ramp; City of Pittsburg Riverview Park; Sacramento County Cliffhouse, Georgiana Slough Fishing Access, Hogback Island Access, and Sherman Island Public Access Facility; City of Sacramento Garcia Bend Park; several public and private marinas in Sacramento County; 12 public and private marinas with over 900 boat slips and boat access within the City of Stockton; San Joaquin County Dos Reis Regional Park, Mossdale Crossing Regional Park, and Westgate Landing Regional Park; and Yolo County Clarksburg River Access.

Several of these sites include launch sites for boats, canoes, and kayaks and numerous trails (DPC 2012; DSC 2011; DFG 2008b, 2008d, 2009; EBRPD 2013a; Antioch 2003; Pittsburg 2001; Sacramento County 2014; Sacramento 2005; Stockton 2007; Yolo County 2009).

One of the larger bodies of water in the Delta is the SWP Clifton Court Forebay. Fishing is the only recreational opportunity that occurs within the Clifton Court Forebay; and the opportunities are limited (DWR 2013c). Public access is

restricted near the radial gate along West Canal. However, boat access occurs at a boat dock along West Canal to the east of the radial gate and by a trail from Clifton Court Road.

Fishing opportunities in the Delta generally include Striped Bass, Smallmouth Bass, Largemouth Bass, Spotted Bass, American Shad, Black Crappie, Chinook Salmon, steelhead, catfish, sunfish, Tule Perch, Warmouth, and White Sturgeon (DPC 2006).

Hunting opportunities for waterfowl, shorebirds, doves, and pheasants occur in many areas of the Delta on privately-owned land. Hunting also occurs at several publically-owned sites within the Delta, including:

- USFWS: Stone Lakes NWR.
- DFW: Decker Island Wildlife Area, Lower Sherman Island Wildlife Area, Miner Slough Wildlife Area, Rhode Island Wildlife Area, White Slough Wildlife Area, Yolo Bypass Wildlife Area; and on some lands owned by DWR (including Sherman and Twitchell islands and Clifton Court Forebay).

The Delta Protection Commission identified several physical constraints to Delta recreational opportunities that could be affected by CVP and SWP operations, including changes in water quality and operation of the CVP or SWP water facilities (Delta Cross Channel, South Delta Temporary Barriers, and Montezuma Slough Salinity Gates) (DPC 2012).

15.3.2.3.2 Yolo Bypass and Cache Slough Recreational Opportunities

The primary recreational activities in the Yolo Bypass and Cache Slough areas are related to wildlife viewing and hunting. Many recreational hunting opportunities occur on private lands, including private hunting clubs. Areas within Yolo Bypass and Cache Slough that provide public access for wildlife viewing or hunting within the Yolo Bypass and Cache Slough area, include:

- Fremont Weir Wildlife Area (DFW 2014a).
  - Wildlife viewing and fishing.
  - Hunting for pheasant, waterfowl, Mourning Dove, deer, quail, rabbit, and turkey.
- Sacramento Bypass Wildlife Area (DFW 2014c).
  - Wildlife viewing and fishing, including for White Sturgeon, White Catfish, and Black Crappie in the Tule Canal; and Largemouth Bass, Bluegill, and White Catfish in the borrow pits.
  - Hunting for pheasant and Mourning Dove.
- Yolo Bypass Wildlife Area (DFG 2008c, 2010).
  - Wildlife viewing and hiking.
  - Fishing for sturgeon, Striped Bass, Black Bass, and catfish.

  - Hunting for waterfowl, coots, Moorhens, Snipe, pheasants, and Mourning Doves.
  - Educational and interpretative programs.
- Calhoun Cut Ecological Reserve (DFG 2008d).
  - Waterfowl hunting and fishing from a boat.

There are other publically-owned lands within the Yolo Bypass and Cache Slough that provide habitat or will be restored to provide habitat. However, these lands are generally not available for public access to protect fragile ecosystems.

15.3.2.4 Suisun Marsh

Suisun Marsh is 106,511 acres of wetlands located between the Delta and the San Francisco Bay. Water-related activities at Suisun Marsh include waterfowl hunting, boating, kayaking, hiking, wildlife viewing, fishing, and hunting (Reclamation et al. 2011). Water-related recreation occurs within the two major channels, Montezuma and Suisun sloughs; and several moderately sized channels, Cordelia, Denverton, Nurse, and Hill sloughs.

The DFW manages several areas within the Suisun Marsh for public access, as described in Chapter 10, Terrestrial Biological Resources. These areas include (Reclamation et al. 2011):

- Grizzly Island Wildlife Area
  - Wildlife viewing, hiking, and fishing (February through July, and late September).
  - Hunting (August through mid-September, and October through January).
- Hill Slough Wildlife Area
  - Wildlife viewing and fishing.
- Peytonia Slough Ecological Preserve
  - Kayaking.
  - Wildlife viewing and fishing.
- Belden's Landing Water Access Facility
  - Boat launch ramp and fishing pier.

Suisun City Marina and Solano Yacht Club, Suisun City Boat Launch, and McAvoy Yacht Harbor and Club also provide boat launch ramp facilities (Reclamation et al. 2011). Pier fishing opportunities are provided at Suisun City Boat Launch.

The Solano Land Trust's Rush Ranch also provides opportunities for hiking and picnicking in the wetlands and upland areas near Potrero Hills (Reclamation et al. 2010).

Fishing opportunities within Suisun March include Striped Bass, White Sturgeon, catfish, and carp (Reclamation et al. 2011). Occasionally, Chinook Salmon, steelhead, and Largemouth Bass are caught in Suisun Marsh near Grizzly Island.

Duck hunting generates the most frequent recreational visits in Suisun Marsh (Reclamation et al. 2011). About 37,500 acres of Suisun Marsh are owned and operated by private duck clubs. DFW manages about 15,300 acres of public lands in Grizzly Island Wildlife Area for hunting of waterfowl, Snipe, coots, Moorhens, Mourning Doves, pheasants, rabbits, and Tule Elk.

There are other publically-owned lands within Suisun Marsh that provide habitat or will be restored to provide habitat. However, these lands are generally not available for public access to protect fragile ecosystems.

15.3.3 San Francisco Bay Area Region

The San Francisco Bay Area Region includes portions of Contra Costa, Alameda, Santa Clara, San Benito, and Napa counties that are within the CVP and SWP service areas. This section describes reservoirs in the San Francisco Bay Area Region that could be affected by CVP and SWP operations, including the CVP Contra Loma and San Justo reservoirs; the SWP Bethany Reservoir and Lake Del Valle; the Contra Costa Water District Los Vaqueros Reservoir; and the East Bay Municipal Utility District Upper San Leandro, San Pablo, Briones, and Lafayette reservoirs and Lake Chabot. CVP and SWP are generally not stored in reservoirs within Santa Clara County (SCVWD 2010).

15.3.3.1 Contra Loma Reservoir

The Contra Loma Reservoir is a CVP facility in Contra Costa County that provides offstream storage along the Contra Costa Canal, as described in Chapter 5, Surface Water Resources and Water Supplies. The recreation facilities are managed by East Bay Regional Park District. The 80 acre reservoir is part of 661-acre Contra Loma Regional Park and Antioch Community Park (Reclamation 2014a). Water-related activities include boating, wind surfing, kayaking, picnicking, and fishing. No bodily contact is to occur in Contra Loma Reservoir; therefore, a large swimming pool was constructed for the visitors by the East Bay Regional Park District. There is one boat launch at the reservoir. Contra Loma Reservoir accommodates fishing all year-round. Fishing opportunities include catfish, Black Bass, Striped Bass, Largemouth Bass, Bluegill, crappie, trout, and Redear Sunfish (EBRPD 2013c).

15.3.3.2 San Justo Reservoir

The San Justo Reservoir is a CVP facility in San Benito County that provides offstream storage as part of the San Felipe Division, as described in Chapter 5, Surface Water Resources and Water Supplies. San Justo Reservoir recreation facilities have been closed to the public since 2009 due to an infestation by the zebra mussel. Previously, the recreation facilities were managed by San Benito County Water District (SBCWD 2014).

15.3.3.3 Bethany Reservoir

Bethany Reservoir is a SWP facility located between the California Aqueduct and South Bay Aqueduct in Alameda County, as described in Chapter 5, Surface Water Resources and Water Supplies. The recreation facilities are part of the Bethany Reservoir State Recreation Area and are managed by State Parks. When the water storage in the reservoir is at full capacity (water elevation at 243 feet msl), Bethany Reservoir has 161 acres of surface area and 6 miles of shoreline (DWR 2001). Water-related activities include boating, windsurfing, picnicking, and fishing. There is one boat launch at the reservoir (State Parks 2013a). Fishing opportunities include Striped Bass, Smallmouth Bass, Largemouth Bass, Spotted Bass, White Bass, catfish, crappie, and trout.

15.3.3.4 Lake Del Valle

Lake Del Valle is a SWP facility located along the South Bay Aqueduct in Alameda County, as described in Chapter 5, Surface Water Resources and Water Supplies. The recreation facilities are managed by East Bay Regional Park District as part of the Del Valle Regional Park. When the water storage in the reservoir is at full capacity (water elevation at 703 feet msl), Lake Del Valle has 708 acres of surface area and 16 miles of shoreline (DWR 2001). Water-related activities include boating, windsurfing, camping, swimming, and fishing (DWR 2001). There is a boat launch at the lake (EBRPD 2014). Boating hazards can occur along the variable shoreline when the surface water elevation declines to 678 feet msl. There are seven group campsites for up to 475 and a family campground (DWR 2001; EBRPD 2014). Fishing opportunities include trout, catfish, Largemouth Bass, and Smallmouth Bass, Striped Bass, and Panfish (EBRPD 2014).

15.3.3.5 Los Vaqueros Reservoir

Los Vaqueros Reservoir is a Contra Costa Water District offstream storage facility in Contra Costa County, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation facilities are managed by Contra Costa Water District. Water-related activities include boating using rented electrical boats, and fishing (CCWD 2014). The Los Vaqueros recreation facilities include a marina, four fishing piers, 55 miles of trails, several individual and group picnic areas, and an interpretative center. Fishing opportunities include Rainbow Trout, Brown Bullhead, White Catfish, Channel Catfish, sunfish, White Crappie, Largemouth Bass, Striped Bass, Chinook Salmon, Kokanee Salmon, Green Sunfish, and Sacramento Perch (EBRPD 2014).

15.3.3.6 San Pablo Reservoir, Lafayette Reservoir, Lake Chabot, and East Bay Municipal Utility District Trails

The East Bay Municipal Utility District reservoirs in Alameda and Contra Costa County are used to store water within and near the East Bay Municipal Utility District service area. Water stored in these reservoirs includes water from local watersheds, the Mokelumne River watershed, and CVP water supplies, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation is allowed within the waters of San Pablo and Lafayette reservoirs and Lake

Chabot (EBMUD 2011). Recreation is not allowed within the waters of Upper San Leandro and Briones reservoir. East Bay Municipal Utility District maintains trails within the watersheds of the reservoirs.

Recreation facilities at San Pablo Reservoir are managed by East Bay Municipal Utility District. Water-related activities at San Pablo Reservoir include boating, picnicking, and fishing (EBMUD 2014a). There is a boat launch at the reservoir. There are individual sites and nine group picnic areas that can accommodate up to 100 people at each site. Hiking can occur in the San Pablo Reservoir watershed on 8.7 miles of trails which connect to about 13 miles of trails in the Briones Reservoir watershed (EBMUD 2007a). The surface water of the reservoirs can be viewed from many locations along these trails. Fishing opportunities at San Pablo Reservoir include Rainbow Trout, catfish, Black Bass, Bluegill, and crappie (EBMUD 2014a).

Recreation facilities at Lafayette Reservoir are managed by East Bay Municipal Utility District. Water-related activities at Lafayette Reservoir include boating, picnicking, and fishing (EBMUD 2014b). There is a private car-top boat launch at the reservoir. There are 125 picnic sites around the reservoir. Hiking can occur in the Lafayette Reservoir watershed on 7.4 miles of trails. Fishing opportunities at Lafayette Reservoir include Rainbow Trout, catfish, Black Bass, and sunfish.

There are no water-related activities within or adjacent to Upper San Leandro Reservoir. However, East Bay Municipal Utility District maintains over 26 miles of trails within the Upper San Leandro Reservoir watershed. The surface water of the reservoirs can be viewed from many locations along these trails (EBMUD 2007b).

Recreation facilities at Lake Chabot are managed by East Bay Regional Park District as part of the Lake Chabot Regional Park (EBRPD 2011). Water-related activities at Lake Chabot include boating, camping, picnicking, and fishing. There is a boat launch at the reservoir and boat rides are offered on the *Chabot Queen*. Individual campsites and group campsites are located near the southern portion of the park. Picnic sites are located near the Lake Chabot Marina. Hiking can occur along the shoreline on over 9 miles of trails which connect to more than 17 miles of other trails in the watershed (EBRPD 2011, 2013d). Other recreational activities, including equestrian trails and a marksmanship range, are located in the upper Lake Chabot watershed. Fishing opportunities at Lake Chabot include Rainbow Trout, catfish, Black Bass, crappie, Bluegill, and carp.

15.3.4 Central Coast Region

The Central Coast Region includes portions of San Luis Obispo and Santa Barbara counties served by the SWP. The SWP water supplies generally are conveyed to Central Coast municipal, industrial, and agricultural water users in pipelines and closed reservoirs. Water is delivered to southern Santa Barbara County communities through Cachuma Lake. Therefore, in the Central Coast Region, the only recreational opportunities that may be affected by changes in SWP operations would be Cachuma Lake in Santa Barbara County (CCWA 2014).

15.3.4.1 Cachuma Lake

Cachuma Lake is a facility owned and operated by Reclamation in Santa Barbara County, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation facilities are managed by Santa Barbara County Parks Department. Water-related activities include boating, and fishing within the lake and along the lake shoreline (Reclamation 2010c). Cachuma Lake recreation facilities include a marina with 87 rental boats and a public boat launch, 94 private boat slips, 520 campsites, equestrian campsites, family center, amphitheater, and trails that range from 0.25 to 9 miles in length. Fishing opportunities include trout, catfish, crappie, bass, Redear Perch, and Bluegill.

15.3.5 Southern California Region

The Southern California Region includes portions of Ventura, Los Angeles, Orange, San Diego, Riverside, and San Bernardino counties served by the SWP. The SWP water supplies generally are conveyed to Southern California municipal, industrial, and agricultural water users in canals and pipelines. There are six SWP reservoirs along the main canal, West Branch, and East Branch of the California Aqueduct and many other reservoirs owned and operated by regional and local agencies. The Metropolitan Water District of Southern California's Diamond Valley Lake and Lake Skinner primarily store water from the SWP. Other reservoirs that store SWP water, include United Water Conservation District's Lake Piru; City of Escondido's Dixon Lake; City of San Diego's San Vicente, El Capitan, Lower Otay, Hodges, and Murray reservoirs; Helix Water District's Lake Jennings; and Sweetwater Authority's Sweetwater Reservoir.

This section does not include reservoirs that do not provide recreational opportunities, such as Vail Lake in Riverside County or Olivenhain Reservoir in San Diego County, or reservoirs that do not store SWP water supplies, such as Lake Mathews in Riverside County which is used to store Colorado River water (RCWD 2011; SDCWA 2015; Riverside County 2000).

15.3.5.1 Quail Lake

Quail Lake is a SWP facility in Los Angeles County, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation facilities are managed by DWR (DWR 2014a). Water-related activities include fishing within the lake and along the shoreline. Fishing opportunities include Channel Catfish, Striped Bass, Blackfish, Tule Perch, Threadfin Shad, and Hitch.

15.3.5.2 Pyramid Lake

Pyramid Lake is a SWP facility located in Los Angeles County and upstream of Castaic Lake on the West Branch of the California Aqueduct, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation facilities are managed by the U.S. Forest Service (DWR 2000, 2014b). Water-related activities include boating, camping, water skiing, swimming, and fishing. Boat launch facilities are available at Vaqueros Beach and Emigrant Landing. A marina and picnic sites are available at Emigrant Landing. Four picnic and viewing sites are accessible only by boat. Family and group camping are available at two sites.

Fishing opportunities include largemouth, smallmouth, and Striped Bass; catfish, blue gill; crappie; and trout. Reservoir elevations can vary substantially on a daily basis because the lake provides short-term storage for the downstream Castaic Powerplant.

15.3.5.3 Castaic Lake

Castaic Lake is a SWP facility located in Los Angeles County at the terminal end of the West Branch of the California Aqueduct, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation facilities are managed by the Los Angeles County Department of Parks (DWR 2007b). Water-related activities include boating, water skiing, jet skiing, wakeboarding, camping, picnicking, swimming at the lagoon/afterbay, and fishing. Fishing opportunities include trout, Largemouth Bass, Striped Bass, catfish, and crappie (DWR 2014c).

15.3.5.4 Silverwood Lake

Silverwood Lake is a SWP facility located in San Bernardino County along the East Branch of the California Aqueduct, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation facilities are managed by State Parks as part of the Silverwood Lake State Recreational Area (State Parks 2006b). Water-related activities include boating, water skiing, camping, picnicking, swimming, and fishing. Facilities available for boating include a boat ramp, marina, and waterskiing area. Camping facilities include 136 family sites, seven walk-in sites, and several group sites for up to 120 people. The park includes two swimming beaches and 13 miles of trails. Fishing opportunities include Largemouth Bass, Striped Bass, Bluegill, crappie, and catfish.

15.3.5.5 Crafton Hills Reservoir

Crafton Hills Reservoir is a SWP facility located in the City of Yucaipa within San Bernardino County, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation facilities are managed by DWR (DWR 2009). Recreation activities in vicinity of the reservoir are associated with hiking trails in the open space within the Crafton Hills watershed. The surface water of the reservoirs can be viewed from many locations along these trails.

15.3.5.6 Lake Perris

Lake Perris is a SWP facility located in Riverside County at the terminal end of the East Branch of the California Aqueduct, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation facilities are managed by State Parks as part of the Lake Perris State Recreational Area (State Parks 2013b; DWR 2010). Water-related activities include boating, camping, swimming, picnicking, and fishing. Boating facilities include a marina and three boat launch ramps. Other recreational facilities include two swimming beaches, family campground, seven equestrian camp sites, boat-in picnic sites on Alessandro Island, and the Ya'i Hek'i Regional Indian Museum. Fishing opportunities include Largemouth Bass, catfish, crappie, carp, Bluegill, and Redear Sunfish.

15.3.5.7 Diamond Valley Lake

Diamond Valley Lake is an offstream storage facility located in Riverside County owned and operated by Metropolitan Water District of Southern California, as described in Chapter 5, Surface Water Resources and Water Supplies (MWD 2013). The lake is used to store SWP water. Water-related activities include boating, and fishing. Boating facilities include a marina with boat rentals. Other recreational facilities include a visitor center, Western Science Center, and the Valley-Wide Recreation and Park District Regional Aquatic Center and Community Park. Fishing opportunities include Black Bass, Bluegill, redear sunfish, Rainbow Trout, blue catfish, and Channel Catfish (DVM 2014).

15.3.5.8 Lake Skinner

Lake Skinner is an offstream storage facility located in Riverside County owned and operated by Metropolitan Water District of Southern California, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation facilities are managed by Riverside County Parks (Riverside County 2014). The lake is used to store SWP water. Water-related activities include boating, camping, and fishing. Other recreational facilities include an amphitheater and Splash Pad. Fishing opportunities include Striped Bass, Largemouth Bass, Bluegill, Rainbow Trout, catfish, and carp.

15.3.5.9 Lake Piru

Lake Piru is located on Piru Creek, a tributary of the Santa Clara River, in Ventura County (UWCD 2014). The lake is owned and operated by United Water Conservation District, as described in Chapter 5, Surface Water Resources and Water Supplies. Lake Piru is located within Los Padres National Forest (PMC 2014). The lake is used to store SWP water.

Recreation facilities are managed by a private concessionaire for the district (UWCD 2014; PMC 2014). Water-related activities include boating, camping, and picnicking. The marina includes a boat launch and private boat slips. There are over 220 campsites, including several group campsites.

15.3.5.10 Dixon Lake

Dixon Lake is located in the hills above the City of Escondido in San Diego County (Escondido 2014a). The lake is owned and operated by the City of Escondido, as described in Chapter 5, Surface Water Resources and Water Supplies. The lake is used to store SWP water.

Recreation facilities are managed by the City of Escondido (Escondido 2014b). Water-related activities include camping, picnicking, and fishing. Boats are allowed on the lake for fishing. There are 45 campsites and 22 picnic sites (Escondido 2014 n.d.; Escondido 2014c). Fishing opportunities include trout, bass, Bluegill, carp, catfish, and crappie.

15.3.5.11 San Vicente, El Capitan, Lower Otay, Hodges, and Murray Reservoirs

San Vicente Reservoir, El Capitan, Lower Otay, Hodges, and Murray reservoirs are located in San Diego County (San Diego 2011). The reservoirs are owned and operated by the City of San Diego, as described in Chapter 5, Surface Water Resources and Water Supplies. The reservoirs are used to store SWP water.

Recreation facilities are managed by the City of San Diego (San Diego 2014a, 2015a, 2015b). Water-related activities at the reservoirs include boating, picnicking, and fishing (San Diego 2014b, 2015a, 2015b). There are 16 picnic sites at Lower Otay Reservoir. Fishing opportunities at Lower Otay Reservoir include Largemouth Bass, Bluegill, black and White Crappie, Channel Catfish, blue catfish, White Catfish, and bullhead. Recreational activities at San Vicente Reservoir are temporarily closed during construction to raise the dam (San Diego 2014c). Fishing opportunities at El Capitan Reservoir include Largemouth Bass, Bluegill, crappie, Channel Catfish, Blue Catfish, Green Sunfish, and carp (San Diego 2014d). Hodges Reservoir provides recreational opportunities including boating, boardsailing, and fishing for bass, catfish, crappie, Bluegill, Bullhead, and carp (San Diego 2015a). Murray Reservoir provides recreational opportunities for boating, floating, swimming, and fishing for Largemouth Bass, Bluegill, Channel Catfish, Black Crappie, and trout (San Diego 2015b).

15.3.5.12 Lake Jennings

Lake Jennings is located in San Diego County (HWD 2014). The lake is owned and operated by Helix Water District, as described in Chapter 5, Surface Water Resources and Water Supplies. The lake is used to store SWP water.

Recreation facilities are managed by Helix Water District (HWD 2014). Water-related activities include boating, camping, picnicking, and fishing. There are 96 campsites. There are a variety of picnic sites at Lake Jennings including: Cloister Cover, Siesta Point, Hermit Cove, and Eagle Point. Bird watchers at Lake Jennings can see Loons, Grebes, Cormorants, Herons, Swans, Geese, Eagles, Hawks, Thrushes, Warblers, and many others. Hikers at Lake Jennings have access to a variety of different trails near the lake including a 5.5 mile loop around the lake. Fishing opportunities include trout, bass, and catfish.

15.3.5.13 Sweetwater Reservoir

Sweetwater Reservoir is located in San Diego County (Sweetwater Authority 2014). The lake is owned and operated by Sweetwater Authority, as described in Chapter 5, Surface Water Resources and Water Supplies. The reservoir is used to store SWP water. Recreation facilities are managed by Sweetwater Authority. Water-related activities include fishing.

15.3.5.14 Lake Arrowhead

Lake Arrowhead is located in San Bernardino County (LACSD 2014). The lake is owned and operated by Arrowhead Lake Association. The Lake Arrowhead Community Services District stores SWP water in the lake, as described in Chapter 5, Surface Water Resources and Water Supplies. Recreation facilities are

managed by the Arrowhead Lake Association. Water-related activities include boating, camping, and fishing (Lake Arrowhead 2014).

15.3.6 Recreational Fishing in San Pablo and San Francisco Bays

Recreational fishing for sturgeon, Striped Bass, steelhead, trout, and salmon in San Pablo and San Francisco bays could be affected by changes in populations that may occur due to implementation of the alternatives considered in this EIS. Of these species, the majority of recreational fishing in the San Francisco Bay Estuary is related to Striped Bass and sturgeon fishing, especially in San Pablo and Suisun bays.

Recreational fishing for White Sturgeon is limited to three sturgeons per person each year, with a daily bag limit of one fish/day and a size limitation of 40 to 60 inches (from the nose tip to fork in the tail). In addition, White Sturgeon fishing is not allowed in San Francisco Bay from March 16 through December 31. Green sturgeon fishing is not allowed. Striped bass fishing occurs throughout the year with a daily bag limit two fish/day and a minimum size limitation of 18 inches. Salmon sportfishing also occurs within the San Francisco Bay Estuary during periods specified by the National Marine Fisheries Service (NMFS).

15.3.7 Recreational Salmon Fishing along Northern California Coast

Chinook Salmon, Coho Salmon, and steelhead are generally the primary species for recreational fishing that could be affected by changes in CVP and SWP operations along the Pacific Coast of Northern California from Pigeon Point to southern Oregon (near Elk River). The Pacific Coast salmon fisheries are managed by the Pacific Fishery Management Council (PFMC) in waters between the United States/Canada border to the United States/Mexico border between 3 and 200 nautical miles offshore (PFMC 2014). The State DFW manages the salmon fisheries within 0 to 3 nautical miles offshore with regulations that are generally similar to the PFMC to the salmon fishing requirements. The PFMC analyzes the a fisheries evaluation each year; and defines the periods of time for the fishing season and minimum size fish to be caught for commercial, recreational, and tribal salmon fishing activities, as described in more detail for recreational and commercial salmon fishing in Chapter 19, Socioeconomics.

15.4 Impact Analysis

This section describes the potential mechanisms and analytical methods for change in recreation resources; results of the impact analysis; potential mitigation measures; and cumulative effects.

15.4.1 Potential Mechanisms for Change and Analytical Methods

As described in Chapter 4, Approach to Environmental Analysis, the impact analysis considers changes in recreational resources conditions related to changes

in CVP and SWP operations under the alternatives as compared to the No Action Alternative and Second Basis of Comparison.

As described in Section 15.3, Affected Environment, there are a wide range of recreational opportunities at the reservoirs and along the downstream rivers. This analysis focuses on the potential changes in these recreational opportunities and not specific recreational actions. For example, this analysis focuses on changes in surface water elevations at reservoirs which could affect boating, shoreline camping and picnicking, and use of trails. The changes in reservoir elevations would occur within the historical range of elevation changes; therefore, none of the recreational opportunities would be permanently reduced or expanded. The changes that would occur within the alternatives would change the potential for enjoyable recreational opportunities based upon changes in reservoir surface water elevations and river flows.

Changes in CVP and SWP operations under the alternatives as compared to the No Action Alternative and Second Basis of Comparison could change recreational opportunities at water bodies affected by CVP and SWP operations.

15.4.1.1 Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Reservoirs that store CVP and SWP water provide a wide diversity of recreational experiences on the water surface, at shoreline campgrounds, and along shoreline trails. By the end of September, the surface water elevations can decline from higher elevations in the spring by up to 100 feet in Shasta Lake and Lake Oroville; and over 50 feet in Trinity and Folsom lakes and New Melones and San Luis reservoirs. As the water elevations declines, boat ramps become unavailable and the water surface recedes along steep slopes from shoreline campgrounds and trails. Changes in CVP and SWP operations under the alternatives could change the surface water elevations, especially in dry and critical dry years as compared to the No Action Alternative and Second Basis of Comparison.

The CalSim II model output includes monthly reservoir elevations for CVP and SWP reservoirs in the Central Valley and Trinity Lake. The end of September reservoir elevations generally indicate low reservoir elevations. To assess changes in recreational resources, changes in reservoir elevations for the end of September were compared between alternatives and the No Action Alternative and Second Basis of Comparison. The reservoir elevations at the end of September were compared to minimum allowable boat ramp elevations as a measure of surface water accessibility.

Reservoirs in the San Francisco Bay Area, Central Coast, and Southern California regions store water from multiple water supplies including CVP and SWP water; however, these reservoirs are not included in the CalSim II model simulation. For the purposes of this EIS analysis, changes in surface water elevations in these reservoirs were assumed to be related to changes in CVP and SWP water deliveries to the areas located to the south of the Delta.

15.4.1.2 Changes in Recreational Resources along Rivers downstream of CVP and SWP Reservoirs

Changes in CVP and SWP operations under the alternatives could change the river flows in Trinity, Sacramento, Feather, American, and Stanislaus rivers in a manner that would affect recreational opportunities including boating and swimming during the spring and summer months, especially in dry and critical dry years.

Results of the CalSim II model were used to assess changes in average monthly flows that could affect recreational opportunities under the alternatives, the No Action Alternative, and the Second Basis of Comparison. This analysis is focused on the Trinity, Sacramento, Feather, American, and Stanislaus rivers. Generally, flow in rivers downstream of San Luis Reservoir and the reservoirs in the San Francisco Bay Area, Central Coast, and Southern California that store CVP and SWP water are based upon minimum instream flow requirements except in high flow events because the reservoirs are operated primarily to provide water into downstream water distribution systems.

15.4.1.3 Changes in Recreational Opportunities at Wildlife Refuges

Changes in CVP and SWP operations under the alternatives would not change water supplies to wildlife refuges that use CVP water for Level 2 water demands, as described in Chapter 5, Surface Water Resources and Water Supplies. Therefore, these changes are not analyzed in this EIS.

15.4.1.4 Effects Related to Water Transfers

Historically water transfer programs have been developed on an annual basis. The demand for water transfers is dependent upon the availability of water supplies to meet water demands. Water transfer transactions have increased over time as CVP and SWP water supply availability has decreased, especially during drier water years.

Water transfers using CVP and SWP Delta pumping plants and south of Delta canals generally occur when there is unused capacity in these facilities. These conditions generally occur drier water year types when the flows from upstream reservoirs plus unregulated flows are adequate to meet the Sacramento Valley water demands and the CVP and SWP export allocations. In non-wet years, the CVP and SWP water allocations would be less than full contract amounts; therefore, capacity may be available in the CVP and SWP conveyance facilities to move water from other sources.

Projecting future recreational conditions related to water transfer activities is difficult because specific water transfer actions required to make the water available, convey the water, and/or use the water would change each year due to changing hydrological conditions, CVP and SWP water availability, specific local agency operations, and local cropping patterns. Reclamation recently prepared a long-term regional water transfer environmental document which evaluated potential changes in conditions related to water transfer actions (Reclamation 2014f). Results from this analysis were used to inform the impact assessment of

potential effects of water transfers under the alternatives as compared to the No Action Alternative and the Second Basis of Comparison.

15.4.2 Conditions in Year 2030 without Implementation of Alternatives 1 through 5

This EIS includes two bases of comparison, as described in Chapter 3, Description of Alternatives: the No Action Alternative and the Second Basis of Comparison. Both of these bases are evaluated at 2030 conditions. Changes that would occur over the next 15 years without implementation of the alternatives are not analyzed in this EIS. However, the changes to recreational resources that are assumed to occur by 2030 under the No Action Alternative and the Second Basis of Comparison are summarized in this section. Many of the changed conditions would occur in the same manner under both the No Action Alternative and the Second Basis of Comparison.

15.4.2.1 Common Changes in Conditions under the No Action Alternative and Second Basis of Comparison

Conditions in 2030 would be different than existing conditions due to:

- Climate change and sea level rise
- General plan development throughout California, including increased water demands in portions of Sacramento Valley
- Implementation of reasonable and foreseeable water resources management projects to provide water supplies

It is anticipated that climate change would result in more short-duration high-rainfall events and less snowpack in the winter and early spring months. The reservoirs would be full more frequently by the end of April or May by 2030 than in recent historical conditions. However, as the water is released in the spring, there would be less snowpack to refill the reservoirs. This condition would reduce reservoir storage and available water supplies to downstream uses in the summer. The reduced end of September storage also would reduce the ability to release stored water to downstream regional reservoirs. These conditions would occur for all reservoirs in the California foothills and mountains, including non-CVP and SWP reservoirs.

Under the No Action Alternative and the Second Basis of Comparison, land uses in 2030 would occur in accordance with adopted general plans. Development under the general plans would could increase demand for recreational resources.

The No Action Alternative and the Second Basis of Comparison assumes completion of water resources management and environmental restoration projects that would have occurred without implementation of Alternatives 1 through 5, including regional and local recycling projects, surface water and groundwater storage projects, conveyance improvement projects, and desalination projects, as described in Chapter 3, Description of Alternatives. The No Action Alternative and the Second Basis of Comparison also assumes implementation of actions included in the 2008 USFWS Biological Opinion (BO) and 2009 NMFS

BO that would have been implemented without the BOs by 2030, as described in Chapter 3, Description of Alternatives. These projects would include several projects that would affect recreational resources, including restoration of more than 10,000 acres of intertidal and associated subtidal wetlands in Suisun Marsh and Cache Slough; and at least 17,000 to 20,000 acres of seasonal floodplain restoration in Yolo Bypass.

15.4.3 Evaluation of Alternatives

Alternatives 1 through 5 have been compared to the No Action Alternative; and the No Action Alternative and Alternatives 1 through 5 have been compared to the Second Basis of Comparison.

During review of the numerical modeling analyses used in this EIS, an error was determined in the CalSim II model assumptions related to the Stanislaus River operations for the Second Basis of Comparison, Alternative 1, and Alternative 4 model runs. Appendix 5C includes a comparison of the CalSim II model run results presented in this chapter and CalSim II model run results with the error corrected. Appendix 5C also includes a discussion of changes in the comparison of groundwater conditions for the following alternative analyses.

- No Action Alternative compared to the Second Basis of Comparison
- Alternative 1 compared to the No Action Alternative
- Alternative 3 compared to the Second Basis of Comparison
- Alternative 5 compared to the Second Basis of Comparison

15.4.3.1 No Action Alternative

The No Action Alternative is compared to the Second Basis of Comparison.

15.4.3.1.1 Trinity River Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under the No Action Alternative as compared to the Second Basis of Comparison would result in similar end of September reservoir elevations (changes within 5 percent) and related recreational resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

There are several boat ramps at Trinity Lake that provide access at different elevations. Boat ramps at Stuart Fork and Bowerman are not useable when the water elevation is less than 2,323 feet which occurs approximately 80 percent of the time under the No Action Alternative and Second Basis of Comparison. Boat ramps at Clark Springs, Fairview, and Trinity Center are not useable when the water elevation is lower than 2,300 feet which occurs approximately 62 percent of the time under the No Action Alternative and Second Basis of Comparison. The Minersville boat ramp is accessible until the elevation declines below 2,170 feet which occurs approximately 5 percent of the time under the No Action Alternative and Second Basis of Comparison.

Potential Changes in Recreational Resources along Rivers Downstream of the CVP and SWP Reservoirs

The following changes would occur on the Trinity River under the No Action Alternative as compared to the Second Basis of Comparison, as summarized in Chapter 5, Surface Water Resources and Water Supplies.

- Over long-term conditions, flows would be similar in March through November; and reduced in December through February (up to 9.5 percent).
- In wet years, flows would be similar in April through November; and reduced in December through March (up to 11.2 percent).
- In dry years, flows would be similar in all months.

Flows in Trinity River would be similar during the recreation season (spring and summer months); therefore, recreational opportunities would be similar.

15.4.3.1.2 Central Valley Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under the No Action Alternative as compared to the Second Basis of Comparison would result in similar end of September reservoir elevations and related recreational resources at Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above normal, below normal, and dry years, as described in Chapter 5, Surface Water Resources and Water Supplies. Changes in recreational resources at San Luis Reservoir would be reduced in wet year and critical dry years because the end of September surface water elevations would be reduced by 6.2 percent in wet and critical dry years.

There are several boat ramps at each of the reservoirs that provide access at different elevations. At Shasta Lake, boat ramps at Antlers, Hirz Bay, Packers Bay, Sugar Loaf, and Centimundi and Jones Valley are not accessible approximately 55, 35, 20, 10, and 9 percent of the time, respectively, under the No Action Alternative; and approximately 55, 30, 15, 10, and 7 percent of the time, respectively, under the Second Basis of Comparison.

At Lake Oroville, boat ramps at Enterprise, Vinton Gulch, and Nelson Bar; Foreman Creek; Dark Canyon and Loafer Creek; and Bidwell Canyon, Lime Saddle, and Spillway are not accessible approximately 95, 87, 73, and 35 percent of the time, respectively, under the No Action Alternative; and approximately 85, 75, 62, and 25 percent of the time, respectively, under the Second Basis of Comparison.

At Folsom Lake, boat ramps at Rattlesnake Bar, Beal's Point; Peninsula, Brown's Ravine, and Folsom Point; Hobie Cove; and Granite Bay are not accessible approximately 80, 65, 40, 10, and 7 percent of the time, respectively, under the No Action Alternative; and approximately 65, 40, 10, and 7 percent of the time, respectively, under the Second Basis of Comparison.

At New Melones Reservoir, the boat ramp at Angels Creek, Parrott's Ferry, Glory Hole, and Mark Twain are not accessible approximately 65, 25, 18, and 5 percent of the time, respectively, under the No Action Alternative; and approximately 30, 25, 15, 5 percent of the time, respectively, under the Second Basis of Comparison.

At San Luis Reservoir, the boat ramps at Dinosaur Point and Basalt Area are not useable approximately 50 and 10 percent of the time, respectively, under the No Action Alternative; and approximately 20 and 5 percent of the time, respectively, under the Second Basis of Comparison.

At all reservoirs, boating opportunities would be decreased, and shoreline recreational opportunities would be similar or decreased under the No Action Alternative as compared to the Second Basis of Comparison.

Potential Changes in Recreational Resources along Rivers Downstream of the CVP and SWP Reservoirs

The recreational opportunities along the Sacramento, Feather, American, and Stanislaus rivers would be affected by the following changes in river flows, as described in Chapter 5.

- Sacramento River downstream of Keswick Dam
  - Over long-term conditions, similar flows would occur in October, February through May, July, and August; increased flows in September and November (up to 37.7 percent); and reduced flows in December, January, and June (up to 7.8 percent).
  - In wet years, similar flows would occur in January through July; increased flows in September through November (up to 77.7 percent); and reduced flows in December and August (up to 14.6 percent).
  - In dry years, similar flows would occur in July through October, December through March, and May; increased flows in November (33.4 percent).
- Sacramento River at Freeport
  - Over long-term conditions, similar flows would occur in October, December through May, and August; increased flows in September, November, and July (up to 43.3 percent); and reduced flows in June (11.4 percent).
  - In wet years, similar flows would occur in January through June and October; increased flows in July through September and November (up to 90.3 percent); and reduced flows in December (10.7 percent).
  - In dry years, similar flows would occur in August through October and December through April; increased flows in November and July (up to 15.8 percent); and reduced flows in May and June (up to 11.9 percent).

- Feather River downstream of the Thermalito Complex
  - Over long-term conditions, similar flows would occur in November and April; increased flows in July through September (up to 76.1 percent); and reduced flows in October, December through March, May, and June (up to 27.2 percent).
  - In wet years, similar flows would occur in October through November and March through May; increased flows in July through September (up to 184 percent) and reduced flows in December through February (up to 26.0 percent).
  - In dry years, similar flows would occur in November through March; increased flows in April and July (up to 52.4 percent); and reduced flows in August through October and May and June (up to 27.6 percent).
- American River downstream of Nimbus Dam
  - Over long-term conditions, similar flows would occur in November through May and July; increased flows in September and October (up to 44.7 percent); and reduced flows in June and August (up to 6.1 percent).
  - In wet years, similar flows would occur in October through November and January through July; increased flows in September (91.1 percent) and reduced flows in December and August (up to 10.7 percent).
  - In dry years, similar flows would occur in all months except October, February and July; increased flows in October (16.5 percent); and reduced flows in February and July (up to 7.3 percent).
- Stanislaus River downstream of Goodwin Dam
  - Over long-term conditions, similar flows would occur in May and July through September; increased flows in October, March, and April (up to 148.7 percent); and reduced flows in November through February and June (up to 33.8 percent).
  - In wet years, similar flows would occur in February and April; increased flows in October, March, May, July, and August (up to 117.1 percent); and reduced flows in September, November through January, and June (up to 50.8 percent).
  - In dry years, similar flows would occur in July through September; increased flows in October and April (up to 154.3 percent); and reduced flows in November through March, May, and June (up to 35.7 percent).

During the spring and summer months, the changes in flow conditions between the No Action Alternative and the Second Basis of Comparison vary on a monthly basis in the Sacramento, Feather, American, and Stanislaus rivers within a water year type. For example, flows in the Sacramento River at Freeport would increase in several months under the No Action Alternative as compared to the Second Basis of Comparison by up to 90 percent, and decrease in several months up to 11 percent. The overall range of flows is within the historical operational

range; therefore, recreational opportunities still exist. However, the value of the recreational opportunities would be both improved and reduced depending upon the timing of the changes.

Overall, under the No Action Alternative and the Second Basis of Comparison, recreational opportunities would be reduced on the Sacramento River downstream of Keswick Dam; and both improved and reduced on the Sacramento River near Freeport, Feather River downstream of Thermalito Complex, American River downstream of Nimbus Dam, and the Stanislaus River downstream of Goodwin Dam depending upon the month.

Effects Related to Cross Delta Water Transfers

Potential effects to recreational resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c). Potential effects to recreational resources were identified as changes in reservoir surface water elevations, streams, and the Delta. The analysis indicated that these potential impacts would not be substantial because the conditions with and without the water transfers would be similar.

Under the No Action Alternative, the timing of cross Delta water transfers would be limited to July through September and include annual volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO. Under the Second Basis of Comparison, water could be transferred throughout the year without an annual volumetric limit. Overall, the potential for cross Delta water transfers would be less under the No Action Alternative than under the Second Basis of Comparison.

15.4.3.1.3 San Francisco Bay Area, Central Coast, and Southern California Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in recreational resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis. Monthly deliveries are not necessarily indicative of reservoir storage because all or a portion of the water deliveries could be directly conveyed to water users in any specific month. Therefore, annual deliveries are considered to be relatively proportional to the amount of water that could be stored over all water year types. In the San Francisco Bay Area Region, values for the CVP municipal and industrial water deliveries and the SWP south of the Delta water deliveries (without Article 21 deliveries) were considered; and SWP south of the Delta water deliveries (without Article 21 deliveries) were considered for the Central Coast and Southern California regions. Under the No Action Alternative as compared to the Second Basis of Comparison CVP water deliveries would be reduced by 10 percent and SWP water deliveries would be reduced by 18 percent. Therefore, for this EIS analysis, it is assumed that recreational resources related to surface water elevations in reservoirs that store CVP and SWP water supplies would be reduced by 10 to 18 percent in the

San Francisco Bay Area Region and 18 percent in the Central Coast and Southern California regions.

15.4.3.2 Alternative 1

Alternative 1 is identical to the Second Basis of Comparison. As described in Chapter 4, Approach to Environmental Analysis, Alternative 1 is compared to the No Action Alternative and the Second Basis of Comparison. However, because recreational resource conditions under Alternative 1 are identical to recreational resource conditions under the Second Basis of Comparison; Alternative 1 is only compared to the No Action Alternative.

15.4.3.2.1 Alternative 1 Compared to the No Action Alternative

Trinity River Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 1 as compared to the No Action Alternative would result in similar end of September reservoir elevations and related recreational resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

There are several boat ramps at Trinity Lake that provide access at different elevations. Boat ramps at Stuart Fork and Bowerman are not useable when the water elevation is less than 2,323 feet which occurs approximately 80 percent of the time under Alternative 1 and the No Action Alternative. Boat ramps at Clark Springs, Fairview, and Trinity Center are not useable when the water elevation is lower than 2,300 feet which occurs approximately 62 percent of the time under Alternative 1 and the No Action Alternative. The Minersville boat ramp is accessible until the elevation declines below 2,170 feet which occurs approximately 5 percent of the time under Alternative 1 and the No Action Alternative.

The potential for reduced recreational resources at Trinity Lake related to shoreline activities would be less under the No Action Alternative as compared to the Second Basis of Comparison.

Potential Changes in Recreational Resources along Rivers Downstream of the CVP and SWP Reservoirs

The following changes would occur on the Trinity River under Alternative 1 as compared to the No Action Alternative, as summarized in Chapter 5, Surface Water Resources and Water Supplies.

- Over long-term conditions, flows would be similar in March through November; and increased in December through February (up to 10.5 percent).
- In wet years, flows would be similar in April through November; and increased in December through March (up to 12.6 percent).
- In dry years, flows would be similar all months.

Flows in Trinity River would be similar during the recreation season (spring and summer months); therefore, recreational opportunities would be similar.

Central Valley Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 1 as compared to the No Action Alternative would result in similar end of September reservoir elevations and related recreational resources at Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above normal, below normal, and dry years, as described in Chapter 5, Surface Water Resources and Water Supplies. Changes in recreational resources at San Luis Reservoir would be reduced in wet year and critical dry years because the end of September surface water elevations would be increased by 6.6 percent in wet and critical dry years.

There are several boat ramps at each of the reservoirs that provide access at different elevations. At Shasta Lake, boat ramps at Antlers, Hirz Bay, Packers Bay, Sugar Loaf, and Centimundi and Jones Valley are not accessible approximately 55, 30, 15, 10, and 7 percent of the time, respectively, under Alternative 1; and approximately 55, 35, 20, 10, and 9 percent of the time, respectively, under the No Action Alternative.

At Lake Oroville, boat ramps at Enterprise, Vinton Gulch, and Nelson Bar; Foreman Creek; Dark Canyon and Loafer Creek; and Bidwell Canyon, Lime Saddle, and Spillway are not accessible approximately 85, 75, 62, and 25 percent of the time, respectively, under Alternative 1; and approximately 95, 87, 73, and 35 percent of the time, respectively, under the No Action Alternative.

At Folsom Lake, boat ramps at Rattlesnake Bar, Beal's Point; Peninsula, Brown's Ravine, and Folsom Point; Hobie Cove; and Granite Bay are not accessible approximately 65, 40, 10, and 7 percent of the time, respectively, under Alternative 1; and approximately 80, 65, 40, 10, and 7 percent of the time, respectively, under the No Action Alternative.

At New Melones Reservoir, the boat ramp at Angels Creek, Parrott's Ferry, Glory Hole, and Mark Twain are not accessible approximately 30, 25, 15, 5 percent of the time, respectively, under Alternative 1 as compared to approximately 65, 25, 18, and 5 percent of the time, respectively, under the No Action Alternative.

At San Luis Reservoir, the boat ramps at Dinosaur Point and Basalt Area are not useable approximately 20 and 5 percent of the time, respectively, under Alternative 1; and approximately 50 and 10 percent of the time, respectively, under the No Action Alternative.

At all reservoirs, boating opportunities would be increased, and shoreline recreational opportunities would be similar or increased under Alternative 1 as compared to the No Action Alternative.

Potential Changes in Recreational Resources along Rivers Downstream of the CVP and SWP Reservoirs

The recreational opportunities along the Sacramento, Feather, American, and Stanislaus rivers would be affected by the following changes in river flows, as described in Chapter 5.

- Sacramento River downstream of Keswick Dam
  - Over long-term conditions, similar flows would occur in October, February through May, July, and August; reduced flows in September and November (up to 27.4 percent); and increased flows in December, January, and June (up to 8.4 percent).
  - In wet years, similar flows would occur in January through July; reduced flows in September through November (up to 43.7 percent); and increased flows in December and August (up to 17.0 percent).
  - In dry years, similar flows would occur in July through October, December through March, and May; reduced flows in November (25.0 percent); and increased flows in April and June (up to 7.8 percent).
- Sacramento River at Freeport
  - Over long-term conditions, similar flows would occur in October, December through May, and August; reduced flows in September, November, and July (up to 30.2 percent); and increased flows in June (12.8 percent).
  - In wet years, similar flows would occur in January through June and October; reduced flows in July through September and November (up to 47.4 percent); and increased flows in December (6.6 percent).
  - In dry years, similar flows would occur in August through October and December through April; reduced flows in November and July (up to 13.6 percent); and increased flows in May and June (up to 13.5 percent).
- Feather River downstream of the Thermalito Complex
  - Over long-term conditions, similar flows would occur in November and April; reduced flows in July through September (up to 43.2 percent); and increased flows in October, December through March, May, and June (up to 37.4 percent).
  - In wet years, similar flows would occur in October, November, and March through May; reduced flows in July through September (up to 64.9 percent); and increased flows in December through February and June (up to 35.1 percent).
  - In dry years, similar flows would occur in December through April; reduced flows in July (34.4 percent); and increased flows in August through October, May, and June (up to 38.1 percent).

- American River downstream of Nimbus Dam
  - Over long-term conditions, similar flows would occur in November through May and July; reduced flows in September and October (up to 30.9 percent); and increased flows in June (5.4 percent).
  - In wet years, similar flows would occur in October, November, and January through July; reduced flows in September (47.7 percent); and increased flows in August (12.0 percent).
  - In dry years, similar flows would occur in November through January, March through June, August, and September; reduced flows in October (14.1 percent); and increased flows in February and July (up to 7.9 percent).
- Stanislaus River downstream of Goodwin Dam
  - Over long-term conditions, similar flows would occur in July through September; reduced flows in October, March, and April (up to 59.8 percent); and increased flows in November through February and June (up to 51.1 percent).
  - In wet years, similar flows would occur in February and April; reduced flows in October, March, May, July, and August (up to 53.9 percent); and increased flows in September, November through January, and June (up to 103.2 percent).
  - In dry years, similar flows would occur in July through September; reduced flows in October and April (up to 60.7 percent); and increased flows in November through March, May, and June (up to 55.5 percent).

During the spring and summer months, the changes in flow conditions between Alternative 1 as compared to the No Action Alternative vary on a monthly basis in the Sacramento, Feather, American, and Stanislaus rivers within a water year type. For example, flows in the Sacramento River at Freeport would increase in several months under Alternative 1 as compared to the No Action Alternative by up to 17 percent, and decrease in several months up to 44 percent. The overall range of flows is within the historical operational range; therefore, recreational opportunities still exist. However, the value of the recreational opportunities would be both improved and reduced depending upon the timing of the changes.

Overall, under Alternative 1 as compared to the No Action Alternative, recreational opportunities would be improved on the Sacramento River downstream of Keswick Dam; and both improved and reduced on the Sacramento River near Freeport, Feather River downstream of Thermalito Complex, American River downstream of Nimbus Dam, and the Stanislaus River downstream of Goodwin Dam depending upon the month.

Effects Related to Cross Delta Water Transfers

Potential effects to recreational resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as

described above under the No Action Alternative compared to the Second Basis of Comparison. For the purposes of this EIS, it is anticipated that similar conditions would occur during implementation of cross Delta water transfers under Alternative 1 and the No Action Alternative, and that impacts on recreational resources would not be substantial in the seller's service area due to implementation requirements of the transfer programs.

Under Alternative 1, water could be transferred throughout the year without an annual volumetric limit. Under the No Action Alternative, the timing of cross Delta water transfers would be limited to July through September and include annual volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO. Overall, the potential for cross Delta water transfers would be increased under Alternative 1 as compared to the No Action Alternative.

San Francisco Bay Area, Central Coast, and Southern California Regions

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in recreational resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis, as described above under the No Action Alternative as compared to the Second Basis of Comparison. Therefore, under Alternative 1 as compared to the No Action Alternative, recreational resources related to surface water elevations in reservoirs that store CVP and SWP water supplies would be increased by 11 to 21 percent in the San Francisco Bay Area Region and 21 percent in the Central Coast and Southern California regions.

15.4.3.2.2 Alternative 1 Compared to the Second Basis of Comparison

Alternative 1 is identical to the Second Basis of Comparison.

15.4.3.3 Alternative 2

The CVP and SWP operations under Alternative 2 are identical to the CVP and SWP operations under the No Action Alternative; therefore, Alternative 2 is only compared to the Second Basis of Comparison.

15.4.3.3.1 Alternative 2 Compared to the Second Basis of Comparison

The CVP and SWP operations under Alternative 2 are identical to the CVP and SWP operations under the No Action Alternative. Therefore, changes to recreational resources conditions under Alternatives 2 as compared to the Second Basis of Comparison would be the same as the impacts described in Section 15.4.3.1, No Action Alternative.

15.4.3.4 Alternative 3

As described in Chapter 3, Description of Alternatives, CVP and SWP operations under Alternative 3 are similar to the Second Basis of Comparison with modified Old and Middle River flow criteria and New Melones Reservoir operations; and additional predation control actions to reduce the populations of striped bass. As

described in Chapter 4, Approach to Environmental Analysis, Alternative 3 is compared to the No Action Alternative and the Second Basis of Comparison.

15.4.3.4.1 Alternative 3 Compared to the No Action Alternative

Trinity River Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 3 as compared to the No Action Alternative would result in similar end of September reservoir elevations and related recreational resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

There are several boat ramps at Trinity Lake that provide access at different elevations. Boat ramps at Stuart Fork and Bowerman are not useable when the water elevation is less than 2,323 feet which occurs approximately 80 percent of the time under Alternative 3 and the No Action Alternative. Boat ramps at Clark Springs, Fairview, and Trinity Center are not useable when the water elevation is lower than 2,300 feet which occurs approximately 62 percent of the time under Alternative 3 and the No Action Alternative. The Minersville boat ramp is accessible until the elevation declines below 2,170 feet which occurs approximately 5 percent of the time under Alternative 3 and the No Action Alternative.

Potential Changes in Recreational Resources along Rivers Downstream of the CVP and SWP Reservoirs

The following changes would occur on the Trinity River under Alternative 3 as compared to the No Action Alternative, as summarized in Chapter 5, Surface Water Resources and Water Supplies.

- Over long-term conditions, flows would be similar in March through November; and increased in December through February (up to 11.8 percent).
- In wet years, flows would be similar in April through October; reduced in November (7.0 percent); and increased in December through March (up to 15.1 percent).
- In dry years, flows would be similar in all months.

Flows in Trinity River would be similar during the recreation season (spring and summer months); therefore, recreational opportunities would be similar.

Central Valley Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 3 as compared to the No Action Alternative would result in similar end of September reservoir elevations and related recreational resources at Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in below normal, dry, and critical dry years, as described in Chapter 5,

Surface Water Resources and Water Supplies. Changes in recreational resources at San Luis Reservoir would be reduced in wet year and critical dry years because the end of September surface water elevations would be increased by 7.9 percent in wet years and 5.7 percent in above normal years.

There are several boat ramps at each of the reservoirs that provide access at different elevations. At Shasta Lake, boat ramps at Antlers, Hirz Bay, Packers Bay, Sugar Loaf, and Centimundi and Jones Valley are not accessible approximately 55, 30, 15, 10, and 7 percent of the time, respectively, under Alternative 3; and approximately 55, 35, 20, 10, and 9 percent of the time, respectively, under the No Action Alternative.

At Lake Oroville, boat ramps at Enterprise, Vinton Gulch, and Nelson Bar; Foreman Creek; Dark Canyon and Loafer Creek; and Bidwell Canyon, Lime Saddle, and Spillway are not accessible approximately 85, 75, 62, and 25 percent of the time, respectively, under Alternative 3; and approximately 95, 87, 73, and 35 percent of the time, respectively, under the No Action Alternative.

At Folsom Lake, boat ramps at Rattlesnake Bar, Beal's Point; Peninsula, Brown's Ravine, and Folsom Point; Hobie Cove; and Granite Bay are not accessible approximately 65, 40, 10, and 7 percent of the time, respectively, under Alternative 3; and approximately 80, 65, 40, 10, and 7 percent of the time, respectively, under the No Action Alternative.

At New Melones Reservoir, the boat ramp at Angels Creek, Parrott's Ferry, Glory Hole, and Mark Twain are not accessible approximately 22, 18, 10, and 5 percent of the time, respectively, under Alternative 3 as compared to approximately 65, 25, 18, and 5 percent of the time, respectively, under the No Action Alternative.

At San Luis Reservoir, the boat ramps at Dinosaur Point and Basalt Area are not useable approximately 28 and 8 percent of the time, respectively, under Alternative 3; and approximately 50 and 10 percent of the time, respectively, under the No Action Alternative.

At Lake Oroville, Folsom Lake, New Melones Reservoir, and San Luis Reservoir, boating opportunities would be increased, and opportunities would be similar at Shasta Lake under Alternative 3 as compared to the No Action Alternative. At Shasta Lake, Lake Oroville, and New Melones Reservoir shoreline recreational opportunities would be increased, and opportunities would be similar at Folsom Lake and San Luis Reservoir under Alternative 3 as compared to the No Action Alternative.

Potential Changes in Recreational Resources along Rivers Downstream of the CVP and SWP Reservoirs

The recreational opportunities along the Sacramento, Feather, American, and Stanislaus rivers would be affected by the following changes in river flows, as described in Chapter 5.

- Sacramento River downstream of Keswick Dam
  - Over long-term conditions, similar flows would occur in October, February through May, July, and August; reduced flows in September and November (up to 20.1 percent); and increased flows in December, January, and June (up to 8.9 percent).
  - In wet years, similar flows would occur in February through August; reduced flows in September through November (up to 42.1 percent); and increased flows in December and January (up to 16.9 percent).
  - In dry years, similar flows would occur in July through September and December through May; reduced flows in November (24.6 percent); and increased flows in January and June (up to 7.3 percent).
- Sacramento River at Freeport
  - Over long-term conditions, similar flows would occur in October, December through May, July, and August; reduced flows in September and November (up to 30.1 percent); and increased flows in June (12.1 percent).
  - In wet years, similar flows would occur in January through May, July, and October; reduced flows in August, September, and November (up to 48.1 percent); and increased flows in December and June (up to 6.6 percent).
  - In dry years, similar flows would occur in July through October and December through April; reduced flows in November (14.2 percent); and increased flows in May and June (up to 15.7 percent).
- Feather River downstream of the Thermalito Complex
  - Over long-term conditions, similar flows would occur in October, November, March, April, and July; reduced flows in August and September (up to 49.4 percent); and increased flows in December through February, May, and June (up to 33.9 percent).
  - In wet years, similar flows would occur in October, November, February through May, and July; reduced flows in August and September (up to 70.0 percent) and increased flows in December, January, and June (up to 28.1 percent).
  - In dry years, similar flows would occur in September and January through April; reduced flows in October through December and July (up to 14.5 percent); and increased flows in May, June, and August (36.9 percent).
- American River downstream of Nimbus Dam
  - Over long-term conditions, similar flows would occur in November, January through May, July, and August; reduced flows in September and October (up to 28.7 percent); and increased flows in June (5.8 percent).

  - In wet years, similar flows would occur in October, November, and January through July; reduced flows in September (45.9 percent); and increased flows in August and December (up to 8.5 percent).
  - In dry years, similar flows would occur in November through January and March through September; reduced flows in October (11.2 percent); and increased flows in February (6.1 percent).

- Stanislaus River downstream of Goodwin Dam
  - Over long-term conditions, reduced flows would occur in October and March through June (up to 58.3 percent); and increased flows in November through February and July through September (up to 36.81 percent).
  - In wet years, similar flows would occur in April; reduced flows in October, March, and May (up to 52.9 percent); and increased flows in June through September and November through February (up to 67.8 percent).
  - In dry years, similar flows would occur in March and July through September; reduced flows in October and April through June (up to 59.6 percent); and increased flows in November through February (up to 37.0 percent).

During the spring and summer months, the changes in flow conditions between Alternative 3 and the No Action Alternative vary on a monthly basis in the Sacramento, Feather, American, and Stanislaus rivers within a water year type. For example, flows in the Sacramento River at Freeport would increase in several months under Alternative 3 as compared to the No Action Alternative by up to 15 percent, and decrease in several months up to 30 percent. The overall range of flows is within the historical operational range; therefore, recreational opportunities still exist. However, the value of the recreational opportunities would be both improved and reduced depending upon the timing of the changes.

Overall, under Alternative 3 as compared to the No Action Alternative, recreational opportunities would be similar or improved on the Sacramento River downstream of Keswick Dam and American River downstream of Nimbus Dam; and both improved and reduced on the Sacramento River near Freeport, Feather River downstream of Thermalito Complex, and the Stanislaus River downstream of Goodwin Dam depending upon the month.

Recreational opportunities related to Striped Bass fishing would be reduced under Alternative 3 as compared to the No Action Alternative due to actions to reduce predation.

Effects Related to Cross Delta Water Transfers

Potential effects to recreational resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as described above under the No Action Alternative compared to the Second Basis

of Comparison. For the purposes of this EIS, it is anticipated that similar conditions would occur during implementation of cross Delta water transfers under Alternative 3 and the No Action Alternative, and that impacts on recreational resources would not be substantial in the seller's service area due to implementation requirements of the transfer programs.

Under Alternative 3, water could be transferred throughout the year without an annual volumetric limit. Under the No Action Alternative, the timing of cross Delta water transfers would be limited to July through September and include annual volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO. Overall, the potential for cross Delta water transfers would be increased under Alternative 3 as compared to the No Action Alternative.

San Francisco Bay Area, Central Coast, and Southern California Regions

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in recreational resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis, as described above under the No Action Alternative as compared to the Second Basis of Comparison. Therefore, under Alternative 3 as compared to the No Action Alternative, recreational resources related to surface water elevations in reservoirs that store CVP and SWP water supplies would be increased by 9 to 17 percent in the San Francisco Bay Area Region and 17 percent in the Central Coast and Southern California regions.

15.4.3.4.2 Alternative 3 Compared to the Second Basis of Comparison

Trinity River Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 3 as compared to the Second Basis of Comparison would result in similar end of September reservoir elevations and related recreational resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

There are several boat ramps at Trinity Lake that provide access at different elevations. Boat ramps at Stuart Fork and Bowerman are not useable when the water elevation is less than 2,323 feet which occurs approximately 80 percent of the time under Alternative 3 and the Second Basis of Comparison. Boat ramps at Clark Springs, Fairview, and Trinity Center are not useable when the water elevation is lower than 2,300 feet which occurs approximately 62 percent of the time under Alternative 3 and the Second Basis of Comparison. The Minersville boat ramp is accessible until the elevation declines below 2,170 feet which occurs approximately 5 percent of the time under Alternative 3 and the Second Basis of Comparison.

The potential for reduced recreational resources at Trinity Lake related to shoreline activities would be greater in critical dry years and similar in dry years and over the long-term average conditions under the No Action Alternative as compared to the Second Basis of Comparison.

Potential Changes in Recreational Resources along Rivers Downstream of the CVP and SWP Reservoirs

Flows in the Trinity River and recreational opportunities under Alternative 3 would be similar to the Second Basis of Comparison, as summarized in Chapter 5, Surface Water Resources and Water Supplies.

Central Valley Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 3 as compared to the Second Basis of Comparison would result in similar end of September reservoir elevations and related recreational resources at Shasta Lake, Lake Oroville, Folsom Lake, New Melones Reservoir, and San Luis Reservoir in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

There are several boat ramps at each of the reservoirs that provide access at different elevations. At Shasta Lake, boat ramps at Antlers, Hirz Bay, Packers Bay, Sugar Loaf, and Centimundi and Jones Valley are not accessible approximately 55, 30, 15, 10, and 7 percent of the time, respectively, under Alternative 3 and the Second Basis of Comparison.

At Lake Oroville, boat ramps at Enterprise, Vinton Gulch, and Nelson Bar; Foreman Creek; Dark Canyon and Loafer Creek; and Bidwell Canyon, Lime Saddle, and Spillway are not accessible approximately 85, 75, 62, and 35 percent of the time, respectively, under Alternative 3 and the Second Basis of Comparison.

At Folsom Lake, boat ramps at Rattlesnake Bar; Beal's Point; Peninsula, Brown's Ravine, and Folsom Point; Hobie Cove; and Granite Bay are not accessible approximately 70, 65, 40, 10, and 7 percent of the time, respectively, under Alternative 3 and the Second Basis of Comparison.

At New Melones Reservoir, the boat ramp at Angels Creek, Parrott's Ferry, Glory Hole, and Mark Twain are not accessible approximately 22, 18, 10, and 8 percent of the time, respectively, under Alternative 3 as compared to approximately 30, 25, 15, and 3 percent of the time, respectively, under the Second Basis of Comparison.

At San Luis Reservoir, the boat ramps at Dinosaur Point and Basalt Area are not useable approximately 28 and 8 percent of the time, respectively, under Alternative 3; and approximately 20 and 5 percent of the time, respectively, under the Second Basis of Comparison.

Boating opportunities would be increased at New Melones Reservoir, decreased at San Luis Reservoir, and similar at all other reservoirs under Alternative 3 as compared to the Second Basis of Comparison. Shoreline recreational opportunities would be increased at New Melones Reservoir, decreased at Lake Oroville, and similar at all other reservoirs under Alternative 3 as compared to the Second Basis of Comparison.

Potential Changes in Recreational Resources along Rivers Downstream of the CVP and SWP Reservoirs

The recreational opportunities along the Sacramento, Feather, American, and Stanislaus rivers would be affected by the following changes in river flows, as described in Chapter 5.

- Similar or increased flows in the Sacramento River downstream of Keswick Dam and at Freeport.
- Feather River downstream of the Thermalito Complex
  - Over long-term conditions, similar flows would occur in November and January through June; reduced flows in October, December, and September (up to 12.5 percent); and increased flows in July and August (up to 17.0 percent).
  - In wet years, similar flows would occur in November and January through May; reduced flows in October, December, and September (up to 14.6 percent); and increased flows in June through August (up to 10.9 percent).
  - In dry years, similar flows would occur in November and January through June; reduced flows in August through October (up to 21.2 percent); and increased flows in July (37.1 percent).
- Similar flows in American River downstream of Nimbus Dam.
- Stanislaus River downstream of Goodwin Dam
  - Over long-term conditions, similar flows would occur in October, December, January, and March; reduced flows would occur in November, May, and June (up to 52.3 percent); and increased flows in February, April, July, and August through September (up to 26.8 percent).
  - In wet years, similar flows would occur in October, November, January, and April; reduced flows in May and June (up to 44.8 percent); and increased flows in December, February, March, and July through September (up to 68.6 percent).
  - In dry years, similar flows would occur in July through October; reduced flows in November through March and May through June (up to 36.0 percent); and increased flows in April (40.2 percent).

During the spring and summer months, the changes in flow conditions between Alternative 3 and the Second Basis of Comparison vary on a monthly basis in the Sacramento, Feather, American, and Stanislaus rivers within a water year type.

For example, flows in the Stanislaus River downstream of Goodwin Dam would increase in several months under Alternative 3 as compared to the Second Basis of Comparison by up to 90 percent, and decrease in several months up to 11 percent. The overall range of flows is within the historical operational range; therefore, recreational opportunities still exist.

Overall, under Alternative 3 as compared to the Second Basis of Comparison, recreational opportunities would be similar or improved on the Sacramento, Feather, and American rivers; and both improved and reduced on the Stanislaus River depending upon the month.

Recreational opportunities related to Striped Bass fishing would be reduced under Alternative 3 as compared to the Second Basis of Comparison due to actions to reduce predation.

Effects Related to Cross Delta Water Transfers

Potential effects to recreational resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as described above under the No Action Alternative compared to the Second Basis of Comparison. For the purposes of this EIS, it is anticipated that similar conditions would occur during implementation of cross Delta water transfers under Alternative 3 and the Second Basis of Comparison, and that impacts on recreational resources would not be substantial in the seller's service area due to implementation requirements of the transfer programs.

Under Alternative 3 and the Second Basis of Comparison, water could be transferred throughout the year without an annual volumetric limit. Overall, the potential for cross Delta water transfers would be similar under Alternative 3 and the Second Basis of Comparison.

San Francisco Bay Area, Central Coast, and Southern California Regions

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in recreational resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis, as described above under the No Action Alternative as compared to the Second Basis of Comparison. Therefore, under Alternative 3 as compared to the Second Basis of Comparison, recreational resources related to surface water elevations in reservoirs that store CVP and SWP water supplies would be similar (changes within 5 percent).

15.4.3.5 Alternative 4

The recreational resources under Alternative 4 would be similar to the conditions under the Second Basis of Comparison with additional predation control actions to reduce the populations of striped bass.

15.4.3.5.1 Alternative 4 Compared to the No Action Alternative

The CVP and SWP operations under Alternative 4 are identical to the CVP and SWP operations under the Second Basis of Comparison and Alternative 1. However, Alternative 4 includes predation controls as compared to the Second Basis. Therefore, reservoir and flow-related changes in recreational resources under Alternative 4 as compared to the No Action Alternative would be the same as the impacts described in Section 15.4.3.2.1, Alternative 1 Compared to the No Action Alternative.

Recreational opportunities related to Striped Bass fishing would be reduced under Alternative 4 as compared to the No Action Alternative due to actions to reduce predation.

15.4.3.5.2 Alternative 4 Compared to the Second Basis of Comparison

The CVP and SWP operations under Alternative 4 are identical to the CVP and SWP operations under the Second Basis of Comparison and Alternative 1. However, Alternative 4 includes predation controls as compared to the Second Basis of Comparison. Therefore, flow-related changes in recreational resources under Alternative 4 are the same as recreational resources under the Second Basis of Comparison. Recreational opportunities related to Striped Bass fishing would be reduced under Alternative 4 as compared to the Second Basis of Comparison due to actions to reduce predation.

15.4.3.6 Alternative 5

As described in Chapter 3, Description of Alternatives, CVP and SWP operations under Alternative 5 are similar to the No Action Alternative with modified Old and Middle River flow criteria and New Melones Reservoir operations. As described in Chapter 4, Approach to Environmental Analysis, Alternative 5 is compared to the No Action Alternative and the Second Basis of Comparison.

15.4.3.6.1 Alternative 5 Compared to the No Action Alternative

Trinity River Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 5 as compared to the No Action Alternative would result in similar end of September reservoir elevations and related recreational resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

There are several boat ramps at Trinity Lake that provide access at different elevations. Boat ramps at Stuart Fork and Bowerman are not useable when the water elevation is less than 2,323 feet which occurs approximately 80 percent of the time under Alternative 5 and the No Action Alternative. Boat ramps at Clark Springs, Fairview, and Trinity Center are not useable when the water elevation is lower than 2,300 feet which occurs approximately 62 percent of the time under Alternative 5 and the No Action Alternative. The Minersville boat ramp is accessible until the elevation declines below 2,170 feet which occurs

approximately 8 percent of the time under Alternative 5 and 5 percent of the time under the No Action Alternative.

The potential for reduced recreational resources at Trinity Lake related to shoreline activities would be slightly less in critical dry years and similar over the long-term average conditions and dry years under Alternative 5 as compared to the No Action Alternative.

Potential Changes in Recreational Resources along Rivers Downstream of the CVP and SWP Reservoirs

Flows in the Trinity River and recreational opportunities under Alternative 5 would be similar to the No Action Alternative, as summarized in Chapter 5, Surface Water Resources and Water Supplies.

Central Valley Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 5 as compared to the No Action Alternative would result in similar end of September reservoir elevations and related recreational resources at Shasta Lake, Lake Oroville, Folsom Lake, New Melones Reservoir, and San Luis Reservoir in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

There are several boat ramps at each of the reservoirs that provide access at different elevations. At Shasta Lake, boat ramps at Antlers, Hirz Bay, Packers Bay, Sugar Loaf, and Centimundi and Jones Valley are not accessible approximately 55, 35, 20, 10, and 9 percent of the time, respectively, under Alternative 5 and the No Action Alternative.

At Lake Oroville, boat ramps at Enterprise, Vinton Gulch, and Nelson Bar; Foreman Creek; Dark Canyon and Loafer Creek; and Bidwell Canyon, Lime Saddle, and Spillway are not accessible approximately 95, 87, 73, and 35 percent of the time, respectively, under Alternative 5 and the Second Basis of Comparison.

At Folsom Lake, boat ramps at Rattlesnake Bar, Beal's Point; Peninsula, Brown's Ravine, and Folsom Point; Hobie Cove; and Granite Bay are not accessible approximately 80, 65, 40, 10, and 7 percent of the time, respectively, under Alternative 5 and the No Action Alternative.

At New Melones Reservoir, the boat ramp at Angels Creek, Parrott's Ferry, Glory Hole, and Mark Twain are not accessible approximately 35, 30, 22, and 8 percent of the time, respectively, under Alternative 5 as compared to approximately 65, 25, 18, and 5 percent of the time, respectively, under the No Action Alternative.

At San Luis Reservoir, the boat ramps at Dinosaur Point and Basalt Area are not useable approximately 50 and 10 percent of the time, respectively, under Alternative 5 and the No Action Alternative.

Increased shoreline recreational opportunities at New Melones Reservoir in long-term average conditions and dry years, decreased opportunities at New Melones Reservoir in critical dry years, and similar opportunities at all times analyzed at all other reservoirs under Alternative 5 as compared to the No Action Alternative. Increased boating opportunities at New Melones Reservoir and similar opportunities at all other reservoirs under Alternative 5 as compared to the No Action Alternative.

Potential Changes in Recreational Resources along Rivers downstream of the CVP and SWP Reservoirs

The recreational opportunities along the Sacramento, Feather, American, and Stanislaus rivers would be affected by the following changes in river flows, as described in Chapter 5.

- Flows in the Sacramento River downstream of Keswick Dam and near Freeport would be similar.
- Feather River downstream of the Thermalito Complex
  - Over long-term conditions, similar flows would occur in June through April; and reduced flows in May (6.6 percent).
  - In wet years, similar flows would occur in all months.
  - In dry years, similar flows would occur in September through April and June; reduced flows in May (27.1 percent); and increased flows in July and August (up to 8.9 percent).
- Flows in the American River downstream of Nimbus Dam would be similar.
- Stanislaus River downstream of Goodwin Dam
  - Over long-term conditions, flows would be similar in September through February and June; reduced flows would occur in March, July, and August (up to 8.0 percent); and increased flows in April and May (up to 22.4 percent).
  - In wet years, similar flows would occur in October, November, January, February, and April through June; reduced flows in December, March, and July through September (up to 18.0 percent).
  - In dry years, similar flows would occur in June through March; and increased flows in April and May (up to 47.3 percent).

During the spring and summer months, the changes in flow conditions between Alternative 5 and the No Action Alternative vary on a monthly basis in the Sacramento, Feather, American, and Stanislaus rivers within a water year type. For example, flows in the Feather River downstream of Thermalito Complex would increase in several months under Alternative 5 and the No Action Alternative by up to 9 percent, and decrease in several months up to 27 percent. The overall range of flows is within the historical operational range; therefore, recreational opportunities still exist. However, the value of the recreational

opportunities would be both improved and reduced depending upon the timing of the changes.

Overall, under Alternative 5 and the No Action Alternative, recreational opportunities would be similar or improved on the Sacramento and American rivers; and both improved and reduced on the Feather and Stanislaus rivers.

Effects Related to Cross Delta Water Transfers

Potential effects to recreational resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as described above under the No Action Alternative compared to the Second Basis of Comparison. For the purposes of this EIS, it is anticipated that similar conditions would occur during implementation of cross Delta water transfers under Alternative 5 and the No Action Alternative, and that impacts on recreational resources would not be substantial in the seller's service area due to implementation requirements of the transfer programs.

Under Alternative 5 and the No Action Alternative, the timing of cross Delta water transfers would be limited to July through September and include annual volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO. Overall, the potential for cross Delta water transfers would be similar under Alternative 5 and the No Action Alternative.

San Francisco Bay Area, Central Coast, and Southern California Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in recreational resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis, as described above under the No Action Alternative as compared to the Second Basis of Comparison. Therefore, under Alternative 5 as compared to the No Action Alternative, recreational resources would be similar.

15.4.3.6.2 Alternative 5 Compared to the Second Basis of Comparison

Trinity River Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 5 as compared to the Second Basis of Comparison would result in similar end of September reservoir elevations and related recreational resources at Trinity Lake in all water year types, as described in Chapter 5, Surface Water Resources and Water Supplies.

There are several boat ramps at Trinity Lake that provide access at different elevations. Boat ramps at Stuart Fork and Bowerman are not useable when the water elevation is less than 2,323 feet which occurs approximately 80 percent of the time under Alternative 5 and the Second Basis of Comparison. Boat ramps at

Clark Springs, Fairview, and Trinity Center are not useable when the water elevation is lower than 2,300 feet which occurs approximately 62 percent of the time under Alternative 5 and the Second Basis of Comparison. The Minersville boat ramp is accessible until the elevation declines below 2,170 feet which occurs approximately 8 percent of the time under Alternative 5 and 5 percent of the time under the Second Basis of Comparison.

The potential for reduced recreational resources at Trinity Lake related to shoreline activities would be similar under Alternative 5 as compared to the Second Basis of Comparison.

Potential Changes in Recreational Resources along Rivers Downstream of the CVP and SWP Reservoirs

Flows in Trinity River would be similar during the recreation season (spring and summer months); therefore, recreational opportunities would be similar under Alternative 5 as compared to the Second Basis of Comparison.

Central Valley Region

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in CVP water supplies and operations under Alternative 5 as compared to the Second Basis of Comparison would result in similar end of September reservoir elevations and related recreational resources at Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in wet, above normal, and below normal years, as described in Chapter 5, Surface Water Resources and Water Supplies. Changes in recreational resources at San Luis Reservoir would be reduced in dry year and critical dry years because the end of September surface water elevations would be decreased by 6.2 percent in dry years and 8.5 percent in critical dry years.

There are several boat ramps at each of the reservoirs that provide access at different elevations. At Shasta Lake, boat ramps at Antlers, Hirz Bay, Packers Bay, Sugar Loaf, and Centimundi and Jones Valley are not accessible approximately 55, 35, 20, 10, and 9 percent of the time, respectively, under Alternative 5; and approximately 55, 30, 15, 10, and 7 percent of the time, respectively, under the Second Basis of Comparison.

At Lake Oroville, boat ramps at Enterprise, Vinton Gulch, and Nelson Bar; Foreman Creek; Dark Canyon and Loafer Creek; and Bidwell Canyon, Lime Saddle, and Spillway are not accessible approximately 95, 87, 73, and 35 percent of the time, respectively, under Alternative 5; and approximately 85, 75, 62, and 25 percent of the time, respectively, under the Second Basis of Comparison.

At Folsom Lake, boat ramps at Rattlesnake Bar are not accessible 80 percent of the time under Alternative 5, and 70 percent of the time, respectively, under the Second Basis of Comparison. Boat ramps at Beal's Point; Peninsula, Brown's Ravine, and Folsom Point; Hobie Cove; and Granite Bay are not accessible approximately 65, 40, 10, and 7 percent of the time, respectively, under Alternative 5 and the Second Basis of Comparison.

At New Melones Reservoir, the boat ramp at Angels Creek, Parrott's Ferry, Glory Hole, and Mark Twain are not accessible approximately 35, 30, 22, and 8 percent of the time, respectively, under Alternative 5 as compared to approximately 30, 25, 15, and 5 percent of the time, respectively, under the Second Basis of Comparison.

At San Luis Reservoir, the boat ramps at Dinosaur Point and Basalt Area are not useable approximately 50 and 10 percent of the time, respectively, under Alternative 5; and approximately 20 and 5 percent of the time, respectively, under the Second Basis of Comparison.

Decreased shoreline recreational opportunities at Shasta Lake, Lake Oroville, and New Melones Reservoir, and similar opportunities at all other reservoirs under Alternative 5 as compared to the Second Basis of Comparison. Decreased boating opportunities at Lake Oroville, New Melones Reservoir, and San Luis Reservoir and similar opportunities at all other reservoirs under Alternative 5 as compared to the Second Basis of Comparison.

Potential Changes in Recreational Resources along Rivers Downstream of the CVP and SWP Reservoirs

The recreational opportunities along the Sacramento, Feather, American, and Stanislaus rivers would be affected by the following changes in river flows, as described in Chapter 5.

- Sacramento River downstream of Keswick Dam
  - Over long-term conditions, flows would be similar in July, August, October, and February through April; reduced in December, January, May and June (up to 8.2 percent); and increased in September and November (up to 38.5 percent).
  - In wet years, flows would be similar in January through July; reduced in December and August (up to 15.0 percent); and increased in September through November (up to 77.3 percent).
  - In dry years, similar flows would occur in July through October and December through March; reduced in April through June (up to 10.1 percent); and increased flows in November (32.1 percent).
- Sacramento River at Freeport
  - Over long-term conditions, flows would be similar in October and December through April; reduced in May and June (up to 11.5 percent); and increased in July through September and November (43.4 percent).
  - In wet years, flows would be similar in October and January through June; reduced in December (6.2 percent); and increased in July through September and November (up to 89.0 percent).
  - In dry years, similar flows would occur in August through October and December through April; reduced in May and June (up to 13.6 percent); and increased flows in July and November (up to 19.3 percent).

- Feather River downstream of the Thermalito Complex
  - Over long-term conditions, similar flows would occur in November and April; reduced flows in October, December through March, May, and June (up to 27.7 percent); and increased flows in July through September (up to 76.2 percent).
  - In wet years, similar flows would occur in October, November, March through May; reduced flows in December through February and June (up to 25.6 percent); and increased flows in July through September (up to 181.9 percent).
  - In dry years, similar flows would occur in November through April; reduced flows in October, May, June, August, and September (up to 45.4 percent); and increased flows in July (60.4 percent).
- American River downstream of Nimbus Dam
  - Over long-term conditions, similar flows would occur in November through July; reduced flows in August (5.8 percent); and increased in September and October (42.4 percent).
  - In wet years, similar flows would occur in October, November, and January through July; reduced flows in December and August (up to 13.7 percent); and increased flows in September (88.2 percent).
  - In dry years, similar flows would occur in November through September; and increased flows in October (16.7 percent).
- Stanislaus River downstream of Goodwin Dam
  - Over long-term conditions, similar flows would occur in August; reduced flows would occur in November through February, June, July, August, and September (up to 35.8 percent); and increased flows in October and March through May (up to 144.8 percent).
  - In wet years, similar flows would occur in February and April; reduced flows in November through January and June through September (up to 52.8 percent); and increased flows in October and March (up to 113.1 percent).
  - In dry years, similar flows would occur in July through September; reduced flows in November through March and June (up to 35.7 percent); and increased flows in October, April, and May (150.1 percent).

During the spring and summer months, the changes in flow conditions between Alternative 5 and the Second Basis of Comparison vary on a monthly basis in the Sacramento, Feather, American, and Stanislaus rivers within a water year type. For example, flows in the Sacramento River at Freeport would increase in several months under Alternative 5 as compared to the Second Basis of Comparison by up to 89 percent, and decrease in several months up to 13 percent. The overall range of flows is within the historical operational range; therefore, recreational

opportunities still exist. However, the value of the recreational opportunities would be both improved and reduced depending upon the timing of the changes.

Overall, under Alternative 5 as compared to the Second Basis of Comparison, recreational opportunities would be similar or improved on the Sacramento River downstream of Keswick Dam and American River downstream of Nimbus Dam; and both improved and reduced on the Sacramento River near Freeport, Feather River downstream of Thermalito Complex, and the Stanislaus River downstream of Goodwin Dam depending upon the month.

Effects Related to Cross Delta Water Transfers

Potential effects to recreational resources could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as described above under the No Action Alternative compared to the Second Basis of Comparison. For the purposes of this EIS, it is anticipated that similar conditions would occur during implementation of cross Delta water transfers under Alternative 5 and the Second Basis of Comparison, and that impacts on recreational resources would not be substantial in the seller's service area due to implementation requirements of the transfer programs.

Under Alternative 5, the timing of cross Delta water transfers would be limited to July through September and include annual volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO. Under the Second Basis of Comparison, water could be transferred throughout the year without an annual volumetric limit. Overall, the potential for cross Delta water transfers would be reduced under Alternative 5 as compared to the Second Basis of Comparison.

San Francisco Bay Area, Central Coast, and Southern California Regions

Potential Changes in Recreational Resources at Reservoirs that Store CVP and SWP Water

Changes in recreational resources at reservoirs that store CVP and SWP water supplies are assumed to be related to changes in water deliveries over long-term conditions for this EIS analysis, as described above under the No Action Alternative as compared to the Second Basis of Comparison. Therefore, under Alternative 5 as compared to the Second Basis of Comparison, recreational resources related to surface water elevations in reservoirs that store CVP and SWP water supplies would be reduced by 10 to 18 percent in the San Francisco Bay Area Region and 18 percent in the Central Coast and Southern California regions.

15.4.3.7 Summary of Impact Assessment

The results of the impact assessment of implementation of Alternatives 1 through 5 as compared to the No Action Alternative and the Second Basis of Comparison are presented in Tables 15.28 and 15.29.

Table 15.28 Comparison of Alternatives 1 through 5 to No Action Alternative

Alternative	Potential Change	Consideration for Mitigation Measures
Alternative 1	Recreational resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above normal, below normal, and dry years. Recreational resources would be increased by 6 percent in wet and critical dry years at San Luis Reservoir, by 11 to 21 percent in the San Francisco Bay Area Region, and by 21 percent in the Central Coast and Southern California regions. Recreational resources similar on Trinity River; improved on the Sacramento River downstream of Keswick Dam; and both improved and reduced on the Sacramento River near Freeport, Feather River downstream of Thermalito Complex, American River downstream of Nimbus Dam, and the Stanislaus River downstream of Goodwin Dam depending upon the month.	Changes in CVP and SWP operations to reduce impacts on recreational opportunities in the rivers.
Alternative 2	No effects on recreational resources.	None needed
Alternative 3	Recreational resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above normal, below normal, and dry years. Recreational resources would be increased by 8 percent in wet years and 6 percent in above normal years at San Luis Reservoir, by 9 to 17 percent in the San Francisco Bay Area Region, and by 17 percent in the Central Coast and Southern California regions. Recreational resources similar on Trinity River, Sacramento River downstream of Keswick Dam, and American River downstream of Nimbus Dam; and both improved and reduced on the Sacramento River near Freeport, Feather River downstream of Thermalito Complex, and the Stanislaus River downstream of Goodwin Dam depending upon the month. Recreational opportunities related to Striped Bass fishing would be reduced.	Changes in CVP and SWP operations to reduce impacts on recreational opportunities in the rivers. No mitigation measures available to reduce impacts to reduction in Striped Bass fishing opportunities.
Alternative 4	Reservoir and flow-related recreational opportunities would be as described for Alternative 1 compared to the No Action Alternative. Recreational opportunities related to Striped Bass fishing would be reduced.	Changes in CVP and SWP operations to reduce impacts on recreational opportunities in the rivers. No mitigation measures available to reduce impacts to reduction in Striped Bass fishing opportunities.
Alternative 5	Recreational resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, San Luis Reservoir, and other reservoirs that store CVP and SWP water in the San Francisco Bay Area, Central Coast, and Southern California regions. Recreational resources similar or improved on Trinity, Sacramento and American rivers; and both improved and reduced on the Feather and Stanislaus rivers.	Changes in CVP and SWP operations to reduce impacts on recreational opportunities in the rivers.

Table 15.29 Comparison of No Action Alternative and Alternatives 1 through 5 to Second Basis of Comparison

Alternative	Potential Change	Consideration for Mitigation Measures
No Action Alternative	Recreational resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above normal, below normal, and dry years. Recreational resources would be reduced by 6 percent in wet and critical dry years at San Luis Reservoir, by 10 to 18 percent in the San Francisco Bay Area Region, and by 18 percent in the Central Coast and Southern California regions. Recreational resources similar on Trinity River; reduced on the Sacramento River downstream of Keswick Dam; and both improved and reduced on the Sacramento River near Freeport, Feather River downstream of Thermalito Complex, American River downstream of Nimbus Dam, and the Stanislaus River downstream of Goodwin Dam depending upon the month.	Not considered for this comparison.
Alternative 1	No effects on recreational resources.	Not considered for this comparison.
Alternative 2	Same effects as described for No Action Alternative as compared to the Second Basis of Comparison.	Not considered for this comparison.
Alternative 3	Recreational resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, San Luis Reservoir, and other reservoirs that store CVP and SWP water in the San Francisco Bay Area, Central Coast, and Southern California regions. Recreational resources similar on Trinity River, Sacramento, Feather, and American rivers; and both improved and reduced on the Stanislaus River depending upon the month. Recreational opportunities related to Striped Bass fishing would be reduced.	Not considered for this comparison.
Alternative 4	Reservoir and flow-related recreational opportunities would be similar. Recreational opportunities related to Striped Bass fishing would be reduced.	Not considered for this comparison.
Alternative 5	Recreational resources would be similar at Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, and New Melones Reservoir in all water year types; and at San Luis Reservoir in above normal, below normal, and dry years. Recreational resources would be reduced by 6 percent in dry years and 9 percent in critical dry years at San Luis Reservoir, by 10 to 18 percent in the San Francisco Bay Area Region, and by 18 percent in the Central Coast and Southern California regions. Recreational resources similar or improved on Trinity River, Sacramento River downstream of Keswick Dam, and American River downstream of Nimbus Dam; and both improved and reduced on the Sacramento River near Freeport, Feather River downstream of Thermalito Complex, and the Stanislaus River downstream of Goodwin Dam depending upon the month.	Not considered for this comparison.

15.4.3.8 Potential Mitigation Measures

Changes in CVP and SWP operations under Alternatives 1 through 5 as compared to the No Action Alternative would not result in adverse changes in recreational resources at reservoirs. However, in some portions of the years, flows are substantially reduced on the Sacramento River near Freeport, Feather River downstream of Thermalito Complex, American River downstream of Nimbus Dam, and the Stanislaus River downstream of Goodwin Dam under the alternatives as compared to the No Action Alternative. The flow patterns are reflective of the definition of the alternative; and would be mitigated by changes in CVP and SWP operations to reduce impacts on recreational opportunities in the rivers.

Under Alternatives 3 and 4, fishing opportunities for Striped Bass would be reduced as compared to the No Action Alternative. Although, fishing opportunities for salmonids could be improved; the recreational opportunities are not identical. Mitigation measures may not exist to reduce the impact to the Striped Bass recreational opportunities.

15.4.3.9 Cumulative Effects Analysis

As described in Chapter 3, the cumulative effects analysis considers projects, programs, and policies that are not speculative; and are based upon known or reasonably foreseeable long-range plans, regulations, operating agreements, or other information that establishes them as reasonably foreseeable.

The No Action Alternative, Alternatives 1 through 5, and Second Basis of Comparison include climate change and sea level rise, implementation of general plans, and completion of ongoing projects and programs (see Chapter 3, Description of Alternatives). The effects of these items were analyzed quantitatively and qualitatively, as described in the Impact Analysis of this chapter. The discussion below focuses on the qualitative effects of the alternatives and other past, present, and reasonably foreseeable future projects identified for consideration of cumulative effects (see Chapter 3, Description of Alternatives).

15.4.3.9.1 No Action Alternative and Alternatives 1 through 5

Continued coordinated long-term operation of the CVP and SWP under the No Action Alternative would result in reduced CVP and SWP water supply availability as compared to recent conditions due to climate change and sea level rise by 2030. These conditions are included in the analysis presented above.

Future water resource management projects considered in cumulative effects analysis could increase water supply availability, as described in Chapter 5, Surface Water Resources and Water Supplies; and reduce recreational impacts in the San Francisco Bay Area, Central Coast, and Southern California regions by providing additional water supplies that could be stored in existing reservoirs.

There also are several ongoing programs that could result in reductions in CVP and SWP water supply availability due to changes in flow patterns in the Sacramento and San Joaquin rivers watersheds and the Delta that could reduce

availability of CVP and SWP water deliveries as well as local and regional water supplies, as described in Chapter 5, Surface Water Resources and Water Supplies. Reduction in available surface water supplies as compared to projected water supplies under the No Action Alternative and Alternatives 1 through 5 could result in reduction of recreational conditions at reservoirs in San Francisco Bay Area, Central Coast, and Southern California.

There would be no adverse recreational resources impacts at the reservoirs associated with implementation of the alternatives as compared to the No Action Alternative or the Second Basis of Comparison. Therefore, Alternatives 1 through 5 would not contribute cumulative impacts to recreational resources at the reservoirs.

There would be recreational resource impacts related to recreational resource impacts in the Sacramento, Feather, American, and Stanislaus rivers. Future water resources programs also could increase or decrease flows in these rivers as compared to the No Action Alternative or Second Basis of Comparison conditions. Therefore, Alternatives 1 through 5 would contribute to adverse cumulative impacts related to recreational resources in these rivers. In addition, Alternatives 3 and 4 would contribute to adverse cumulative impacts to Striped Bass fishing.

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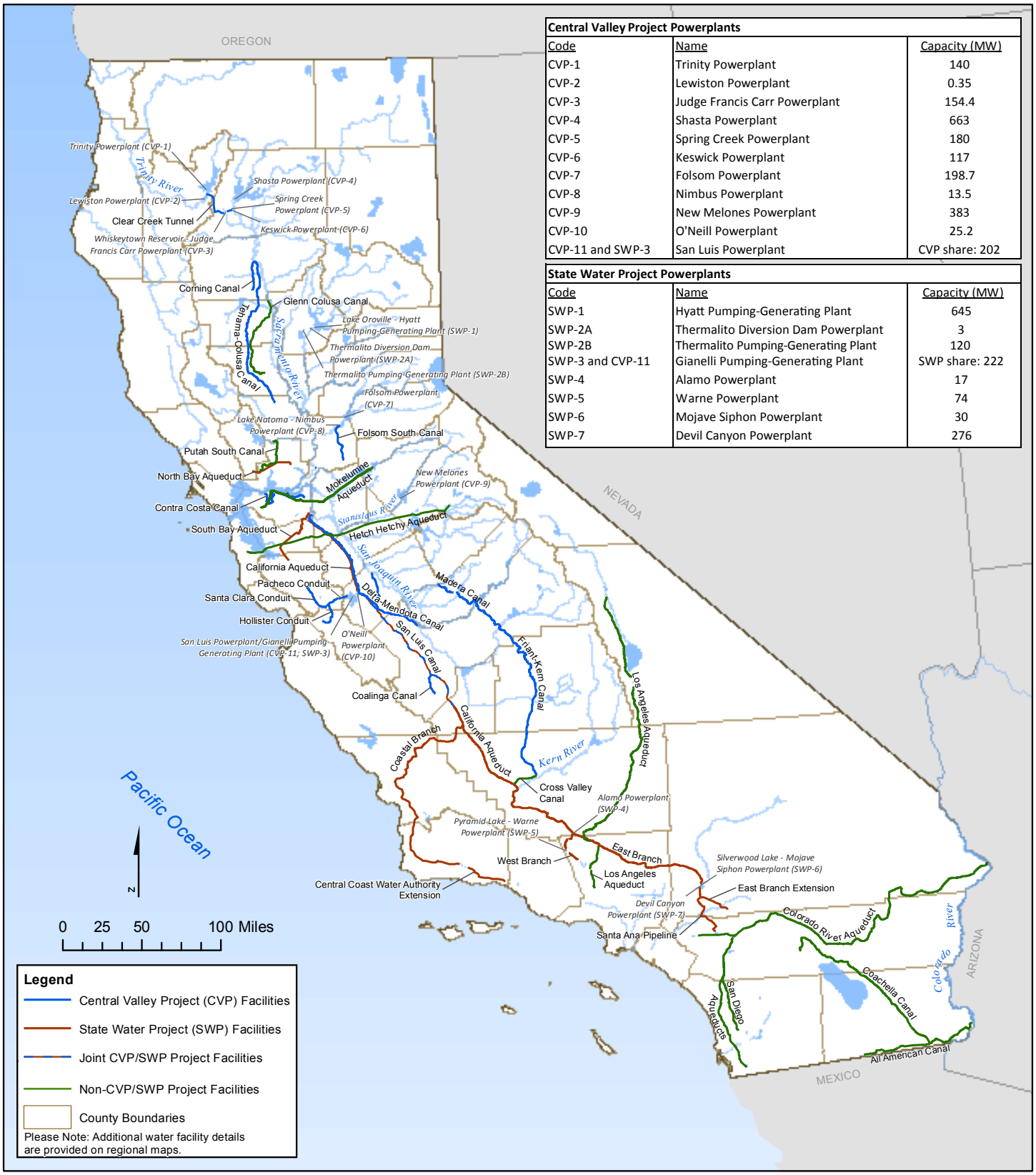

Central Valley Project Powerplants

Code	Name	Capacity (MW)
CVP-1	Trinity Powerplant	140
CVP-2	Lewiston Powerplant	0.35
CVP-3	Judge Francis Carr Powerplant	154.4
CVP-4	Shasta Powerplant	663
CVP-5	Spring Creek Powerplant	180
CVP-6	Keswick Powerplant	117
CVP-7	Folsom Powerplant	198.7
CVP-8	Nimbus Powerplant	13.5
CVP-9	New Melones Powerplant	383
CVP-10	O'Neill Powerplant	25.2
CVP-11 and SWP-3	San Luis Powerplant	CVP share: 202

State Water Project Powerplants

Code	Name	Capacity (MW)
SWP-1	Hyatt Pumping-Generating Plant	645
SWP-2A	Thermalito Diversion Dam Powerplant	3
SWP-2B	Thermalito Pumping-Generating Plant	120
SWP-3 and CVP-11	Gianelli Pumping-Generating Plant	SWP share: 222
SWP-4	Alamo Powerplant	17
SWP-5	Warne Powerplant	74
SWP-6	Mojave Siphon Powerplant	30
SWP-7	Devil Canyon Powerplant	276

Figure 8.1 Central Valley Project and State Water Project Hydroelectric Generation Facilities
Sources: Reclamation 2013a, 2013b, 2013c, 2013d, 2013e, 2013f, 2013g, 2013h, 2013i, 2013j, 2013k, 2013l; DWR 2012

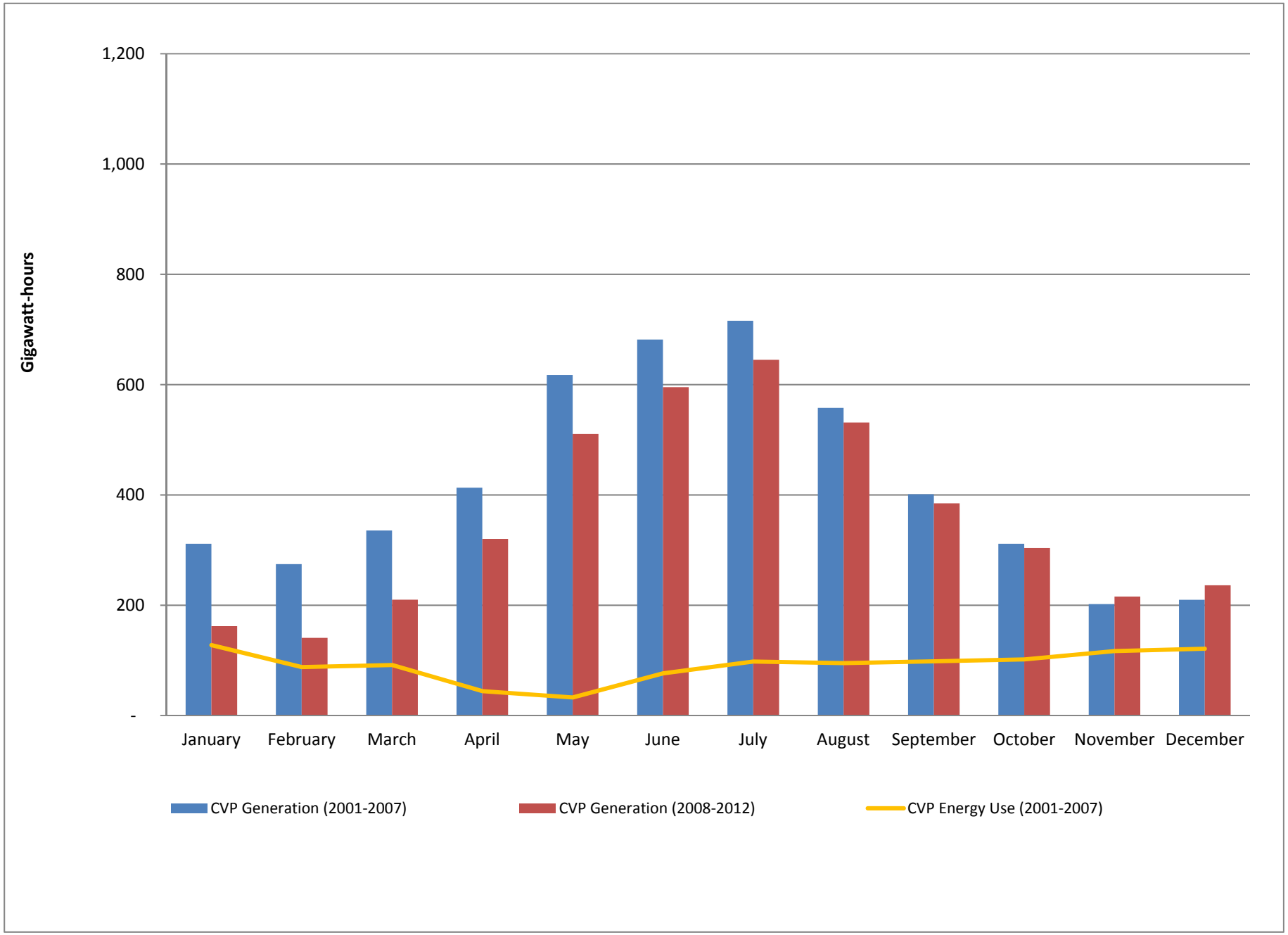

Figure 8.2 Central Valley Project Energy Generation and Energy Use
Sources: Reclamation 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008 a-l, 2009a-l, 2010a-l, 2011a-l, 2012a-l

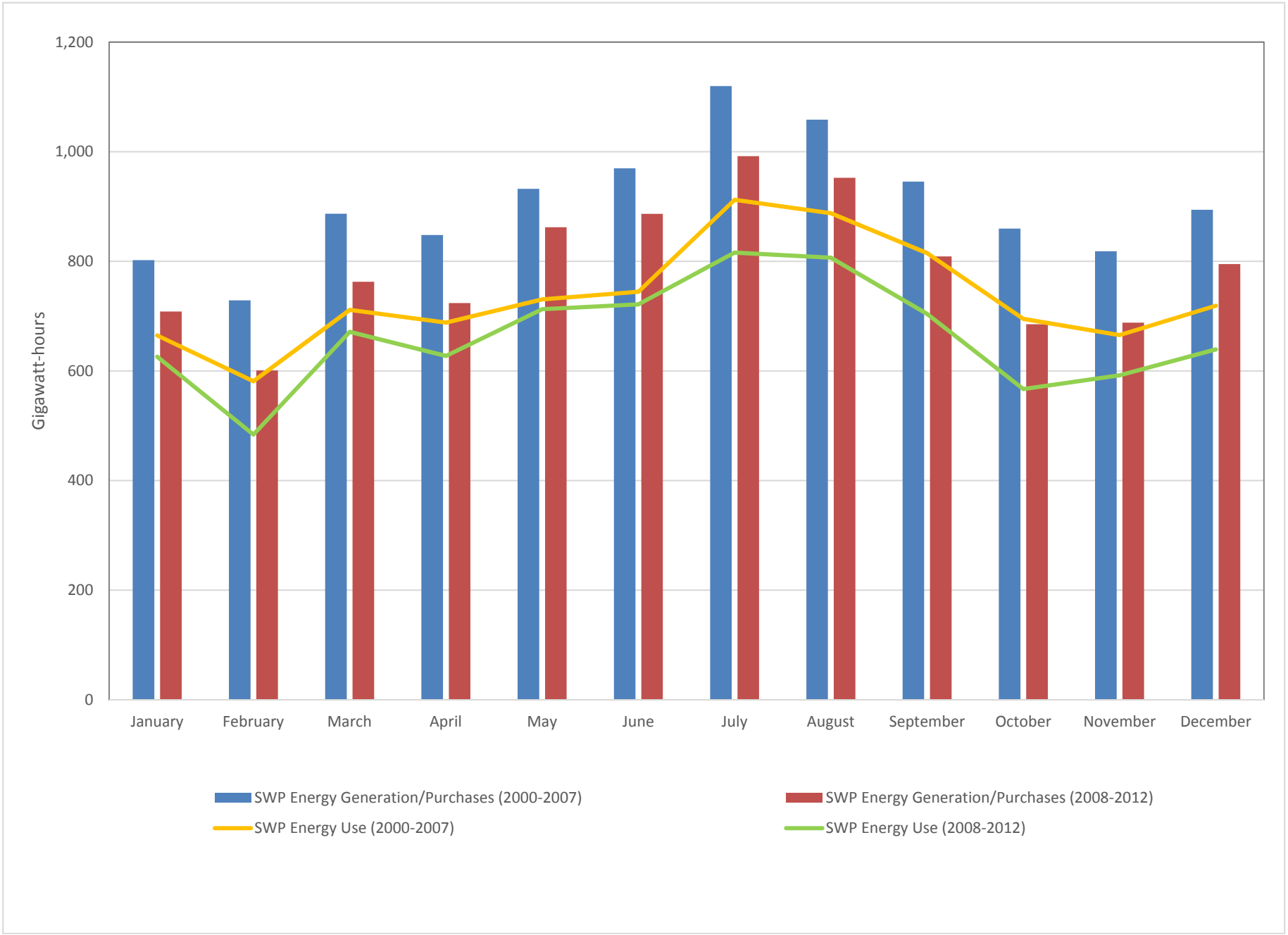

Figure 8.3 State Water Project Energy Generation and Energy Use
Sources: DWR 2002, 2004a, 2004b, 2005, 2006, 2007, 2008, 2012a, 2012b, 2013