21. Recreation Resources

21.1 Introduction

This chapter provides a description of the recreation resources setting for the Extended, Secondary, and Primary study areas. Descriptions and maps of these three study areas are provided in Chapter 1 Introduction. Recreation is one of several benefits typically provided by public and private water supply projects. The amount of visitation at regional lakes and reservoirs can reasonably be expected to increase as the population of California increases. Projections indicate that the population of California, which was nearly 37 million in 2005, is expected to exceed 49 million in 2030 (DOF, 2007).

Popular recreation activities in California fall into two categories: (1) water-dependent activities, such as boating, waterskiing, swimming, and fishing; and (2) water-enhanced activities, such as wildlife viewing, camping, hiking, and hunting. The quality of the recreation experience at lakes, reservoirs, and streams depends on water levels, natural conditions, and the level of facility development.

The regulatory setting for recreation resources is discussed briefly in this chapter, and is presented in greater detail in Chapter 4 Environmental Compliance and Permit Summary.

This chapter focuses primarily on the Primary Study Area. Potential impacts in the Secondary and Extended study areas were evaluated and discussed qualitatively, except when quantitative estimates were possible. Potential local and regional impacts from constructing, operating, and maintaining the alternatives were described and compared to applicable significance thresholds. Mitigation measures are provided for identified significant or potentially significant impacts, where appropriate.

21.2 Affected Environment

21.2.1 Extended, Secondary, and Primary Study Areas

21.2.1.1 Methodology

Recreation Resources, Use, and Capacity

There are approximately 1,400 reservoirs in California. Their function is to store and distribute water to supplement the needs of agriculture and urban water users. Some provide hydropower and flood control benefits. Recreation is also a beneficial use of many of these facilities. The level of detail for existing recreation resources varies, based on whether the resource would be affected by the Project. This analysis is based upon the recreation areas as they existed as of June 2009.

The following key sources of information were used in the preparation of this chapter:

- Recreation studies completed for the SWP Oroville Facilities Federal Energy Regulatory Commission (FERC) relicensing (2003 to 2004) (DWR, 2007a)
- CALFED Final Programmatic EIS/EIR (CALFED, 2000)
- North-of-the-Delta Offstream Storage Investigation Report, Appendix J – Recreation (Rischbieter and Elkins, 2000)
- Comparative Inventory of Recreation Facilities at California's Largest Reservoirs (Rischbieter, 2001)

- Sacramento River Public Recreation Access Study (EDAW, 2003)
- South Delta Improvements Program Draft EIR/EIS (Reclamation, 2005)
- Recreation Facilities of the State Water Project: An Inventory (Thrapp, 1989)
- Recreation Lakes of California (14th Edition) (Dirksen and Dirksen, 2003)
- Regional recreation guides
- Internet websites (Refer to Section 21.5 References)

Some of the recreation areas were visited to verify facility information. Detailed recreation use data were collected for Black Butte Lake and East Park Reservoir in 2000.

Recreation use is measured in recreation days (or recreation visitor days), with one recreation day representing one person spending a day or a portion of a day in one or more types of recreation activities[1]. For the purposes of this analysis, the peak recreation season is defined as Memorial Day weekend through Labor Day weekend (approximately 100 days), and the primary recreation season is considered to be from May 1 through September 30. At some areas, recreation occurs much earlier or later in the year depending on elevation and weather (i.e., an extended recreation season). In general, the primary recreation season is defined as those months when visitation equals or exceeds the monthly average for the year.

Recreation resource capacity can be measured by looking at availability of space, number and condition of facilities, visitor perceptions, or the ecological carrying capacity of the affected sites. Capacity is the number of visitors that a site is capable of handling with no apparent or undue environmental degradation (California State Parks, 2004). For the tables presented in this chapter that specify recreation use and capacity at reservoirs in the Extended and Secondary study areas (in Sections 21.2.2.1 and 21.2.3.1), the recreation capacity was based on the number of campsites, picnic areas, boat launches, and other facilities at each reservoir, and an estimate of optimum carrying capacity in persons for each recreation resource over a typical recreation seasonal period. This number was compared to the reported recreation use to derive a capacity percentage.

21.2.2 Extended Study Area

21.2.2.1 Recreation Resources, Use, and Capacity

This section includes descriptions of CVP, SWP, local water-dependent or water-enhanced recreation resources, and the wildlife refuges in the Extended Study Area. Table 21-1 shows the recreation use and capacity at the reservoirs within the Extended Study Area, and Figure 21-1 depicts the existing lakes and reservoirs.

[1]This is one standard definition of a recreation visitor day, but should not to be confused with the 12-hour recreation visitor day definition used by some federal agencies.

Table 21-1
Recreation Use and Capacity at Reservoirs in the Extended Study Area[a]

Name	Storage Capacity (Acre-Feet)	Surface Area (Acres)	Shoreline (Miles)	Approximate Recreation Capacity[b]	Approximate Recreation Use[b]	Capacity (Percent)	Operator[c]	County
Tri-Dam Reservoirs[d]	932,000	14,000	146	1,090,000	900,000	83	USACE, EBMUD	Calaveras, San Joaquin, Amador
New Melones Reservoir[e]	2,400,000	12,500	100	700,000	500,000	71	Reclamation	Calaveras, Tuolumne
Don Pedro Reservoir[d]	2,030,000	12,960	160	660,000	450,000	68	TID	Tuolumne
Lake McClure[d]	1,032,000	7,147	80	956,000	600,000	63	MIDPD	Mariposa
San Luis Reservoir SRA[f]	2,095,000	15,400	77	1,036,000	492,000	47	DWR/State Parks	Merced
Pyramid Lake SRA[f]	180,000	1,360	21	285,000	126,000	44	DWR	Los Angeles
Castaic Lake SRA[f]	323,700	2,235	29	1,300,000	614,000	47	DWR/State Parks	Los Angeles
Silverwood Lake SRA[f]	78,000	990	13	690,000	330,000	48	DWR/State Parks	San Bernardino
Lake Perris SRA[f]	131,450	2,340	10	1,144,000	872,000	76	DWR/State Parks	Riverside
Totals and Percent Capacity	**9,202,150**	**68,932**	**636**	**7,861,000**	**4,884,000**	**62**		

[a]It is difficult to obtain recent reported recreation information because many agencies no longer collect and report this information. The recreation use reported is approximate and represents an average of the three most recent years of available data, or a single year when only one year was available. Although the data indicate that recreation use does not currently meet or exceed the capacity of the recreational facilities at these reservoirs, some of them may be at or near capacity on a few summer weekends and especially on holiday weekends, such as Memorial Day and July 4th weekends.

[b]The units for Recreation Capacity and Recreation Use are recreation visitor days (RVDs), defined as a visit by one person for part or all of one day.

[c]USACE= U.S. Army Corps of Engineers; EBMUD = East Bay Municipal Utility District; Reclamation = U.S. Bureau of Reclamation; TID = Turlock Irrigation District; MIDPD = Merced Irrigation District Parks Department; DWR = California Department of Water Resources; State Parks = California Department of Parks and Recreation;

[d]Local Agency water project.

[e]Central Valley Project

[f]State Water Project

Note:

SRA = State Recreation Area

Sources: Rischbieter, 2001; DWR, 2007b, 2008, and 2012, Stienstra, 2004; Dirksen and Dirksen, 2003; California State Parks, 2011; Dean's AnglerNet.com, 2011; FishersNet.com, 2011; Fishniffer.com, 2011.

Tri-Dam Reservoir Complex

The Tri-Dam Reservoir Complex includes New Hogan, Comanche, and Pardee reservoirs. Recreation opportunities include camping, fishing, and boating. New Hogan Reservoir facilities include three campgrounds, day-use and picnic areas, two launch ramps and a marina. Comanche Reservoir provides six campgrounds and two day-use areas, plus two boat ramps at concessionaire-operated marinas. Water skiing and swimming is allowed. Pardee Reservoir facilities include two campgrounds and several day-use areas, with one boat ramp and a large marina. Shoreline access is restricted at these two reservoirs and there is virtually no opportunity for recreation outside the developed areas. Swimming is prohibited at Pardee Reservoir (Rischbieter, 2001).

New Melones Reservoir

New Melones Reservoir is the fourth-largest reservoir in California. It was constructed by the U.S. Army Corps of Engineers (USACE) for water, power, and flood control, as well as recreation. The facilities and recreation opportunities are currently administered by the U.S. Bureau of Reclamation (Reclamation).

Despite its very large size, New Melones has only two public recreation areas with camping facilities: the Glory Hole Recreation Area and the Tuttletown Recreation Area. However, there are five campgrounds with more than 300 campsites, four boat ramps, and a large marina, as well as several developed and primitive areas for day-use shoreline access (Rischbieter, 2001).

Don Pedro Reservoir

Don Pedro is the fifth largest reservoir in California. It is located in the Sierra Nevada foothills east of the cities of Modesto and Stockton. Built in a deep canyon of the Tuolumne River, Don Pedro Reservoir provides water, power, and flood control benefits for Turlock Irrigation District. The recreational facilities are maintained and operated by the Don Pedro Recreation Agency. The facilities include three recreation areas and two full-service marinas. The recreation areas include launch ramps, picnic facilities, and a total of 550 campsites. Boat-in camping is allowed, but there is little opportunity for roadside access (Rischbieter, 2001).

Lake McClure

Located in the Mother Lode Country of the Sierra foothills, Lake McClure is the closest reservoir to the City of Modesto. Lake McClure has four developed recreation areas and a fifth at Lake McSwain (the small re-regulation reservoir located downstream), all operated by Merced Irrigation District Parks Department. The campgrounds are equipped with bathrooms, showers, laundry facilities, and marina facilities. Day use areas include sandy beaches and swim lagoons, often in grassy park-like settings, that include group facilities and play equipment (Rischbieter, 2001).

San Luis Reservoir

San Luis Reservoir, a joint CVP/SWP facility, is the largest reservoir in the San Joaquin Valley. O'Neill Forebay and San Luis Reservoir are part of the San Luis Reservoir State Recreation Area (SRA), which also includes the Los Banos Detention Reservoir. The forebay has relatively stable water levels and provides popular swimming, boating, fishing, and camping opportunities.

In contrast, San Luis Reservoir has a very large annual water level fluctuation and frequent strong afternoon winds, so its primary activities are fishing, boating, wind surfing, and picnicking. San Luis Reservoir and O'Neill Forebay have two developed campgrounds and one primitive campground. There are four boat ramps at the two lakes, plus extensive day use areas with lawns and beaches at O'Neill Forebay. All facilities are operated by the California Department of Parks and Recreation (Rischbieter, 2001).

San Luis Reservoir has two major boat ramps: the Basalt boat ramp near Basalt Campground, and the Dinosaur Point boat ramp at the west end of San Luis Reservoir. Table 21-2 details the size and operating range of these ramps.

Table 21-2
San Luis Reservoir State Recreation Area Boat Ramp Bottom Elevations

	Elevation (Feet)	Feet Below MNWS	Number of Boat Ramp Lanes
Dinosaur Point Boat Ramp	378	166	4
Basalt Boat Ramp	340	204	2

Note:
Maximum Normal Water Surface (MNWS) elevation occurs at 544 feet.

Source: Martin, pers. comm., 2011.

The Basalt Campground receives its water supply from the reservoir at the Basalt Water Intake. The water intake is located at elevation 345.

Pyramid Lake State Recreation Area

Pyramid Lake has 21 miles of shoreline and a surface area of 1,297 acres. Recreation opportunities include boating, swimming, picnicking, camping, and fishing. The shoreline is rugged and accessible only by boat. The nearby Los Alamos campground has 93 campsites and two group campgrounds. Boat-in picnic sites and restrooms are scattered around the lake at several locations. The recreation program at the lake is administered by a concessionaire operating pursuant to an agreement with the U.S. Forest Service (USFS) (Thrapp, 1989).

Castaic Lake State Recreation Area

Castaic Lake and Lagoon has 29 miles of shoreline, and its afterbay Lagoon has three miles of shoreline. Together, they provide many opportunities for recreation, including a 60-unit campground and a group campground. There are two boat launches for water sports, including sailing, fishing, and power boating. The lagoon has one ramp and is limited to non-power boats. Visitors may sail, canoe, or fish (Dirksen and Dirksen, 2003). A grassy area is available for outdoor events. The recreational facilities at this SWP reservoir are operated by Los Angeles County. Castaic Lake State Recreation Area is operated by the California Department of Parks and Recreation.

Silverwood Lake State Recreation Area

Silverwood Lake SRA occupies 2,400 acres. The lake has 13 miles of shoreline and a surface area of approximately 1,000 acres. The lake is open to all types of boating, although several brushy areas were not cleared and provide natural fish habitat for anglers. There are two campgrounds, a group camp, a visitor information building, and three boat-in picnic areas. Recreational activities include swimming, boating, waterskiing, fishing, hiking, camping, picnicking, and bicycling. Silverwood Lake SRA is operated by California State Parks (Dirksen and Dirksen, 2003).

Lake Perris State Recreation Area

Lake Perris, operated by California Department of Parks and Recreation, is the southernmost reservoir of the SWP. There are 421 RV and tent campsites and six group campgrounds, a full service marina and boat ramp, and swimming and ski beaches. Recreation activities include swimming, horseback riding, sailing, power boating, camping, water skiing, fishing, hiking, bicycling, hunting, and rock climbing (Dirksen and Dirksen, 2003). As of 2013, Lake Perris is operating at reduced water and visitor capacity until remediation of seismic concerns at Perris Dam is completed.

Wildlife Refuges and Wildlife Areas

There are several wildlife refuges in the Extended Study Area from San Luis Reservoir to Kern County that receive Level 4 refuge water (Figure 1-7 in Chapter 1 Introduction): the West Bear Creek Unit of the San Luis National Wildlife Refuge (NWR) Complex; the Los Banos, Volta, and Mendota Wildlife Areas (WAs); the Merced Unit of the Merced NWR; the China Island and Salt Slough units of the North Grasslands WA; private wetlands in the Grassland Resource Conservation District; and Kern and Pixley NWRs. Recreation activities within these refuges include hunting, fishing, wildlife observation, photography, and environmental education programs (Reclamation, 2011).

21.2.3 Secondary Study Area

21.2.3.1 Recreation Resources, Use, and Capacity

This section includes descriptions of CVP, SWP, and local water-dependent or water-enhanced recreation resources in the Secondary Study Area. The existing lakes and reservoirs are listed in Table 21-3, and are depicted on Figure 21-2.

Table 21-3
Recreation Use and Capacity at Reservoirs in the Secondary Study Area[a]

Name	Storage Capacity (Acre-Feet)	Surface Area (Acres)	Shoreline (Miles)	Approximate Recreation Capacity[b]	Approximate Recreation Use[b]	Capacity (Percent)	Operator[c]	County
Shasta Lake NRA[e]	4,552,000	29,740	370	2,370,000	2,330,000	98	Reclamation, USFS	Shasta
Trinity/Lewiston Lake NRA[e]	2,462,000	17,085	160	1,180,000	425,000	36	Reclamation, USFS	Trinity
Whiskeytown NRA[e]	241,000	3,220	36	1,230,000	773,000	63	Reclamation, NPS	Shasta
Lake Almanor[d]	1,300,000	28,200	52	460,000	244,000	53	PG&E, USFS	Plumas
Lake Red Bluff[e]	3,920	530	6	135,000	65,000	48	Reclamation, USFS	Tehama
Black Butte Reservoir[e]	144,000	4,560	40	300,000	220,000	73	USACE	Tehama/Glenn
Lake Oroville[f]	3,538,000	15,800	167	2,100,000	1,200,000	57	DWR, State Parks	Butte
Stony Gorge Reservoir[e]	50,000	1,280	25	67,000	50,000	75	Reclamation	Glen
New Bullard's Bar Reservoir[d]	970,000	4,810	60	200,000	104,000	52	YCWA	Yuba
East Park Reservoir[e]	51,000	1,820	25	245,000	53,000	22	Reclamation	Colusa
Englebright Reservoir[e]	70,000	815	24	157,000	105,000	67	USACE	Yuba
Indian Valley Reservoir[d]	300,000	4,000	40	76,000	50,000	66	YCFCWCD	Lake
Clear Lake[d]	315,000	43,800	100	1,500,000	1,000,000	67	YCFCWCD, State Parks, Private	Lake
Folsom Lake SRA[e]	975,000	11,450	75	2,200,000	1,000,000	45	Reclamation, State Parks	Sacramento
Lake Berryessa[e]	1,600,000	20,700	165	1,700,000	1,400,000	82	Reclamation, Concession	Napa
Totals and Percent Capacity	**16571,920**	**188,100**	**1,345**	**13,920,000**	**9,019,000**	**65**		

[a]It is difficult to obtain recent reported recreation information because many agencies no longer collect and report this information. The recreation use reported is approximate and represents an average of the three most recent years of available data, or a single year when only one year was available. Although the data indicate that recreation use does not currently meet or exceed the capacity of the recreational facilities at these reservoirs, some of them may be at or near capacity on a few summer weekends and especially on holiday weekends, such as Memorial Day and July 4th weekends.

[b]The units for Recreation Capacity and Recreation Use are recreation visitor days (RVDs), defined as a visit by one person for part or all of one day.

[c]Reclamation = U.S. Bureau of Reclamation; USFS = U.S. Forest Service; NPS = National Park Service; PG&E = Pacific Gas and Electric Company; DWR = California Department of Water Resources; State Parks = California Department of Parks and Recreation; YCWA =Yuba County Water Agency; USACE = U. S. Army Corps of Engineers; YCFCWCD = Yolo County Flood Control & Water Conservation District; Concession = Concessionaires for Reclamation.

[d]Local Agency Water Project

[e]Central Valley Project

[f]State Water Project

Sources: Rischbieter, 2001; DWR, 2007b, 2008, and 2012; Guthrie et. al., 1995; Dirksen and Dirksen, 2003; Stienstra, 2004; Dean's AnglerNet.com, 2011; FishersNet.com, 2011; Fishsniffer.com, 2011; USFS, 2011.

Klamath River

Recreation activities on the Klamath River (upper and lower) include kayaking, boating, fishing, and hunting. The Klamath River is also popular for whitewater rafting and recreational gold mining. The river is 263 miles long, and flows through the Klamath and Six Rivers national forests in California. Several wildlife refuges near the Oregon border offer hunting, wildlife viewing, and other recreation resources. The Klamath Wildlife area in southern Oregon is adjacent to the river (Mt. Shasta Region Travel Center, 2011). A total of 250.8 miles of the Klamath River, from 100 yards downstream of the Iron Gate Dam to the river mouth at the Pacific Ocean, is designated as "recreational[2]" in the State and federal Wild and Scenic River acts. The federal act also designates 11.7 miles of the Klamath River as "wild[3]", and 23.5 miles as "scenic[4]" (NWSRS, 2013; CPRC, 2013).

Trinity River

The Trinity River ranges from stretches of calm water to rapids and cascades. SR 299 is adjacent to the river for many miles, allowing access for recreation activities that include fishing, hiking, swimming, rafting, kayaking, recreational gold mining, and wildlife viewing. The Trinity River is widely known for its fishing opportunities (Trinity County Visitors Guide, 2011). Most of the Trinity River from 100 yards downstream of Lewiston Dam to its confluence with Klamath River at Weitchpec is designated as either "recreational" (120 miles), "scenic" (39 miles), or "wild" (44 miles) in the State and federal Wild and Scenic Rivers acts (NWSRS, 2013; CPRC, 2013).

Whiskeytown-Shasta-Trinity National Recreation Area

The Whiskeytown-Shasta-Trinity National Recreation Area (NRA) includes Trinity Lake, Lewiston Lake, Shasta Lake, Keswick Reservoir, and Whiskeytown Lake. The lakes are components of the CVP. Of the five lakes, Shasta is the largest and receives most of the recreation use. Water levels at Shasta and Trinity lakes fluctuate, based on water supply and demand, but levels at Whiskeytown, Lewiston, and Keswick do not change much during the recreation season (Reclamation, 2005.)

Trinity Lake is the third largest reservoir in California, with more than 147 miles of shoreline. Recreation opportunities and much of the lands surrounding this component of the NRA are managed by USFS. Anglers fish along the shore for various fish species. Private resorts and Forest Service campgrounds offer facilities ranging from housekeeping cabins to rustic campgrounds. Four marinas offer houseboat, skiboat, fishing boat, canoe, and jetski rentals. The maximum storage capacity of Trinity Lake is 2,447,000 acre-feet at elevation 2,370 feet. However, the lake is rarely allowed to store water at full capacity because of its flood control requirements. The only month when the lake is allowed to fill completely is June; the lake is, therefore, rarely full during the remaining months of the primary recreation season.

Trinity Lake has seven ramps at elevations from 2,170 feet to the maximum water surface elevation of 2,370 feet (Table 21-4). Four of the ramps (Stuart Fork, Bowerman, Clark Springs, and Fairview) are relatively short and are out of the water when Trinity Lake is drawn down 60 feet (to elevation 2,310 feet).

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[2] Wild = those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.

[3] Scenic = those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

[4] Recreational = those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shoreline, and that may have undergone some impoundment or diversion in the past.

Table 21-4
Trinity Lake Boat Ramp Bottom Elevations

	Elevation (Feet)	Feet Below MNWS	Boat Ramp Lanes
Stuart Fork	2,338	32	2
Clark Springs	2,324	46	2
Bowerman	2,323	47	2
Fairview	2,313	57	3
Trinity Center	2,300	70	3
Cedar Stock	2,230	140	3
Minersville	2,170	200	2

Note:
Maximum Normal Water Surface (MNWS) elevation occurs at 2,370 feet.

Source: Reclamation, 2005; USFS, 2011.

When Trinity Lake reaches elevation 2,300 feet, which often occurs in July, August, or September, only the Minersville and Cedar Stock boat ramps are available. Minersville becomes usable when the lake drops to elevation 2,305. It is the only ramp extending below elevation 2,230, so in late summer during Critical years, it is the only available boat ramp on Trinity Lake.

Lewiston Lake is best known for its quality fly fishing and is also popular with trollers and bank anglers. A 10-mile-per-hour speed limit makes the lake popular with float tubers and canoeists. The area also offers excellent wildlife viewing and recreation on the lands surrounding the reservoir, which are managed by USFS.

Shasta Lake is the largest reservoir in California and the primary water storage facility of the CVP. It has 29,740 surface acres and more than 370 miles of shoreline. Recreation on and around this portion of the NRA is also managed by USFS. Much of the outdoor recreation and tourism in Shasta County is related to Shasta Lake. There are several marinas, campgrounds, boat-in campgrounds, boat ramps, and related facilities around Shasta Lake (USFS, 2011). Shasta Lake is very popular for houseboating and other water sports, as well as a major fishing destination. There are more than 16 species of fish available. Bass fishing tournaments are frequently held at the lake. Of the seven public boat ramps at Shasta Lake (Table 21-5), only the Centimudi and Jones Valley boat ramps extend more than 160 feet down in elevation. Commercial ramps at Bridge Bay Resort, Digger Bay Marina, and Silverthorn Marina also may be available to the public.

Keswick Reservoir is the afterbay for Shasta Lake and regulates the hydropower releases. It is approximately five miles long with a surface area of 630 acres. Most of its shoreline is steep and brushy, providing limited access for shore anglers. There is a small paved boat ramp and vault toilets at the day-use area. Fed by cold water released from the penstocks at Shasta Dam, Keswick is used little except for a few anglers who fish when the power plants at Shasta Dam are operating. BLM manages much of the recreation opportunities surrounding the reservoir. An extensive off-highway vehicle, mountain bike, and national recreation trail comprises a majority of the recreation use around the reservoir.

Recreation around Whiskeytown Lake is operated by the National Park Service and offers 3,220 surface acres and 36 miles of shoreline. There are two major campgrounds and two day-use areas with swimming beaches plus complete marina facilities at two of the three boat ramps. Houseboats or overnight stays on boats are not allowed. Fishing occurs from boats and from the shore (Dirksen and Dirksen, 2003; Stienstra, 2004).

Table 21-5
Shasta Lake Boat Ramp Bottom Elevations

	Elevation (Feet)	Feet Below MNWS	Boat Ramp Lanes
Bailey Cove	1,017	50	2
Antlers	992	75	4
Hirz Bay	972	95	2 to 3
Packers Bay	952	115	2 to 4
Silverthorn Marina[a]	942	125	1 to 2
Digger Bay Marina[b]	937	130	2
Sugarloaf[c]	907	160	2
Bridge Bay Resort	882	185	2
Centimudi	857	210	2 to 4
Jones Valley	857	210	1 to 4

[a]Silverthorn ramp is not paved from elevation 1,023 feet to elevation 942 feet.
[b]Digger Bay ramp is usable to elevation 930 feet on an unpaved ramp.
[c]Sugarloaf ramp is a low water ramp that is not available until elevation 992 feet.

Note:
Maximum Normal Water Surface (MNWS) elevation occurs at 1,067 feet.

Source: USFS, 2011.

Clear Creek

Lower Clear Creek begins downstream of Whiskeytown Lake on National Park Service lands; the upstream portion of lower Clear Creek is part of the Whiskeytown-Shasta-Trinity NRA. Downstream of the NRA, the majority of the land surrounding the creek is owned by the U.S. Bureau of Land Management (BLM). BLM lands within the lower Clear Creek corridor receive substantial public recreational use. Recreational opportunities include swimming, beach use, hiking, fishing, limited hunting, kayaking, gold panning, and bird watching. Salmon spawning viewing is also an important recreation activity during the fall. A recreation survey conducted in 1980 concluded that there were 15,000 recreation user days along lower Clear Creek during the summer months, but this survey was conducted prior to the increase in BLM-managed lands along lower Clear Creek, when most lands were in private holdings (BLM, 2008).

Spring Creek

Spring Creek flows are regulated by Spring Creek Dam and diluted by flows from Whiskeytown Lake via the Clear Creek Tunnel. Spring Creek flows are contaminated with acid mine drainage from the Iron Mountain Mine, which is located on upstream tributaries of the creek and is designated as a Superfund site. Consequently, no recreation occurs along this reach of Spring Creek.

Sacramento River – Shasta Dam (Keswick) to Colusa (Sacramento River Conservation Area)

The main river recreation resources and public access sites within the Secondary Study Area are located along the Sacramento River from the Shasta Dam to the City of Colusa. These resources include day use sites, boat launches, trail accesses, fishing accesses, recreational vehicle parks, wildlife areas, and undeveloped open space areas.

Between Keswick Dam (downstream of Shasta Dam) and the City of Red Bluff, much of the Sacramento River is confined by geology and narrow bands of riparian forest, but from Red Bluff to the City of Chico, the river meanders over a broad floodplain. From Chico to Colusa, sloughs and broad basins extend for miles on either side of the river. There is also an extensive system of levees and weirs for flood control purposes. These conditions create many opportunities for water-based recreation. Fly fishing and conventional fishing in and along the Sacramento River occur year-round. Various fish species are abundant at different times during the year. Fishing is popular downstream of the Red Bluff Diversion Dam (RBDD). In addition, rafting, canoeing, camping, and swimming are popular activities. Power boat use and whitewater rafting require a minimum river flow of at least 5,000 cfs. Tables 21-6A and 21-6B list existing public recreation sites between Red Bluff and Colusa on the Sacramento River (EDAW, 2003). Recreation use along the Sacramento River is generally less than the capacity of the recreation sites, with the exception of occasional special events, such as those that occur on major holiday weekends or during periods of exceptional salmon fishing.

Recreational use of the Sacramento River and its tributaries probably has paralleled increased population growth in the region. It is expected that demand for recreation activities, such as bird watching, wildlife viewing, nature observation, and hiking, will increase over the next 40 years, and the demand for traditional Sacramento River recreation uses, such as hunting, fishing, and boating, will continue (EDAW, 2003). However, salmon fishing recently declined due to closed fall-run Chinook salmon seasons in 2008 and 2009, and a restricted fall-run Chinook salmon season in 2010 (Lyons, pers. comm., 2012).

Lake Almanor

Lake Almanor has the second largest surface area among California's reservoirs. Recreation opportunities are provided by 22 resorts with five full-service marinas with rental boats, and moorage for private boats. Much of the lakeshore is private property, but there are stretches of National Forest lands open to the public and an extensive paved bicycle path on the west side of the lake. The Forest Service and PG&E also provide a few public facilities (Rischbieter, 2001; PG&E, 2002).

Lake Red Bluff Recreation Area

The Lake Red Bluff Recreation Area is administratively managed and operated by the Mendocino National Forest. However, the federal lands in this area are owned by Reclamation and are adjacent to the RBDD within the city limits of Red Bluff. Approximately 65,000 people recreated in and along the Sacramento River near the RBDD in 1995 (Guthrie, et al., 1995). Most of them used one of three locations: City Park, Ide Adobe State Historical Park, and the boat launch ramp area at the Lake Red Bluff Recreation Area. The majority of this use occurred in the summer months during the "gates in" period of the RBDD (Reclamation, 2002). However, Lake Red Bluff no longer exists because the gates that formed it were permanently raised in 2012.

Black Butte Reservoir

Black Butte Reservoir is located on Stony Creek, approximately eight miles west of the town of Orland in northern Glenn and southern Tehama counties, in a transition zone between the Sacramento Valley and the foothills of the Coast Range at an elevation of 470 feet. There are six recreation areas, a dam overlook, and several nature trails. Each recreation area includes restrooms and fishing access with other facilities, including campgrounds, a marina, boat ramps, an outdoor amphitheater, fish cleaning stations, and an off-highway vehicle park. Recreation lands surrounding the reservoir total approximately 4,000 acres (Rischbieter and Elkins, 2000).

Table 21-6A
Recreation Sites and Amenities on the Sacramento River from Red Bluff to Colusa

Site Name	Acres	Access: Mode of Access: Public Use Allowed	Access: Mode of Access: Public Road	Access: Mode of Access: River	Site Amenities and Uses: Facility Signage: Entrance	Facility Signage: Directional	Facility Signage: Facility Rules	Facility Signage: Services	Boating Facilities: Marina	Boating Facilities: Ramp(s)	Boating Facilities: Carry-in	Boating Facilities: Boat Dock/Landing	On-Site Parking: Asphalt Lot	On-Site Parking: Gravel Lot	On-Site Parking: Boat Trailer Parking	On-Site Parking: Dirt Lot	Pedestrian Access: ADA Accessible	Pedestrian Access: Paved Walks	Pedestrian Access: Unpaved Walks/Trails	Overnighting (R=Reservable/ NR=Non-Reservable): Tent sites	Overnighting: Tent/Trailer Sites	Overnighting: RV Sites	Overnighting: Group Camps	Overnighting: Cabins	Water: Potable Water	Water: Drinking Fountains	Picnic Sites: Picnic Tables	Picnic Sites: Picnic Shelters	Picnic Sites: BBQ Grills/Pits	Picnic Sites: Informal/Tree Shaded	Toilet Facilities: Flush Toilets & Sinks	Toilet Facilities: Pit/Chemical Toilets	Toilet Facilities: Porta-potties	Toilet Facilities: None	Other Amenities: Showers	Other Amenities: Public Phones	Recreation Uses: Store/Bar/Restaurant	Recreation Uses: Fishing	Recreation Uses: Hiking	Recreation Uses: Hunting	Recreation Uses: Passive Recreation	Recreation Uses: Wildlife Observation	Site Characteristics: Shore Characteristics: Steep/Cut Embankment	Sandy Beach	Grassy/tule	Shrubby	Undercut	Overhanging Shrubs	Overhanging Trees
Federal Facilities																																																			
Bureau of Reclamation																																																			
Altube Island				☒																														☒																	
Bureau of Land Management																																																		
Todd Island	~125			☒																														☒																	
Foster Island	222			☒																														☒																	
Fish and Wildlife Service																																																		
Sacramento River National Wildlife Refuge																																																		
Capay Unit	666																																																	
Codora Unit	394																																																	
Deadman's Reach	637																																																	
Flynn Unit	552																																																	
Heron Island Unit	116																																																	
Jacinto Unit	82																																																	
La Barranaca Unit	1067																																																	
Llano Seco unit	907																																																	
McIntosh Landing North	60																																																	
McIntosh Landing South	71																																																	
Mooney Unit	344																																																	
North Ord Unit	43																																																	
Ohm Unit	750																																																	
Ord Unit	100																																																	
Packer Lake Unit	375	☒	☒							☒					☒																					☒			☒							☒					
Phelan Island	308																																																	
Pine Creek Unit	435																																																	
Rio Vista Unit	1202	☒	☒	☒						☒					☒																				☒			☒							☒					
South Ord Unit	122																																																	
Sul Norte Unit	600																																																	
Forest Service																																																		
Lake Red Bluff Recreation Area	~488	☒	☒	☒	☒	☒	☒			2				☒	☒		☒	☒	☒	30/NR					☒	☒	☒	☒	☒	☒	☒	☒	☒				☒	☒		☒		☒		☒	☒						
State Facilities																																																		
Department of Parks and Recreation																																																	
Bidwell-Sacramento River SRA																																																		
Big Chico Creek Day-use Area	~260	☒	☒	☒	☒		☒				☒					☒			☒	☒											☒					☒	☒			☒	☒	☒				☒	☒
Indian Fishery		☒	☒	☒	☒		☒							☒			☒		☒	☒						☒			☒		☒					☒	☒			☒	☒			☒		
Irvine Finch River Access		☒	☒	☒	☒	☒	☒			1			☒		☒		☒		☒	6 N/R					☒	☒	☒		☒		☒					☒	☒			☒	☒			☒		☒	☒
Pine Creek Landing		☒	☒	☒	☒		☒			1				☒	☒					☒							☒			☒					☒				☒	☒					☒		
Colusa-Sacramento River SRA	67	☒	☒	☒	☒	☒	☒			1			☒		☒		☒	☒	☒	14/R					☒		☒	☒	☒		☒	☒	☒			☒	☒			☒	☒						
Woodson Bridge SRA	470	☒	☒	☒	☒	☒	☒						☒				☒		☒	35/R					☒		☒	☒	☒		☒	☒	☒			☒	☒			☒	☒						

Table 21-6A
Recreation Sites and Amenities on the Sacramento River from Red Bluff to Colusa

Site Name	Acres	Access			Site Amenities and Uses																																				Site Characteristics							
		Mode of Access			Facility Signage				Boating Facilities				On-Site Parking				Pedestrian Access			Overnighting (R=Reservable/ NR=Non-Reservable)					Water		Picnic Sites				Toilet Facilities				Other Amenities		Recreation Uses						Shore Characteristics							
		Public Use Allowed	Public Road	River	Entrance	Directional	Facility Rules	Services	Marina	Ramp(s)	Carry-in	Boat Dock/Landing	Asphalt Lot	Gravel Lot	Boat Trailer Parking	Dirt Lot	ADA Accessible	Paved Walks	Unpaved Walks/Trails	Tent sites	Tent/Trailer Sites	RV Sites	Group Camps	Cabins	Potable Water	Drinking Fountains	Picnic Tables	Picnic Shelters	BBQ Grills/Pits	Informal/Tree Shaded	Flush Toilets & Sinks	Pit/Chemical Toilets	Porta-potties	None	Showers	Public Phones	Store/Bar/Restaurant	Fishing	Hiking	Hunting	Passive Recreation	Wildlife Observation	Steep/Cut Embankment	Sandy Beach	Grassy/tule	Shrubby	Undercut	Overhanging Shrubs	Overhanging Trees
Department of Fish and Game																																															
Sacramento River Wildlife Area																																															
Beehive Bend	216	☒																		☒													☒				☒	☒	☒	☒	☒		☒					
Colusa Unit North	119	☒		☒																☒													☒				☒	☒	☒	☒	☒	☒	☒					
Colusa Unit South	45	☒		☒																☒													☒				☒	☒	☒	☒	☒	☒	☒					
Dicus Slough Unit	1712	☒		☒																☒													☒				☒	☒	☒	☒	☒		☒					
Jacinto Unit	283	☒		☒																☒													☒				☒	☒	☒	☒	☒	☒	☒					
Merrill's Landing Unit	172	☒	☒	☒																☒													☒				☒	☒	☒	☒	☒		☒					
Moulton Unit North	106	☒		☒																☒													☒				☒				☒	☒						
Moulton Unit South	131	☒		☒																☒													☒				☒	☒	☒	☒	☒	☒	☒					☒

Table 21-6B
Recreation Sites and Amenities on the Sacramento River from Red Bluff to Colusa

River Mile #	Site Name	Acres	Access: Mode of Access			Site Amenities & Uses: Facility Signage				Boating Facilities				On-Site Parking				Pedestrian Access			Overnighting (R=Reservable/ NR=Non-Reservable)					Water		Picnic Sites				Toilet Facilities				Other Amenities		Recreation Uses						Site Characteristics: Shore Characteristics						
			Public Use Allowed	Public Road	River	Entrance	Directional	Facility Rules	Services	Marina	Ramp(s)	Carry-in	Boat Dock/Landing	Asphalt Lot	Gravel Lot	Boat Trailer Parking	Dirt Lot	ADA Accessible	Paved Walks	Unpaved Walks/Trails	Tent sites	Tent/Trailer Sites	RV Sites	Group Camps	Cabins	Potable Water	Drinking Fountains	Picnic Tables	Picnic Shelters	BBQ Grills/Pits	Informal/Tree Shaded	Flush Toilets & Sinks	Pit/Chemical Toilets	Porta-potties	None	Showers	Public Phones	Store/Bar/Restaurant	Fishing	Hiking	Hunting	Passive Recreation	Wildlife Observation	Steep/Cut Embankment	Sandy Beach	Grassy/tule	Shrubby	Undercut	Overhanging Shrubs	Overhanging Trees
182.5	Ord Bend Unit	112	☒	☒	☒	☒	☒	☒				☒		☒	☒	☒	☒	☒	☒	☒	☒			☒	☒	☒	☒	☒	☒	☒	☒	☒		☒	☒	☒		☒	☒	☒	☒	☒	☒	☒		☒	☒		
174.5	Oxbow Unit	94	☒		☒																☒													☒	☒			☒	☒	☒	☒	☒	☒						
194-8	Pine Creek Unit	1060	☒		☒																☒													☒				☒	☒	☒	☒	☒		☒					
163	Princeton Unit North	551	☒	☒	☒												☒				☒													☒				☒	☒	☒	☒	☒	☒	☒					
164	Princeton Unit East		☒	☒	☒																☒													☒				☒	☒	☒	☒	☒	☒						
162	Princeton Unit South	150	☒		☒																☒													☒				☒	☒	☒	☒	☒	☒	☒					
187	Shannon Slough Unit	150	☒	☒	☒																☒													☒				☒	☒	☒	☒	☒	☒	☒					
159	Stegemen Unit	154	☒		☒																☒													☒				☒	☒	☒	☒	☒	☒	☒					
202-5	Wilson's Landing Unit	285	☒		☒																☒													☒				☒	☒	☒	☒	☒		☒		☒			
Reclamation Board																																																	
146.2	Beach at SRWA Colusa Unit	50+/-			☒																																☒						☒						
145.9	Cobb's Bend (island)	35+/-			☒																																☒						☒						
145.5	Cruise n' Tarry Marina	22.2	☒	☒	☒							☒					☒																				☒					☒	☒						
190	Sam's Slough	70.2																																			☒					☒							
196	Site near Pine Creek Landing	~50			☒																																											
196	Site 86F (in SWRA Pine Creek)	~25			☒																																						☒						
192.5	Site 32F (Instr. #960756)	33.7																																			☒						☒						
191	Sacramento River Parcel	33.3			☒																																					☒						
178.2	Site 85F (B808 P72 S 43)	73.3			☒																																☒					☒						
172	Site 86F	29			☒																																☒						☒						
	Site 78 (B795 P140 S67)	122																																															
	Site 79F (B807 P293 S67)	36																																															
170.5	Site 86F (B807 P293 S67)	29			☒																																☒						☒		☒				
170	Site 79F (B795 P135 S67)	122			☒																																☒						☒		☒				
State Lands Commission																																																	
221	Kopta Slough		☒	☒	☒	☒	☒	☒			☒	☒		☒	☒	☒	☒	☒	☒	☒	☒			☒	☒	☒	☒	☒	☒	☒	☒		☒	☒	☒	☒		☒	☒	☒	☒	☒	☒	☒		☒	☒		
County and City Public Facilities																																																	
City of Colusa																																																	
144	Colusa Levee Scenic Park	2.19	☒	☒	☒	☒		☒												☒		☒					☒	☒		☒	☒							☒				☒	☒			☒			
	Glenn County																																																
169	Butte City Launch Facilities	2	☒	☒		☒	☒	☒			☒			☒													☒	☒					☒				☒					☒			☒			
184	Ordbend Park	12	☒	☒	☒	☒	☒	☒			☒			☒					☒							☒	☒		☒		☒						☒				☒	☒			☒			
	Tehama County																																																
229.5	Mill Creek Park Launching Facility		☒	☒	☒	☒					☒			☒												☒	☒	☒				☒		☒															
231.5	North Mill Creek Fishing Access		☒	☒	☒												☒			☒	☒										☒				☒														
218	Tehama County River Park		☒	☒	☒	☒					☒			☒				☒	☒		☒					☒	☒	☒	☒	☒	☒	☒											☒						

Table 21-6B
Recreation Sites and Amenities on the Sacramento River from Red Bluff to Colusa

River Mile #	Site Name	Acres	Access: Mode of Access: Public Use Allowed	Access: Mode of Access: Public Road	Access: Mode of Access: River	Site Amenities & Uses: Facility Signage: Entrance	Facility Signage: Directional	Facility Signage: Facility Rules	Facility Signage: Services	Boating Facilities: Marina	Boating Facilities: Ramp(s)	Boating Facilities: Carry-in	Boating Facilities: Boat Dock/Landing	On-Site Parking: Asphalt Lot	On-Site Parking: Gravel Lot	On-Site Parking: Boat Trailer Parking	On-Site Parking: Dirt Lot	Pedestrian Access: ADA Accessible	Pedestrian Access: Paved Walks	Pedestrian Access: Unpaved Walks/Trails	Overnighting (R=Reservable/ NR=Non-Reservable): Tent sites	Overnighting: Tent/Trailer Sites	Overnighting: RV Sites	Overnighting: Group Camps	Overnighting: Cabins	Water: Potable Water	Water: Drinking Fountains	Picnic Sites: Picnic Tables	Picnic Sites: Picnic Shelters	Picnic Sites: BBQ Grills/Pits	Picnic Sites: Informal/Tree Shaded	Toilet Facilities: Flush Toilets & Sinks	Toilet Facilities: Pit/Chemical Toilets	Toilet Facilities: Porta-potties	Toilet Facilities: None	Other Amenities: Showers	Other Amenities: Public Phones	Recreation Uses: Store/Bar/Restaurant	Recreation Uses: Fishing	Recreation Uses: Hiking	Recreation Uses: Hunting	Recreation Uses: Passive Recreation	Recreation Uses: Wildlife Observation	Site Characteristics: Shore Characteristics: Steep/Cut Embankment	Sandy Beach	Grassy/tule	Shrubby	Undercut	Overhanging Shrubs	Overhanging Trees
Private Facilities																																																									
The Nature Conservancy																																																									
197	Bratten	83																																																									
197	Gunhill	58																																																							
197	Kaplan	102																																																							
199	Harley	103		☒																																																					
194	Rx Ranch	236		☒																																																				
199	Sunset Ranch	111		☒	☒																																																		
198	Vereschagen	177		☒	☒																																																		
145-6	Ward	238			☒																																																				
Private																																																									
142	Bert's Steelhead Marina	~1	☒	☒	☒	☒							☒	☒							☒		☒			☒		☒				☒						☒						☒			☒						
229.5	Driftwood RV Fishing Resort	~6	☒	☒	☒	☒							☒		☒						☒		☒	☒		☒		☒				☒				☒						☒	☒			☒					
229.7	Hidden Harbor Marina & RV Park	8.86	☒	☒	☒	☒				☒	☒		☒			☒					☒		☒			☒		☒				☒						☒						☒	☒			☒					
235	Hunter's Resort	~12	☒	☒	☒	☒				☒	☒		☒			☒					☒		☒			☒		☒															☒	☒			☒					
229.5	River's Rest Resort	~2	☒	☒	☒	☒							☒		☒						☒		☒			☒		☒				☒											☒	☒			☒					
196.5	Scotty's Boat Landing (lease)	~2	☒	☒	☒	☒					☒					☒	☒				☒		☒			☒		☒				☒					☒	☒						☒	☒							
218	Woodson Bridge RV Park	~12	☒	☒	☒	☒							☒		☒	☒					☒	☒	☒	?		☒		☒		☒		☒				☒	☒	☒					☒	☒	☒						

Source, EDAW, 2003.

Lake Oroville State Recreation Area

Lake Oroville SRA includes Lake Oroville, the second largest storage reservoir in California, and much of the Thermalito Complex, which are owned and operated by DWR as part of the SWP. Recreation resources at Lake Oroville SRA include boating, fishing, fully developed and primitive camping, picnicking, swimming, horseback riding, mountain biking, wildlife watching, and hunting. Lake Oroville has two full-service marinas, numerous boat ramps, 10 floating campsites, 84 boat-in campsites, and seven two-stall floating toilets (DWR, 2004). The Oroville WA contains the surface of the Thermalito Afterbay and surrounding lands, and some lands adjacent to the Feather River. Recreation activities include boating, waterskiing, hunting, fishing, wildlife viewing, camping, and picnicking.

Lake Oroville has five public boat ramps with two lanes or more, a DWR service ramp, and five one-lane cartop boat ramps (Table 21-7). Four of the cartop ramps are shallow, reaching only to elevations between 825 and 866 feet. Foreman Creek Ramp is much deeper, extending to 730 feet, as does the DWR Service Ramp. The five major public boat ramps (Loafer Creek, Enterprise, Lime Saddle, Spillway, and Bidwell Canyon) launch most of the recreational boats on Lake Oroville. A day-use area and Aquatic Center are popular at Thermalito Forebay. These Lake Oroville SRA recreational facilities are managed by California Department of Parks and Recreation, which has entered into a contract with the Feather River Recreation and Park District for Aquatic Center operation. No motorized boating is allowed at the North Forebay area, but personal watercraft use is popular at South Forebay.

Table 21-7
Lake Oroville Boat Ramp Bottom Elevations

	Elevation (Feet)	Feet Below MNWS	Boat Ramp Lanes
Stringtown Cartop	866	34	1
Dark Canyon Cartop	851	49	1
Vinton Gulch Cartop	848	52	1
Nelson Bar Cartop	825	75	1
Loafer Creek	775	125	2 to 8
Enterprise	750	150	2
Foreman Creek Cartop	730	170	1
DWR Service Ramp	730	170	2
Lime Saddle	702	198	2 to 4
Spillway	695	205	2 to 12
Bidwell Canyon	675	227	2 to 7

Note:
Maximum Normal Water Surface (MNWS) elevation occurs at 900 feet.

Source: DWR, 2004; Dossey, pers. comm., 2012; Rischbieter, pers. comm., 2011.

Stony Gorge Reservoir

Stony Gorge Reservoir is located approximately 23 miles west of Willows and upstream of Black Butte Lake on Stony Creek. Its primary purpose is to provide irrigation water, but there is one recreation area on the north end of the reservoir. Use declines in the latter half of summer and fall as the water level declines. There are primitive campsites for tents and recreational vehicles, and one reservable pay-for-use group campsite. No hunting or off-road vehicle use is permitted. Some permanent restrooms are available. There is one single-lane concrete boat ramp at Stony Gorge that is available year-round (Dirksen and Dirksen, 2003).

Feather River

Downstream of Lake Oroville, the Feather River passes through the Oroville WA and several towns before joining the Sacramento River at Verona. The most popular recreation area is Riverfront Park near Marysville. Facilities include picnic areas, restrooms, nearby campgrounds and lodging, and a boat ramp. Verona Marina, located at the mouth of the Feather River, has a boat ramp which is used primarily by boat anglers. Recreation activities on the Feather River downstream of Lake Oroville include boating, fishing, camping, picnicking, swimming, wildlife viewing, and hunting. Several miles of the river near the City of Oroville are popular for bank fishing, and boat anglers frequent the lower river. Recreational facilities include public and private launch ramps, camp and day-use facilities, and trails (Stienstra, 2004).

New Bullard's Bar Reservoir

New Bullard's Bar Reservoir is located on the Yuba River in the Tahoe and Plumas national forests in Yuba County. Popular recreation activities include waterskiing, wakeboarding, houseboating, wildlife viewing, power boating, non-motorized boating, fishing, hiking, mountain biking, and camping. The Yuba County Water Agency and the USFS maintain 30 boat access camps and lakeside camping. Emerald Cove Marina is a full-service facility offering rental houseboats and fishing boats along with moorings for private houseboats (YCWA, 2010).

East Park Reservoir

East Park Reservoir is located approximately 20 miles west of Maxwell in the Stony Creek watershed. The reservoir is located between the towns of Lodoga and Stonyford and 10 miles south of Stony Gorge Reservoir. There are areas on the west and east shores of the reservoir that are developed for recreation. Although there are no concrete boat ramps, there are two designated and six informal boat launch sites on the lake (Hinton and Campbell, 2003). There are no formally defined campsites or user fees at East Park except for three reservable fee group campsites: Chisholm Cove Group Camp, Hole in the Wall, and Coyote Cove. Camping areas are user defined and are located near the water's edge. There are approximately 44 acres of camping area available to the public at East Park (Tetra Tech, 2004).

Englebright Reservoir

Englebright Reservoir is located in the Sierra Nevada foothills approximately 21 miles east of Marysville. Recreation opportunities include boat-in camping, fishing, a marina, a store, and a café. Boats can be launched near the dam or at Joe Miller Recreation Area. A variety of rental boats are available at Skippers Cove (Dean's AnglerNet.com, 2011).

Indian Valley Reservoir

Indian Valley Reservoir, including the Cache Creek Recreation Area, is located on the North Fork of Cache Creek in Lake County, and is operated by the Yolo County Flood Control & Water Conservation District. It is located in a secluded area of the Coast Range and is surrounded by public land managed by the BLM. There are four designated recreation areas, which include a marina and unimproved and primitive campsites. Boating speed is limited to 10 mph, and waterskiing and jetskis are prohibited (Rischbieter and Elkins, 2000; FishersNet.com, 2011).

Clear Lake

Clear Lake provides many year-round recreation resources including fishing, boating, sailing, swimming, and waterskiing. There are eight county parks, two State parks, and three city parks located on the lake's

perimeter, with 11 no-fee public boat ramps. There are also many private resorts and marinas. Clear Lake hosts many bass fishing tournaments. Because of Clear Lake's elevated mercury levels, a health advisory is in effect for consumption of fish caught in the lake (Stienstra, 2004; Dirksen and Dirksen, 2003).

Folsom Lake State Recreation Area and Lake Natoma

Folsom Lake and Lake Natoma are owned by Reclamation, and recreation is managed through an agreement with the California Department of Parks and Recreation. Folsom Lake is located east of the City of Sacramento and extends to the north and south forks of the American River. Recreation resources include boating, camping, fishing, picnicking, and an extensive trail system. The trail system connects to the American River Parkway, a 6,000-acre open corridor that connects trails and parks throughout the City of Sacramento. Facilities at Folsom Lake include two major campgrounds and multi-stage boat ramps to provide continuous boating under fluctuating water level conditions (Rischbieter, 2001).

Folsom Lake has eight major boat ramps with two or more lanes and two one-lane ramps more suitable for cartop boats (Table 21-8). Both one-lane ramps are relatively shallow ramps, and Bigger's Cove ramp is out of the water by the end of September every year. Some of the ramps are not available until the lake elevation is 18 to 58 feet below the normal maximum water surface elevation.

Table 21-8
Folsom Lake Boat Ramp Bottom Elevations

	Elevation (Feet)	Feet Below MNWS	Boat Ramp Lanes
Bigger's Cove (Peninsula North)	434	34	1
New Stage Four (Granite Bay)	425	43	4
Rattlesnake Bar	425	43	2
Peninsula South	410	58	1
5 percent Ramp (Granite Bay)	408	60	4
Folsom Point (Old Dyke 8)	406	62	4
Old Stage One to Four[a] (Granite Bay)	395	73	2-10
Folsom Lake Marina (Brown's Ravine)	395	73	4
Hobie Cove[b] (Brown's Ravine)	375	93	4
Low Water Ramp[c] (Granite Bay)	370	98	2

[a]Stage Three boat ramp (10 lanes) starts at elevation 450 feet, Stage two (10 lanes) starts at elevation 435 feet, and Stage One (2 lanes) starts at elevation 420 feet.

[b]Hobie Cove boat ramp starts at elevation 426 feet.

[c]Low Water ramp starts at elevation 410 feet.

Note:

Maximum Normal Water Surface (MNWS) elevation occurs at 468 feet.

Source: Moses, pers. comm., 2011.

Lake Natoma is the regulating reservoir for Folsom Lake. The water is very cold and lake levels can fluctuate three or four feet per day. This narrow lake has approximately 500 surface acres, with 13 miles of shoreline. The lake covers old dredge tailings, which create good fish habitat, but can be a boating hazard. Waterskiing is prohibited and a five-mile-per-hour speed limit is enforced. Boats with small motors, canoes, kayaks, inflatables, sail boats, and sail-boards are permitted. There are three group camps and a boat ramp at Negro Bar. The California State University Sacramento Aquatic Center near Nimbus Dam has a boat ramp and offers rentals and lessons for aquatic sports (Stienstra, 2004).

American River

The lower American River flows for 23 miles downstream of Lake Natoma and Folsom Dam through the greater Sacramento urban area. Recreation activities include recreational boating, rafting, kayaking, fishing, swimming, and wading. The river passes through the American River Parkway. This heavily used parkway is a paved bike, walking, running, hiking, and equestrian trail that extends from Lake Natoma to Discovery Park. The American River Parkway provides a greenbelt for several communities and experiences over one million visitors annually. There are more than a dozen public access points or parks along the trail. This is a Class 1 rafting river (with three Class II rapids) and is used heavily from Memorial Day weekend to Labor Day. Fishing is also popular in this reach (Stienstra, 2004). The 23 miles of the lower American River from Nimbus Dam to the confluence with the Sacramento River is designated "recreational" in the State and federal Wild and Scenic Rivers System (NWSRS, 2013).

Lake Berryessa

Lake Berryessa, which is directly managed by Reclamation, is the largest reservoir in the eastern foothills of the Coast Range. Its primary purposes are water supply, hydroelectric power, and recreation. Located near major metropolitan areas (Sacramento and the San Francisco Bay Area) and known for excellent year-round fishing, it is one of northern California's more popular lakes. There are several public access areas along the western shoreline for day use, one boat ramp, and several recreation areas operated by concessionaires who have contracts with Reclamation. These resorts and marinas provide camping, boat launching, moorage, day use, and marina services (Dirksen and Dirksen, 2003).

Wildlife Refuges and Wildlife Areas

There is a complex of federal and State wildlife refuges in the Sacramento Valley along the Sacramento River that provides fishing, hunting, and wildlife viewing opportunities via auto tours and trails. Hunting is generally limited to upland game and waterfowl. These refuges include the Sacramento, Colusa, Sutter, and Delevan NWRs and Gray Lodge Wildlife Management Area. Gray Lodge is considered the most popular of the five refuges in the region. Fishing and hunting account for approximately 50 percent of the total use. The remaining 50 percent is devoted to hiking and photography. Recreational opportunities at the Colusa NWR include hunting, hiking, wildlife viewing, auto tour routes, and environmental education. The Sacramento NWR is headquarters for the Sacramento Valley Refuge Complex and contains a visitor center. At the Delevan NWR, hunting is allowed and a photo blind is available (CALFED, 2000).

Sutter and Yolo Bypasses

The Sutter Bypass includes the Sutter NWR, part of the larger Sutter Bypass WA. Hunting, fishing, bird watching, photography, and general nature observation are primary recreation activities. Fishing occurs year-round (DFG, 2011a).

The Yolo Bypass includes the 1,461-acre Fremont Weir WA. Although there are no formal facilities in this WA, recreationists fish, bird watch, and view wildlife. Hunting is allowed during spring turkey season and also daily from July 1 through January 31.

The Yolo Bypass also includes the Sacramento Bypass WA. The Sacramento Bypass WA is located along the Sacramento River Deep Water Ship Channel downstream of the City of Sacramento. It is a major public waterfowl and pheasant hunting area, with several duck blinds and parking areas. There are also picnic facilities and trails. This 360-acre area provides fishing and wildlife and bird watching. Hunting is

allowed from September 1 to January 31. Fishing occurs at the East Toe Drain and along lower Putah Creek (EDAW, 2010).

Sacramento–San Joaquin Delta, San Francisco Bay, Suisun Bay, and San Pablo Bay

The Sacramento-San Joaquin Delta includes the legal Delta and the Sacramento River from Colusa to the Delta. It is the largest estuary on the west coast and provides more than 500 miles of navigable waterways. Most of the recreation in the Delta is water-dependent or water-enhanced. Although boating and fishing are the most popular activities, people also engage in camping, picnicking, hiking, bicycling, hunting, and wildlife viewing.

San Francisco Bay is used heavily for sailing. Yachting and yacht racing are also popular activities. A bicycle and pedestrian trail circles the shoreline of the bay along with many parks and natural areas.

Suisun Bay is a shallow tidal estuary that provides fishing opportunities year-round. Boat access is available at three marinas, and camping sites for motor homes or trailers are available at the Benicia State Recreation Area. Suisun Bay is surrounded by Suisun Marsh, which is the largest brackish marsh on the west coast and includes 116,000 acres of wetlands. It contains public waterfowl hunting areas and 158 private duck clubs. The marsh's open space and proximity to major urban areas make it well-suited for wildlife viewing, hiking, canoeing, as well as hunting (DWR, 2011).

San Pablo Bay is a tidal estuary that forms the northern extension of San Francisco Bay. Because of its large size and shallow waters, San Pablo Bay frequently has difficult conditions for boating. Prevailing winds produce large waves and there are few protected areas for most boats. The San Pablo Bay NWR and the Napa-Sonoma Marshes WA are located along the Napa River estuary on the north shore of the bay. Most of the area is accessible to the public by boat only. However, there is enough vehicle access that the area is regularly used by hunters and anglers, as well as bird watchers, photographers, bicyclists, and hikers (USFWS, 2011; DFG, 2011b).

21.2.4 Primary Study Area

21.2.4.1 Recreation Resources, Use, and Capacity

This section describes the existing recreation resources in the Primary Study Area, which includes the footprints of the Project facilities, as well as the construction disturbance area around those proposed facilities.

All Primary Study Area Project Facilities

Most of the Project facility sites are privately owned[5], with no public access. However, the private landowners within Antelope Valley, their guests, and their employees may participate in recreational activities, such as hunting upland game birds, deer, and wild boar, as well as firearm target practice, hiking and picnicking, off-road vehicle use, and primitive camping. Occasional horseback riding has also been observed. Fishing is an infrequent activity because of the intermittent nature of the streams in Antelope Valley; children have been observed fishing in Stone Corral Creek located downstream of the

[5] The following proposed Project facility sites are privately owned: Sites Reservoir and Dams, Recreation Areas, Sites Pumping/Generating Plant, Sites Electrical Switchyard, Tunnel from Sites Pumping/Generating Plant to Sites Reservoir Inlet/Outlet Structure, Sites Reservoir Inlet/Outlet Structure, Field Office Maintenance Yard, Holthouse Reservoir Complex, Holthouse Reservoir Electrical Switchyard, TRR, TRR Pumping/Generating Plant, TRR Electrical Switchyard, TRR Pipeline, TRR Pipeline Road, Delevan Pipeline Electrical Switchyard, and GCID Canal Connection to the TRR.

proposed Sites Dam site. There are several stock ponds located throughout the proposed Sites Reservoir footprint, and some are large enough to support warmwater fishes; it is not known, however, if these ponds are used for recreational fishing. Estimated recreation use within Antelope Valley is approximately 300 hours annually (Rischbieter and Elkins, 2000; Reclamation, 2012).

Existing recreation activities that occur along the proposed Delevan Pipeline and Delevan Transmission Line alignments are associated with private hunting and fishing clubs; the duck hunting clubs experience high use levels.

The proposed location of the Delevan Pipeline Intake/Discharge facilities, which includes a portion of the bank of the Sacramento River, is currently used for shore fishing, but use is limited because the shore can only be accessed from private land. In addition, the river is used for activities such as boating and boat fishing at this location.

The GCID Canal, facilities, and lateral bank roads are for the use of authorized personnel only. The use of the GCID Canal, facilities and roads for public recreation or other unauthorized activity is prohibited.

Limited recreation activities occur on private lands within the proposed construction disturbance areas for the proposed new roads. Existing county roads are used by the public for access to the local area, including existing reservoirs and the Mendocino National Forest.

The existing Funks Reservoir and the land surrounding the reservoir are owned by Reclamation. Opportunities for public recreation at Funks Reservoir do not exist because the maintenance roads leading into and around it are closed to the public.

21.3 Environmental Impacts/Environmental Consequences

21.3.1 Regulatory Setting

Recreation resources are regulated at the federal, State, and local levels. Provided below is a list of the applicable regulations. These regulations are discussed in detail in Chapter 4 Environmental Compliance and Permit Summary of this EIR/EIS.

21.3.1.1 Federal Plans, Policies, and Regulations

- Management Guide for the Shasta and Trinity Units of the Whiskeytown-Shasta-Trinity National Recreation Area
- Federal Water Project Recreation Act of 1965
- Rehabilitation Act of 1973
- Architectural Barriers Act of 1968
- Americans with Disabilities Act of 1990, as Amended
- San Luis Authorization Act

21.3.1.2 State Plans, Policies, and Regulations

- Davis-Dolwig Act of 1961 and State Water Code Section 11900-11901
- California Public Trust Doctrine
- Folsom Lake State Recreation Area General Plan and Amendment

- Lake Oroville State Recreation Area Resource Management Plan and General Development Plan and Amendment
- San Luis Reservoir State Recreation Area General Development Plan and Amendment

21.3.1.3 Regional and Local Plans, Policies, and Regulations

- Glenn County General Plan
- Colusa County General Plan

21.3.2 Evaluation Criteria and Significance Thresholds

Significance criteria represent the thresholds that were used to identify whether an impact would be significant. Appendix G of the *CEQA Guidelines* suggests the following evaluation criteria for recreation resources:

- Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?
- Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

The evaluation criteria used for this impact analysis represent a combination of the Appendix G criteria and professional judgment that considers current regulations, standards, and/or consultation with agencies, knowledge of the area, and the context and intensity of the environmental effects, as required pursuant to NEPA. For the purposes of this analysis, an alternative would result in a significant impact if it would result in any of the following:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Require the construction or expansion of existing recreational facilities, which may have an adverse physical effect on the environment.
- Reduce recreation use levels at existing recreational facilities by providing an alternative new site for recreation visitors.
- Reduce recreation use levels and/or recreation benefits at existing reservoirs or rivers due to changes in operating criteria (significant impacts would be triggered by the loss of use for one month for the lowest boat ramp and two months for intermediate[6] boat ramps over the 82-year period of record within the primary recreation season.; in addition, a one point reduction or more in the recreation-day benefit value for reservoir operation would be considered a significant impact.)
- Reduce recreation use levels at existing recreational facilities during the Project construction period.
- Create hazardous conditions for water-based activities due to changes in operating criteria.

[6] Intermediate boat ramps are all major boat ramps other than the lowest boat ramp.

21.3.3 Impact Assessment Assumptions and Methodology

21.3.3.1 Assumptions

The following assumptions were made regarding Project-related construction, operation, and maintenance impacts to recreation resources:

- Direct Project-related construction, operation, and maintenance activities would occur in the Primary Study Area.
- Direct Project-related operational effects would occur in the Secondary Study Area.
- The only direct Project-related construction activity that would occur in the Secondary Study Area is the installation of an additional pump into an existing bay at the Red Bluff Pumping Plant.
- The only direct Project-related maintenance activity that would occur in the Secondary Study Area is the sediment removal and disposal at the two intake locations (i.e., GCID Canal Intake and Red Bluff Pumping Plant).
- No direct Project-related construction or maintenance activities would occur in the Extended Study Area.
- Direct Project-related operational effects that would occur in the Extended Study Area are related to San Luis Reservoir operation; increased reliability of water supply to agricultural, municipal, and industrial water users; and the provision of an alternate Level 4 wildlife refuge water supply. Indirect effects to the operation of certain facilities that are located in the Extended Study Area, and indirect effects to the consequent water deliveries made by those facilities, would occur as a result of implementing the alternatives.
- The existing bank protection located upstream of the proposed Delevan Pipeline Intake/Discharge facilities would continue to be maintained and remain functional.
- No additional channel stabilization, grade control measures, or dredging in the Sacramento River at or upstream of the Delevan Pipeline Intake or Discharge facilities would be required.
- The extension of the Bidwell Canyon boat ramp at Lake Oroville that is planned for in the FERC License Renewal Project, which is a project included in the No Project/No Action Alternative, would be implemented.

21.3.3.2 Methodology

Potential impacts to recreation resources were evaluated for the proposed Sites Reservoir and five major reservoirs that would potentially be affected by Project operations (Trinity, Shasta, Oroville, Folsom, and San Luis). End-of-month water surface elevations for each of these reservoirs were evaluated to determine if changes in operation would result in adverse effects to the aesthetic quality of the reservoirs, or would result in reduced availability of boat ramps. The methods used to evaluate these effects are described below.

Recreation-Day Benefit Value for Reservoir Operation

Recreation-day benefit values for reservoirs are based on guidelines described in DWR's Economics and Recreation Planning Manuals and in Supplementary Procedures for Application of Department of Water

Resources Guidelines for Evaluation of General Recreation, developed jointly by the Departments of Parks and Recreation and DWR (California State Parks, 1967).

These guidelines are intended to express the net benefit of a reservoir to a recreationist in terms of two equally weighted factors: (1) variety and quality of recreation, and (2) aesthetic qualities of the site. Factors considered in determining the variety and quality of recreation at a reservoir include the types of activities available, quality of the experience, quality of development, and operation and maintenance of the facilities and area. Aesthetic factors include reservoir operation, geologic, topographic, aquatic, vegetative, climate, and other environmental factors.

For the purposes of this analysis, only the reservoir operation portion of the recreation-day benefit value was evaluated. Reservoir operations were assigned up to 50 points; in general, a full reservoir with no water level fluctuations during the recreation season would receive 50 points, and a reservoir that experiences severe water level fluctuations or drawdowns during the recreation season would receive few points.

Specifically, CALSIM II modeling results (Appendix 6B) were used to obtain the long-term average end of month surface area during the primary recreation season (May 1 through September 30), for each reservoir, for Existing Conditions, the No Project/No Action Alternative, and for each action alternative. Because modeling results represent end-of-month values, results for April through September were analyzed to represent the primary recreation season.

The average end of month surface area was calculated for April through September, and then divided by the maximum normal water elevation surface area of the reservoir to obtain a ratio of average surface area to normal pool surface area. The calculated ratio was compared to a Project Operations –Reservoir Point Rating Graph (California State Parks, 1967) to obtain the associated operation points portion of the recreation-day benefit value. The operation point value was then rounded to the nearest half point (Appendix 21A). A one point reduction or more in the recreation-day benefit value for reservoir operation resulting from changes in reservoir operations was considered a potentially significant impact.

Boat Ramp Availability

CALSIM II modeling results (Appendix 6B) were used to obtain the average end of month water elevations for the reservoirs that could be affected by Project operations. The entire 82-year period of record equates to 984 months; for the purposes of this analysis, only the primary recreation season was evaluated, which includes 492 months of the entire period of record. To analyze the potential impact of changes in reservoir operations on the availability of major boat ramps, average end-of-month reservoir elevations during the primary recreation season were compared to the bottom elevations of the boat ramps (i.e., the elevation when a boat ramp is no longer usable) to determine the number of months that each boat ramp would be dewatered for Existing Conditions and for each of the alternatives (Appendix 21B). Major boat ramps are defined as having two lanes or more; cartop boat ramps and service ramps were not evaluated. The major boat ramps evaluated included the following:

- San Luis Reservoir: Dinosaur Point, Basalt
- Trinity Lake: Stuart Fork, Clark Springs, Bowerman, Fairview, Trinity Center, Cedar Stock, Minersville
- Lake Shasta: Bailey Cove, Antlers, Hirz Bay, Packers Bay, Silverthorn Marina, Digger Bay Marina, Sugarloaf, Bridge Bay Resort, Centimudi, Jones Valley

- Lake Oroville: Loafer Creek, Enterprise, Lime Saddle, Spillway, Bidwell Canyon
- Folsom Lake: Rattlesnake Bar, New Stage Four (Granite Bay), Five Percent (Granite Bay), Folsom Point (Old Dyke 8), Folsom Lake Marina (Brown's Ravine), Old Stage One to Four (Granite Bay), Hobie Cove (Brown's Ravine), Low Water (Granite Bay)
- Proposed Sites Reservoir: Stone Corral, Unnamed

It should be noted that this method of evaluation does not provide the exact number of months or days the boat ramps would be dewatered because six end-of-month estimates of average reservoir elevation are required to define the May 1 to September 30 period. Water levels could reach the bottom of a boat ramp any time during the month, but modeling results only provide elevation information for the end of each month.

21.3.4 Topics Eliminated from Further Analytical Consideration

There is no recreational use directly associated with agricultural, municipal, or industrial water use within the Extended Study Area. As described in the Affected Environment section, there is also no recreation use associated with Spring Creek. Therefore, the potential impacts to recreation use associated with these water supply uses or Spring Creek were not evaluated.

O'Neill Forebay in the Extended Study Area, as well as the regulating reservoirs that are located within the Secondary Study Area (including Lewiston Reservoir, Whiskeytown Reservoir, Keswick Reservoir, Thermalito Complex, and Lake Natoma), have also been eliminated from further consideration. As regulating afterbays, these reservoirs are operated to receive highly variable flows and, as a result, surface water elevations fluctuate significantly on a daily and hourly basis. Therefore, changes in the operation of upstream reservoirs with implementation of any of the alternatives would not affect the monthly mean elevation of these regulating reservoirs. Consequently, no assessment of potential elevation-related impacts on recreation resources in these regulating reservoirs is warranted.

The evaluation of reduced recreation use levels at existing reservoirs or rivers (**Impact Rec-4**) is not applicable to the managed wetlands of the Level 4 wildlife refuges within the Extended Study Area, and is, therefore, not discussed for those refuges.

Project construction activities would occur only with Alternatives A, B, and C at the Red Bluff Pumping Plant (located within the Secondary Study Area) and at Project facilities sites located within the Primary Study Area. Therefore, the effects of Project construction on existing recreation use levels (**Impact Rec-5**) are not discussed for any of the three study areas for the No Project/No Action Alternative, or for the Extended Study Area and the areas beyond the Red Bluff Pumping Plant within the Secondary Study Area for Alternatives A, B, and C.

The only alternative new site for recreation visitors for Alternatives A, B, and C would be Sites Reservoir. Therefore, the effects of a new recreation site on recreation use levels at existing recreational facilities (**Impact Rec-3**) are not discussed for the other proposed Project facilities within the Primary Study Area.

The defined Primary Study Area does not include any existing reservoirs that provide recreational opportunities, and does not include the Sacramento River. Impacts to recreation use levels and recreation benefits resulting from changes in operating criteria (**Impact Rec-4**) are, therefore, not discussed for the Primary Study Area. For these same reasons, hazardous conditions resulting from changes in operating criteria (**Impact Rec-6**) are not discussed for the Primary Study Area, with the exception of the Delevan

Pipeline Intake Facilities and Delevan Pipeline Discharge Facility, which would release water into the Sacramento River.

21.3.5 Impacts Associated with the No Project/No Action Alternative

21.3.5.1 Extended Study Area – No Project/No Action Alternative

Construction, Operation, and Maintenance Impacts

San Luis Reservoir

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Project operational modeling results indicate that implementation of the No Project/No Action Alternative, when compared to Existing Conditions, would result in the same or slightly decreased water surface elevations during most water years, and increased water surface elevations during Dry and Critical years at San Luis Reservoir. These fluctuations in San Luis Reservoir surface water elevations are not expected to affect recreation use or to increase use of existing facilities. Therefore, these changes in surface water elevations at San Luis Reservoir resulting from implementation of the No Project/No Action Alternative **would not have a substantial adverse effect** on recreation use at other existing facilities, when compared to Existing Conditions.

Population growth is expected to occur in California throughout the period of Project analysis (i.e., 100 years), and is included in the assumptions for the No Project/No Action Alternative. Population growth could result in the increased use of existing recreational facilities such that substantial physical deterioration of the facilities would occur. Therefore, population growth associated with implementation of the No Project/No Action Alternative **could have a substantial adverse effect** on recreation use at existing facilities, when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Negligible fluctuations in San Luis Reservoir surface water elevations would not require the construction or expansion of existing facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, there **would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

It is possible that one or more projects included in the No Project/No Action Alternative could include recreational facilities that could affect recreation use levels at San Luis Reservoir. However, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Population growth would not be expected to result in reduced recreation use levels. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

San Luis Reservoir surface water elevation is currently drawn down to a level that is below the bottom of the Basalt boat ramp in Above Normal, Dry, and Critical years. Implementation of the No Project/No Action Alternative would result in lower water levels than Existing Conditions in Wet, Above Normal, and Below Normal years, but would average eight feet higher in Dry years and 13 feet higher in Critical years.

Project modeling for the No Project/No Action Alternative indicates that the Dinosaur Point ramp would be dewatered more often during Wet and Below Normal years, but less often during above Normal, Dry, and Critical years over the 82-year period of record within the primary recreation season. Overall, San Luis Reservoir surface water elevations would drop below the Dinosaur Point boat ramp one month less often over the 82-year period of record within the primary recreation season than for Existing Conditions, and below the Basalt Boat Ramp three months less often over the 82-year period of record within the primary recreation season than for Existing Conditions. This decrease in the frequency of dewatering of boat ramps would be a **beneficial effect,** when compared to Existing Conditions. There are no boat-in camps or swimming beaches at San Luis Reservoir because of its existing frequent and severe drawdown pattern (as much as 40 feet in one month during a Critical year, and commonly 70 feet during the recreation season). Based on Project modeling for the No Project/No Action Alternative, the water intake at the Basalt Campground would be dewatered five fewer months over the 82-year period of record within the primary recreation season than with Existing Conditions. This would be a **beneficial effect**, when compared to Existing Conditions

Continued reservoir fluctuations associated with the No Project/No Action Alternative would result in a recreation-day benefit value for reservoir operation of 4 points, which is the same as the value for Existing Conditions. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions**.**

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Negligible fluctuations in San Luis Reservoir surface water elevations would not be expected to create hazardous conditions for water-based activities. Therefore, there **would not be a substantial adverse effect,** when compared to Existing Conditions.

Other Reservoirs within the Extended Study Area

Tri-Dam Reservoirs, New Melones Reservoir, Don Pedro Reservoir, Lake McClure, Pyramid Lake, Castaic Lake, Silverwood Lake, and Lake Perris

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for San Luis Reservoir. The discussion related to population growth would also apply to these other reservoirs. Recreation use at these other existing reservoirs in the Extended Study Area could be affected by implementation of the No Project/No Action Alternative because modeling results indicate that patterns of Delta exports would change and would be reduced more frequently, including by 10 percent or more during some months of Critical years. Additionally, large decreases in exports would also occur, which could potentially result in large reductions in storage during

some years. Reductions in Delta exports and large reductions in reservoir storage would not be expected to result in increased use of existing recreational facilities. Implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect**, when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** modeling results discussion. Decreases in storage at these other reservoirs in the Extended Study Area would not require the construction or expansion of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect**, when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

It is possible that one or more projects included in the No Project/No Action Alternative could include recreational facilities that could affect recreation use levels at existing recreational facilities at these other existing reservoirs in the Extended Study Area. However, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Population growth would not be expected to result in reduced recreation use levels. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Refer to the **Impact Rec-1** modeling results discussion. Decreases in Delta exports and the resulting potential reductions in reservoir storage at these other existing reservoirs in the Extended Study Area could result in reduced recreation use levels and decreased recreation-day benefit values for reservoir operations. These reductions **would have a potentially substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** modeling results discussion. Potential large reductions in reservoir storage at these other existing reservoirs in the Extended Study Area could expose submerged obstacles and create hazardous conditions for boaters and other recreationists participating in water-based activities. Reductions in reservoir storage, therefore, **would have a potentially substantial adverse effect**, when compared to Existing Conditions.

Wildlife Refuge Water Use

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for San Luis Reservoir. The discussion related to population growth would also apply to wildlife refuges. Implementation of the No Project/No Action Alternative is

expected to result in a slight increase in water supplies for wildlife refuges. Increased water supplies for the managed wetlands at these refuges could result in increased recreation opportunities, and consequently, increased use of these refuges. However, the slight increase would not be expected to result in the deterioration of existing recreational facilities. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. The potential slight increase in recreation use at these wildlife refuges would not require the construction or expansion of the existing recreational facilities. In addition, if increased use of wildlife refuges associated with population growth resulted in the need to expand refuge facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect**, when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

It is possible that one or more projects included in the No Project/No Action Alternative could include recreational facilities that could affect recreation use levels at existing recreational facilities at these wildlife refuges. However, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Population growth would not be expected to result in reduced recreation use levels. Therefore, **there would not be a substantial adverse effect**, when compared to Existing Conditions.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. The potential slight increase in water supplies for wildlife refuges would not be expected to create hazardous conditions for water-based activities and, therefore, **would not have a substantial adverse effect**, when compared to Existing Conditions.

21.3.5.2 Secondary Study Area – No Project/No Action Alternative

Construction, Operation, and Maintenance Impacts

Trinity Lake

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to Trinity Lake. Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in negligible changes to surface water elevations at Trinity Lake. These small fluctuations would not be expected to increase use of existing recreational facilities, and therefore, **would not have a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Negligible changes in surface water elevations would not be expected to increase recreation use, and consequently, would not require the construction or expansion of existing facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Even though only relatively small changes in operation are expected, Project modeling indicates that the No Project/No Action Alternative would reduce the total number of months that five of the Trinity Lake boat ramps would be dewatered by 40 months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions. This increase in availability of these boat ramps at Trinity Lake would be a **beneficial effect,** when compared to Existing Conditions.

Project modeling also indicates that the Cedar Stock boat ramp would be dewatered the same number of months over the 82-year period of record within the primary recreation season with implementation of the No Project/No Action Alternative, when compared to Existing Conditions. This lack of change in the availability of the boat ramp **would not have a substantial adverse effect,** when compared to Existing Conditions.

The No Project/No Action Alternative would, however, dewater the Minersville ramp at the end of August during a Critical year, which, over the 82-year period of record within the primary recreation season, is two weeks sooner than with Existing Conditions. The two weeks of reduced availability does not meet the significance criteria of a one month reduction for a lowest boat ramp with implementation of the No Project/No Action Alternative, and therefore, **would not have a substantial adverse effect,** when compared to Existing Conditions.

Impacts on the relatively undeveloped swimming areas at Trinity Lake would be negligible because the swimming areas are always out of the water by late summer. Access impacts to the boat-in campsites are unknown; however, with Existing Conditions, the water is always a considerable distance away from the boat-in sites by September. These negligible decreases in availability associated with implementation of the No Project/No Action Alternative therefore, **would not have a substantial adverse effect,** when compared to Existing Conditions.

Recreation use at Trinity Lake may increase slightly in response to the improvement in reservoir operations associated with implementation of the No Project/No Action Alternative. This improvement in operation would increase the recreation-day benefit value for reservoir operation by one point, when compared to Existing Conditions, resulting in a **beneficial effect.**

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Negligible changes in surface water elevations would not be expected to create hazardous conditions for water-based activities and therefore **would not have a substantial adverse effect,** when compared to Existing Conditions.

Trinity River

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to the Trinity River. Modeling results for Trinity River flows downstream of Lewiston Lake for the No Project/No Action Alternative, when compared to Existing Conditions, indicate only slight changes in flows during Below Normal, Dry, or Critical water years. Large decreases in flow are indicated during Wet water years, but these decreases would not occur during the primary recreation season. These slight changes in flow would not result in increased use of existing facilities, and therefore, **would not have a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Negligible changes to the flow regime are expected during the primary recreation season, which would not be expected to result in increased recreation use, or consequently, require the construction or expansion of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect**, when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

With implementation of the No Project/No Action Alternative, decreases in flow are expected during Wet water years during the months of March and April (although the Trinity River Record of Decision (ROD) requirements would always be met), and increases in flows are indicated in Above Normal water years in the month of February. Large increases in flow during February could negatively affect boat and shore anglers, who are the primary recreationists at that time, and may adversely affect early season whitewater boating. However, these changes to the flow regime would not affect recreation during the primary recreation season. These changes therefore, **would not have a substantial adverse effect,** when compared to Existing Conditions, because the previously approved and implemented ROD requirements would always be met.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Negligible changes to the flow regime would not be expected to create hazardous conditions for water-based activities and therefore **would not have a substantial adverse effect,** when compared to Existing Conditions.

Klamath River Downstream of the Trinity River

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to the Klamath River. Modeling results for Klamath River downstream of the Trinity River for the No Project/No Action Alternative, when compared to Existing Conditions, indicate negligible changes in flows. These negligible changes in the flow regime would not result in increased use of existing facilities, and therefore, **would not have a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Negligible changes in the flow regime would not be expected to result in increased recreation use, and consequently, would not require the construction or expansion of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

River flows and levels in the Klamath River would not be changed by implementation of the No Project/No Action Alternative, so there would be no impact to its recreational uses. Changes in the Trinity River temperatures would not extend past Douglas City, and so would have no effect on the Klamath River. Therefore, implementation of the No Project/No Action Alternative, when compared to Existing Conditions, **would not have a substantial adverse effect** on recreation use levels on the Klamath River.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Negligible changes in the flow regime would not be expected to create hazardous conditions for water-based activities and therefore **would not have a substantial adverse effect,** when compared to Existing Conditions.

Shasta Lake

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to Shasta Lake. Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in no change to surface water elevations at Shasta Lake. This lack of change would not result in increased use of existing recreational facilities, and therefore, **would not have a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. A lack of change in surface water elevations would not be expected to increase recreation use, and consequently, would not require the construction or expansion of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Project operation modeling indicates that Shasta Lake water levels associated with implementation of the No Project/No Action Alternative typically would be less than one foot higher or lower than Existing Conditions during most months of the primary recreation season. The only exception would be during August and September in Critical years, when the No Project/No Action Alternative may increase lake levels by two or three feet from Existing Conditions.

However, an evaluation of all 10 major boat ramps at Shasta Lake indicates that the No Project/No Action Alternative would dewater seven ramps several months more over the 82-year period of record within the primary recreation season than with Existing Conditions. Overall, the No Project/No Action Alternative would dewater boat ramps at Shasta Lake 30 months more than Existing Conditions over the 82-year period of record within the primary recreation season, which **would have a potentially substantial adverse effect.**

However, Bridge Bay, Centimudi, and Jones Valley (the lowest ramps) would be dewatered two months less often over the 82-year period of record within the primary recreation season than for Existing Conditions, which is considered a **beneficial effect.**

The relatively small water level changes at Shasta Lake **would not have a substantial adverse effect** on recreation use levels; the recreation-day benefit value for reservoir operation would remain unchanged at

28 points, and therefore, **would not have a substantial adverse effect**, when compared to Existing Conditions.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. A lack of change in surface water elevations would not be expected to create hazardous conditions for water-based activities and therefore **would not have a substantial adverse effect**, when compared to Existing Conditions.

Sacramento River

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to the Sacramento River. Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in an overall negligible change to the flow regime of the Sacramento River, with the exception of decreased flows below Keswick in November during Dry years. The decreases in November would occur outside of the primary recreation season, and the other negligible changes in flow would not result in the increased use of existing recreational facilities. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Negligible changes in the flow regime during the primary recreation season would not be expected to result in increased recreation use, and consequently, would not require the construction or expansion of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in an overall minor change to the flow regime of the Sacramento River, with the exception of decreased flows downstream of Keswick Reservoir in November during Dry years. These minor changes in flows on the Sacramento River **would not have a substantial adverse effect** on recreation use levels on the river, when compared to Existing Conditions.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Negligible changes in the flow regime during the primary recreation season would not be expected to create hazardous conditions for water-based activities and therefore **would not have a substantial adverse effect**, when compared to Existing Conditions.

Clear Creek

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to Clear Creek. Project operational modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in an overall minor change to the flow regime of Clear Creek, with the exception of large increases in flows during Critical years. The increase in Critical year flows would benefit summer recreation along the creek and could increase use levels, but would not be expected to increase to a level that would cause the deterioration of existing facilities. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. A potential increase in recreation use due to increased flow during Critical years would not be expected to occur at a level that would require the construction or expansion of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Project operational modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in an overall minor change to the flow regime of Clear Creek, with the exception of large increases in flows during Critical years. The increase in Critical year flows would benefit summer recreation along the creek. This would result in a **potentially beneficial effect,** when compared to Existing Conditions**.**

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. An overall minor change to the flow regime of Clear Creek would not be expected to create hazardous conditions for water-based activities and therefore **would not have a substantial adverse effect**, when compared to Existing Conditions.

Lake Oroville

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to Lake Oroville. Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in slight decreases in surface water elevations at Lake Oroville. These lower water elevations would not result in the increased use of existing recreational facilities, and therefore, **would not have a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Slightly decreased surface water elevations would not be expected to result in increased recreation use, and consequently, would not require the construction or expansions of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

If the No Project/No Action Alternative is implemented, Lake Oroville surface water levels typically would be two or three feet lower during the primary recreation season, when compared to Existing Conditions. The slightly lower lake levels would have relatively minor effects on boat ramp accessibility. Overall, the No Project/No Action Alternative would increase boat ramp availability by five months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions. The No Project/No Action Alternative would increase the number of months that two of the intermediate boat ramps would be dewatered by three to four months over the 82-year period of record within the primary recreation season, which **would have a potentially substantial adverse effect,** when compared to Existing Conditions. Lime Saddle, another intermediate boat ramp that has an associated marina, would be dewatered one additional month over the 82-year period of record within the primary recreation season

with implementation of the No Project/No Action Alternative. However, this additional dewatering does not meet the significance criteria of two additional months for intermediate boat ramps.

Enterprise, another intermediate boat ramp, would be dewatered one less month over the 82-year period of record within the primary recreation season with implementation of the No Project/No Action Alternative. In addition, the lowest ramp at Bidwell Canyon would be extended, with implementation of the FERC License Renewal Project included in the No Project/No Action Alternative, to a bottom elevation (640 feet) at which the ramp would always be in the water. This increased availability, especially during Critical years, would be a **beneficial effect,** when compared to Existing Conditions.

Although the lowest boat ramp at Bidwell Canyon would always be available, recreation use at Lake Oroville could be expected to decrease in response to the decreased availability of the intermediate boat ramps, especially Lime Saddle and its associated marina. Therefore, implementation of the No Project/No Action Alternative **would have a potentially substantial adverse effect,** when compared to Existing Conditions.

The recreation-day benefit value for reservoir operation with implementation of the No Project/No Action Alternative would decrease by one point from 17.5 to 16.5 points as a result of the overall decrease in surface water levels during the recreation season. This one point reduction **would have a potentially substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Slightly decreased surface water elevations would not be expected to create hazardous conditions for water-based activities and therefore **would not have a substantial adverse effect**, when compared to Existing Conditions.

Feather River

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to the Feather River. Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in many changes to the flow regime of the Feather River downstream of Thermalito, such as increased flows from June through September during most water year types, and decreases in flows during August and September in Dry years. Increased flows during the primary recreation season could result in increased use of the recreational facilities located along the Feather River, but not to a level that would result in the deterioration of those facilities. Decreased flows during Dry years could slightly reduce recreations use levels, but not to a level that would be expected to cause the increased use of other recreational facilities. Therefore, the No Project/No Action Alternative **would not have a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. The potential slight increases and decreases in recreation use in response to a fluctuating flow regime would not be expected to occur at a level that would require the

construction or expansion of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Increased flows from June through September during most water year types and decreases in flows during August and September in Dry years could affect use levels or recreation benefits. However, flow levels would remain in an acceptable range of 1,500 to 4,000 cfs (Pike, 2001) downstream of Thermalito for fishery habitat, wading, and recreational boating, except during Below Normal, Dry, and Critical years when May flows would be between 1,000 to 1,500 cfs downstream of Thermalito and 3,000 to 5,000 cfs at Verona. During those times, the No Project/No Action Alternative conditions would be virtually the same as Existing Conditions. Therefore, the No Project/No Action Alternative **would not have a substantial adverse effect** on lower Feather River recreation use levels, when compared to Existing Conditions.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-4** discussion. Changes to the flow regime of the Feather River could create hazardous conditions for water-based activities. However, flow levels would remain in an acceptable range for wading and boating downstream of Thermalito and therefore **would not have a substantial adverse effect**, when compared to Existing Conditions.

Sutter Bypass and Yolo Bypass

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to the Sutter and Yolo bypasses. Project operational modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in an overall small change in spills into the Sutter Bypass at Moulton, Tisdale, and Ord Ferry weirs. Colusa Weir would experience an overall decrease in spills during November, especially in Dry years. Modeling results also indicate overall small change in monthly flows into the Yolo Bypass, with the exception of large decreases in flow during late fall in Below Normal and Dry years. These changes would occur in the winter months when little or no recreation use occurs along the bypasses because of hazardous flows and poor road access. Therefore, the reduction in winter flows in the Sutter and Yolo bypasses would not impact its recreational uses and would not increase use at other recreational facilities. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Because changes in weir spills into these bypasses would occur outside of the primary recreation season, these operational changes would not be expected to require the construction or expansion of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Because these changes in spills would occur in the winter months when little or no recreation use occurs along the bypasses, the changes **would not have a substantial adverse effect** on recreation use levels in the bypasses, when compared to Existing Conditions.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. An overall small change in spills into the Sutter and Yolo Bypass, with the exception of large decreases in flow during late fall in Below Normal and Dry years at the Yolo Bypass, would occur in the winter months when little or no recreation use occurs along the bypasses because of hazardous flows and poor road access. Small changes in spills would not be expected to create additional hazardous conditions, and decreases in flow could potentially reduce existing hazards. These expected changes in flows into the bypasses therefore **would not have a substantial adverse effect**, when compared to Existing Conditions.

Folsom Lake

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to Folsom Lake. If the No Project/No Action Alternative is implemented, decreases in surface water elevations at Folsom Lake are expected during some months of the year. These decreases could result in reduced recreation use, but these minor decreases would not result in increased use levels that would cause the deterioration of other recreational facilities. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. A potential reduction in recreation use levels would not require the construction or expansion of existing recreational facilities. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Slight decreases in surface water elevations associated with implementation of the No Project/No Action Alternative would dewater the eight major boat ramps (that have two or more lanes) at Folsom Lake a total of 29 months more over the 82-year period of record within the primary recreation season than with Existing Conditions. Most of this impact would occur at the intermediate ramps, with the dewatering occurring seven to 11 months more per boat ramp. This increased amount of dewatering **would have a potentially substantial adverse effect,** when compared to Existing Conditions.

In addition, the lowest ramps (Hobie Cove and Low Water) would be dewatered one additional month each over the 82-year period of record within the primary recreation season. Therefore, these two boat ramps **would have a potentially substantial adverse effect,** when compared to Existing Conditions.

Although any reduction in recreation use from modestly lower lake levels cannot be accurately quantified, it is likely to equal approximately one month of use at these ramps during the peak recreation season. The operational portion of the recreation-day benefit value for Folsom Lake would decline from 25 to 22.5 points due to the lower lake levels. These effects **would have a potentially substantial adverse effect,** when compared to Existing Conditions**.**

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Decreases in surface water elevations at Folsom Lake could expose submerged obstacles and create hazardous conditions for water-based activities, and therefore **would have a potentially substantial adverse effect,** when compared to Existing Conditions.

American River

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to the American River. Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in an overall decrease in flows on the American River in all months, with the exception of December. Large decreases in flow are also indicated in September of Above Normal years, September and October of Below Normal years, and in August and September in Critically Dry years. This overall reduction in

flows could result in decreased recreation use, but not at levels that would be expected to increase use of other recreational facilities or cause the deterioration of those facilities. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. A potential decrease in recreation use would not require the construction or expansion of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Flows needed to support recreation uses and fishery production on the American River have been studied extensively. In general, flows of 1,500 to 3,000 cfs are acceptable for general recreation activities, and 3,000 to 5,000 cfs is desirable for boating uses during the primary recreation season (Hinton and Tittel, 1987). The No Project/No Action Alternative would generally reduce flows in the American River downstream of Nimbus Dam and at the H Street Bridge during the primary recreation season in nearly all water year types. These reductions would range from 3 percent to as much as 24 percent in August and September of Critical years at the H Street Bridge. Although streamflows would remain in the desirable ranges during most years with these reductions, flows would generally be less than 1,500 cfs during Critical years, when reductions **would have a potentially substantial adverse effect,** when compared to Existing Conditions**.**

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. An overall decrease in flows on the American River, especially during critical years, could result in hazardous boating conditions and therefore **would have a potentially substantial adverse effect,** when compared to Existing Conditions**.**

Sacramento-San Joaquin Delta

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to the Sacramento-San Joaquin Delta. Project modeling indicates that the No Project/No Action Alternative, when compared to Existing Conditions, would result in an overall minor change in Delta monthly outflow. This minor change would not be

expected to increase use levels and cause the deterioration of recreational facilities. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Minor changes in Delta flow would not be expected to result in increased recreation use, and consequently, would not require the construction or expansion of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

The overall minor change in Delta monthly outflow associated with implementation of the No Project/No Action Alternative, when compared to Existing Conditions, would not be expected to affect recreation use levels. These minor changes would, **therefore, not have a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Minor changes in Delta flow would not be expected to create hazardous conditions for water-based activities and therefore **would not have a substantial adverse effect,** when compared to Existing Conditions.

Suisun Bay, San Pablo Bay, and San Francisco Bay

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to the Sacramento-San Joaquin Delta. Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in an overall negligible change in Delta monthly outflow. Therefore, Suisun, San Pablo, and San Francisco bays would also be expected to experience negligible changes. Negligible changes in the flow regime of these bays would not increase use levels or cause the deterioration of recreational facilities. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Negligible changes within the bays would not be expected to result in increased recreation use, and consequently, would not require the construction or expansion of existing recreational facilities. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect,** when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

The overall minor change in Delta monthly outflow and negligible changes in the flow regime of Suisun, San Pablo, and San Francisco bays **would not have a substantial adverse effect** on recreation use of the bays, when compared to Existing Conditions.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Negligible changes within the bays would not be expected to create hazardous conditions for water-based activities and therefore **would not have a substantial adverse effect**, when compared to Existing Conditions.

Other Reservoirs within the Secondary Study Area

Lake Almanor, Clear Lake, Lake Berryessa, New Bullard's Bar Reservoir, Englebright Lake, Black Butte, East Park, Stony Gorge, and Indian Valley

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Refer to the **Impact Rec-1** discussion for the Extended Study Area for San Luis Reservoir. The discussion related to population growth would also apply to these other reservoirs within the Secondary Study Area. The No Project/No Action Alternative includes implementation of projects and programs being constructed, or those that have gained approval as of June 2009. Some of those projects may result in indirect effects to recreation opportunities at these other reservoirs within the Secondary Study Area. However, the impacts of these projects have already been evaluated on a project-by-project basis, pursuant to CEQA and/or NEPA, and their potential for impacts to existing recreation resources and opportunities in the vicinity of those projects has been addressed in those environmental documents. The impact on recreation resources therefore, **would not have a substantial adverse effect**, when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. It is possible that one or more projects included in the No Project/No Action Alternative could require the construction or expansion of recreational facilities at these other Secondary Study Area reservoirs that may result in adverse effects on the environment. However, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. In addition, if increased use of existing recreational facilities associated with population growth resulted in the need to expand those facilities, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect**, when compared to Existing Conditions.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-3** discussion for the Extended Study Area for San Luis Reservoir. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

It is possible that other projects included in the No Project/No Action Alternative could include operations that could affect recreation use levels at the existing recreational facilities of these other Secondary Study Area reservoirs. However, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect**, when compared to Existing Conditions.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

It is possible that other projects included in the No Project/No Action Alternative could include operations that would affect water levels within the existing recreational facilities of these other Secondary Study Area reservoirs. However, any project being considered for implementation would be subject to CEQA and/or NEPA review and would be required to mitigate for that impact. Therefore, **there would not be a substantial adverse effect**, when compared to Existing Conditions.

21.3.5.3 Primary Study Area – No Project/No Action Alternative

Construction, Operation, and Maintenance Impacts

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Population throughout California is expected to increase. Recreation use at existing neighborhood or regional parks also may (or may not) continue to increase, as described and anticipated in City and County General Plans that address areas within the Primary Study Area. However, none of the projects and programs included in the No Project/No Action Alternative are located within the Primary Study Area, and they would not directly affect existing recreation in that area. Therefore, implementation of the No Project/No Action Alternative **would not have a substantial adverse effect**, when compared to Existing Conditions.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. That discussion is also applicable to effects on the environment from the construction or expansion of existing recreational facilities.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to the **Impact Rec-1** discussion. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. That discussion is also applicable to effects on recreation use levels and/or recreation benefits at existing reservoirs or rivers.

21.3.6 Impacts Associated with Alternative A

21.3.6.1 Extended Study Area – Alternative A

Construction, Operation, and Maintenance Impacts

San Luis Reservoir

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

San Luis Reservoir currently experiences severe water level fluctuations. Operational modeling results for Alternative A, when compared to Existing Conditions and the No Project/No Action Alternative, indicate that operation of the Project would cause San Luis Reservoir water levels to continue to fluctuate, but would occur more often and could be more severe. Water level fluctuations can adversely affect recreation use levels if they occur during the recreation season. However, the water level fluctuations associated with implementation of Alternative A are expected to fall within the historic range of fluctuations during the primary recreation season and, therefore, are not expected to decrease recreation use at San Luis Reservoir or increase or substitute use at other recreational facilities. Therefore, the increased fluctuations in water levels at San Luis Reservoir resulting from implementation of Alternative A would have **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Fluctuating surface water elevations would not be expected to increase recreation use at San Luis Reservoir, and consequently would not require the construction or expansion of existing recreational facilities. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels at San Luis Reservoir because Sites Reservoir would be located approximately 200 miles from this facility. There would, therefore, be **no impact** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Changes in operation that would result in increased surface water elevation fluctuations at San Luis Reservoir associated with implementation of Alternative A would make the Dinosaur Boat Ramp available five more months over the 82-year period of record within the primary recreation season than Existing Conditions, and four more months over the 82-year period of record within the primary recreation season than with implementation of the No Project/No Action Alternative. The Basalt Boat Ramp would be usable six months over the 82-year period of record within the primary recreation season more than Existing Conditions and three months over the 82-year period of record within the primary recreation season more than with the No Project/No Action Alternative, including increased availability during Critical years. Therefore, implementation of Alternative A, when compared to Existing Conditions and the No Project/No Action Alternative, would result in a **beneficial effect.**

Implementation of Alternative A would provide sufficient water surface elevations for boating use of the reservoir; in comparison, boating access would not be possible for several months for Existing Conditions and the No Project/No Action Alternative. Recreation use at San Luis Reservoir could be expected to increase by an amount roughly equal to the five additional months over the 82-year period of record within the primary recreation season that the boat ramps would be available, which is considered a **beneficial effect,** when compared to Existing Conditions and the No Project Alternative.

The Basalt Campground water intake would be dewatered three fewer months over the 82-year period of record within the primary recreation season when compared to Existing Conditions, but two more months over the 82-year period of record within the primary recreation season when compared to the No Project/No Action Alternative. This would be a **beneficial effect,** when compared to Existing Conditions, but would be a **potentially significant impact,** when compared to the No Project/No Action Alternative.

The reservoir operations portion of the recreation-day benefit value for existing San Luis Reservoir operations is approximately five out of a possible 50 points because of extensive drawdown nearly every year (averaging 138 feet). Therefore, a few feet of change in water levels with implementation of Alternative A would have only a small effect on the recreation-day benefit value for reservoir operation. Even in the Wet year conditions when the reservoir is expected to average 13 feet lower during the recreation season, or the Critical years when it could be 6 to 16 feet higher during the season, there would be a small change in the recreation-day benefit value for reservoir operation because the value is based on average conditions, rather than specific water years. The recreation-day benefit value for reservoir operation at San Luis Reservoir would be decreased by 0.5 point because the average water surface elevation would be approximately two feet lower with Alternative A than with either Existing Conditions or the No Project/No Action Alternative. This would be a **less-than-significant impact,** when compared to Existing Conditions and the No Project/No Action Alternative**.**

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Fluctuating surface water elevations at San Luis Reservoir could create hazardous conditions for water-based activities by exposing submerged obstacles or concealing obstacles that were previously visible. However, because the water level fluctuations at San Luis Reservoir are expected to fall within the historic range of fluctuations during the primary recreation season, they are not expected to create additional hazardous conditions and therefore would result in a **less-than-significant impact,** when compared to Existing Conditions and the No Project/No Action Alternative**.**

Other Reservoirs within the Extended Study Area

Tri-Dam Reservoirs, New Melones Reservoir, Don Pedro Reservoir, Lake McClure, Pyramid Lake, Castaic Lake, Silverwood Lake, and Lake Perris

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

The increased SWP/CVP exports associated with implementation of Alternative A could potentially result in increased storage at these other existing reservoirs within the Extended Study Area. Small increases in storage at these reservoirs could result in increased recreation use at these reservoirs, but the increase would be negligible and would not cause physical deterioration of existing facilities. The potential slight increases in storage at these service area reservoirs would, therefore, also not be expected to result in increased recreation use at other reservoirs. Implementation of Alternative A would, therefore, have **no impact** on increased recreation use levels at these reservoirs, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Slight increases in storage could result in slightly increased recreation use levels, but not at the level that would require the construction or expansion of existing recreational facilities. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels at these other existing reservoirs located within the Extended Study Area because Sites Reservoir would be located a great distance away from these facilities. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. The potential slight increase in storage at some of these other existing reservoirs within the Extended Study Area could result in increased recreation use and an increased recreation-day benefit value if the increase occurs during the primary recreation season. The slight change in operation would, therefore, not be expected to reduce recreation use levels or other

recreation benefits, and would have a **less-than-significant impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. The potential slight increase in storage at some of these other existing reservoirs within the Extended Study Area would not be expected to create hazardous conditions for water-based activities and therefore would have a **less-than-significant impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Wildlife Refuge Water Use

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Alternative A would provide an alternate source of Level 4 water deliveries to the wildlife refuges. The provision of an alternate source of water would have **no impact** on recreational use levels, and therefore, would not cause the deterioration of recreational facilities within the wildlife refuges, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. An alternate water supply source would not increase recreational use levels, and consequently, would not require the construction or expansion of existing recreational facilities. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas (up to five recreation areas are proposed) are not expected to affect recreation use levels at existing wildlife refuges located within the Extended Study Area because Sites Reservoir would be located a great distance away from these facilities and would not offer the same recreational opportunities as a wildlife refuge. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. An alternate water supply source would not create hazardous conditions for water-based activities and would, therefore, have **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

21.3.6.2 Secondary Study Area – Alternative A

Construction, Operation, and Maintenance Impacts

Trinity Lake

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Operational modeling results for Alternative A, when compared to Existing Conditions and the No Project/No Action Alternative, indicate that Alternative A would provide operational flexibility to Trinity Lake. Storage would be improved in all months of all water year types, including during May through October in Dry and Critical year conditions. In other years, larger releases would be made to stabilize fall flow conditions. Seasonal and monthly improvements in storage would occur, when compared to Existing Conditions and the No Project/No Action Alternative. In addition, operational modeling results indicate that a reduced range of change in fluctuations would occur, resulting in less severe drawdowns. These improved conditions at Trinity Lake are not expected to increase use of existing recreational facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Improved storage conditions are not expected to increase recreation use to a level that would require the construction of new facilities, nor would it require the expansion of the lake's existing facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels at Trinity Lake because Sites Reservoir would be located more than 130 miles away from this facility. In addition, Sites Reservoir would not provide the same recreation experiences as the larger and higher elevation, tributary-filled Trinity Lake. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

With implementation of Alternative A, average end of month storage at Trinity Lake would increase during nearly all months of the year, when compared to Existing Conditions and the No Project/No Action Alternative. Improved storage could increase recreation use and/or recreation benefits, especially if boat ramps or boat-in campsites are more accessible or accessible for longer periods. There are some months in many water year types when an increase in water level of several feet would make one or more boat ramps available for longer than Existing Conditions during the recreation season.

Implementation of Alternative A would increase Trinity Lake boat ramp accessibility by a total of 87 months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and by a total of 47 months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. However, the most important

change would be in Below Normal, Dry, and Critical years, when the Cedar Stock ramp would be available six more months over the 82-year period of record within the primary recreation season than for Existing Conditions and the No Project/No Action Alternative, and the Minersville ramp would be available three more months over the 82-year period of record within the primary recreation season than for Existing Conditions and four more months over the 82-year period of record within the primary recreation season than for the No Project/No Action Alternative. These increases in boat ramp availability are considered **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative**.**

With implementation of Alternative A, boat-in campsites would be more accessible than for Existing Conditions and the No Project/No Action Alternative. There would likely be an increase in recreation use due to increased access to boat ramps and boat in-camps. The increased use would likely be equivalent to or greater than the additional four months of boating use at the Minersville Ramp. This would be a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative**.**

The reservoir operation portion of the recreation-day benefit value with Existing Conditions has a point value of 12 out of 50 possible points, and would have a value of 13 if the No Project/No Action Alternative is implemented. With implementation of Alternative A, the expected increase in water levels during the primary recreation season would increase this value to 15. Thus, the increased recreation-day benefit value for reservoir operation would be a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative**.**

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Improved storage conditions would not be expected to create hazardous conditions for water-based activities and therefore would have a **less-than-significant** impact, when compared to Existing Conditions and the No Project/No Action Alternative**.**

Trinity River

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Project operational modeling results indicate that Trinity River flows would meet or exceed the Trinity River ROD requirements in all scenarios, with or without implementation of Alternative A. Modeling results show little change from the existing flow schedule, and the small amount of change would rarely occur. These occasional small changes to the existing flow schedule are not expected to affect recreation use along the Trinity River, and would not increase use at other recreational facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Occasional small changes to the existing flow schedule are not expected to increase recreation use to a level that would require the construction or expansion of existing recreational facilities along the river. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels on the Trinity River because Sites Reservoir would be located a great distance away from this river and would not provide river recreation opportunities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Project operational modeling results for Alternative A show little change from the existing flow schedule, or from the No Project/No Action Alternative. Cooler water temperatures could improve conditions for anadromous fish and possibly increase Trinity River angling. Conversely, colder water temperatures in the summer months could affect water contact recreation, such as swimming or tubing. However, Project operation studies suggest the temperature change at Lewiston would be less than 1°F, except for one or two months in Critical years when it may be 2°F or 3°F colder. These minor changes in temperature would, therefore, not be likely to improve angling opportunities or adversely affect water contact recreation. This slight change in the flow regime and change in water temperature on the Trinity River would have a **less-than-significant impact** on recreation use levels, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Occasional small changes to the existing flow regime would not be expected to create hazardous conditions for water-based activities and therefore would have a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Klamath River downstream of the Trinity River

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

River flows and levels in the Klamath River would not be changed by implementation of Alternative A, when compared to Existing Conditions the No Project/No Action Alternative, so there would be **no impact** to its recreational uses.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Because recreational use levels would not be affected, the construction or expansion of existing recreational facilities would not be required. There would, therefore, be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels on the Klamath River because Sites Reservoir would be located approximately 300 miles away

from this river and would not provide river recreation opportunities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. In addition, any changes in Trinity River temperatures would be negligible past Douglas City and therefore would have no effect on the Klamath River. Therefore, implementation of Alternative A would have **no impact** on recreation use levels on the Klamath River, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. A lack of change to the existing flow regime would not create hazardous conditions for water-based activities and therefore would have a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Shasta Lake

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Operational modeling results for Alternative A, when compared to Existing Conditions and the No Project/No Action Alternative, indicate that Alternative A would provide operational flexibility to Shasta Lake, similar to that described for Trinity Lake. Improved storage conditions and reduced water level fluctuations are not expected to reduce recreation use of Shasta Lake and would not increase use at other recreational facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Improved storage conditions are not expected to increase recreation use to a level that would require the construction or expansion of existing facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels at Shasta Lake because Sites Reservoir would be located approximately 115 miles away from this facility. In addition, Sites Reservoir would not provide the same recreation experience as the larger and higher elevation, tributary-filled Shasta Lake. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

For Alternative A, storage at Shasta Lake would increase nearly every month during all water year types, when compared to Existing Conditions and the No Project/No Action Alternative.

There are no obvious major changes to boat ramp accessibility, but implementation of Alternative A would increase accessibility to several ramps in August and September during most water year types (a **beneficial effect**). In Dry years, the Antlers Ramp would go out of service in August and September (an adverse impact), but eight of the remaining major boat ramps would still be accessible. In addition, overall accessibility at Antlers Ramp would improve by 11 months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and by 15 months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative.

In Critical years, access to Packers Bay and Digger Bay ramps would be increased by nearly one month. Access to Centimudi and Jones Valley ramps would be increased by three months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions and the No Project/No Action Alternative. Access to all major boats ramps would be improved by at least two months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions and the No Project/No Action Alternative. The exception would be the Silverthorn Marina, which would be dewatered two months more over the 82-year period of record within the primary recreation season, when compared to Existing Conditions. Overall, Shasta Lake boat ramp accessibility associated with Alternative A would increase by a total of 56 months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and by 86 months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. When considering all of the expected changes, implementation of Alternative A would result in a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

The USFS provides information on the Whiskeytown-Shasta-Trinity National Recreation Area website indicating how far it is to the water's edge from campgrounds at various water levels. Data specific to each of the 17 campgrounds located at that recreation area are not available, so a detailed analysis of the operational effect of Alternative A on those areas was not performed. However, a 20-foot increase in water level during the recreation season would shorten the distance to the lake by more than 150 feet (USFS, 2011).

In addition to slightly improved boat ramp and boat-in camp accessibility, the increased water levels at Shasta Lake associated with Alternative A would increase the lake's recreation-day benefit value. The Existing Conditions and No Project/No Action Alternative's reservoir operation portion of the benefit value both have a point value of 28 out of 50 possible points. The increase in water levels during the primary recreation season with implementation of Alternative A would increase this value to 33 points. Improved storage at Shasta Lake would have a **beneficial effect** on the recreation-day benefit value for reservoir operation, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Improved storage conditions would not be expected to create hazardous conditions for water-based activities and therefore would have a **less-than-significant** impact, when compared to Existing Conditions and the No Project/No Action Alternative**.**

Sacramento River

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

The flow regime modifications on the Sacramento River expected with implementation of Alternative A would not significantly affect river recreation use and would not increase use at other recreational facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Occasional small changes to the existing flow schedule are not expected to increase recreation use to a level that would require the construction or expansion of existing facilities along the river. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels on the Sacramento River because Sites Reservoir would not provide river recreation opportunities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Improved (colder) water temperatures on the Sacramento River resulting from flow regime modifications have the potential to improve conditions for salmon and steelhead, and consequently, increase fishing use on the river. Conversely, colder water temperatures in the summer months may adversely affect water contact recreation, such as swimming and tubing, which is already limited in the Sacramento River. However, Project operation modeling indicates that water temperatures at Balls Ferry, Bend Bridge, and the City of Red Bluff would be essentially unchanged, with differences always less than 1°F. Thus, changes in the flow regime of the Sacramento River would have a **less-than-significant impact** on recreation use levels, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Occasional small changes to the existing flow regime of the Sacramento River would not be expected to create hazardous conditions for water-based activities. Decreased water temperatures could, however, create hazardous conditions for swimmers or tubers, but these types of recreation are limited on the

Sacramento River and modeling results indicate the changes in temperature would be less than 1°F. Therefore, changes in the flow regime of the Sacramento River would have a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Pump Installation at the Red Bluff Pumping Plant

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

The installation and operation of an additional pump in an existing bay at the Red Bluff Pumping Plant would result in only minor increases in diversions from the river, when compared to Existing Conditions and the No Project/No Action Alternative. This minor change in flow would have **no impact** on recreation use levels in the Sacramento River near that location and would not increase use at other recreational facilities, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Minor changes in the flow regime would not be expected to affect recreation use levels on the Sacramento River at this location and consequently would not require the construction or expansion of existing recreational facilities. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

Refer to **Impact Rec-3** for the Sacramento River. That discussion is also applicable to effects on recreation use levels at existing recreational facilities.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Minor changes in the flow regime would not be expected to affect recreation use levels. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-5: Reduce Recreation Use Levels at Existing Recreational Facilities during the Project Construction Period

Construction activities associated with the installation of an additional pump at the Red Bluff Pumping Plant would not occur within the river, and therefore, would have **no impact** on recreation use levels in that area, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Minor changes in the flow regime would not be expected to create hazardous conditions for water-based activities and therefore would have **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Clear Creek

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Project operational modeling results indicate that Clear Creek flow requirements would be met or exceeded, if Alternative A is implemented, and that changes in Clear Creek flows and water temperatures would be minor. Minor changes in flow would have **no impact** on Clear Creek recreation use levels and would not increase use at other recreational facilities, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Minor changes in flow would not be expected to affect recreation use levels, and consequently, would not require the construction or expansion of existing recreational facilities. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels on Clear Creek because Sites Reservoir would be located approximately 100 miles away from this creek and would not provide the same type of recreation opportunities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Cooler water temperatures downstream of Whiskeytown Lake in Dry and Critical years could potentially improve conditions for anadromous fish in Clear Creek and ultimately increase Sacramento River angling. However, Project operational modeling results indicate that changes in Clear Creek flows and water temperatures would be minor, so no measureable improvement is anticipated. Therefore, there would be **no impact** on recreation use levels, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Minor changes in flow would not be expected to create hazardous conditions for water-based activities and therefore would have **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Lake Oroville

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Operational modeling results for Alternative A, when compared to Existing Conditions and the No Project/No Action Alternative, indicate that Alternative A would provide operational flexibility to Lake Oroville, similar to that described for Trinity Lake. Improved storage conditions and reduced water level

fluctuations are not expected to reduce recreation use at Lake Oroville and would not increase use at other recreational facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Improved storage conditions are not expected to increase recreation use to a level that would require the construction or expansion of existing facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas could affect recreation use levels at Lake Oroville, especially if Sites Reservoir surface water elevations are high when Lake Oroville surface water elevations are low. However, Sites Reservoir would be smaller than Lake Oroville and would not provide the same recreation experience as the larger tributary-filled Lake Oroville; it, therefore, would not be expected to substantially reduce recreation use levels at Lake Oroville. Therefore, there would be **a less-than-significant impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

The Bidwell Canyon low water ramp would always be in the water with implementation of the No Project/No Action Alternative, and would remain in the water with or without implementation of Alternative A. Alternative A would increase access to the remaining four major ramps evaluated at Lake Oroville by 15 months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and by 22 months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. This situation would result in a **beneficial effect** with implementation of Alternative A when compared to Existing Conditions and the No Project/No Action Alternative.

Typically, the changes in water elevations with Alternative A would not substantially change access to the boat-in campsites, when compared to Existing Conditions and the No Project/No Action Alternative, so there would be **no impact**.

The Existing Conditions operation for Lake Oroville has a recreation-day benefit value of 17.5 points. This value would not change with implementation of Alternative A. However, the operation portion of the recreation-day benefit value for the No Project/No Action Alternative is 16.5 points, so Alternative A would provide an increase of one point. Therefore, implementation of Alternative A would have **no impact** on the recreation-day benefit value when compared to Existing Conditions, and would have a **beneficial effect** when compared to the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Improved storage conditions would not be expected to create hazardous conditions for water-based activities and therefore would have a **less-than-significant** impact, when compared to Existing Conditions and the No Project/No Action Alternative**.**

Feather River

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Project operational modeling results indicate that Feather River flows would meet or exceed the FERC Settlement Agreement's minimum flow requirements in all scenarios. When compared to Existing Conditions and the No Project/No Action Alternative, flows in June through September in drier years would be improved. However, flows would generally be decreased during October, November, and December. The flow regime modifications on the Feather River expected with implementation of Alternative A would not significantly affect river recreation use and would not increase use at other recreational facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Increased flows during the recreation season during drier years are not expected to increase recreation use to a level that would require the construction or expansion of existing recreational facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels on the Feather River, as Sites Reservoir would not provide river recreation opportunities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Improved flow and temperature conditions for salmon and steelhead during drier years could result in increased populations; consequently, fishing use would likely increase. Conversely, colder water temperatures in the summer months could affect water contact recreation, such as swimming or tubing. However, Project operational modeling results indicate small changes in flows and water temperatures in the lower Feather River with implementation of Alternative A, with the exception of June through September which would have relatively large increases in flow during drier years. These flow regime changes would have a **less-than-significant impact** on recreation use levels, when compared to Existing Conditions or the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Increased flows during the recreation season during drier years would fall within acceptable levels for water-based activities and would not be expected to create hazardous conditions. These flow regime changes would have a **less-than-significant impact**, when compared to Existing Conditions or the No Project/No Action Alternative.

Sutter Bypass and Yolo Bypass

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

With implementation of Alternative A, winter flood flows that spill into the Sutter Bypass would be reduced by up to 5,900 cfs due to diversions to Sites Reservoir. Flows in the Yolo Bypass would also be reduced in duration and magnitude due to Sites Reservoir diversions. However, these reductions in winter flows in the bypasses would not be expected to substantially impact its recreational uses and would not increase use at other recreational facilities. Therefore, there would be a **less-than-significant impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Reductions in winter flows would not be expected to substantially affect recreation use levels and consequently would not require the construction or expansion of existing recreational facilities. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels within the bypasses because Sites Reservoir would not provide the type of recreation opportunities that are available within the bypasses. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Reductions in winter flows would not be expected to substantially affect recreation use levels. There would, therefore, be a **less-than-significant impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Reductions in winter flows in the bypasses would occur when little or no recreation use occurs because of hazardous flows and poor road access. Decreases in flow would not create hazardous conditions and could potentially reduce existing hazards. These expected changes in flows into the bypasses would, therefore, be **less-than-significant impact,** when compared to Existing Conditions and the No Project/No Action Alternative. Folsom Lake

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Project operational modeling results for Alternative A, when compared to Existing Conditions and the No Project/No Action Alternative, indicate that Alternative A would provide operational flexibility to Folsom Lake, similar to that described for Trinity Lake. Improved storage conditions and reduced water level fluctuations are not expected to reduce recreation use of Folsom Lake and would not increase use at other recreational facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Improved storage conditions are not expected to increase recreation use to a level that would require the construction or expansion of the lake's facilities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas could affect recreation use levels at Folsom Lake, especially if Sites Reservoir surface water elevations are high when Folsom Lake surface water elevations are low. However, Sites Reservoir would not provide the same recreation experiences as Folsom Lake, such as a marina and associated equipment rentals; it, therefore, would not be expected to substantially reduce recreation use levels at Folsom Lake. Therefore, there would be a **less-than-significant impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Implementation of Alternative A would result in small increases in storage at Folsom Lake during some months of the year. Increased storage and resulting higher water surface elevations could slightly increase recreation use and/or the recreation-day benefit value, especially if boat ramps or boat moorage areas are more accessible.

With implementation of Alternative A, the eight major boat ramps at Folsom Lake would be available 16 additional months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and 45 additional months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. The Low Water Ramp would be available three more months over the 82-year period of record within the primary recreation season than for Existing Conditions and four more months over the 82-year period of record within the primary recreation season than with the No Project/No Action Alternative. These changes would be **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

There are no designated boat-in campgrounds at Folsom Lake. However, boaters can beach their boats and camp overnight up to two nights in unoccupied campsites at Peninsula Campground. There is also a designated swimming beach. The higher water surface elevations during the recreation season resulting

from implementation of Alternative A would provide slightly better access from the Peninsula and Beals Point campgrounds to the water surface, and could improve conditions at the swim beach. This would be a **potentially beneficial effect**, when compared to Existing Conditions and the No Project/No Action Alternative.

The modest increases in lake levels with implementation of Alternative A would affect the recreation-day benefit value for Folsom Lake. Existing Conditions has a value of 25 points, and the No Project/No Action Alternative would have a reservoir operation value of 22.5 points; the value would increase to 26.5 points with implementation of Alternative A. The increased recreation-day benefit value would be a **beneficial effect**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Improved storage conditions would not be expected to create hazardous conditions for water-based activities and therefore would have a **less-than-significant** impact, when compared to Existing Conditions and the No Project/No Action Alternative**.**

American River

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Operational changes on the American River related to implementation of Alternative A, when compared to Existing Conditions, would result in a substantial reduction in summer flows, but would have a flow regime similar to the No Project/No Action Alternative. Decreased or similar flows during the primary recreation season would not increase recreational use or cause the deterioration of recreational facilities along the American River. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

The operational changes associated with Alternative A would not require the construction or expansion of existing recreational facilities along the American River. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels along the American River because Sites Reservoir would not provide river recreation opportunities. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Project operational modeling results indicate that American River flows would be similar between Alternative A and the No Project/No Action Alternative, but would be significantly reduced with implementation of Alternative A, especially in Critically Dry years, when compared to Existing

Conditions (adverse impact). However, the significant flow reductions are associated with operational changes that would occur with implementation of the No Project/No Action Alternative, and were carried forward/incorporated into Alternative A. These adverse changes would occur with or without implementation of Alternative A, and are, therefore, not considered to be Project-related impacts. Because the adverse changes in flows would not be caused by implementation of Alternative A, the potential operational impacts on recreation use levels are considered to be **less than significant**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to **Impact Rec-4** discussion. Slight changes in flow would not be expected to create hazardous conditions for water-based activities and would, therefore, be **less than significant**, when compared to the No Project/No Action Alternative. Significant flow reductions could create hazardous boating conditions, however, the significant flow reductions are associated with operational changes that would occur with implementation of the No Project/No Action Alternative, and were carried forward/incorporated into Alternative A. These adverse changes would occur with or without implementation of Alternative A, and are, therefore, not considered to be Project-related impacts. Because the adverse changes in flows would not be caused by implementation of Alternative A, the potential operational impacts are considered to be **less than significant**, when compared to Existing Conditions.

Sacramento-San Joaquin Delta and Suisun Bay

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Alternative A operations would cause minor changes in flows entering the Sacramento-San Joaquin Delta and Suisun Bay, when compared to Existing Conditions and the No Project/No Action Alternative. These changes would be too small to affect its many recreational uses and, therefore, would have **no impact** on recreation use levels.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Negligible changes in flows would not be expected to affect recreation use levels, and consequently, would not require the construction or expansion of existing recreational facilities. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels within the Delta because Sites Reservoir would not provide the type of recreation opportunities that are available within the Delta. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Negligible changes in flows would not be expected to affect recreation use levels. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Negligible changes in flows would not create hazardous conditions for water-based activities and would, therefore, have **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

San Pablo Bay and San Francisco Bay

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Implementation of Alternative A would not result in changes to the hydrology of San Pablo Bay or San Francisco Bay. Therefore, there would be **no impact** to recreation use levels within the bays or at other recreational facilities, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Because recreation use levels would not be affected, the construction or expansion of existing recreational facilities would not be required. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The proposed Sites Reservoir and its associated recreation areas are not expected to affect recreation use levels within the bays because Sites Reservoir would not provide the type of recreation opportunities that are available within the bays. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Because recreation use levels would not be affected, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. A lack of change in the hydrology of the bays would not create hazardous conditions and would, therefore, have **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Other Reservoirs within the Secondary Study Area

Lake Almanor, Clear Lake, Lake Berryessa, New Bullard's Bar Reservoir, Englebright Lake, Black Butte, East Park, Stony Gorge, and Indian Valley

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

No operational changes would occur at these other reservoirs within the Secondary Study Area with implementation of Alternative A. In addition, the availability of a new Sites Reservoir would not be expected to increase use of these reservoirs. Therefore, there would be **no impact** to recreation use levels at these reservoirs, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Because implementation of Alternative A is not expected to affect recreation use levels at these reservoirs, construction or expansion of their existing recreational facilities would not be required. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The new availability of Sites Reservoir would not be expected to reduce recreation use levels at Lake Almanor, Lake Berryessa, New Bullard's Bar Reservoir, or Englebright Lake due to their large distance away from Sites Reservoir. However, Sites Reservoir is likely to reduce recreation use at neighboring Black Butte, East Park, Stony Gorge, and Indian Valley reservoirs, as well as Clear Lake, at least initially. Alternative A would provide a new recreation site (i.e., additional recreation opportunities) for recreation visitors. It is expected that recreationists would want to visit the new reservoir to see what it offers. Fishing in a recently filled reservoir is often outstanding for several years because a newly filled reservoir increases the biological productivity of the inundated lands; this productivity supports rapid fish growth and growth in fish populations. Publicity related to construction of the new reservoir would also create interest and would alert potential recreationists to its existence, which may attract additional visitors to the area.

Construction of a new reservoir could also cause a temporary or even permanent redistribution of recreation use among the nearby recreation sites. The factors that would determine this redistribution of use include access convenience, climate, vegetative cover, available recreation opportunities, user fees, and quality of the recreation development. Sites Reservoir would be closer to I-5 than Clear Lake or East Park, Stony Gorge, or Indian Valley reservoirs, and would be located approximately the same distance from I-5 as Black Butte Reservoir. Climate and vegetative cover are similar at all five sites. The primary differences between the reservoirs would, therefore, be the available recreation opportunities and quality of recreation development.

Sites Reservoir would be smaller than Clear Lake and much larger than the other four reservoirs, which has both positive and negative aspects. Clear Lake offers private resorts and marinas, as well as county, State, and city parks on the lake's perimeter. East Park, Stony Gorge, and Indian Valley reservoirs are minimally developed, and many of their visitors enjoy the relative freedom of movement and ability to camp or picnic more or less wherever they want. Black Butte Reservoir has designated camp and picnic

sites and a paved boat ramp. In this regard, it is probably most comparable to the proposed recreation area development level at Sites Reservoir.

The large surface area of Sites Reservoir may be daunting to some boaters and appealing to others. The expected average annual 33-foot drawdown that would occur during the recreation season at Sites Reservoir with implementation of Alternative A is greater than the drawdown typical of neighboring reservoirs and could adversely affect the proposed recreation opportunities due to the increased difficulty of accessing the reservoir, the barren exposed land during the drawdown (i.e., the bathtub ring appearance), and the creation of potential boating hazards. After a few years of Project operation, the distribution of recreation use at all area reservoirs is expected to stabilize, with use of neighboring reservoirs returning to pre-Sites Reservoir levels, i.e., Existing Conditions. Therefore, the temporary redistribution of recreation use resulting from implementation of Sites Reservoir and its associated Recreation Areas would have a **less-than-significant impact** on recreation use levels at existing recreational facilities, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Implementation of Alternative A would not affect the operation of any of these other reservoirs within the Secondary Study Area. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

Refer to the **Impact Rec-1** discussion. Because no operational changes would occur at these other reservoirs within the Secondary Study Area, no hazardous conditions for water-based activities would be created. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

21.3.6.3 Primary Study Area – Alternative A

Construction, Operation, and Maintenance Impacts

The following Project facility locations do not currently provide public recreation opportunities and would continue to provide little or no recreation opportunities if Alternative A is implemented, so there would be **no impact** to recreation resources at these locations from constructing or operating Alternative A, when compared to Existing Conditions and the No Project/No Action Alternative:

- Sites Reservoir Dams
- Road Relocations and South Bridge
- Sites Pumping/Generating Plant
- Sites Electrical Switchyard
- Tunnel from Sites Pumping/Generating Plant to Sites Reservoir Inlet/Outlet Structure
- Sites Reservoir Inlet/Outlet Structure
- Field Office Maintenance Yard
- Holthouse Reservoir Complex
- Holthouse Reservoir Electrical Switchyard
- GCID Canal Facilities Modifications
- GCID Canal Connection to the TRR

- TRR
- TRR Pumping/Generating Plant
- TRR Electrical Switchyard
- TRR Pipeline
- TRR Pipeline Road
- Delevan Pipeline Electrical Switchyard
- Project Buffer

The remaining Project facilities and their potential impacts to recreation resources are described below.

Sites Reservoir Inundation Area and Recreation Areas

The recreation-day benefit value for Sites Reservoir was calculated for the purpose of comparison between Alternatives A, B, and C. Based on the expected operation of the reservoir, the recreation-day benefit value for the Alternative A Sites Reservoir would be 30.

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

The only existing recreational facilities within the Primary Study Area are the private duck clubs located along the proposed Delevan Pipeline. The operation of the Alternative A 1.27-MAF Sites Reservoir and associated recreation areas would not increase the use of those duck clubs. There would, therefore, be **no impact** to the existing recreational facilities, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Because the operation of Sites Reservoir and its associated recreation areas would not increase use levels at existing private duck clubs within the Primary Study Area, the construction or expansion of the existing duck clubs would not be required. There would, therefore, be **no impact** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-3: Reduce Recreation Use Levels at Existing Recreational Facilities by Providing an Alternative New Site for Recreation Visitors

The effects to recreation use levels resulting from the provision of a new Sites Reservoir are evaluated within the Extended and Secondary study area discussions for each facility that is included in those study areas.

Sites Reservoir would not be expected to reduce recreation use levels at the private duck clubs located within the Primary Study Area because Sites Reservoir would not offer hunting opportunities. There would, therefore, be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-5: Reduce Recreation Use Levels at Existing Recreational Facilities during the Period of Construction

There are no existing developed or public recreational facilities within the footprint of the proposed Sites Reservoir Inundation Area or its associated Recreation Areas. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Delevan Pipeline and Delevan Transmission Line

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

During construction of the Delevan Pipeline, land that the proposed pipeline and transmission line would cross that is owned by private duck clubs would be fallowed, which would reduce the amount of habitat available to waterfowl and, consequently, could reduce hunting opportunities on those lands. In response, it is possible that hunters who hunt on these lands would instead temporarily use other nearby duck clubs during the Alternative A construction period. However, duck clubs impose limits on recreation use levels, so they would not experience a level of use that would result in substantial deterioration of their facilities. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

During operation of the Delevan Pipeline and Transmission Line, these lands would be restored to their original condition and would support the same recreation use levels. Therefore, there would be **no impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Refer to the **Impact Rec-1** discussion. Because private duck clubs impose limits on recreation use levels, the potential redirected use of these clubs during the construction period for the Delevan Pipeline and Transmission Line would not require the construction or expansion of those facilities. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-5: Reduce Recreation Use Levels at Existing Recreational Facilities during the Period of Construction

There are several private duck clubs located on lands where the Delevan Pipeline and Delevan Transmission Line alignments are proposed to be located. Hunting use at these clubs would be adversely affected during the Alternative A construction period because the fields within the construction disturbance area would be fallowed for at least one season. However, the loss of hunting opportunity would be minimized by the construction schedule for the Alternative A Delevan Pipeline alignment, which, based on other environmental considerations, would minimize the total amount of fields that would be fallowed during each year of construction of Alternative A, rather than fallowing the entire length of the construction disturbance area for the entire Alternative A construction period. In addition, hunting opportunities would still exist on adjacent lands. Therefore, this phased construction approach would have a **less-than-significant impact** on recreation use levels within the Delevan Pipeline and Transmission Line construction disturbance areas, when compared to Existing Conditions and the No Project/No Action Alternative.

Delevan Pipeline Intake Facilities

Impact Rec-1: Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities such that Substantial Physical Deterioration of the Facility would Occur or be Accelerated

Some fishing currently occurs along the bank of the Sacramento River near the existing Maxwell Irrigation District Pumping Plant, which is adjacent to the proposed Delevan Pipeline Intake Facilities location. The Delevan Pipeline Intake Facilities' fish screen would extend from this portion of the bank, so it would no longer be available for recreational use. However, current use levels along the bank are low because the bank can be accessed only by private roads that connect to the levee road. Any redirected recreation use of other existing recreational facilities resulting from the loss of access to this river bank is expected to be minimal and would not cause the deterioration of those facilities. Therefore, there would be **a less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-2: Require the Construction or Expansion of Existing Recreational Facilities, which may have an Adverse Physical Effect on the Environment

Because any redirected recreation use of the river bank would be minimal, the redirected use would not require the construction or expansion of existing recreational facilities. Therefore, there would be **no impact** when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-5: Reduce Recreation Use Levels at Existing Recreational Facilities during the Period of Construction

Refer to the **Impact Rec-1** discussion. The loss of this portion of the river bank during Project construction would eliminate recreation use at this location. However, due to the limited amount of recreation use that occurs there and the alternative opportunities for recreation at nearby areas, the impact would be **less than significant**, when compared to Existing Conditions and the No Project/No Action Alternative.

Boat fishing and recreation in the river would not be affected except within and adjacent to the Project construction disturbance area. Due to this impact being temporary, this impact on recreation use levels would be **less than significant**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

During Project operations, releases would be made to the Sacramento River through the Delevan Pipeline Intake Facilities. The increased flows in the immediate vicinity of the facilities could create hazardous boating conditions. However, releases would be made through a fish screen, which would dissipate the energy of the water being released to the river to a velocity of one foot per second. These releases would not be expected to create hazardous boating conditions and would be **less than significant**, when compared to Existing Conditions and the No Project/No Action Alternative.

21.3.7 Impacts Associated with Alternative B

21.3.7.1 Extended Study Area – Alternative B

Construction, Operation, and Maintenance Impacts

The impacts associated with Alternative B, as they relate to increased use of existing recreational facilities (**Impact Rec-1**), construction or expansion of existing recreational facilities (**Impact Rec-2**), reduced recreation use levels at existing recreational facilities from providing an alternative new site for recreation visitors (**Impact Rec-3**), and hazardous conditions resulting from changes in operating criteria (**Impact Rec-6**) would be the same for San Luis Reservoir, other reservoirs within the Extended Study Area, and wildlife refuges as described for Alternative A.

The impacts associated with Alternative B, as they relate to reduced recreation use levels and recreation benefits at existing reservoirs or rivers (**Impact Rec-4**), would be the same as described for Alternative A for the other reservoirs within the Extended Study Area, but not for San Luis Reservoir. The effects of operational changes at San Luis Reservoir on recreation use levels and recreation benefits resulting from implementation of Alternative B are discussed below.

San Luis Reservoir

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

With implementation of Alternative B, San Luis Reservoir would be drawn down below the Dinosaur Point Boat Ramp four months fewer over the 82-year period of record within the primary recreation season than with Existing Conditions, and three months fewer over the 82-year period of record within the primary recreation season than with the No Project/No Action Alternative. This would be a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

Alternative B would dewater the Basalt Boat Ramp, which is the lowest boat ramp, four fewer months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and one less month over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. Thus, impacts on boating resulting from implementation of Alternative B would be a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

The Basalt Campground water intake would be dewatered four fewer months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, but one more month over the 82-year period of record within the primary recreation season, when compared to the No Project / No Action Alternative. This would be a **beneficial effect** when compared to Existing Conditions, but would be a **potentially significant impact,** when compared to the No Project/No Action Alternative.

The recreation-day benefit value of Alternative B on San Luis Reservoir would be 4 points for reservoir operation, the same as with Existing Conditions and the No Project/No Action Alternative, so there would be **no impact** on the recreation-day benefit value with implementation of Alternative B, when compared to Existing Conditions and the No Project/No Action Alternative.

21.3.7.2 Secondary Study Area – Alternative B

Construction, Operation, and Maintenance Impacts

The impacts associated with Alternative B, as they relate to increased use of existing recreational facilities (**Impact Rec-1**), construction or expansion of existing recreational facilities (**Impact Rec-2**), reduced recreation use levels at existing recreational facilities from providing an alternative new site for recreation visitors (**Impact Rec-3**), reduced recreation use levels and recreation benefits at existing reservoirs or rivers (**Impact Rec-4**), and hazardous conditions resulting from changes in operating criteria (**Impact Rec-6**) would be the same as described for Alternative A for Trinity River, Klamath River, Sacramento River and pump installation at the Red Bluff Pumping Plant, Clear Creek, Feather River, American River, Sutter Bypass, Yolo Bypass, Sacramento-San Joaquin Delta, Suisun Bay, San Pablo Bay, and San Francisco Bay. In addition, reduced recreation use levels at existing recreational facilities during the period of construction (**Impact Rec-5**) would be the same as described for Alternative A for the pump installation at the Red Bluff Pumping Plant.

For the remaining facilities, the impacts associated with Alternative B, as they relate to increased use of existing recreational facilities (**Impact Rec-1**), construction or expansion of existing recreational facilities (**Impact Rec-2**), reduced recreation use levels at existing recreational facilities from providing an alternative new site for recreation visitors (**Impact Rec-3**), and hazardous conditions resulting from changes in operating criteria (**Impact Rec-6**) would be the same as described for Alternative A. However, the effects of Alternative B operational changes on reduced recreation use levels and recreation benefits at existing reservoirs or rivers (**Impact Rec-4)** would differ from Alternative A at Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. These differences are discussed below.

Trinity Lake

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

If Alternative B is implemented, the Trinity Lake boat ramps would be usable 94 more months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and 54 more months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. Also, the low water ramps (Cedar Stock and Minersville) would be usable a few additional months. Although not specifically defined, access to boat-in camps would also be improved. These changes would be a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative**.**

The recreation-day benefit value for reservoir operation with implementation of Alternative B would be 15 points, when compared to 12 points for Existing Conditions and 13 points for the No Project/No Action Alternative. This would also be a **beneficial effect** when compared to Existing Conditions and the No Project Alternative**.**

Shasta Lake

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

With implementation of Alternative B, Shasta Lake boat ramps would be usable 63 additional months over the 82-year period of record within the primary recreation season when compared to Existing

Conditions, and 93 more months over the 82-year period of record within the primary recreation season than with the No Project/No Action Alternative. The low water ramps (Centimudi and Jones Valley) would be usable for three additional months. Access to boat-in campsites would also be improved. These changes are a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

The recreation-day benefit value for Shasta Lake with implementation of Alternative B would be 33 points, when compared to 28 points for Existing Conditions and the No Project/No Action Alternative. This is a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

Lake Oroville

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

The Bidwell Canyon low water ramp would always be in the water with implementation of the No Project/No Action Alternative, and would remain in the water with or without implementation of Alternative B. Alternative B would increase access to the remaining four major boat ramps at Lake Oroville by 15 months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and 22 months over the 82-year period of record within the primary recreation season when compared to the No Project/No Action Alternative. Access to boat-in camps would be improved slightly due to slightly increased surface water elevations. These changes would be considered a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

The recreation-day benefit value for Lake Oroville operation with implementation of Alternative B would be 17.5 points, when compared to 17.5 points for Existing Conditions and 16.5 points for the No Project/No Action Alternative. This would result in **no impact** for Alternative B, when compared to Existing Conditions, and a **beneficial effect** for Alternative B, when compared to the No Project/No Action Alternative.

Folsom Lake

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Alternative B would increase access to the Folsom Lake boat ramps by nine months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and by 38 months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. Access to the Low Water Ramp would be increased by one month over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and two months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. This is considered a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

The recreation-day benefit value for operations at Folsom Lake would be 26 points for Alternative B, as compared to 25 points for Existing Conditions and 22.5 points for the No Project/No Action Alternative. This is considered a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

21.3.7.3 Primary Study Area – Alternative B

Construction, Operation, and Maintenance Impacts

The following Primary Study Area Project facilities have no current public recreation uses and would continue to provide negligible if any recreation opportunities after the Project is implemented, so there would be **no impact** to recreation resources at these locations:

- Sites Reservoir Dams
- Road Relocations and South Bridge
- Sites Pumping/Generating Plant
- Sites Electrical Switchyard
- Tunnel from Sites Pumping/Generating Plant to Sites Reservoir Inlet/Outlet Structure
- Sites Reservoir Inlet/Outlet Structure
- Field Office Maintenance Yard
- Holthouse Reservoir Complex
- Holthouse Reservoir Electrical Switchyard
- GCID Canal Facilities Modifications
- GCID Canal Connection to the TRR
- TRR
- TRR Pumping/Generating Plant
- TRR Electrical Switchyard
- TRR Pipeline
- TRR Pipeline Road
- Delevan Pipeline Electrical Switchyard
- Delevan Transmission Line
- Project Buffer

The Alternative B Recreation Areas, which would provide recreation opportunities, and the Delevan Pipeline construction disturbance area, which currently supports private hunting activities along portions of the alignment and would continue to support those activities during Project operation, would have the same design for alternatives A and B. These facilities would, therefore, have the same impacts on increased use of existing recreational facilities (**Impact Rec-1**), construction or expansion of existing recreational facilities (**Impact Rec-2**), and reduced recreation use levels at existing recreational facilities during the period of construction (**Impact Rec-5**) as described for Alternative A.

With implementation of Alternative B, the Delevan Pipeline Discharge Facility would replace the Delevan Pipeline Intake Facilities that were included in Alternative A. Although the Alternative B Delevan Pipeline Discharge Facility would be much smaller than the Alternative A Delevan Pipeline Intake Facilities, the portion of the river bank described for Alternative A would still become unavailable for shore fishing with implementation of Alternative B. Therefore, the impacts on increased use of existing recreational facilities (**Impact Rec-1**), construction or expansion of existing recreational facilities (**Impact Rec-2**), and reduced recreation use levels at existing recreational facilities during the period of construction (**Impact Rec-5**) at that location would be the same as described for Alternative A. However, the design of the release structure differs for each facility. That difference is discussed below as it relates to hazardous conditions resulting from changes in operating criteria (**Impact Rec-6**).

The Alternative B Sites Reservoir would be 1.81 MAF in size, as compared to the 1.27-MAF Alternative A Sites Reservoir. However, these differences in the size of the facility footprint, alignment, or

construction disturbance area would not change the type of construction, operation, and maintenance activities that were described for Alternative A. They would, therefore, have the same impact on increased use of existing recreational facilities (**Impact Rec-1**), construction or expansion of existing recreational facilities (**Impact Rec-2**), and reduced recreation use levels at existing recreational facilities during the period of construction (**Impact Rec-5**) at existing private duck clubs as described for Alternative A. However, changes in reservoir operation would affect the recreation-day benefit value. Those changes are discussed below and provided for the purpose of comparison to Alternative A.

Sites Reservoir Inundation Area

The Alternative B Sites Reservoir Inundation Area would be larger than described for Alternative A. A larger reservoir has the potential to provide improved recreation opportunities, depending on the operation of the reservoir. However, the larger Alternative B Sites Reservoir would have an associated release-only Delevan Pipeline that would change reservoir operation. When compared to Alternative A, water level fluctuations during the primary recreation season would be increased by Alternative B, resulting in adverse effects to recreation resources. Consequently, the recreation-day benefit value for the Alternative B reservoir would be 19, as compared to 30 for the Alternative A reservoir.

Delevan Pipeline Discharge Facility

Impact Rec-6: Create Hazardous Conditions for Water-Based Activities due to Changes in Operating Criteria

During Project operations, releases would be made to the Sacramento River through the Delevan Pipeline Discharge Facility. The increased flows in the immediate vicinity of the facilities could create hazardous boating conditions. However, releases would be made through energy dissipating valves, which would dissipate the energy of the water being released to the river. These releases would not be expected to create hazardous boating conditions and would be **less than significant**, when compared to Existing Conditions and the No Project/No Action Alternative.

21.3.8 Impacts Associated with Alternative C

21.3.8.1 Extended Study Area

Construction, Operation, and Maintenance Impacts

The impacts associated with Alternative C, as they relate to increased use of existing recreational facilities (**Impact Rec-1**), construction or expansion of existing recreational facilities (**Impact Rec-2**), reduced recreation use levels at existing recreational facilities from providing an alternative new site for recreation visitors (**Impact Rec-3**), and hazardous conditions resulting from changes in operating criteria (**Impact Rec-6**) would be the same for San Luis Reservoir, other reservoirs within the Extended Study Area, and wildlife refuges as described for Alternative A.

Impacts associated with Alternative C as they relate to reduced recreation use levels and recreation benefits at existing reservoirs or rivers (**Impact Rec-4**), would be the same as described for Alternative A for the other reservoirs within the Extended Study Area, but not for San Luis Reservoir. The effects of operational changes at San Luis Reservoir on recreation use levels and recreation benefits resulting from implementation of Alternative B are discussed below.

San Luis Reservoir

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

With implementation of Alternative C, San Luis Reservoir would dewater the Dinosaur Point boat ramp two additional months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions. However, the Basalt boat ramp, which is the lowest ramp and associated with a campground, would be dewatered four fewer months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions. The four-month increase in availability at the lowest boat ramp would outweigh the two-month decrease in availability of the intermediate ramp. This would therefore be a **less-than-significant impact,** when compared to Existing Conditions.

When compared to the No Project/No Action Alternative, operation of San Luis Reservoir with implementation of Alternative C would dewater the Dinosaur Point boat ramp three additional months over the 82-year period of record within the primary recreation season. Although the low water ramp at the Basalt Campground would be dewatered one month less over the 82-year period of record within the primary recreation season than the No Project/No Action Alternative, the loss of three additional months of availability at Dinosaur Point could outweigh this benefit. This would, therefore, be a **potentially significant impact,** when compared to the No Project/No Action Alternative.

The Basalt Campground water intake would be dewatered three fewer months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, but two more months over the 82-year period of record within the primary recreation season, when compared to the No Project / No Action Alternative. This would be a **beneficial effect,** when compared to Existing Conditions, but would be a **potentially significant impact,** when compared to the No Project/No Action Alternative.

The recreation-day benefit for San Luis Reservoir with implementation of Alternative C would be 3 points, as compared to 4 points for Existing Conditions and the No Project/No Action Alternative. This one point decrease in recreation-day benefit would be a **significant impact,** when compared to Existing Conditions and the No Project/No Action Alternative.

21.3.8.2 Secondary Study Area – Alternative C

Construction, Operation, and Maintenance Impacts

The impacts associated with Alternative C, as they relate to increased use of existing recreational facilities (**Impact Rec-1**), construction or expansion of existing recreational facilities (**Impact Rec-2**), reduced recreation use levels at existing recreational facilities from providing an alternative new site for recreation visitors (**Impact Rec-3**), reduced recreation use levels and recreation benefits at existing reservoirs or rivers (**Impact Rec-4**), and hazardous conditions resulting from changes in operating criteria (**Impact Rec-6**) would be the same as discussed for Alternative A for Trinity River, Klamath River, Sacramento River and pump installation at the Red Bluff Pumping Plant, Clear Creek, Feather River, American River, Sutter Bypass, Yolo Bypass, Sacramento-San Joaquin Delta, Suisun Bay, San Pablo Bay, and San Francisco Bay. In addition, reduced recreation use levels at existing recreational facilities during the period of construction (**Impact Rec-5**) would be the same as described for Alternative A for the pump installation at the Red Bluff Pumping Plant.

For the remaining facilities, the impacts associated with Alternative C, as they relate to increased use of existing recreational facilities (**Impact Rec-1**), construction or expansion of existing recreational facilities (**Impact Rec-2**), reduced recreation use levels at existing recreational facilities from providing an alternative new site for recreation visitors (**Impact Rec-3**), and hazardous conditions resulting from changes in operating criteria (**Impact Rec-6**) would be the same as described for Alternative A. The effects of Alternative B operational changes on reduced recreation use levels and recreation benefits at existing reservoirs or rivers (**Impact Rec-4)** would differ from Alternative A at Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. These differences are discussed below.

Trinity Lake

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

With implementation of Alternative C, Trinity Lake boat ramps would be usable 101 more months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and 61 more months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. Alternative C operation of Trinity Lake would make the Cedar Stock and Minersville boat ramps usable for several additional months and access to the boat-in campsites would also be better. This would be a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

The recreation-day benefit value for Trinity Lake operation would be 16 points for Alternative C, as compared to 12 points for Existing Conditions and 13 points for the No Project/No Action Alternative. This would be a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

Shasta Lake

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

With implementation of Alternative C, Shasta Lake boat ramps would be available 100 additional months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and 130 additional months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. The low water ramps (Centimudi and Jones Valley) would be usable for seven additional months, when comparison to Existing Conditions and the No Project/No Action Alternative. Access to boat-in campsites would be improved. These changes are considered a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

The recreation-day benefit value for Shasta Lake operation with implementation of Alternative C would be 33 points, when compared to 28 points for Existing Conditions and the No Project/No Action Alternative. This would be a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

Lake Oroville

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

The Bidwell Canyon low water ramp would always be in the water with implementation of the No Project/No Action Alternative, and would remain in the water with or without implementation of Alternative C. Operation of Lake Oroville with implementation of Alternative C would increase access to the remaining four major boat ramps at Lake Oroville by 11 months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and 18 months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. Access to boat-in campsites would be slightly increased, when compared to Existing Conditions and the No Project/No Action Alternative, due to slight changes in surface water elevations. These changes would result in a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

The recreation-day benefit value at Lake Oroville with implementation of Alternative C would be 17.5 points, which is the same as for Existing Conditions, resulting in **no impact**. The No Project/No Action Alternative would be 16.5 points; implementation of Alternative C would increase the value by one point, resulting in a **beneficial effect**.

Folsom Lake

Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria

Implementation of Alternative C would increase access to the Folsom Lake boat ramps by 23 months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and by 52 months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. Access to the Low Water Ramp would be increased by four months over the 82-year period of record within the primary recreation season, when compared to Existing Conditions, and five months over the 82-year period of record within the primary recreation season, when compared to the No Project/No Action Alternative. This would be a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

The recreation-day benefit value for operations at Folsom Lake with implementation of Alternative C would be 26.5 points, as compared to 25 points for Existing Conditions and 22.5 points for the No Project/No Action Alternative, resulting in a **beneficial effect,** when compared to Existing Conditions and the No Project/No Action Alternative.

21.3.8.3 Primary Study Area – Alternative C

Construction, Operation, and Maintenance Impacts

The following Primary Study Area Project facility sites have no current public recreation uses and would continue to provide negligible if any recreation opportunities after the Project is implemented, so there would be **no impact** to recreation resources at these locations:

- Sites Reservoir Dams
- Road Relocations and South Bridge
- Sites Pumping/Generating Plant

- Sites Electrical Switchyard
- Tunnel from Sites Pumping/Generating Plant to Sites Reservoir Inlet/Outlet Structure
- Sites Reservoir Inlet/Outlet Structure
- Field Office Maintenance Yard
- Holthouse Reservoir Complex
- Holthouse Reservoir Electrical Switchyard
- GCID Canal Facilities Modifications
- GCID Canal Connection to the TRR
- TRR
- TRR Pumping/Generating Plant
- TRR Electrical Switchyard
- TRR Pipeline
- TRR Pipeline Road
- Delevan Pipeline Electrical Switchyard
- Project Buffer

The Alternative B Recreation Areas, which would provide recreation opportunities, and the Delevan Pipeline route, which currently supports private hunting activities along portions of its alignment and would continue to support those activities during Project operation, would have the same design for all three alternatives. These facilities would, therefore, have the same impacts on recreation resources as described for Alternative A.

The Alternative C design of the Delevan Pipeline Intake Facilities and Delevan Transmission Line is the same as described for Alternative A. These facilities would require the same construction methods and operation and maintenance activities regardless of alternative, and would, therefore, result in the same construction, operation, and maintenance impacts to recreation resources as described for Alternative A.

The Alternative C design for the Sites Reservoir Inundation Area would be the same as described for Alternative B. Despite the larger size, the reservoir would have the same impacts to recreation resources at existing private duck clubs as described for Alternative A. However, changes in reservoir operation would affect the recreation-day benefit value. Those changes are discussed below and provided for the purpose of comparison to Alternatives A and B.

Sites Reservoir Inundation Area

The Alternative C Sites Reservoir would larger than described for Alternative A, but the same size as described for Alternative B. However, the Delevan Pipeline associated with Alternative C would be able to deliver water to the reservoir (rather than being a release-only pipeline, as is the case with Alternative B). When compared to alternatives A and B, water level fluctuations during the primary recreation season associated with Alternative C would result in beneficial effects to recreation resources. Consequently, the recreation-day benefit value for the Alternative C reservoir would be 39.5, as compared to 19 for the Alternative B reservoir and 30 for the Alternative A reservoir.

21.4 Mitigation Measures

Mitigation measures are provided below and summarized in Table 21-9 for the impacts that have been identified as significant or potentially significant.

Table 21-9
Summary of Mitigation Measures for
Potential NODOS Project Impacts to Recreation Resources

Impact	Associated Project Facility	LOS Before Mitigation	Mitigation Measure	LOS After Mitigation
Impact Rec-4: Reduce Recreation Use Levels and/or Recreation Benefits at Existing Reservoirs or Rivers due to Changes in Operating Criteria	San Luis Reservoir (Alternative C)	Significant	Mitigation Measure Rec-4a: Extend the Existing Dinosaur Point Boat Ramp at San Luis Reservoir	Less than Significant
	San Luis Reservoir (Alternatives A, B, and C)	Potentially Significant	Mitigation Measure Rec-4b: Extend the Basalt Campground Water Intake at San Luis Reservoir	Less than Significant

Note:
LOS = Level of Significance

Mitigation Measure Rec-4a: Extend the Existing Dinosaur Point Boat Ramp at San Luis Reservoir

DWR and Reclamation shall coordinate with California State Parks' Division of Boating and Waterways to extend the Dinosaur Point boat ramp to accommodate the decreased water levels associated with Project operation. The boat ramp extension shall be constructed when San Luis Reservoir reaches a water level below 378 feet. The feasibility of this mitigation has not been evaluated.

Mitigation Measure Rec-4b: Extend the Basalt Campground Water Intake at San Luis Reservoir

DWR and Reclamation shall extend the Basalt Campground water intake to accommodate the expected decreased water levels associated with Project operation. The water intake extension shall be constructed when San Luis Reservoir reaches a water level below 345 feet. The feasibility of this mitigation has not been evaluated.

Implementation of **Mitigation Measures Rec-4a and Rec-4b** would reduce the level of significance of Project impacts to recreation resources to **less than significant**.

21.5 References

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Figures

Legend

Lakes and Reservoirs

N

0 25 50 75 100 Miles

FIGURE 21-1
Existing Lakes and Reservoirs in the Extended Study Area
North-of-the Delta Offstream Storage Project

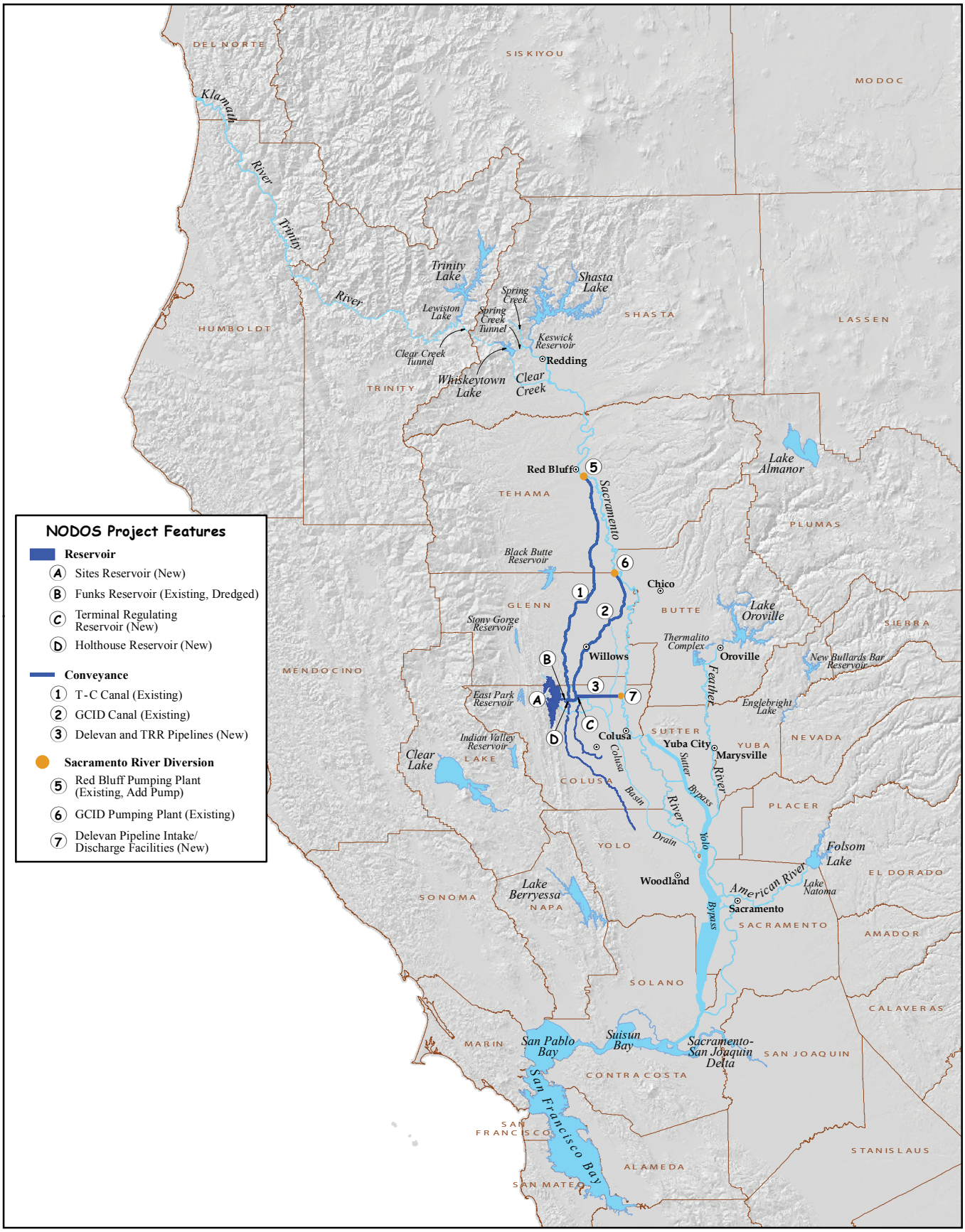

FIGURE 21-2
Existing Lakes and Reservoirs in the Secondary Study Area
North-of-the Delta Offstream Storage Project