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.

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 presented 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 potentially significant impacts, where appropriate.

21.2 Environmental Setting/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 Sites Reservoir Project (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 State Water Project (SWP) Oroville Facilities Federal Energy Regulatory Commission (FERC) relicensing (2003 to 2004) (DWR, 2007a)
- CALFED Final Programmatic Environmental Impact Study/Environmental Impact Report (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 (Bureau of Reclamation [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 Central Valley Project (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 it should not 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	800,000	114	Reclamation	Calaveras, Tuolumne
Don Pedro Reservoir[d]	2,030,000	12,960	160	500,000	400,000	80	TID	Tuolumne
Lake McClure[d]	1,032,000	7,147	80	956,000	1,900,000	199	MIDPD	Mariposa
San Luis Reservoir SRA[f]	2,095,000	15,400	77	1,036,000	327,000	32	DWR/ California 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/ California State Parks	Los Angeles
Silverwood Lake SRA[f]	78,000	990	13	690,000	330,000	48	DWR/ California State Parks	San Bernardino
Lake Perris SRA[f]	131,450	2,340	10	1,144,000	872,000	76	DWR/ California State Parks	Riverside
Totals and Percent Capacity	**9,202,150**	**68,932**	**636**	**7,761,000**	**6,269,000**	**81**		

[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 3 most recent years of available data, or a single year when only 1 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 1 day.

[c]USACE = U.S. Army Corps of Engineers; EBMUD = East Bay Municipal Utility District; Reclamation = Bureau of Reclamation; TID = Turlock Irrigation District; MIDPD = Merced Irrigation District Parks Department; DWR = California Department of Water Resources; California 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; Reclamation, 2016; TID and MID, 2013; FERC, 2015; Reclamation, 2013

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

Legend

Lakes and Reservoirs

N

0 25 50 75 100 Miles

FIGURE 21-1
Existing Lakes and Reservoirs in the Extended Study Area
Sites Reservoir Project EIR/EIS

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 USACE for water, power, and flood control, as well as recreation. The facilities and recreation opportunities are currently administered by 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 (Recreation, 2016a).

Don Pedro Reservoir

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 MIDPD. 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 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. On July 31, 2016, the water surface elevation at San Luis Reservoir reached a record low of 351.55 feet. The total storage at that time was 195,296 acre-feet, just 9.5 percent of its total capacity (CDEC, 2016).

San Luis Reservoir and O'Neill Forebay have two developed campgrounds and two primitive campgrounds. There are three 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 (California State Parks, 2016b).

San Luis Reservoir frequently experiences strong afternoon winds. Primary activities are fishing, boating, wind surfing, and picnicking. The 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. Because of the regular fluctuation of the water level, it is not unusual for the lowest boat ramp, Dinosaur Point, to be dewatered and therefore unusable during the late summer months (August and September). The Basalt Boat Ramp, with a 38-foot lower bottom elevation, experiences months of dewatering less frequently (Appendix 21B Impact of Sites Reservoir Project Operations on Usability of Reservoir Boat Ramps). 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, 2011, pers. comm.

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. Most of 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 (Recreation, 2016). The recreation program at the lake is administered by a concessionaire operating pursuant to an agreement with the California Department of Water Resources (DWR) (DWR, 2016).

Castaic Lake State Recreation Area

Castaic Lake and Lagoon has 29 miles of shoreline, and its afterbay Lagoon has 3 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 (California State Parks, 2016a). A grassy area is available for outdoor events. The recreational facilities at this SWP reservoir are operated by Los Angeles County. Castaic Lake SRA 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 (California State Parks, 2009).

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 2016, Lake Perris is operating at reduced water and visitor capacity until remediation of seismic concerns at Perris Dam is completed (DWR, 2016).

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 1-4 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; the Merced Unit of the Merced NWR; the China Island and Salt Slough units of the North Grasslands Wildlife Area; 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	843,846	69	Reclamation, NPS	Shasta
Lake Almanor[d]	1,300,000	28,200	52	460,000	244,000	53	PG&E, USFS	Plumas
Red Bluff[e]	3,920	530	6	135,000	65,000	48	Reclamation, USFS	Tehama
Black Butte Reservoir[e]	136,200	4,453	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, California 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 County	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, California State Parks, Private	Lake
Folsom Lake SRA[e]	975,000	11,450	75	2,200,000	1,000,000	45	Reclamation, California State Parks	Sacramento
Lake Berryessa[e]	1,600,000	20,700	165	1,700,000	1,400,000	82	Reclamation, Concession	Napa

Name	Storage Capacity (Acre-feet)	Surface Area (Acres)	Shoreline (Miles)	Approximate Recreation Capacity[b]	Approximate Recreation Use[b]	Capacity (Percent)	Operator[c]	County
Totals and Percent Capacity	**16,564,120**	**187,703**	**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 3 most recent years of available data, or a single year when only 1 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 1 day.

[c]Reclamation = 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; California 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 and 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; NPS, 2016; Unsinn, 2017, pers. comm.

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. 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).

[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.

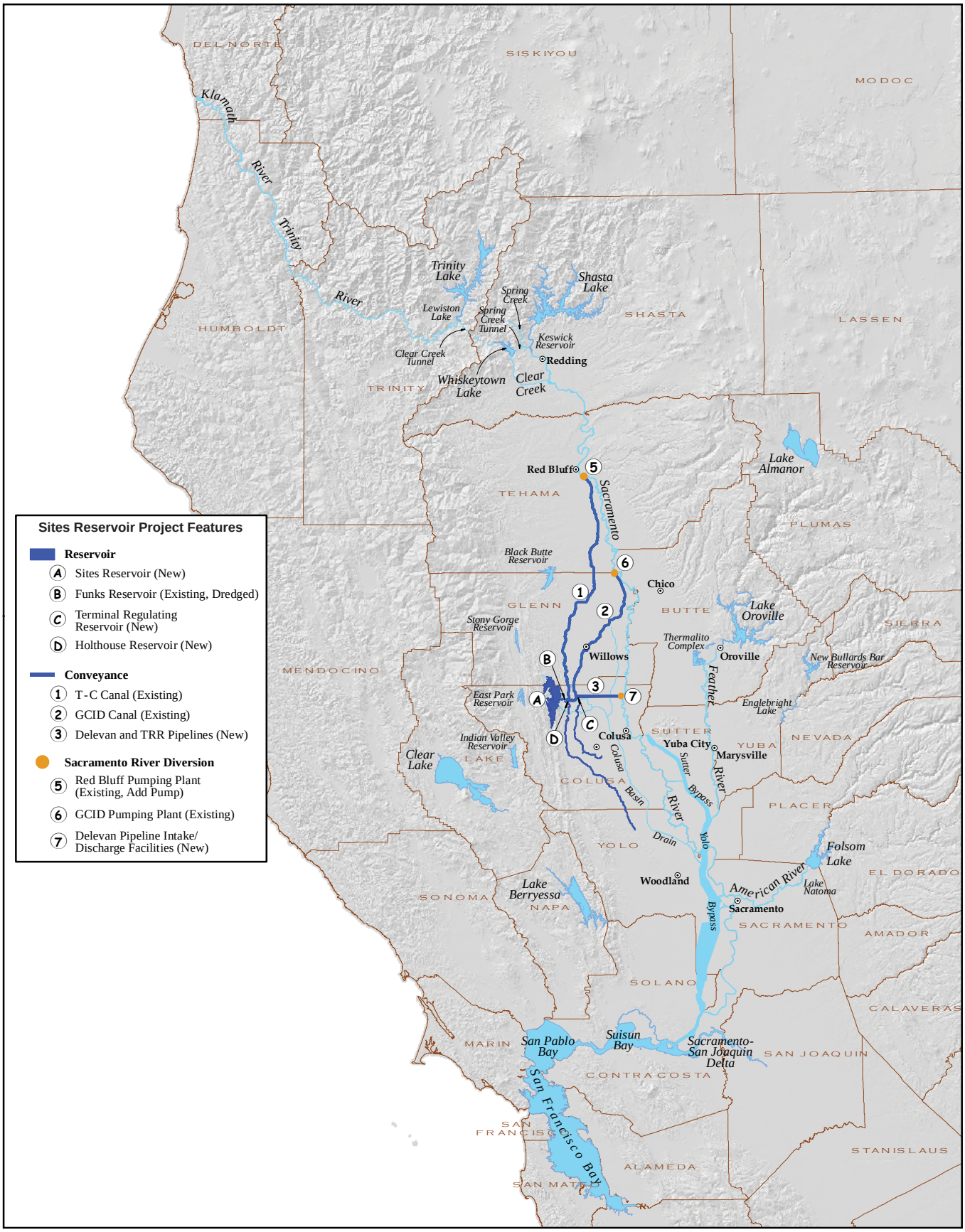


FIGURE 21-2
Existing Lakes and Reservoirs in the Secondary Study Area
Sites Reservoir Project EIR/EIS

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 many 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 USFS campgrounds offer facilities ranging from housekeeping cabins to rustic campgrounds. Four marinas offer houseboat, ski boat, fishing boat, canoe, and jet ski 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).

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:
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 360 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 5 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. The Bureau of Land Management (BLM) manages many 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:
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 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

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 cubic feet per second. 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, 2012, pers. comm.).

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

Site Name	Acres	Access: Mode of Access			Site Amenities and 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
Federal Facilities																																																
Bureau of Reclamation																																																
Altube Island				X																													X															
Bureau of Land Management																																																
Todd Island	~125			X																													X															
Foster Island	222			X																													X															
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	X	X								X					X																				X				X				X				
Phelan Island	308																																															
Pine Creek Unit	435																																															
Rio Vista Unit	1202	X	X	X							X					X																		X				X				X				X				
South Ord Unit	122																																															
Sul Norte Unit	600																																															
Forest Service																																																
Lake Red Bluff Recreation Area	~488	X	X	X	X	X	X			2				X	X		X	X	X	30/NR			X	X	X	X	X	X	X	X				X	X		X		X		X	X							
State Facilities																																																
Department of Parks and Recreation																																															
Bidwell-Sacramento River SRA																																																
Big Chico Creek Day-use Area	~260	X	X	X	X		X				X					X			X	X													X				X	X			X	X	X			X	X
Indian Fishery		X	X	X	X		X							X			X		X	X						X			X			X				X	X			X	X			X			
Irvine Finch River Access		X	X	X	X	X	X			1			X		X		X		X	6 N/R				X	X	X		X		X						X	X			X	X			X		X	X
Pine Creek Landing		X	X	X	X		X			1				X	X					X						X			X			X				X				X	X				X		
Colusa-Sacramento River SRA	67	X	X	X	X	X	X			1			X		X		X	X	X	14/R			X		X	X	X		X	X	X				X	X			X	X							
Woodson Bridge SRA	470	X	X	X	X	X	X						X				X		X	35/R			X		X	X	X		X	X	X				X	X			X	X							

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	X																		X													X				X	X	X	X	X		X					
Colusa Unit North	119	X		X																X													X				X	X	X	X	X	X	X					
Colusa Unit South	45	X		X																X													X				X	X	X	X	X	X	X					
Dicus Slough Unit	1712	X		X																X													X				X	X	X	X	X		X					
Jacinto Unit	283	X		X																X													X				X	X	X	X	X	X	X					
Merrill's Landing Unit	172	X	X	X																X													X				X	X	X	X	X		X					
Moulton Unit North	106	X		X																X													X				X				X	X						
Moulton Unit South	131	X		X																X													X				X	X	X	X	X	X	X					X

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

River Mile #	Site Name	Acres	Access			Site Amenities & 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
182.5	Ord Bend Unit	112	X	X	X	X	X	X				X		X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X		X	X	
174.5	Oxbow Unit	94	X		X																X													X	X			X	X	X	X	X	X						
194-8	Pine Creek Unit	1060	X		X																X													X	X			X	X	X	X	X		X				
163	Princeton Unit North	551	X	X	X												X				X													X	X			X	X	X	X	X	X	X				
164	Princeton Unit East		X	X	X																X													X	X			X	X	X	X	X	X					
162	Princeton Unit South	150	X		X																X													X	X			X	X	X	X	X	X	X				
187	Shannon Slough Unit	150	X	X	X																X													X	X			X	X	X	X	X	X	X				
159	Stegemen Unit	154	X		X																X													X	X			X	X	X	X	X	X	X				
202-5	Wilson's Landing Unit	285	X		X																X													X	X			X	X	X	X	X		X		X		
Reclamation Board																																																		
146.2	Beach at SRWA Colusa Unit	50+/-			X																																	X						X					
145.9	Cobb's Bend (island)	35+/-			X																																	X						X					
145.5	Cruise n' Tarry Marina	22.2	X	X	X							X					X																					X					X	X					
190	Sam's Slough	70.2																																				X					X						
196	Site near Pine Creek Landing	~50			X																																												
196	Site 86F (in SRWA Pine Creek)	~25			X																																							X					
192.5	Site 32F (Instr. #960756)	33.7																																				X					X						
191	Sacramento River Parcel	33.3			X																																						X						
178.2	Site 85F (B808 P72 S 43)	73.3			X																																	X					X						
172	Site 86F	29			X																																	X					X						
	Site 78 (B795 P140 S67)	122																																															
	Site 79F (B807 P293 S67)	36																																															
170.5	Site 86F (B807 P293 S67)	29			X																																	X					X		X				
170	Site 79F (B795 P135 S67)	122			X																																	X					X		X				
State Lands Commission																																																		
221	Kopta Slough		X	X	X	X	X	X			X	X		X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X		X	X	
County and City Public Facilities																																																		
City of Colusa																																																		
144	Colusa Levee Scenic Park	2.19	X	X	X	X		X											X		X						X	X		X	X							X				X	X			X			
	Glenn County																																					X												
169	Butte City Launch Facilities	2	X	X		X	X	X			X			X													X	X					X				X				X	X			X			
184	Ordbend Park	12	X	X	X	X	X	X			X			X					X								X	X		X		X					X				X	X			X			
	Tehama County																																																	
229.5	Mill Creek Park Launching Facility		X	X	X	X					X			X													X	X	X				X		X												
231.5	North Mill Creek Fishing Access		X	X	X												X			X	X											X																
218	Tehama County River Park		X	X	X	X					X			X				X	X		X					X	X	X	X	X	X	X										X		X				

River Mile #	Site Name	Acres	Access			Site Amenities & 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
Private Facilities																																															
The Nature Conservancy																																															
197	Bratten	83																																														
197	Gunhill	58																																										X					
197	Kaplan	102																																										X					
199	Harley	103		X																																											
194	Rx Ranch	236		X																																											
199	Sunset Ranch	111		X	X																																										
198	Vereschagen	177		X	X																																						X					
145-6	Ward	238			X																																						X	X				
Private																																															
142	Bert's Steelhead Marina	~1	X	X	X	X							X	X								X		X			X		X				X					X					X			X			
229.5	Driftwood RV Fishing Resort	~6	X	X	X	X							X		X							X		X	X		X		X				X			X						X	X			X			
229.7	Hidden Harbor Marina & RV Park	8.86	X	X	X	X				X	X		X			X						X		X			X		X				X					X					X	X			X			
235	Hunter's Resort	~12	X	X	X	X				X	X		X			X						X		X			X		X														X	X			X			
229.5	River's Rest Resort	~2	X	X	X	X							X		X							X		X			X		X				X										X	X			X			
196.5	Scotty's Boat Landing (lease)	~2	X	X	X	X					X					X	X					X		X			X		X				X					X	X						X	X			
218	Woodson Bridge RV Park	~12	X	X	X	X							X		X	X						X	X	X	?		X		X		X					X	X	X					X	X	X				

Note:

SRWA = Sacramento River Wildlife Area

Source: EDAW, 2003.

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. USFS and PG&E also provide a few public facilities (Rischbieter, 2001; PG&E, 2002).

Red Bluff Recreation Area

The 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 Red Bluff Recreation Area. The majority of this use occurred in the summer months during the "gates in" period of the RBDD (Reclamation, 2002). 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 8 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).

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 Wildlife Area 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:
MNWS elevation occurs at 900 feet.

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

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 Wildlife Area 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. The Reservoir is operated by Reclamation; however, in 2013, Colusa County entered into a managing agreement and assumed responsibility for collecting user fees and developing and implementing rules and regulations for the recreational facilities at East Park. East Park includes approximately 150 designated group and individual campsites on the Lodoga side, and 16 designated individual campsites on the Stoneyford side (Colusa County, 2016), totaling approximately 44 acres of camping area (Tetra Tech, 2004). East Park also includes areas on the west and east shores of the reservoir developed for recreation, and two designated and six informal boat launch sites on the lake (Hinton and Campbell, 2003).

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 jet skis 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:
MNWS elevation occurs at 468 feet.

Source: Moses, 2011, pers. comm.

Lake Natoma is the regulating reservoir for Folsom Lake. The water is very cold and lake levels can fluctuate 3 or 4 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 5-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 more than 1 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, Sacramento River, 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 Wildlife Area. Hunting, fishing, bird watching, photography, and general nature observation are primary recreation activities. Fishing occurs year-round (CDFW, 2016a).

The Yolo Bypass includes the 1,461-acre Fremont Weir Wildlife Area. Although there are no formal facilities in this wildlife area, 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 Wildlife Area. The Sacramento Bypass Wildlife Area 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 SRA. 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 Wildlife Area 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; CDFW, 2016b).

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.

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 proposed Sites Dam site. There are several stock ponds located throughout the proposed Sites Reservoir footprint, and some are large enough to support warm-water 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 Sites/Delevan Overhead Power 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.

[5] The following 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, TRR, TRR Pumping/Generating Plant, TRR Electrical Switchyard, TRR Pipeline, TRR Pipeline Road, Delevan Pipeline Electrical Switchyard, and GCID Main Canal Connection to the TRR.

The Glenn-Colusa Irrigation District (GCID) Main Canal, facilities, and lateral bank roads are for the use of authorized personnel only. The use of the GCID Main 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 Evaluation Criteria and Significance Thresholds

Significance criteria represent the thresholds that were used to identify whether an impact would be potentially 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 potentially significant impact if it would result in any of the following:

- An increase in 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.
- Required construction or expansion of existing recreational facilities, which may have an adverse physical effect on the environment.
- A substantial reduction of recreation use levels at existing recreational facilities by providing an alternative new site for recreation visitors.
- A substantial reduction of recreation use levels and/or recreation benefits at existing reservoirs or rivers because of changes in operating criteria.
- A substantial reduction of recreation use levels at existing recreational facilities during the Project construction period.
- Hazardous conditions for water-based activities as a result of changes in operating criteria.

21.3.2 Impact Assessment Assumptions and Methodology

Combinations of Project facilities were used to create Alternatives A, B, C, C_1, and D. In all resource chapters, the Authority and Reclamation described the potential impacts associated with the construction, operation, and maintenance of each of the Project facilities for each of the five action alternatives. Some Project features/facilities and operations (e.g., reservoir size, overhead power line alignments, provision of water for local uses) differ by alternative and are evaluated in detail within each of the resource areas chapters. As such, the Authority has evaluated all potential impacts with each feature individually and may choose to select or combine individual features as determined necessary.

Impacts associated with the construction, operation, and maintenance for Alternative C_1 would be the same as those for Alternative C and are therefore not discussed separately below.

21.3.2.1 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.
- The only direct Project-related construction activity that would occur in the Secondary Study Area is the installation of two additional pumps into existing bays 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 Red Bluff Pumping Plant.
- Direct Project-related operational effects would occur in the Secondary Study Area at various CVP and SWP reservoirs. Operational effects would be 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 on the operation of certain facilities that are located in the Extended Study Area and indirect effects on the consequent water deliveries made by those facilities would occur as a result of implementing the alternatives.
- 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 would be similar to those in the Secondary Study Area related to San Luis Reservoir operation and other water users who receive CVP or SWP supplies in this area.
- 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/Discharge Facilities would be required.
- Public recreational opportunities do not occur at many of the Project facility areas, and the proposed facilities and associated operations would continue to provide no recreation opportunities, regardless of the alternative implemented. Accordingly, the following facilities and complexes are not included in the discussion of impacts below as it is assumed that there would be no impact to recreation

resources from constructing, operating, or maintaining these facilities when compared to the Existing Conditions/No Project/No Action Condition:

- Holthouse Reservoir Complex
- Terminal Regulating Reservoir Complex
- Overhead Power Lines and Substations
- Project Buffer

The remaining Project facilities and complexes and their potential impacts to recreation resources are described in the sections below.

21.3.2.2 Methodology

Existing Conditions and the No Project/No Action Alternative were assumed to be similar in the Primary Study Area given the generally rural nature of the area and limited potential for growth and development in Glenn and Colusa counties within the 2030 study period used for this EIR/EIS, as further described in Chapter 2 Alternatives Analysis. As a result, within the Primary Study Area, it is anticipated that the No Project/No Action Alternative would not entail material changes in conditions as compared to the Existing Conditions baseline.

With respect to the Extended and Secondary study areas, the effects of the proposed action alternatives would be primarily related to changes to available water supplies in the Extended and Secondary study areas and the Project's cooperative operations with other existing large reservoirs in the Sacramento watershed, and the resultant potential impacts and benefits to biological resources, land use, recreation, socioeconomic conditions, and other resource areas. DWR has projected future water demands through 2030 conditions that assume the vast majority of CVP and SWP water contractors would use their total contract amounts, and that most senior water rights users also would fully use most of their water rights. This increased demand, in addition to the projects currently under construction and those that have received approvals and permits at the time of preparation of the EIR/EIS, would constitute the No Project/No Action Condition. As described in Chapter 2 Alternatives Analysis, the primary difference in these projected water demands would be in the Sacramento Valley; and, as of the time of preparation of this EIR/EIS, the water demands have expanded to the levels projected to be achieved on or before 2030.

Accordingly, Existing Conditions and the No Project/No Action Alternative are assumed to be the same for this EIR/EIS and, as such, are referred to as the Existing Conditions/No Project/No Action Condition, which is further discussed in Chapter 2 Alternatives Analysis. With respect to applicable, reasonably foreseeable plans, projects, programs, and policies that may be implemented in the future but that have not yet been approved, these are included as part of the analysis of cumulative impacts in Chapter 35 Cumulative Impacts.

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 (or beneficial) 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 Department 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.

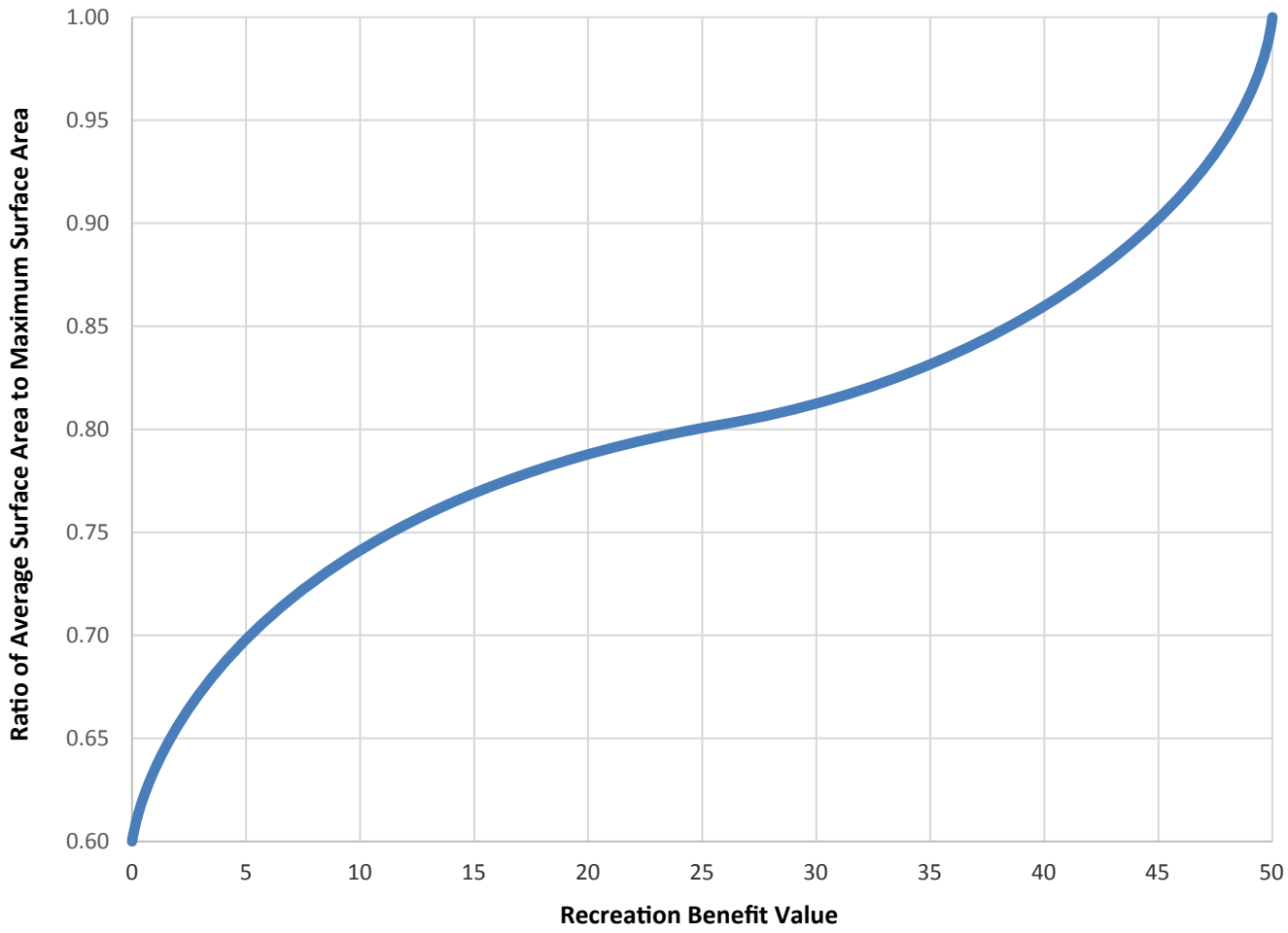
For the purposes of this analysis, only the reservoir operation portion of the recreation-day benefit value was evaluated. Reservoir operations were assigned up to 50 points; in general, a full reservoir with no water level fluctuations during the recreation season would receive 50 points, and a reservoir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

Specifically, CALSIM II modeling results (Appendix 6B Water Resources System Modeling) 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 the Existing Conditions/No Project/No Action Condition, which are assumed to be the same as of the writing of this EIR/EIS, 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, May 1 through September 30.

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 the Project Operations – Reservoir Point Rating Graph developed by California State Parks (1967), presented in Figure 21-3, to obtain the operation point value associated with the recreation-day benefit value. The operation point value, presented in Appendix 21A Impact of Sites Reservoir Project Operations on Recreation-day Benefit Values, was rounded to the nearest half point and used as an indicator of potential use, accounting for the Existing Conditions/No Project/No Action Condition and all action alternatives.

Boat Ramp Availability

CALSIM II modeling results (Appendix 6B Water Resources System Modeling) 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 compared to the Existing Conditions/No Project/No Action Condition and for each of the alternatives (Appendix 21B Impact of Sites Reservoir Project Operations on Usability of Reservoir Boat Ramps). A potentially significant impact was assumed to occur if the majority of boat ramps associated with any one of the reservoirs that could be affected by



Source: California State Parks, Recreation Planning Manual 1967

FIGURE 21-3
Project Operations –
Reservoir Point Rating Graph
Sites Reservoir Project EIR/EIS

the Project would be made unavailable for use within the primary recreation season over the 82-year modeling period compared to Existing Conditions/No Project/No Action. 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), 5 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

21.3.3 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 related to Alternatives A, B, C, and D would occur only at the Red Bluff Pumping Plant 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 only discussed for the Red Bluff Pumping Plant within the Secondary Study Area, in addition to Primary Study Area facilities for Alternatives A, B, C, and D.

The only alternative new site for recreation visitors for Alternatives A, B, C, and D 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 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/Discharge Facilities, which would release water into the Sacramento River.

21.3.4 Impacts Associated with Alternative A

21.3.4.1 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 the Existing Conditions/No Project/No Action Condition, indicate that operation of the Project would cause San Luis Reservoir water levels to continue to fluctuate, but within the historical range. Water level fluctuations could adversely affect recreation use levels if they occur during the recreation season. However, the water level fluctuations associated with implementation of Alternative A would result in 3 fewer months of dewatering at the boat ramps on San Luis Reservoir across the primary recreation season over the 82-year period of record. This marginal increase in usability at San Luis Reservoir would not be expected to increase or substitute use at other recreational facilities. Therefore, implementation of Alternative A would have **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

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. Recreation would not be expected to increase at San Luis Reservoir as a result of Project operations under Alternative A and, consequently, would not result in the need for construction or expansion of existing recreational facilities. There would, therefore, be **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/ No Action Condition.

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 associated with implementation of Alternative A would make the Dinosaur Boat Ramp available 2 more months and the Basalt Boat Ramp usable 3 more months over the 82-year period of record within the primary recreation season than under the Existing Conditions/No Project/No Action

Condition. Therefore, implementation of Alternative A would result in a benefit; however, it would be a marginal benefit, resulting in **no impact** when compared to the Existing Conditions/No Project/No Action Condition**.**

Boating access, even from the lowest boat ramp, would not be possible for several months over the 82-year period of record under the Existing Conditions/No Project/No Action Condition. Recreation use at San Luis Reservoir could be expected to increase by approximately 5 additional months over the 82-year period of record within the primary recreation season, which is considered beneficial; however, because the benefit would not be substantial, it would be considered to have **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

The assumed recreation-day benefit value for San Luis Reservoir operations under the Existing Conditions/No Project/No Action Condition is quite low (approximately 4 out of a possible 50 points) because of extensive drawdown (averaging 138 feet) that occurs at the reservoir nearly every year as part of normal operations. With implementation of Alternative A, the recreation-day benefit value for reservoir operation at San Luis Reservoir would decrease slightly because average water surface elevation would be approximately 2 feet lower than under the Existing Conditions/No Project/No Action Condition. This change, given the typical fluctuations in water levels, would be a **less-than-significant impact** when compared to the Existing Conditions/No Project/No Action Condition**.**

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; therefore water level fluctuations would result in a **less-than-significant impact** when compared to the Existing Conditions/No Project/ No Action Condition**.**

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 and 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 predicted 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 slight increase in storage at some of the existing reservoirs within the Extended Study Area could result in a small amount of 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, however, not be expected to reduce recreation use levels or other recreation benefits, and would have **no impact** when compared to the Existing Conditions/No Project/ No Action Condition.

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 would, therefore, have **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/ No Action Condition.

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 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

21.3.4.2 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 the Existing Conditions/No Project/ No Action Condition, 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 the Existing Conditions/No Project/No Action Condition. 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 would be considered a beneficial effect on overall recreation opportunities but are not expected to result in a substantial increase in the use of existing recreational facilities, nor cause substantial physical degradation of those facilities. Therefore, there would be **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition. 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 under the Existing Conditions/No Project/No Action Condition during the recreation season.

Implementation of Alternative A would increase Trinity Lake boat ramp accessibility by a total of 47 months within the primary recreation season over the 82-year period of record when compared to the Existing Conditions/No Project/No Action Condition. Over the 82-year period of record, during Below Normal, Dry, and Critical years, the Cedar Stock ramp would be available 6 more months, and the Minersville ramp would be available 4 more months than under the Existing Conditions/No Project/ No Action Condition. This projected increase in boat ramp availability is considered a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

With implementation of Alternative A, boat-in campsites would be more accessible than under the Existing Conditions/No Project/No Action Condition. 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 4 months of boating use at the Minersville Ramp. This would be a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition**.**

The reservoir operation portion of the recreation-day benefit value is expected to increase given anticipated increased water levels during the primary recreation season. Thus, the projected minimal increased recreation-day benefit value for reservoir operation would be a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

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 would, therefore, have **no impact** when compared to the Existing Conditions/No Project/No Action Condition**.**

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 Record of Decision requirements in all scenarios, with or without implementation of Alternative A. Modeling results show little change in flows, and the small amount of change would rarely occur. These occasional small changes to flows 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 the Existing Conditions/No Project/No Action Condition.

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 flows 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 Conditions/ No Project/No Action Condition flows. 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 degree Fahrenheit (°F), except for 1 or 2 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 flows and water temperature on the Trinity River would have a **less-than-significant impact** on recreation use levels when compared to the Existing Conditions/No Project/No Action Condition.

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 existing flows would not be expected to create hazardous conditions for water-based activities and, therefore, would have a **less-than-significant impact** when compared to the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition, so there would be **no impact** to its recreational uses and, thus, no subsequent physical degradation.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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, thus, 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 the Existing Conditions/No Project/No Action Condition.

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 would, therefore, result in **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/ No Action Condition, indicate that Alternative A would provide increased operational flexibility to Shasta Lake, similar to that described for Trinity Lake. Improved storage conditions and reduced water level fluctuations would be beneficial and are not expected to reduce recreation use of Shasta Lake nor increase use at other recreational facilities. Therefore, there would be **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

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

Improved storage conditions would be beneficial and 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition. Overall boat ramp accessibility across all nine boat ramps would improve by 95 months over the 82-year modeling period during the primary recreation season, which would be a **beneficial effect**.

In Dry years, the Antlers Ramp would continue to go out of service in August and September, but eight of the remaining major boat ramps would still be accessible. In addition, overall accessibility at Antlers Ramp would improve by 15 months over the 82-year period of record within the primary recreation season when compared to the Existing Conditions/No Project/No Action Condition.

In Critical years, access to the vast majority of ramps would increase slightly. Overall, implementation of Alternative A would result in a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

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 increase in water levels during the primary recreation season with implementation of Alternative A would also improve such values. Improved storage at Shasta Lake would have a **beneficial effect** on the recreation-day benefit value for reservoir operation when compared to the Existing Conditions/No Project/No Action Condition.

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 **no impact** when compared to the Existing Conditions/No Project/No Action Condition**.**

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 the Existing Conditions/No Project/ No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 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 **no impact** on recreation use levels when compared to the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 two additional pumps in existing bays at the Red Bluff Pumping Plant would result in only minor increases in diversions from the river when compared to the Existing Conditions/No Project/No Action Condition. 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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

Construction activities associated with the installation of two additional pumps 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/ No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 changes in Clear Creek flows and water temperatures would be minor, with no measurable improvement anticipated. Therefore, there would be **no impact** on recreation use levels when compared to the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/ No Action Condition, 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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; therefore, Sites Reservoir 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 the Existing Conditions/No Project/No Action Condition.

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 increase access to the five major ramps evaluated at Lake Oroville by a total of 30 months over the 82-year period of record within the primary recreation season when compared to the Existing Conditions/No Project/No Action Condition. The increased storage associated with implementation of Alternative A would result in a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

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

Implementation of Alternative A would have a minor beneficial effect when compared to the Existing Conditions/No Project/No Action Condition, which effect would not be substantial; therefore, Alternative A would be expected to result in **no impact**.

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 the Existing Conditions/No Project/No Action Condition**.**

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 the Existing Conditions/No Project/No Action Condition, flows in June through September in drier years would be improved. However, flows would generally decrease during October, November, and December. The flows 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 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, overall, would have **no impact** on recreation use levels when compared to the Existing Conditions/No Project/ No Action Condition.

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 **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

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 could be reduced in some years associated with diversions into Sites Reservoir. Flows in the Yolo Bypass would also be reduced in duration and magnitude in some years. These reductions in winter flows in some years would not be expected to substantially impact its recreational uses and would not increase use at other recreational facilities. Therefore, there would be **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 a **less-than-significant impact** when compared to the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition, indicate that Alternative A would provide improved operational flexibility to Folsom Lake, similar to that described for Trinity Lake. Improved storage conditions and reduced water level fluctuations would be beneficial and 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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; Sites Reservoir, 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 the Existing Conditions/No Project/No Action Condition.

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 five major boat ramps at Folsom Lake would be available 45 additional months over the 82-year period of record within the primary recreation season when compared to the Existing Conditions/No Project/No Action Condition. The Low Water Ramp would be slightly more available over the 82-year period of record within the primary recreation season than under the Existing Conditions/No Project/No Action Condition. These projected changes would be a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

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 swimming beach. This projected minimal change would be a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

The modest increases in lake levels would slightly increase recreation-day benefit values at Folsom Lake with implementation of Alternative A. The increased values would be a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

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 **no impact** when compared to the Existing Conditions/No Project/No Action Condition**.**

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 would result in flows similar to those under the Existing Conditions/No Project/No Action Condition. 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 Existing Conditions/No Project/No Action Condition. Potential operational impacts on recreation use levels are considered to be **less than significant** when compared to the Existing Conditions/No Project/No Action Condition.

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 Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition. 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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/No Project/No Action.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/ No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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

The 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 has the potential 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. Publicity related to construction of the new reservoir would also be anticipated to create interest and would alert potential recreationists to its existence, which may attract additional visitors to the area.

The availability of a new reservoir could also cause a temporary or even permanent redistribution of recreation use among the nearby recreation sites. Use would be influenced by 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.

Sites Reservoir would be smaller than Clear Lake and much larger than the other four reservoirs. 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 expected average annual 33-foot drawdown during the recreation season with implementation of Alternative A is greater than the drawdown typical of neighboring reservoirs and would likely influence proposed recreation opportunities and use of the facility 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 (the Existing Conditions/No Project/No Action Condition). 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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/ No Action Condition.

21.3.4.3 Primary Study Area – Alternative A

Construction, Operation, and Maintenance Impacts

The only existing recreational facilities within the Primary Study Area are the private duck hunting and fishing clubs located along the proposed Delevan Pipeline alignment, and the only proposed facilities that would result in new recreational opportunities would occur at the Sites Inundation Area and Recreation Areas; therefore, only the potential impacts at the Sites Reservoir Complex and the Delevan Pipeline Complex are discussed below. The remaining facilities and complexes are assumed to have no impact to recreational resources.

Although the Sites/Delevan Overhead Power Line would be located within the Overhead Power Lines and Substations grouping of facilities, it is assumed that all impacts associated with the construction, operation, and maintenance of the overhead power line, as they relate to recreational resources, would be the same as those described for the Delevan Pipeline; therefore, those impacts are not discussed independently for Alternatives A, B, and C.

Sites Reservoir Complex

The recreation-day benefit value for Sites Reservoir was calculated for the purpose of comparison between Alternatives A, B, C, and D. Based on the results of the CALSIM II modeling on the expected operation of the reservoir, and methodology described in section 21.3.2.2, Methodology, the recreation-day benefit value for the Alternative A Sites Reservoir would be 30.

As presented in section 21.3.3, Topics Eliminated from Further Analytical Consideration, impacts to recreation use levels and recreation benefits resulting from changes in operating criteria (**Impact Rec-4**) are not discussed for the Primary Study Area, and hazardous conditions resulting from changes in operating criteria (**Impact Rec-6**) are not discussed for Delevan Pipeline Complex within the Primary Study Area.

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 private duck hunting and fishing clubs located in the vicinity of the proposed Delevan Pipeline. Such potential impacts are presented under the Delevan Pipeline Complex discussion. Operation of the Alternative A 1.3-million-acre-foot (MAF) Sites Reservoir and associated recreation areas would not affect any other neighborhood or regional parks. There would, therefore, be **no impact** to the existing recreational facilities when compared to the Existing Conditions/No Project/No Action Condition.

Impact Rec-2: Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment

Although implementation of Alternative A would not require the expansion of existing private hunting and fishing clubs, the Project would include the construction of up to five Recreation Areas, as described in Chapter 3 Description of the Sites Reservoir Project Alternatives. These facilities would result in environmental effects primarily during construction and as a result of operation associated with recreational use. These effects are addressed in other respective chapters and are anticipated to result in a **less-than-significant impact** when compared to the Existing Conditions/No Project/No Action Condition.

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 operation of a new Sites Reservoir and associated Recreation Areas 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 other recreational facilities located within the Primary Study Area because Sites Reservoir would offer reservoir-related recreational opportunities. There would, therefore, be **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

Delevan Pipeline Complex

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 hunting and fishing clubs located near the proposed Delevan Pipeline and Sites/Delevan Overhead Power Line alignments. During the construction phase of the Delevan Pipeline, land owned by private duck clubs that the proposed pipeline would cross would be fallowed, which would temporarily reduce the amount of habitat available to waterfowl and, consequently, could reduce hunting opportunities on those lands during construction. It is anticipated that hunters who hunt on these lands would likely temporarily use other nearby duck clubs during the Alternative A construction period. Duck clubs typically impose limits

on recreation use levels and, therefore, would not experience a level of use that would result in substantial deterioration of their facilities. Therefore, there would be a **less-than-significant impact** when compared to the Existing Conditions/No Project/No Action Condition.

A limited amount of fishing currently occurs along the bank of the Sacramento River near the existing Maxwell Irrigation District Pumping Plant, adjacent to the proposed Delevan Pipeline Intake/Discharge Facilities location. The Delevan Pipeline Intake/Discharge 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 this particular portion of 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 would be minimal and would not be expected to cause the deterioration of those facilities. Therefore, there would be a **less-than-significant impact** when compared to the Existing Conditions/No Project/No Action Condition.

Following construction of the Delevan Pipeline and Sites/Delevan Overhead Power Line, fallowed private duck club-owned lands affected by the Project would be restored to their original condition and would support the same recreation use levels as those under existing conditions. Therefore, there would be a **less-than-significant impact** when compared to the Existing Conditions/No Project/No Action Condition.

Impact Rec-2: Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment

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 Sites/Delevan Overhead Power Line would not require the construction or expansion of those facilities. Therefore, there would be **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

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 the Existing Conditions/No Project/No Action Condition.

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

There are several private duck hunting and fishing clubs located on lands where the Delevan Pipeline and Sites/Delevan Overhead Power 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 Sites/Delevan Overhead Power Line construction disturbance areas when compared to the Existing Conditions/No Project/No Action Condition.

The loss of the portion of the river bank at the proposed Delevan Pipeline Intake/Discharge Facilities 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 similar recreation at nearby areas, the impact would be **less than significant** when compared to the Existing Conditions/ No Project/No Action Condition.

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 and limited, the impact on recreation use levels would be **less than significant** when compared to the Existing Conditions/No Project/No Action Condition.

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

During Project operations, releases would be made into the Sacramento River through the proposed Delevan Pipeline Intake/Discharge 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 1 foot per second. These releases would not be expected to create hazardous boating conditions and would be **less than significant** when compared to the Existing Conditions/No Project/No Action Condition.

21.3.5 Impacts Associated with Alternative B

21.3.5.1 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**) due to operating criteria, 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 for 3 fewer months over the 82-year period of record within the primary recreation season than under the Existing Conditions/No Project/No Action Condition. This projected minimal increase would be a benefit when compared to the Existing Conditions/No Project/No Action Condition; however, the increase would not be substantial, resulting in **no impact**.

Alternative B would dewater the Basalt Boat Ramp, which is the lowest boat ramp, for 1 less month over the 82-year period of record within the primary recreation season when compared to the Existing Conditions/No Project/No Action Condition. Thus, projected minimal impacts on boating resulting from implementation of Alternative B would be a benefit when compared to the Existing Conditions/No Project/No Action Condition; however, the increase would be marginal and therefore considered to have **no impact**.

The Basalt Campground water intake would be dewatered 1 more month over the 82-year period of record within the primary recreation season when compared to the Existing Conditions/No Project/ No Action Condition. This projected minimal increase when compared to the Existing Conditions/ No Project/No Action Condition, would result in **no impact**.

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

21.3.5.2 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 77 more months over the 82-year period of record within the primary recreation season when compared to the Existing Conditions/No Project/No Action Condition. Also, the low water ramps (Cedar Stock and Minersville)

would be usable up to 4 additional months. Although not specifically defined, access to boat-in camps would also be improved. These changes would result in a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition**.**

The recreation-day benefit value for reservoir operation with implementation of Alternative B would be slightly improved when compared to the Existing Conditions/No Project/No Action Condition, resulting in a **beneficial effect**.

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 97 additional months over the 82-year period of record within the primary recreation season than under the Existing Conditions/No Project/No Action Condition. The low water ramps (Centimudi and Jones Valley) would be usable for 8 additional months. Access to boat-in campsites would also be improved. These changes would be a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

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

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 was extended in 2016, which has reduced the frequency with which the boat ramp is dewatered. Over the 82-year period of record within the primary recreation season, Alternative B would increase access to all five major boat ramps at Lake Oroville by a total of 34 months when compared to the Existing Conditions/No Project/No Action Condition. 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 the Existing Conditions/No Project/No Action Condition

The recreation-day benefit value for Lake Oroville operation with implementation of Alternative B would be the same as under the Existing Conditions/No Project/No Action Condition. This would result in **no impact** for Alternative B when compared to the Existing Conditions/No Project/No Action Condition.

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 35 months when compared to the Existing Conditions/No Project/No Action Condition. Access to the Low Water Ramp would be increased by 2 months when compared to the Existing Conditions/No Project/No Action Condition. This projected change is considered a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

As a result of implementation of Alternative B, the recreation-day benefit value for operations at Folsom Lake would increase compared to the Existing Conditions/No Project/No Action Condition. This is considered a **beneficial effect**.

21.3.5.3 Primary Study Area – Alternative B

Construction, Operation, and Maintenance Impacts

Many of the same Project facilities are included in Alternatives A and B (see Table 3-1 in Chapter 3 Description of the Sites Reservoir Project Alternatives). These facilities would require the same construction methods and operations and maintenance activities regardless of alternative, and would thus result in the same construction, operation, and maintenance impacts to recreational resources. Therefore, unless explicitly discussed below, impacts at all Project facilities 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**), are anticipated to be the same as those described for Alternative A.

Sites Reservoir Complex

The Alternative B Sites Reservoir would be 1.8 MAF in size, as compared to the 1.3-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 hunting and fishing 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.

The Alternative B design of the Sites Reservoir Complex 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 when compared to the Alternative A reservoir. This would result in a recreation-day benefit value (as described in Section 21.3.2.2, Methodology) of 19 compared to a value of 30 for Alternative A. The value associated with Alternative B, however, would still be higher than the recreation-day benefit value for the Existing Conditions/No Project/No Action Condition given that no public recreational facilities are currently in place within the proposed Sites Reservoir Complex footprint, and private recreational opportunities are limited. Therefore, although the benefit would be lower than with Alternative A, implementation of Alternative B would still have a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

Because of the increased capacity, the Alternative B Sites Reservoir Inundation Area would also have a larger surface area than described for Alternative A. A larger reservoir has the potential to provide improved recreation opportunities, depending on the operation of the reservoir. However, given that the only existing recreational opportunities located within the Primary Study Area are the private hunting and fishing clubs, which would be expected to continue operating with the larger Sites Reservoir, Alternative B would have the same impact to existing recreational facilities as described for

Alternative A. This would, therefore, have **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

The Alternative B Recreation Areas, which would provide recreation opportunities, and the Delevan Pipeline construction disturbance area, which currently supports private hunting and fishing 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.

Delevan Pipeline Complex

With implementation of Alternative B, the Delevan Pipeline Discharge Facility would replace the Delevan Pipeline Intake/Discharge 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/Discharge 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**).

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 the Existing Conditions/No Project/No Action Condition.

21.3.6 Impacts Associated with Alternative C

21.3.6.1 Extended 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**), 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 C 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

When compared to the Existing Conditions/No Project/No Action Condition, operation of San Luis Reservoir under implementation of Alternative C would dewater the Dinosaur Point Boat Ramp 9 additional months over the 82-year period of record within the primary recreation season. The low water ramp at the Basalt Campground would be dewatered 3 fewer months over the 82-year period of record within the primary recreation season than under the Existing Conditions/No Project/No Action Condition. Therefore, projections indicate a loss of 6 months of availability between the boat ramps. Given historical fluctuation at San Luis Reservoir and regular inaccessibility at the boat ramps on the reservoir, this projected minimal change would be a **less-than-significant impact** when compared to the Existing Conditions/No Project/No Action Condition.

The recreation-day benefit for San Luis Reservoir with implementation of Alternative C would be 3 points, as compared to 4 points for the Existing Conditions/No Project/No Action Condition. Given the already low value resulting from frequent fluctuations, this projected minimal decrease in recreation-day benefits would be a **less-than-significant impact** when compared to the Existing Conditions/No Project/No Action Condition.

21.3.6.2 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. However, the effects of Alternative C 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 89 more months over the 82-year period of record within the primary recreation season when compared to the Existing Conditions/No Project/No Action Condition. Alternative C operation of Trinity Lake would make the Cedar Stock and Minersville boat ramps usable for 8 additional months, and access to the boat-in campsites would also be improved. This would be a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

The recreation-day benefit value for Trinity Lake operation would be improved when compared to the Existing Conditions/No Project/No Action Condition, resulting in a **beneficial effect**.

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 119 additional months over the 82-year period of record within the primary recreation season when compared to the Existing Conditions/No Project/No Action Condition. The low water ramps (Centimudi and Jones Valley) would be usable for 7 additional months when compared to the Existing Conditions/No Project/No Action Condition. Access to boat-in campsites would be improved. These changes would be considered a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

The recreation-day benefit value for Shasta Lake operation with implementation of Alternative C would be improved when compared to the Existing Conditions/No Project/No Action Condition, resulting in a **beneficial effect**.

Lake Oroville

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

Operation of Lake Oroville with implementation of Alternative C would increase access to the five major boat ramps at Lake Oroville by 27 months over the 82-year period of record within the primary recreation season when compared to the Existing Conditions/No Project/No Action Condition. Access to boat-in campsites would be slightly increased when compared to the Existing Conditions/No Project/No Action Condition, due to slight changes in surface water elevations. These projected changes would result in a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

The recreation-day benefit value at Lake Oroville with implementation of Alternative C would be the same as that under Alternatives A and B but would be improved when compared to the Existing Conditions/No Project/No Action Condition. Therefore, implementation of Alternative C would result in a potential **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

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 52 months over the 82-year period of record within the primary recreation season when compared to the Existing Conditions/No Project/No Action Condition. Access to the Low Water Ramp would be increased by 5 months over the 82-year period of record within the primary recreation season when compared to the Existing Conditions/No Project/No Action Condition. This projected change would be a **beneficial effect** when compared to the Existing Conditions/No Project/No Action Condition.

The recreation-day benefit value for operations at Folsom Lake with implementation of Alternative C would increase, as compared to the Existing Conditions/No Project/No Action Condition, resulting in a **beneficial effect**.

21.3.6.3 Primary Study Area – Alternative C

Construction, Operation, and Maintenance Impacts

Many of the same Project facilities are included in Alternatives A and C (see Table 3-1 in Chapter 3 Description of the Sites Reservoir Project Alternatives). These facilities would require the same construction methods and operation and maintenance activities regardless of alternative, and would thus result in the same construction, operation, and maintenance impacts to recreational resources. Therefore, unless explicitly discussed below, impacts at all Project facilities are anticipated to be the same as described for Alternative A.

Sites Reservoir Complex

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

The Alternative C Sites Reservoir would be the same size as that 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 be reduced, resulting in 123 months of a dewatered state for both proposed boat ramps, as compared to 186 months and 188 months for Alternatives A and B, respectively, resulting in a **beneficial effect**. Consequently, the recreation-day benefit value for the Alternative C reservoir would be 39.5, as compared to 30 for Alternative A and 19 for Alternative B. This would increase recreation opportunities at the Sites Reservoir Complex. However, given that existing recreational opportunities located within the proposed footprint are limited, Alternative C would not be expected to reduce existing levels. This would, therefore, have the same impact as that described for Alternative A, resulting in **no impact** when compared to the Existing Conditions/No Project/No Action Condition.

The Alternative C 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 as that described for Alternatives A and B, resulting in the same impacts on existing recreational facilities as described for those alternatives.

21.3.7 Impacts Associated with Alternative D

21.3.7.1 Extended and Secondary Study Areas – Alternative D

Construction, Operation, and Maintenance Impacts

The impacts associated with Alternative D would be the same as those for Alternative A for wildlife refuges, San Luis and other reservoirs within the Extended Study Area, and all waterbodies located within the Secondary Study Area, as they relate to the following: 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**).

21.3.7.2 Primary Study Area – Alternative D

Construction, Operation, and Maintenance Impacts

Many of the same Project facilities are included in Alternatives C and D (see Table 3-1 in Chapter 3 Description of the Sites Reservoir Project Alternatives). These facilities would require the same construction methods and operation and maintenance activities regardless of alternative, and would thus result in the same construction, operation, and maintenance impacts 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**), reduced recreation use levels at existing recreational facilities during the period of construction (**Impact Rec-5**), and hazardous conditions resulting from changes in operating criteria (**Impact Rec-6**). Therefore, unless explicitly discussed below, impacts at all Project facilities are anticipated to be the same as described for Alternative C.

Sites Reservoir Complex

The Alternative D Sites Reservoir would be the same size as that described for Alternative C and would also 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 C, water level fluctuations during the primary recreation season associated with Alternative D would result in beneficial effects to recreation resources. Consequently, the recreation-day benefit value for the Alternative D Sites Reservoir Complex would be 37 points. Although this would be slightly lower than the 39.5 points for Alternative C, the 37 points would be higher than the points under Alternatives A and B and would be a **beneficial effect** compared to the Existing Conditions/No Project/No Action Condition.

- Alternative D would include the development of only two recreation areas (Stone Corral Creek Recreation Area and Peninsula Hills Recreation Area) instead of up to five recreation areas that could be developed for Alternative C. Lurline Headwaters Recreation Area, Saddle Dam Recreation Area, and Antelope Island Recreation Area would not be developed under Alternative D. This alternative

would also include a boat ramp at the western side of the reservoir where the existing Sites Lodoga Road would be inundated. As a result of the modified recreation areas, the road segments providing access to Lurline Headwaters Recreation Area required for the other alternatives would not be required; however, Alternative D does include an additional 5.2 miles of roadway from Huffmaster Road to Leesville Road. The proposed recreation areas would increase the recreation-day benefit value when compared to the Existing Conditions/No Project/No Action Condition and require less construction of facilities, resulting in a **beneficial effect**.

- Under Alternative D, the TRR would be slightly smaller (approximately 80 acres smaller for Alternative D); however, this difference is not expected to change the potential impacts related to recreation resources as compared to other alternatives.
- For Alternative D, the Delevan Pipeline alignment would be approximately 50 to 150 feet south of the alignment presented under Alternatives A, B, and C. The Alternative D alignment takes advantage of existing easements to reduce impacts on local landowners. The shift in alignment is not expected to change the potential impacts to recreation resources.
- The boundary of the Project Buffer would be the same for all alternatives, but because the footprints of some of the Project facilities that are included in the Project Buffer would differ among the alternatives, the acreage of land within the Project Buffer would also differ. However, these differences in the size of the area included within the buffer would not change the type of construction, operation, and maintenance activities, and would have similar impacts as those described for all other alternatives.
- Alternative D includes a north-south alignment of the Delevan Overhead Power Line, rather than the east-west alignment between the TRR and the Delevan Pipeline Intake/Discharge Facilities. Additionally, Alternative D includes a proposed electrical substation west of Colusa in addition to the substation located near the Holthouse Reservoir. The Alternative D north-south alignment of the Delevan Overhead Power Line and related substation are not anticipated to result in different impacts on recreational resources than those associated with the east-west alignment described for the other alternatives.
- Under Alternative D, the Lurline Headwaters Recreation Area would not be constructed; therefore, the road segment providing access to that recreation area would not be required. Alternative D includes an additional 5.2 miles of roadway from Huffmaster Road to Leesville Road; otherwise, the design of the Sites Reservoir Inundation Area and Dams, and South Bridge would be the same as that for Alternative A and is not expected to change the potential impacts to recreational resources.

21.4 Mitigation Measures

Because no potentially significant impacts were identified, no mitigation is required or recommended. Environmental commitments, including construction management procedures and stormwater pollution prevention, erosion control, dewatering, and vector control Best Management Practices are included in all Project alternatives and discussed in Chapter 3 Description of the Sites Reservoir Project Alternatives.

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