Chapter 10
Recreational Resources and Visual Quality

10.1 Introduction

This chapter describes the environmental setting for recreational resources and visual quality, the regulatory setting associated with recreational resources and visual quality. It also evaluates environmental impacts on recreational resources and visual quality that could result from the Lower San Joaquin River (LSJR) alternatives and, if applicable, offers mitigation measures that would reduce significant impacts.

Recreationists enjoy a variety of water-dependent and water-enhanced activities, including boating, fishing, swimming, hiking, and camping in the plan area. This chapter analyzes potential impacts on recreation opportunities and visual quality in the plan area, specifically on the Merced, Tuolumne, and Stanislaus Rivers (the three eastside tributaries); the rim dams and major reservoirs on each river (New Exchequer Dam and Lake McClure, New Don Pedro Dam and Reservoir, and New Melones Dam and Reservoir, respectively; the LSJR; and southern Delta waterways.

Table 10-1 summarizes the impacts of the LSJR alternatives. An alternative would have a significant impact on recreational resources if it would: (1) substantially reduce recreational opportunities on rivers or at reservoirs or reduce the use of existing recreational facilities; (2) substantially degrade the functionality of existing recreation facilities on rivers or at reservoirs; or (3) substantially degrade the visual character or quality of the reservoirs. Recreational impacts and visual character and quality impacts were generally evaluated using the change in the frequency of acceptable recreation seasonal flow and reservoir conditions (between May and September).

As discussed in Appendix B, *State Water Board's Environmental Checklist*, changes in salinity would not a result in changes to water-dependent or water-enhanced recreational opportunities in the southern Delta. The southern Delta water quality (SDWQ) alternatives are not anticipated to affect recreational resources in the southern Delta because water quality in the southern Delta is expected to remain within historical ranges (see Chapter 5, *Water Supply, Surface Hydrology, and Water Quality*). Historical levels of salinity in the southern Delta do not significantly impact recreation opportunities or quality, and changes in salinity levels within historical ranges are expected to be imperceptible to recreationists; there would be no impacts. As discussed in Appendix B, changes in salinity would not result in substantial changes to visual character or quality and aesthetic impacts are not expected. Therefore, the SDWQ alternatives are not analyzed in detail in this chapter.

Impacts related to LSJR Alternative 1 and SDWQ Alternative 1 (No Project) are presented in Chapter 15, *LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*, and the supporting technical analysis is presented in Appendix D, *Evaluation of LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*. Impacts related to methods of compliance are discussed in Appendix H, *Evaluation of Methods of Compliance*.

Table 10-1. Summary of Recreation Impacts

Alternative	Summary of Impact(s)	Significance Determination
REC-1 Substantially reduce recreational opportunities or the use of existing recreation facilities on rivers or at reservoirs		
LSJR Alternative 1	See note.[1]	
LSJR Alternative 2	The modeled seasonal average frequency of river flows that support recreation would not be reduced by more than 10%. The change in reservoir elevations would not be greater than 10 feet or decrease below designated recreational elevations. Therefore, it is expected that recreational opportunities would not be substantially reduced.	Less than significant
LSJR Alternative 3	There would be a change in river flow such that the modeled average seasonal frequency of lower flows on the Merced and Tuolumne would be reduced by more than 10%, and, therefore, it is expected that low-flow recreation opportunities (e.g., swimming, wading, floating) would be substantially reduced.	Significant and unavoidable
LSJR Alternative 4	There would be a change in river flow such that the modeled average seasonal frequency of lower flows on the Merced and Tuolumne and mid-range flows on Tuolumne would be reduced by more than 10%,and, therefore, it is expected that low-flow recreation opportunities (e.g., swimming, wading, floating) would be substantially reduced.	Significant and unavoidable
REC-2 Substantially degrade the functionality of existing recreation facilities on the rivers or at reservoirs		
LSJR Alternative 1	See note.[1]	
LSJR Alternatives 2–4	There would be no change in the frequency or magnitude of the highest river flows or increase in reservoir elevations above capacity: thus the functionality of existing recreational facilities would not be degraded.	Less than significant
REC-3 Substantially degrade the existing visual character or quality of the reservoirs		
LSJR Alternative 1	See note.[1]	
LSJR Alternatives 2–4	No decrease in reservoir elevation levels such that a substantial degradation of existing visual character or quality would occur.	Less than significant

[1] The No Project Alternative would result in implementation of flow objectives and salinity objectives identified in the 2006 Bay-Delta Plan. See Chapter 15, *LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*, for the No Project impact discussion and Appendix D, *Evaluation of LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*, for the No Project Alternative technical analysis.

10.2 Environmental Setting

There are three distinct environments for water-based recreation on the Merced, Tuolumne, and Stanislaus Rivers, the LSJR, and the southern Delta: flowing rivers, controlled reservoirs, and open (i.e., tidal) Delta waterways. Recreation takes place in managed facilities, at informal access points, and in undeveloped areas. Much of the recreation use is water dependent (e.g., boating, swimming), but many other popular activities (e.g., camping, hiking) are simply enhanced by the presence of water. Recreational opportunities have been substantially influenced by the construction of reservoirs and the management of water (i.e., flow).

Typical recreational activities in the watersheds include: boating, fishing, swimming, water sports, horseback riding, hiking, biking, camping, picnicking, birding and nature viewing, hunting, and gold panning. Facilities constructed throughout the plan area permit similar recreational uses (e.g., boat-based fishing, kayaking, beach swimming, picnicking); although the spectrum of uses may shift depending on conditions. Swimming is more common in the reservoirs, but may also occur on the rivers during low flow. Boating activities such as whitewater rafting, kayaking, and canoeing, are popular on the rivers. Preferred recreational activities change with time, reflecting the current economic and cultural conditions. For example, undeveloped areas in the plan area, such as wildlife preserves, were once widely used for hunting and are now becoming increasingly popular for nonconsumptive uses, such as nature viewing and bird watching (USBR 1999).

The existing recreational uses of the LSJR, its three eastside tributaries, the reservoirs at the rim dams, and the southern Delta are described below.

10.2.1 Rivers

Flows in the LSJR and eastside tributaries are regulated by the major storage rim dams. This storage regulation allows for a consistent release flow that can benefit river recreationists by increasing the usability of the river, increasing the safety of the river, and maintaining the appearance of the setting. Different ranges of flow support different recreational uses. Lower flows, generally less than 500 cubic feet per second (cfs), support swimming, wading, and floating; mid-range flows 500–1,500 cfs support motorized boating, rafting, kayaking, and canoeing; higher flows 1,500–2,500 cfs support advanced (i.e., whitewater) rafting or kayaking. Flows above 2,500 cfs are suitable for advanced rafters or kayakers and are generally unsafe for other recreational uses. Recreational uses of the Merced, Tuolumne, and Stanislaus Rivers and the LSJR are discussed below.

Merced River

The reach of the Merced River below McSwain Dam to the river's confluence with the LSJR is 50 miles long and crosses private agricultural and grazing land in Merced County. Major public recreation facilities include Henderson County Park on Merced Falls Road east of Snelling, McConnell SRA northeast of Livingston on SR 99, Hagaman County Park at the State Route (SR) 165 river crossing, and George J. Hatfield State Recreation Area (SRA) on Kelley Road near the LSJR confluence. The county parks are primarily day-use facilities, while the SRA's provide both day-use and camping units (USBR 1999). The county parks do not have boat launch ramps, and they do not allow swimming because lifeguards are not present. Approximately 73,000 water-related visitor

days are spent on the Merced River annually (USBR 1999). The Merced River is largely surrounded by private land, which limits the opportunities for public access (Merced ID 2011a).

Water-dependent activities include some canoeing and rafting in the lower portion of the river. Water-enhanced activities include picnicking, camping, and softball (USBR 1999). Boat-based fishing is popular between the Merced Falls Dam and the Crocker–Hoffman Diversion Dam, especially during high flows. Generally, flows below 500 cfs are considered too low for boating. Flows are presently below 500 cfs approximately 83 percent of the time in the summer months. Fish species in this stretch of the Merced River include catfish and smallmouth bass (USBR 1999).

Kayaking, rafting, and canoeing take place on the Merced River at flows 250–3,200 cfs. Flows of approximately 300–350 cfs are considered beginning flows for kayakers and rafters, while high flows of 1,200–3,200 cfs are for advanced kayakers or rafters (American Whitewater 2012). In a study conducted in the winter of 2010, the boaters surveyed indicated that while the river's reach was floatable at the winter low flow levels down to 250 cfs, they would not likely return to boat because the flow did not provide a quality boating opportunity (Merced ID 2011b). Overall, the boaters surveyed in the study identified a boatable flow range for canoes and kayaks of roughly 570 to 2,000 cfs (Merced ID 2011b).

During lower flows in the fall and winter, wading is more popular (Merced ID 2011b). Optimal flow ranges on the Merced River are 50–200 cfs for swimming (USBR 2001).

Tuolumne River

The Tuolumne River, from New Don Pedro Dam to the river's confluence with the SJR, is approximately 52 miles long. This reach traverses mainly private open space and grazing lands, City of Modesto property, and several public parks. Access to the river is limited.

Existing recreation facilities include: La Grange County Regional Park, Fox Grove County Regional Park, Riverdale, two golf courses adjacent to the river near the SR 99 crossing, and the Shiloh fishing access. In addition, the Turlock SRA and Modesto Reservoir Regional Park provide camping facilities. There is also public access to the river at the Tuolumne River Regional Park near Modesto (San Joaquin River Partnership 2012).

Common water-dependent recreational activities on the Tuolumne River include boating, fishing, swimming, and rafting. Together with wildlife viewing, 150,000 visitor days were spent conducting these water-dependent recreational activities in 1992 (USBR 1999). Rafting season is generally April–October. The optimal flow for rafting is 300 cfs (TID and MID 2011). The critical minimum flow[1] for canoeing and kayaking is 150 cfs (USBR 2001). Optimal flow ranges for recreating on the Tuolumne River are 400–700 cfs for all boating activities and 200–600 cfs for swimming. Summer flows are within this optimal range for all boating activities approximately 6 percent of the time and are within the optimal range for swimming approximately 32 percent of the time. Summer flows are large enough to support kayaking and canoeing 57 percent of the time and support power boating approximately 25 percent of the time (USBR 1999).

[1] Critical minimum flow refers to the minimum flow needed by a particular recreational activity to occur.

Stanislaus River

The Stanislaus River runs 60 miles from the New Melones Dam to its confluence with the SJR, crossing primarily private agricultural and grazing lands in Tuolumne, Stanislaus, and San Joaquin Counties (see Chapter 11, *Agricultural Resources*). The Stanislaus River has numerous park facilities, many used for boat launching, fishing, camping, swimming, and picnicking. Parks include Knights Ferry Recreation Area, Horseshoe Park, Orange Blossom Park, Valley Oak, Oakdale Recreation Area, Jacob Meyers Park, McHenry Recreation Area, and Caswell Memorial State Park. There is also public access to the river at numerous road crossings. In 1999, there were an estimated 330,217 recreational visitor days spent on the Stanislaus River (McAfee 2000).

Water-dependent activities practiced on the Stanislaus River include fishing, swimming, and whitewater boating. In general, all boating activities on the Stanislaus River take place when the flow is 25–1,200 cfs (Dreamflows 2011). Flows of 500 cfs–3,000 cfs can allow for advanced rafting and kayaking (All Outdoors 2011). Fish species in this stretch of the Stanislaus River include catfish, crappie, largemouth bass, and smallmouth bass. Water-enhanced activities include picnicking and camping. Access to an advanced, 4-mile whitewater boating run is provided below Goodwin Dam (USBR 1999). Extensive boating use on the lower Stanislaus River has contributed to eroding beaches, excessive noise, trespassing, and other issues that degrade visitor experience (McAfee 2000).

Lower San Joaquin River

An estimated 157,000 visitor days are spent boating and fishing in the LSJR annually (USBR 2001). Popular sport fish that occur in this stretch of the SJR include catfish and smallmouth bass (USBR 1999). Public access to the LSJR is available at several road and highway crossings. Stanislaus County recreation facilities on the LSJR include the Las Palmas fishing access site and Laird County Park (USBR 2001). In addition, there is Durham Ferry SRA in San Joaquin County, and the San Joaquin National Wildlife Refuge between the Stanislaus and Tuolumne River confluences (San Joaquin River Partnership 2012). Most of the use of these recreational areas is assumed to come from the local counties (USBR 1999). In addition to boating and fishing, picnicking and other water-enhanced shore activities are dependent on LSJR flows.

Flows on the LSJR are variable within the plan area, increasing at each river confluence. South of the Merced River confluence, the river has been nearly dry at times in recent years, while summer flows in the SJR at Vernalis range between about 1,000 cfs in dry years to more than 10,000 cfs in wet years. The monthly median flows at Vernalis range between 5,000 cfs in the spring (May) and 2,000 cfs in the late summer (August and September). This variability renders a characterization of the optimal flows for recreation much more complex than on the three eastside tributaries. The optimal range for non-motorized boating activities on the LSJR has been estimated to be 300–500 cfs, while motorized boating may occur at flows up to 750 cfs (USBR 1997; Melissa Frago, pers. comm.).

10.2.2 Reservoirs

Peak visitation of California reservoirs is generally in the dry months of May through August. Visitor use and the quality of the recreational experience are directly affected by the manner in which a reservoir is operated. Recreation facilities, such as beaches, boat ramps, trails, restrooms, access roads, picnic areas, and camping facilities add to the quality of the recreation experience. Reservoir

operations for water supply are usually adequate to support established recreation activities, particularly when surface runoff from precipitation is near normal.

Recreational opportunities on reservoirs are influenced by water levels. Lower reservoir levels result in water surface receding far from developed recreation facilities, such as campgrounds, picnic areas, and swimming beaches; boat ramps and swimming areas becoming unusable because they are no longer submerged; boating and water skiing being reduced by declining surface area; and aesthetic values generally being reduced. Recreation attendance decreases when water levels drop well below major recreation facilities and boat ramps. During the 1976–1977 drought, total attendance at state and federal reservoirs in California was reduced about 30 percent, with some reservoirs experiencing declines of as much as 80 percent, while attendance at a few stable reservoirs actually increased. A similar pattern developed during the 1987–1992 drought, although there were even fewer stable reservoirs (DWR 1994).

Lake McClure

Lake McClure is on the Merced River, impounded behind the New Exchequer Dam. The reservoir's visual character and quality as experienced by a recreationist is that of both a natural environment (e.g., surrounding mountains) and a managed environment (e.g., recreation and hydropower facilities). Generally, the surrounding area is of the Sierra Nevada mountains and includes low rolling hills and rugged mountains, with differing trees and vegetation bordering the reservoir. The dominant visual elements are the hills, ridges, small valleys, and patterns created by the vegetation on the hills and the surface of the water. The vegetative patterns are influenced by a combination of soil types, aspect, and fire history. The hills are occasionally accented by steep canyon walls. Native vegetation transitions to nonnative plants and trees in a few residential and more developed areas.

There are two-lane roads and highways around the reservoir that afford views of the mountains, trees, and reservoir. The Highway 49 bridge, Lake McClure, and part of Bagby Recreation Area can be seen from the Highway 49 vista point just north of the bridge. The Sierra Nevada foothills are taller and more dramatic in this area than other areas around the reservoir, and the vegetation is similar to other areas around the reservoir. The Bagby Boat Launch facility can be seen, and its small footprint presents a weak visual contrast to the surrounding natural landscape. The road presents strong visual contrast when compared to the natural surroundings due to the shape, texture, and color of the road (Merced ID 2011a).

Areas where residential and recreational structures exist contrast with the surrounding foothill and mountain scenery. These rural developed areas are within close proximity of the reservoir and include towns and primary road networks. Development is common, yet the setting is pastoral or rural because of interspersing of forests, water resources, hills, and valleys. Shoreline edges along the reservoir appear natural and include vegetation and land and water interface; however, these edges also exhibit ununnatural features, such as man-made facilities (e.g., water control structures and other facilities) and large bands of exposed soil. Recreation facilities are prevalent around the shoreline edges of the reservoir. The edges of the shore include boat docks, beaches, campgrounds, and marinas, all of which are also considered a contrasting visual quality to the surrounding natural setting of the Sierra Nevada foothills and mountains. The shore and water interface also exhibits the typical area with no vegetation that is associated with the daily, monthly, and seasonal fluctuations in surface elevation (USBR 2007; USBR 2011b). Generally, those participating in recreational activities in and around the reservoir are more likely to highly value the natural environment, appreciate the visual experience, and be sensitive to changes in visual character and quality.

Lake McClure recreation facilities include 4 developed areas (McClure Point, Barrett Cove, Horseshoe Bend, and Bagby), with 530 camping units, 5 boat launch facilities, 2 marinas, 62 picnic units, and fish cleaning stations. Day-use facilities include sandy beaches and swim lagoons, most in grassy park-like settings with group facilities and play equipment (DWR 2001). The recreation facilities are owned and operated by Merced Irrigation District's Parks Department, with the exception of two small areas within McClure Point Recreation Area and Horseshoe Bend Recreation Area that are owned by the U.S. Bureau of Land Management (BLM).

Outside of the 4 public access areas on Lake McClure, the remainder of the land surrounding the reservoir is private (Merced ID 2011a). Since most undeveloped reservoir shoreline points are relatively far from roads (and the shoreline is irregular and steep), there is little recreation activity (DWR 2001). Lake McSwain is located just below the dam and offers adjacent recreational opportunities.

The primary recreational activities on Lake McClure are camping and fishing. In 2010, 1.4 million visitor days were spent on Lake McClure, and 500,000 visitor days were spent on McSwain Reservoir (Merced ID 2011a). Lake McClure is also protected from the prevailing westerly winds by the surrounding tree-covered foothills, and thus is popular with water skiers (DWR 2001).

Modeled historical reservoir elevation has ranged between approximately 865 feet mean sea level (MSL) and 635 feet MSL. Therefore, reservoir elevations during drought years can be 230 feet below the historical maximum elevation. Historically, the monthly average elevation of the reservoir has ranged from a minimum of 755 feet MSL in October to a maximum of 810 feet MSL in June. Boat access is provided at ramps located around the shoreline. Lake McClure boat ramps cease operation reservoir elevation is 590–793 feet MSL. The ramp at Bagby is the first to close when the reservoir reaches an elevation of 793 feet MSL, followed by Horseshoe Bend at 758 feet MSL, McClure Point at 650 feet MSL, southern Barrett Cove ramp at 630 feet MSL, and northern Barrett Cove and Piney Creek, both at 590 feet MSL (USBR 1999). In 2010, an average of 100 watercraft was reported on Lake McClure at one time (0.01 watercraft per acre), 94 percent of which were motorized (Merced ID 2011a). Recent surveys conducted by Merced ID have indicated that most visitors to Lake McClure are local (Merced ID 2011a). These visitors report that the current water levels in the reservoir are acceptable but can sometimes cause degraded scenery (Merced ID 2011a).

New Don Pedro Reservoir

New Don Pedro Reservoir is on the Tuolumne River, impounded behind New Don Pedro Dam. Generally, the visual character and quality experienced by recreationists and others around the reservoir are similar to those described above for Lake McClure. Don Pedro Reservoir's visual setting is characterized by its numerous long expanses of flat water that stretch through a series of narrow valleys and inlets. As described for Lake McClure, the Sierra Nevada foothills surround the reservoir, rising gradually from its shoreline and giving wide and open views. The hillsides are largely covered by trees interspersed with grassland areas that remain unvegetated during the dry summer months. As the water level falls, an unvegetated ring around the entire reservoir is clearly visible (San Francisco Planning Department 2007). There are very few buildings in the vicinity of the reservoir and the views are not urban or suburban in nature. There are two-lane roads and highways that provide views of the mountains, trees, and water.

New Don Pedro Reservoir provides 160 miles of shoreline and 13,000 acre-feet of surface area at maximum reservoir level. The reservoir has hiking trails, two marinas, a swimming lagoon, and 559

campsites in three locations (Fleming Meadows Recreation Area, Blue Oaks Recreation Area, and Moccasin Point Recreation Area). Outside of the three developed recreation areas, there is boat-in access to much of the shoreline and to the islands within the reservoir for dispersed use, including day use and primitive camping. The recreation facilities are operated by the Don Pedro Recreation Agency (DPRA), which is a department within Turlock Irrigation District (TID) and sponsored by the Modesto Irrigation District (MID) and the City and County of San Francisco (CCSF). The primary objective of the DPRA is to provide a quality family camping experience and a water sports-oriented environment (TID and MID 2011).

The maximum reservoir elevation is 830 feet. In the past, the monthly average elevation of the reservoir has ranged from a low of 750 feet MSL in October to a high of 790 feet MSL in June. The minimum elevation in drought periods has been recorded at 630 feet; therefore, the reservoir elevations can vary by approximately 200 feet. Boat launches are available at the Fleming Meadows campsite until the reservoir reaches the minimum reservoir elevation of 600 feet MSL. The boat launches at Moccasin Point and Blue Oaks are usable above 722 feet MSL and 726 feet MSL, respectively. Reservoir use declines at reservoir levels of 790–750 feet MSL (USBR 1999). The maximum recreation capacity of New Don Pedro Reservoir is 500,000 visitor days annually (Barnes 1987). Between 1999 and 2008, average annual visitation on New Don Pedro Reservoir was 407,000 (TID and MID 2011).

New Melones Reservoir

New Melones Reservoir is on the Stanislaus River, impounded behind New Melones Dam. New Melones Reservoir is relatively large and uncrowded with a varied geography that promotes many types of recreation. Generally, the visual character and quality of the reservoir experienced by recreationists and others around the reservoir include views of mountains and pine forest interspersed with grasslands, and the shoreline, which has been modified with recreational amenities. The visual character and quality is similar to that of Lake McClure described above.

The reservoir provides approximately 12,500 surface acres of water for recreation and supports approximately 800,000 visitor days annually (USBR 2011a). There are 6 recreation areas on New Melones Reservoir. The Mark Twain, Parrot's Ferry, Camp Nine, and Old Town areas are relatively undeveloped and offer few recreation facilities. The remaining recreation areas, Glory Hole and Tuttleton, offer the most structured visitor experience and are the most visited with approximately 750,000 annual visitor days (McAfee 2000). The Glory Hole Recreation Area has 2 campgrounds with a total of 144 campsites, 3 day-use areas, hiking and biking trails, swim beaches, two boat launch ramps, and a marina with a store. The Tuttleton Recreation Area has 3 campgrounds with a total of 161 campsites, 2 day use areas, a boat ramp, and a visitor's center. All recreation facilities on New Melones Reservoir are operated by USBR.

Hunting is permitted on all of USBR's lands surrounding the reservoir, with the exception of Tuttletown and Glory Hole, but it takes place mostly within or near the Peoria Wildlife Management Area. Bank fishing and gold panning takes place along the shoreline. Hiking, bicycling, and horseback riding are conducted on the approximately 25 miles of trails surrounding the reservoir. There are also several caves near the reservoir, and many visitors are involved in spelunking, or caving, in the handful of caves open to the public, with the most frequented caves being the two Natural Bridges located within the Coyote Creek tributary (USBR 2007).

In the past, the average elevation of the reservoir has typically ranged from 948 feet (in October) to 973 feet (in March and June). The average minimum reservoir elevation has been 712 feet MSL (July through November) and the average maximum reservoir has been as high as 1,085 (June). Therefore, typical seasonal drawdown is approximately 25–50 feet, but the minimum reservoir elevation is about 375 feet below the maximum water elevation (during drought periods), which indicates a larger drawdown when compared to the typical seasonal drawdown. Boat launch facilities are present at various depths to accommodate water levels as low as 860 feet. The optimal water level for recreational use of the reservoir is 950–980 feet MSL (State Water Board 1999). In the recreation areas used for camping, visitation tends to follow reservoir surface levels, declining when water levels are low. However, other recreational uses of the reservoir have been observed to increase when water levels recede, such as boating and kayaking (McAfee 2000). Prior to construction of the New Melones Dam, whitewater rafting was popular in what is now the northern portion of the reservoir near Camp Nine. This area is still used for rafting when reservoir water levels are low and flow returns to the exposed channel, such as in drought years.

The seasonal reservoir drawdown can result in an area of exposed soil with little or low-growing vegetation around the shoreline. Where the slopes are steeper, reddish brown soils are exposed; and where slopes are gentler, more grasses and low vegetation tend to become established. This view, although typically experienced by summertime recreationists, is exacerbated during periods of low precipitation and drought.

Tulloch Reservoir

The Tulloch Reservoir is owned by the Oakdale Irrigation District (OID) and SSJID. Private development is extensive around the perimeter of the reservoir. Access to the water is provided by private residences, private parks operated by housing developments, and two privately owned marinas. The marinas, South Shore Campground and Marina in Tuolumne County and Lake Tulloch Resort in Calaveras County, provide public access to the reservoir (OID and SSJID 2008).

Tulloch Reservoir provides 1,260 acres of surface water for recreation. Dams control the surface elevation of the reservoir, so the elevation remains fairly constant. The reservoir is regularly lowered by approximately 10 feet in the winter to provide space for flood control releases from New Melones Reservoir (OID and SSJID 2008).

10.2.3 Southern Delta

The majority of the land within the Delta is privately owned, which reduces the availability of land-based recreation (Delta Protection Commission 2010). Navigable waterways in the Delta, however, are publicly accessible and currently constitute the majority of the available recreational opportunities (Delta Protection Commission 2010). The southern Delta, specifically, encompasses miles of navigable channels along the San Joaquin, Middle, and Old Rivers. The Clifton Court Forebay, the SWP primary collection reservoir, and Discovery Bay, a water-oriented, residential development, are located northwest of the southern Delta (The Dangermond Group and LSA Associates 2006).The water flows in the southern Delta are heavily managed because of the location of the CVP and SWP pumps located along the western boundary of the southern Delta.

Both privately owned and publicly operated marinas exist throughout the area, including Durham Ferry SRA, Mossdale Marina, Dos Reis Park, Haven Acres Marina, and Tracy Oasis Marina. In addition to boating amenities, these locations provide opportunities for various shore activities,

such as fishing and hiking. Sport fishing in the Delta occurs year-round and may take place on private vessels or from shore. Popular sport fishing species include striped bass, white sturgeon, salmon, American shad, catfish, and largemouth bass (USBR 1999).

A recreation survey conducted by the Department of Recreation in 1996 found that recreational use of the southern Delta is proportionally less than the recreational use in other regions of the Delta. The survey found waterskiing, boat cruising, fishing, and swimming were the most popular water-dependent activities in the southern Delta. Of water-enhanced activities, sightseeing was the most common, followed closely by fishing from shore and viewing wildlife (Delta Protection Commission 1997). The southern Delta is currently estimated to support 11 percent of the total boating use in the Sacramento–San Joaquin Delta. In 2000, an estimated 6.4 million visitor days were associated with boating throughout the Delta.

Recreational opportunities in the southern Delta are influenced by the volume of water in the navigable waterways and the relative quantity of navigable waterways. There are fewer boating and water-associated facilities in the southern Delta compared to the adjoining portions of the Delta to the north. Many of the channels are currently impassable due to snags and vegetation encroachment (Delta Protection Commission 1997). Additionally, during heavy flows, sediment and debris can accumulate, affecting the navigability of the channels and the viability of marinas. The existing salinity of the southern Delta does not influence the water-dependent or water-enhanced recreational opportunities.

10.3 Regulatory Setting

10.3.1 Federal

Relevant federal programs, policies, or regulations related to recreation and/or visual quality and character and are described below.

Title 43, Part 423 of the Code of Federal Regulations

Public conduct on USBR lands and projects is guided by 43 CFR 423. Established on April 17, 2002, the purpose of this regulation is to maintain law and order and protect persons and property.

Flood Control Act of 1962

The Flood Control Act describes the responsibilities of the Secretary of the Army at federal dam projects. This act authorized the Secretary of the Army to allow and plan for recreational activities.

Land and Water Conservation Fund Act of 1965

The Land and Water Conservation Fund Act directed the Secretary of the Interior to inventory, evaluate, and classify outdoor recreation facilities, as well as formulate and maintain a comprehensive nationwide outdoor recreation plan.

Federal Power Act

The Federal Power Act authorizes the Federal Energy Regulatory Commission's (FERC) to require licensees under FERC's jurisdiction to provide recreation opportunities at hydroelectric projects. New Don Pedro and New Exchequer Dams are under FERC's jurisdiction.

Sierra Resource Management Plan of 2008

Consistent with the Federal Land Policy and Management Act, BLM prepared the Sierra Resource Management Plan to set goals and objectives for various resources, including recreation and aesthetics, on land BLM owns and operates. BLM owns and operates land surrounding and at New Exchequer Dam and Lake McClure on the Merced River and New Don Pedro Dam on the Tuolumne River. This management plan identifies the Lake McClure/Highway 49 and New Melones Reservoir/Stanislaus River viewsheds as Class II visual resources and the Don Pedro Reservoir/Highway 49 viewshed as a Class III visual resource. The plan's objectives include maintaining the existing visual quality of these resources and providing for continued availability of outdoor recreational opportunities while protecting other resources and uses. Specifically, Class II views have an objective to retain the existing character of the landscape and to keep levels of change to the characteristic landscape low. Class III views have an objective to partially retain existing characteristics (BLM 2008). Activities in these views may attract attention(BLM 2008). The level of change to the characteristic landscape can be moderate (BLM 2008).

Water and Land Recreation Opportunity Spectrum User's Handbook of 2011

USBR prepared a handbook establishing the Water and Land Recreation Opportunity Spectrum as a tool to understand the type and location of six types of water-related recreation opportunities, which include urban, suburban, rural developed, rural natural, semi-primitive, and primitive recreation opportunities. A particular "package" of activities, setting attributes, experiences, and benefits defines each type. New Melones Reservoir has three types: rural developed, rural natural, and semiprimitive. The visual quality objectives of these three types include modification, partial retention, and retention, respectively (USBR 2011b).[2]

New Melones Lake Area Resource Management Plan

The Resource Management Plan (RMP) provides a range of alternatives for managing USBR-administered lands within the New Melones Lake Area. The RMP addresses the interrelationships among the various resources at the New Melones Lake Area and provides options to balance resource management with public use and USBR's mission and authority.

10.3.2 State

Relevant state programs, policies, or regulations related to recreation and/or visual quality and character and are described below.

[2] New Don Pedro Dam and New Exchequer Dam are not operated by USBR.

Park and Recreation Commission

The Park and Recreation Commission has specific authorities and responsibilities that are defined in California law. These include the approval of general plans for units of the California State Park System, classifying units of the system, establishing general policies for the guidance of the director of state parks in the administration, protection and development of the system, and recommending to the director a comprehensive recreation policy for the state.

California Public Resources Code

The California Public Resources Code (§ 5001 et seq.) grants the California Department of Parks and Recreation the authority to enforce the laws, policies, rules, and regulations that apply to state-owned park properties.

Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins

The Basin Plan designates recreation as one of the beneficial uses of surface water bodies, including the LSJR and its three eastside tributaries.

10.3.3 Regional or Local

Relevant regional or local programs, policies, or regulations related to recreation and/or visual quality and character and are described below. Although local policies, plans, and regulations are not binding on the State of California, below is a description of relevant ones.

Mariposa County General Plan

Chapter 12 of the *County of Mariposa General Plan* includes goals and policies to achieve local recreation service, create programs to provide a range of recreation opportunities and facilities, and cooperate with regional agencies in the development of recreation opportunities. The general plan also contains policies that provide for the establishment of measures for the protection of large-scale views and viewsheds through comprehensive development standards. Standards must take into account the scenic aspect of the county to conserve designated views and viewsheds.

Mariposa County Code

The Mariposa County Code, Title 12, sets standards for recreation within the county, particularly at Lake McClure and Lake McSwain. The code sets forth regulations concerning reservoir use, vehicle use, camping and picnicking, whitewater rafting, and recreational use of BLM and National Forest sections of the Merced River.

Merced General Plan

The *Recreation and Cultural Resources Element* of the *2030 Merced County General Plan* sets goals and policies to achieve its vision for recreational opportunities. The goals and policies are meant to preserve, enhance, expand, and manage Merced County's system of regional parks, trails, and natural resources.

Tuolumne County General Plan

Chapter 8 of the *Tuolumne County General Plan* includes goals and policies to provide adequate and equitable distribution of recreation facilities, cooperate with other public agencies and private enterprises to provide recreation facilities, acquire and develop land for recreation facilities, and obtain revenue sources to fund recreation. One of the goals of the Tuolumne County General Plan *Conservation and Open Space Element* is to conserve the scenic environment and rural character of the county. The policies for preserving scenic resources address the history of agricultural and timberlands, the natural scenic quality and rural character along designated transportation routes, conserving the natural scenic quality of hillsides and hilltops, and voluntary efforts to protect clusters of native trees and conserve the county's scenic resources.

Stanislaus County General Plan

Chapter 3 of the *Stanislaus County General Plan* emphasizes the conservation and management of natural resources and the preservation of open space for outdoor recreation. It sets goals and policies to maintain the natural environment in areas dedicated as parks and open space and to provide for the open-space recreational needs of the residents of the county.

Stanislaus County Code

Title 18 of the Stanislaus County Code contains regulations concerning general recreation areas, campgrounds and day-use areas, and the Stanislaus River special-use areas, which include the Orange Blossom Recreation Area and the Horseshoe Road Recreation Area.

Calaveras County General Plan

The *Open Space Element* of the *Calaveras County General Plan* states there are significant topographic variations and several resources which contribute to scenic quality. The primary attributes include the lakes, rivers and streams, rolling hills with oak habitat, ridgelines, and forests.

Calaveras County Code

The Calaveras County Code, Title 17, sets standards for campgrounds and other recreation facilities in the county.

San Joaquin County General Plan

Goals of the *San Joaquin County General Plan* include the preservation of open space for recreation, encouraging the use of waterways for recreation, recognition of scenic routes within the county, providing that water-diversion projects ensure adequate water for recreation, and recognizing that local vegetation communities are important to the recreational experience.

10.4 Impact Analysis

This section lists the thresholds used to define impacts on recreational resources and visual quality. It describes the methods of analysis and the approach to determine the significance of impacts on recreational resources and visual quality. It also identifies impacts that are not evaluated further in the impact discussion. The impact discussion describes the changes to baseline resulting from the

alternatives and incorporates the thresholds for determining whether those changes are significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany the impact discussion, where appropriate.

10.4.1 Thresholds of Significance

The thresholds for determining the significance of impacts for this analysis are based on the State Water Board's Environmental Checklist in Appendix A of the State Water Board's CEQA regulations (23 Cal. Code Regs., §§ 3720–3781) and the Environmental Checklist in Appendix G of the State CEQA Guidelines. The thresholds derived from the checklist(s) have been modified, as appropriate, to meet the circumstances of the alternatives. (23 Cal. Code Regs., § 3777 subd. (a)(2)). Recreational resource and visual quality impacts were determined to be potentially significant (see Appendix B, *State Water Board's Environmental Checklist* in this SED) and therefore are discussed in the analysis. Impacts would be significant if the LSJR alternatives result in any of the following conditions.

- Substantially reduce recreational opportunities or the use of existing recreation facilities.
- Substantially degrade the functionality of existing recreation facilities.
- Substantially degrade the existing visual character or quality of the reservoirs.

As discussed in Appendix B, *State Water Board's Environmental Checklist*, the LSJR and SDWQ alternatives would result in either no impact or less-than-significant impacts on the following related to recreational resources and visual quality and, therefore, are not discussed within this chapter.

- Develop recreation facilities or require the construction or expansion of recreation facilities that might have an adverse physical effect on the environment.
- Have a substantial adverse effect on a scenic vista.
- Substantially damage scenic resources, including trees, rock outcroppings, and historic buildings within a state scenic highway.
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

10.4.2 Methods and Approach

Recreational and visual impacts are analyzed using modeling results from the State Water Board's Water Supply Effects (WSE) model for flows and reservoir elevations (Chapter 5, *Water Supply, Surface Hydrology, and Water Quality*, and Appendix F.1, *Hydrologic and Water Quality Modeling*) for the LSJR alternatives. The modeling results for the LSJR alternatives are compared to the baseline modeled conditions. Recreation surveys were not conducted for the analysis, and existing setting information is based on the most recent available information regarding recreational opportunities at the LSJR, eastside tributaries, and reservoirs. The results of the hydrologic modeling are presented below, along with an assessment of the implications of the modeled results for potential impacts on recreation opportunities. The analysis identifies the frequency with which flow ranges support different types of flow-dependent activities. Reservoir elevation levels predicted from the hydrologic modeling also are used to determine if the exposed shoreline would modify the visual character and quality of the reservoirs experienced by recreationists. The impact analysis then qualitatively discusses if the LSJR alternatives would substantially reduce recreational opportunities

or the use of existing recreation facilities, substantially degrade the functionality of existing recreation facilities,or substantially degrade the visual character and quality of the reservoirs.

LSJR and Tributary Modeling Results and Methodology

Water is diverted from the rivers below the rim (i.e., storage) dams; however, these diversions take place either at the most downstream diversion dam via large canals, or via small riparian pumps along the river. The flow in each eastside tributary river is fairly uniform from the diversion dam (e.g., Goodwin Dam on the Stanislaus River) to the mouth (e.g., Stanislaus River at Ripon). The major surface water diversions are made at the diversion dam that is located a few miles downstream of the rim dam. Therefore, the release flows that are under evaluation are considered the monthly flow along the entire river. Recreational use of the LSJR and its tributaries occurs year-round, although the most frequent use is during the summer. Therefore, proposed changes in river flows are analyzed May–September. Streamflow determines the recreation opportunity in the rivers. Unacceptable flows can occur when flows are lower than optimal for boating or swimming or when flows that are too high and result in potentially unsafe velocities. Higher flows may also inundate and reduce access to existing on-bank recreation (e.g., campsites) facilities.

For in-water recreational opportunities, the flow for different known activities on each of the rivers is compared to the expected modeled flow under each of the alternatives to determine how often the expected modeled flow would be within the flow ranges. Although optimal flows vary for each river based on hydrologic and geologic conditions, the flows can generally be classified into the following optimal flow ranges to evaluate the hydrologic modeling results.

- Less than 500 cfs for swimming and floating.
- Between 500 and 1,500 cfs for motorized boating, rafting, and kayaking.
- Between 1,500 and 2,500 for advanced rafting or kayaking.

A flow above 2,500 cfs is generally considered unsafe for recreational activities, although advanced whitewater rafting and kayaking may still occur. As described in Chapter 3, *Alternatives Description*, the percent of unimpaired flow requirement, as specified by a particular LSJR alternative, would cease to apply during high flows or flooding to preserve public health and safety. The State Water Board would coordinate with federal, state, and regional or local agencies to determine when it is appropriate to waive the requirements. The WSE modeling performed for this chapter and other chapters, uses monthly flow limits derived from observed flows above which the unimpaired flow requirement no longer applies. These monthly limits would also avoid unsafe recreating conditions. The monthly limits generally reflect the median February–June unimpaired flow (e.g., 2,000 cfs on the Merced River, 3,500 cfs on the Tuolumne River, and 2,500 cfs on the Stanislaus River). The modeling and incorporation of the monthly maximums is further discussed in Appendix L, *Sensitivity Analyses*. Therefore, higher flows are not expected as the result of the LSJR alternatives and would be considered part of the baseline (e.g., flood control operations).

The WSE modeling results are presented as monthly distributions of river flows to provide the basis for the evaluation of potential impacts on recreational opportunities and visual experiences. By comparing baseline conditions to the average monthly flow conditions that would result from LSJR Alternatives 2–4 during the summer recreation season, the magnitude and frequency of the changes in flows that support recreation can be determined.

Potential recreation impacts were determined using the WSE model results in a three-step procedure. The first step described recreational opportunities May–September (i.e., the recreation season) with values for the acceptable range of flows known to support recreation. The second step calculated the frequency of monthly flows are within this range, based on the monthly WSE model results. For LSJR Alternatives 2–4, the frequency of flows (or reservoir elevations) within this optimal range was then compared to those associated with the baseline. As described in Chapter 5, *Water Supply, Surface Hydrology, and Water Quality*, baselines was developed using an 82-year simulation period. A table was generated that reflects the frequency of average monthly flow values for baseline and the LSJR Alternatives 2–4.

The results of this assessment are presented below first using the Merced River as an example (Tables 10-2 through 10-4). Summary tables are then presented for the Tuolumne River (Table 10-5) and Stanislaus River (Table 10-6). A significant impact on a particular type of river recreation is identified where the frequency of flows generally supporting that type of recreation would decrease by more than 10 percent when averaged over the summer recreation season (i.e., the seasonal monthly average frequency of flows within a range that supports a type of recreation would decrease more than 10 percent).

The LSJR and eastside tributaries are generally characterized by a river channel flanked with a narrow ribbon of riparian vegetation, complemented in areas by larger wildlife preserves and parks, and interrupted by agricultural development and urbanization. The viewsheds are variable, but unified by the natural aspect of the rivers and the interface with either the natural or augmented landside. Due to the variability of rivers and the dynamic shoreline, viewers are generally less sensitive to changes in river height, and are affected only by severely high or low flows. Although the LJSR alternatives would alter the flows in the river, and thus potentially the water level and appearance, these differences would not constitute a significant change in the visual quality of the plan area because flows would generally be within the historical range and viewers are not as sensitive to these changes. Furthermore, the LSJR alternatives would not influence flood flows currently produced by the rim dams and would reduce lower flows during critical and critically dry years. Therefore, visual character and quality of the rivers are not discussed further.

Merced River

The Merced River is used for swimming, boating, fishing, rafting and kayaking. Tables 10-2 to 10-4 show the baseline flows suitable for recreation on the Merced River. Table 10-2 gives the full range of monthly flows in the cumulative distribution format, using 10 percent increments from the minimum flow (at the top) to the maximum flow (at the bottom), with the average monthly flow below the maximum value. Table 10-3 shows the percentage of the years that the monthly flows were greater than specified flows of 250 cfs–2,500 cfs, with increments of 250 cfs.

Table 10-4 shows the percentage of the years when the Merced River monthly flows were within the four ranges of flows for recreation (e.g., less than 500 cfs, between 500 and 1,500 cfs, etc.) for the baseline and the LSJR alternatives. The frequency percentages for the months in the recreation season and the average percentages are shown for all alternatives.

As identified in Table 10-4, the seasonal monthly averages indicate that flows were suitable for swimming in 66 percent of the years, rafting and boating 22 percent of the years, kayaking in five percent of the years, and were too high in 6 percent of the years. The LSJR alternatives would change the Merced River flows in May and June, with less frequent average monthly flows of less than 500 cfs and more frequent average monthly flows 1,500–2,500 cfs. The LSJR alternatives generally are

not expected to change river flows in the months of July to September. The LSJR alternatives generally are not expected change the frequency of river flows above 2,500 cfs. The modeled average seasonal frequency of all flow ranges would generally increase or stay the same under all of the alternatives when compared to baseline, except the frequency of flows less than 500 cfs under LSJR Alternatives 3 and 4, which would decrease to 49 percent and 46 percent, respectively.

Table 10-2. Monthly Cumulative Distributions of Merced River Flow (cubic feet per second) at Stevinson for Baseline Conditions (WSE Model Results for 1922–2003)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
Minimum	206	258	133	270	205	186	9	20	29	35	35	2
10%	266	316	323	330	322	271	203	169	132	68	54	31
20%	283	346	354	377	380	304	356	219	146	90	74	54
30%	308	365	375	393	407	335	508	283	176	117	100	69
40%	337	380	385	410	445	356	626	359	238	160	123	80
50%	359	387	396	435	504	377	670	513	267	175	159	92
60%	425	397	409	482	726	468	733	622	311	224	201	134
70%	481	409	424	618	978	661	803	784	441	304	811	445
80%	609	424	457	1,232	1,981	1,135	902	1,165	1,644	1,119	1,060	566
90%	741	528	1,081	1,775	2,998	1,836	1,036	2,627	3,071	2,209	1,233	640
Maximum	1,344	1,802	3,551	9,912	5,205	6,069	4,921	5,555	7,343	5,943	2,444	1,369
Average	453	437	593	898	1,158	837	742	882	927	701	473	271

Table 10-3. Percentage of Years with Merced River Flow (cubic feet per second) Greater than Specified Flows within the Recreation Range Baseline Conditions (WSE Model Results for 1922–2003)

Flow	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
250	94%	100%	99%	100%	99%	93%	87%	76%	54%	38%	35%	35%
500	28%	11%	17%	37%	50%	37%	71%	54%	27%	28%	34%	26%
750	9%	6%	16%	28%	39%	28%	38%	30%	22%	24%	33%	6%
1000	4%	2%	11%	24%	30%	23%	12%	26%	22%	21%	24%	4%
1250	1%	2%	9%	21%	29%	18%	7%	20%	22%	20%	9%	1%
1500	0%	2%	7%	16%	27%	13%	6%	17%	21%	17%	2%	0%
1750	0%	2%	7%	11%	23%	11%	5%	12%	20%	13%	1%	0%
2000	0%	0%	5%	7%	20%	9%	4%	12%	18%	11%	1%	0%
2250	0%	0%	4%	6%	13%	7%	2%	12%	16%	9%	1%	0%
2500	0%	0%	2%	6%	13%	6%	2%	11%	13%	6%	0%	0%

Table 10-4. Percentage of Years with Monthly Merced River Flows within Specified Recreational Ranges (WSE Model Results for 1922–2003)

Range of Flow	Months					Seasonal Average
	May	June	July	Aug	Sept	
Baseline						
<500 cfs	46%	73%	72%	66%	74%	66%
500–1,500 cfs	37%	6%	11%	32%	26%	22%
1,500–2,500 cfs	6%	7%	11%	2%	0%	5%
>2,500 cfs *	11%	13%	6%	0%	0%	6%
LSRJ Alternative 2						
<500 cfs	24%	51%	72%	66%	74%	58%
500–1,500 cfs	60%	27%	11%	32%	26%	31%
1,500–2,500 cfs	7%	9%	11%	2%	0%	6%
>2,500 cfs	9%	13%	6%	0%	0%	6%
LSJR Alternative 3						
<500 cfs	2%	29%	72%	66%	74%	49%
500–1,500 cfs	44%	44%	11%	32%	26%	31%
1,500–2,500 cfs	46%	16%	11%	2%	0%	15%
>2,500 cfs	7%	11%	6%	0%	0%	5%
LSJR Alternative 4						
<500 cfs	1%	17%	72%	66%	74%	46%
500–1,500 cfs	23%	34%	11%	32%	26%	25%
1,500–2,500 cfs	72%	38%	11%	2%	0%	25%
>2,500 cfs	4%	11%	6%	0%	0%	4%

*Merced at Stevinson >3000 cfs in May 9%, June 11%, July 5%.

Gray cells indicate a decrease in the seasonal average greater than 10 percent.

cfs = cubic feet per second

Tuolumne River

Common water-dependent recreational activities on the Tuolumne River include boating, swimming, and rafting. Table 10-5 shows the percentage of years over the 82-year simulation period in which flows are within specified recreational ranges. The LSJR alternatives are expected to change the Tuolumne River flows in May and June, with less frequent average monthly flows of less than 500 cfs. The alternatives generally would not change river flows July–September. The alternatives would generally increase the frequency of river flows above 2,500 cfs. The modeled average seasonal frequency of all flow ranges would generally increase or stay the same under all of the alternatives when compared to baseline. However, the frequency of flows less than 500 cfs under LSJR Alternatives 3 and 4 would decrease to 37 percent and 36 percent, respectively. This would be a decrease in frequency greater than 10 percent. In addition, the modeled average seasonal frequency of flows of 500–1,500 cfs would decrease by more than 10 percent to 22 percent under LSJR Alternative 4.

Table 10-5. Percentage of Years with Monthly Tuolumne River Flows within Specified Recreational Ranges (WSE Model Results for 1922–2003)

Range of Flow	Months					Seasonal Average
	May	Jun	Jul	Aug	Sep	
Baseline						
<500 cfs	5%	57%	59%	61%	59%	48%
500–1,500 cfs	62%	18%	23%	37%	39%	36%
1,500–2,500 cfs	17%	1%	2%	1%	2%	5%
>2,500 cfs *	16%	23%	16%	1%	0%	11%
LSJR Alternative 2						
<500 cfs	2%	23%	57%	61%	56%	40%
500–1,500 cfs	51%	43%	24%	37%	38%	39%
1,500–2,500 cfs	39%	12%	2%	1%	5%	12%
>2,500 cfs	7%	22%	16%	1%	1%	10%
LSJR Alternative 3						
<500 cfs	0%	9%	59%	61%	57%	37%
500–1,500 cfs	13%	23%	23%	37%	38%	27%
1,500–2,500 cfs	28%	23%	2%	1%	4%	12%
>2,500 cfs**	59%	45%	16%	1%	1%	24%
LSRJ Alternative 4						
<500 cfs	0%	5%	59%	61%	57%	36%
500–1,500 cfs	2%	18%	23%	37%	29%	22%
1,500–2,500 cfs	13%	12%	2%	1%	9%	8%
>2,500 cfs***	84%	65%	16%	1%	5%	34%

*Tuolumne at Modesto >3000 cfs: May 15%, June 20%, July 12%, August 0%, September 0%

**Tuolumne at Modesto > 3000 cfs: May 46%, June 29%, July 12%, August 0%, September 0%

***Tuolumne at Modesto > 3000 cfs: May 77%, June 57%, July 12%, August 0%, September 0%

Gray cells in the table indicate a decrease greater than 10 percent.

cfs = cubic feet per second

Stanislaus River

The Stanislaus River generally supports boating and rafting recreation. Table 10-6 shows the percentage of years when monthly Stanislaus River flows would be within the specific recreational ranges. LSJR Alternative 2 would be expected to change the Stanislaus River flows in May such that there would be a greater frequency of average monthly flows less than 500 cfs and between 500 and 1,500 cfs. LSJR Alternatives 3 and 4 would be expected to change average monthly Stanislaus River flows in May and June, with less frequent average monthly flows below 500 cfs and more frequent average monthly flows of 1,500–2,500 cfs. The alternatives generally would not be expected change river flows July–September. The alternatives would generally decrease the frequency of river flows above 2,500 cfs. The modeled seasonal average frequency of flows of 500–1,500 cfs would decrease 10 percent under LSJR Alternative 4.

Table 10-6. Percentage of Years with Monthly Stanislaus River Flows within Specified Recreational Ranges (WSE Model Results for 1922–2003)

Range of Flows	Months					Seasonal Average
	May	June	July	Aug	Sep	
Baseline						
<500 cfs	5%	40%	68%	79%	74%	53%
500–1,500 cfs	45%	49%	29%	16%	20%	32%
1,500–2,500 cfs	35%	10%	1%	4%	4%	11%
>2,500 cfs*	15%	1%	1%	1%	2%	4%
LSJR Alternative 2						
<500 cfs	10%	45%	68%	78%	74%	55%
500–1,500 cfs	80%	46%	23%	12%	15%	35%
1,500–2,500 cfs	9%	5%	7%	9%	9%	8%
>2,500 cfs	1%	4%	1%	1%	2%	2%
LSJR Alternative 3						
<500 cfs	2%	27%	68%	79%	74%	50%
500–1,500 cfs	35%	44%	28%	16%	20%	29%
1,500–2,500 cfs	62%	28%	2%	4%	4%	20%
>2,500 cfs	0%	1%	1%	1%	2%	1%
LSJR Alternative 4						
<500 cfs	1%	16%	68%	79%	74%	48%
500–1,500 cfs	15%	32%	28%	16%	20%	22%
1,500–2,500 cfs	84%	50%	1%	4%	4%	29%
>2,500 cfs	0%	2%	2%	1%	2%	2%

*Stanislaus at Ripon >3000 cfs in May 6%, in June 1%, in July 1%.
cfs = cubic feet per second

Lower San Joaquin River

Available data on the optimal flows on the LSJR do not follow the general trends described above for the eastside tributaries. Sources indicate that boating conditions are optimal at flows less than 750 cfs, while swimming and canoeing are best conducted when flows are less than 300 cfs (USBR 1997; Frago, pers. comm.). Opportunities for land-based recreation are limited by flows and access.

Chapter 5, *Water Supply, Surface Hydrology, and Water Quality*, and Appendix F.1, *Hydrologic and Water Quality Modeling*, present modeled flows on the SJR at Vernalis. Because the LSJR flows would be incrementally influenced by the proposed modifications in flows on the three eastside tributaries, flows in the southern portion of the plan area would be lower than those at Vernalis. At Vernalis, the SJR frequently experiences flows that are too high for any in-water recreation other than motorized boating or advanced kayaking and rafting (greater than 1,000 cfs in dry years). The hydrologic modeling predicts that LSJR flows would generally continue to be too high to support any in-water recreational opportunities other than advanced boating or kayaking under all alternatives.

LSJR Alternative Reservoir Modeling Results and Methodology

The evaluation of impacts on recreational opportunities at reservoirs is based on the reservoir surface water elevations. When critical elevations are reached, boat ramps are no longer operational, marinas close, and camping and picnicking opportunities become limited by the small surface area of the reservoir available for recreation. Lower surface water levels can also reduce the visual character and quality of the reservoir's surroundings. Thus, although reservoirs are subject to a large variation in elevation associated with water releases, weather conditions, and seasonal variation, the quality of the recreation experience is best when the reservoir is full and the elevation change is minimal.

Peak recreation seasons vary amongst reservoirs and predominate recreation uses; however, the majority of use typically occurs during the summer months, between Memorial Day and Labor Day. The LSJR alternatives would alter flows February–June. Thus, the recreation impact analysis focuses on May–September, the period of time when changes in water elevations are most likely to impact recreation.

Visual quality is evaluated qualitatively by identifying the existing visual setting (using the descriptions above in Section 10.2.2) of the reservoirs and their assigned visual classifications. It was then determined whether the change in elevation under LSJR Alternatives 2–4 would result in a substantial degradation of the visual quality. Table 10-7 below identifies the visual classifications and the potential for modifying the existing visual setting.

Baseline conditions and LSJR Alternative 2–4 conditions are compared using the lowest one-third of reservoir elevations experienced over the 82-year simulation period for May–September and the average end-of-the-month reservoir elevations. The lowest one-third is represented by the 30 percent cumulative distribution[3] of reservoir elevations during this time period. This distribution provides a conservative method of evaluating the reservoir elevation data because it represents low elevation conditions typically experienced under drought or dry conditions. Recreational opportunities and visual quality would be potentially restricted or reduced during these dry conditions because of the effect of reduced reservoir elevations on the usability of recreation facilities and the visual character and quality of a reservoir. Recreational opportunities or visual character and quality could be significantly affected if a reservoir experiences a seasonal average decrease greater than 10 feet May–September, or a decrease below critical elevation levels for certain recreation activities (e.g., elevation levels associated with a boat launch), relative to baseline conditions. Quantifying the conditions in feet provide the actual reservoir elevation under baseline conditions compared to the conditions under the LSJR alternatives. Identifying a change in 10 or more feet is expected to result in a visible change to the reservoir elevations noticeable to recreationists. The reservoir elevations are already expected to be low because the evaluation is conducted using reservoir elevations at the 30 percent cumulative distribution, which represents

[3] The cumulative distribution of a particular variable (i.e., reservoir elevations) is determined by sorting the values from minimum to maximum and graphing them as the percentage of the total number of values. The lowest value is at the left of the graph (e.g., 0 percent) and the highest value is at the right of the graph (100 percent). The cumulative distribution indicates the probability of occurrence for the variable. This term is not referring to, and should not be confused with, the term cumulative impacts, which is a specific CEQA term. A discussion of cumulative impacts for CEQA purposes is provided at the end of resource chapters, Chapter 5–14; Chapter 4, *Introduction to Analysis;* Chapter 15, *LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*, and, Chapter 16, *Cumulative Impact Summary, Growth-Inducting Effects, and Irreversible Commitment of Resources.*

drier year conditions. These conditions are expected to result in limitations of recreational facilities or visual quality that might not otherwise occur under baseline conditions. Therefore, this chapter presents a conservative analysis of potential changes when compared to baseline.

Table 10-7. Summary of Visual Characteristics and Classifications

Reservoir	View Summary	Classification	Potential for Modification
Lake McClure[1]	Lake McClure and Highway 49 viewshed; characteristic landscape is the Sierra Nevada mountains and aesthetics associated with foothills and mountains	Class II	Retain existing character of the landscape. Levels of change to the characteristic landscape should be low.
	Developed recreation areas around the reservoir (e.g., Horseshoe Bend) and water infrastructure of dam	Class III	Partially retain existing visual characteristics. The change to the characteristic landscape can be moderate.
New Don Pedro[2]	Don Pedro Reservoir and Highway 49 viewshed; characteristic landscape is the Sierra Nevada mountains and aesthetics associated with foothills and mountains; developed recreation areas around the reservoir and water infrastructure of the dam.	Class III	Partially retain existing visual characteristics. The change to the characteristic landscape can be moderate.
New Melones[3]	New Melones Reservoir/Stanislaus River; characteristic landscape is the Sierra Nevada mountains and aesthetics associated with foothills and mountains	Class II	Retain existing character of the landscape. Levels of change to the characteristic landscape should be low.
	Residential areas surrounding reservoir; the recreation areas of Tuttleton and Glory Hole; water infrastructure of the dam	Rural Developed	Views can experience modification.
	Less developed recreation areas and opportunities, hiking trails	Rural Natural	Views should be partially retained.
	Surrounding landscape of Sierra Nevada mountains	Semi-Primitive	Views should be preserved.

Sources:

[1] BLM 2008, Merced ID 2011a, and Merced ID 2010.

[2]BLM 2008 and Merced ID 2010.

[3] BLM 2008, USBR 2011b, and USBR 2007.

Lake McClure

Lake McClure boat ramps cease operation at reservoir levels of 590–793 feet MSL. The ramp at Bagby is the first to close when the reservoir decreases to an elevation of 793 feet MSL, followed by Horseshoe Bend when reservoir levels decrease to 758 feet MSL, McClure Point at 650 feet MSL, southern Barrett Cove ramp at 630 feet MSL, and northern Barrett Cove and Piney Creek, both at 590 feet MSL (USBR 1999).

Tables 10-8 and 10-9 present the modeled reservoir height of Lake McClure for the LSJR alternatives May–September. Modeled reservoir elevations under baseline conditions May–September result in a seasonal change of approximately 50 feet for the 30 percent cumulative distribution and can support the use of some boat ramps. The reservoir elevations predicted by the model for the LSJR alternatives would be similar to baseline seasonal elevations May–September. The elevations at the 30 percent cumulative distribution would not decrease below 590 feet (the level at which all boat ramps are inoperable). Reservoir elevations would be higher under LSJR Alternatives 2 and 3 at the 30 percent cumulative distribution. Under LSJR Alternative 4, elevations would be lower in the first part of the summer season (May–July), but higher at the end of the summer season. As shown in Table 10-9, LSJR Alternatives 2 and 3 would result in a seasonal average increase of 24 and 9 feet, respectively, at the 30 percent cumulative distribution. There would not be a seasonal average decrease in elevation of greater than 10 feet at the 30 percent cumulative distribution under LSJR Alternative 4.

Table 10-8. Lake McClure May–September Elevations for LSJR Alternatives at 30 Percent Cumulative Distribution (feet)

Month	Baseline Conditions	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
May	790	812	795	772
June	789	811	792	775
July	770	795	779	763
August	749	775	761	752
September	740	766	754	746

Table 10-9. LSJR Alternatives Changes in Lake McClure Elevations at 30 Percent Cumulative Distribution Compared to Baseline (feet)

Month	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
May	22	5	-18
June	22	3	-14
July	25	9	-7
August	26	12	3
September	26	14	6
Seasonal Average	24	9	-6

New Don Pedro Reservoir

The maximum reservoir level for recreational use of New Don Pedro Reservoir is 830 feet MSL. Reservoir levels below 790 feet MSL generally result in lower recreational use (USBR 1999)[4]. At 780 feet MSL, beach use declines, and below 720 feet MSL some boat ramps become inoperable, there is limited reservoir surface area, and campground and picnicking use declines (USBR 1999). At 630

[4] Table 10-10 shows baseline surface water elevation levels lower than 790 MSL because they are the predicted surface water elevations at the 30 percent cumulative distribution.

feet MSL, the marina at Moccasin Point closes, and at 600 feet MSL the boat launch and marina at Flemming Meadows become inoperable (USBR 1999).

Tables 10-10 and 10-11 present predicted reservoir elevations at New Don Pedro Reservoir for the LSJR alternatives May–September at the 30 percent cumulative distribution. New Don Pedro Reservoir elevation levels typically are below 780 feet MSL May–September at the 30 percent cumulative distribution. Reservoir elevations have not decreased to 630 feet under baseline. Reservoir elevations May–September result in a seasonal change of approximately 40 feet at the 30 percent cumulative distribution. The reservoir elevations predicted by hydrologic modeling for the LSJR alternatives would be similar to baseline seasonal elevations May–September. The elevations at the 30 percent cumulative distribution would not decrease below 720 feet (the level at which some boat ramps become inoperable and campgrounds and picnicking use begin to decline) for all of the alternatives. Reservoir elevations are predicted to increase under LSJR Alternative 2 at the 30 percent cumulative distribution. Under LSJR Alternatives 3 and 4, elevations would generally decrease at the first part of the summer season (May–July), but increase at the end of the summer season. The elevation under LSJR Alternative 2 would experience a seasonal average increase of 14 feet at the 30 percent cumulative distribution. The elevations under LSJR Alternatives 3 and 4 would not result in a seasonal average decrease of greater than 10 feet at the 30 percent cumulative distribution.

Table 10-10. New Don Pedro Reservoir May–September Elevations for LSJR Alternatives at 30 Percent Cumulative Distribution (feet)

Month	Baseline	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
May	775	788	769	761
June	776	788	768	760
July	759	773	758	751
August	743	758	746	743
September	737	752	741	740

Table 10-11. LSJR Alternatives Changes in New Don Pedro Reservoir Elevations at 30 Percent Cumulative Distribution Compared to Baseline (feet)

Month	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
May	13	-6	-14
June	12	-8	-16
July	14	-1	-8
August	15	3	0
September	15	4	3
Seasonal Average	14	-2	-7

New Melones Reservoir

On New Melones Reservoir, the optimal reservoir water level for recreation is 950–980 feet MSL (State Water Board 1999). Below 900 feet MSL, use of beaches begins to decline. Below 880 feet MSL, the marina closes. At 860 feet MSL, the last official boat ramp (Glory Hole) becomes inoperable,

there is limited reservoir surface area, and campground and picnicking use declines. Below 850 feet MSL, all boat launches are inoperable (USBR 1999).

Tables 10-12 and 10-13 show modeled New Melones elevations for the LSJR alternatives during the May–September months. New Melones Reservoir has experienced elevations below 950 feet (the lowest level for optimal recreation), resulting in baseline reductions to recreational opportunities. Reservoir elevations May–September result in a seasonal change of approximately 20 feet for the 30 percent cumulative distribution. The reservoir elevations predicted by the hydrologic modeling for the LSJR alternatives would be similar to baseline seasonal elevations May–September. The elevations at the 30 percent cumulative distribution for all alternatives would not decrease below 900 feet (the level at which beach uses begins to decline). Reservoir elevations would increase under LSJR Alternative 2 and decrease under LSJR Alternatives 3 and 4 at the 30 percent cumulative distribution. However, the magnitude of the decrease over the summer season declines (e.g., decrease gets smaller in August and September) (Table 10-13). The elevation under LSJR Alternative 2 would experience a seasonal average increase of 22 feet at the 30 percent cumulative distribution. The elevations under LSJR Alternatives 3 and 4 would not result in a seasonal average decrease of greater than 10 feet at the 30 percent cumulative distribution.

Table 10-12. New Melones Reservoir May–September Elevations under LSJR Alternatives at 30 Percent Cumulative Distribution (feet)

Month	Baseline	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
May	945	961	935	938
June	945	969	940	941
July	939	962	934	937
August	929	953	925	928
September	925	948	921	924

Table 10-13. Changes in New Melones Reservoir Elevations at 30 Percent Cumulative Distribution Compared to Baseline (feet)

Month	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
May	16	-10	-8
June	23	-6	-5
July	23	-5	-2
August	24	-4	-1
September	23	-4	-1
Seasonal Average	22	-6	-3

Tulloch Reservoir

Water surface levels in Tulloch Reservoir are maintained through coordinated water releases from the New Melones Dam upstream and the Tulloch Dam downstream. Although the LSJR alternatives could alter the quantity of water flowing into Tulloch Reservoir, equivalent quantities of water would be released through Tulloch Dam. Therefore, while there would be different monthly flows

through Tulloch Reservoir in LSJR Alternatives 2–4, the surface elevations of the reservoir would not change.

SDWQ Alternatives

As discussed in Appendix B, *State Water Board's Environmental Checklist*, changes in salinity would not a result in changes to water-dependent or water-enhanced recreational opportunities in the southern Delta. Salinity levels are imperceptible to recreationists that use the southern Delta for water-dependent activities such as boating or kayaking and water-enhanced activities such as wildlife viewing. Furthermore, as discussed in Chapter 5, *Water Supply, Surface Hydrology, and Water Quality*, salinity levels in the southern Delta are expected to remain within their historical range (i.e., 0.2 dS/m–1.2 dS/m) because the salinity levels in the southern Delta have a strong relationship with the salinity at Vernalis, and the SDWQ alternatives would not change at Vernalis. These ranges are considered not to adversely affect recreation opportunities, including the quality of these opportunities, and would not represent a change from baseline. Therefore, the SDWQ alternatives with respect to recreational resources or visual quality are not discussed further in this chapter. As discussed in Chapter 7, *Aquatic Resources*, fish that inhabit the LSJR and southern Delta channels would not be affected by the fluctuations in salinity. Furthermore, these fluctuations would be within the historical range of salinity in the southern Delta. Therefore, impacts on recreational fishing would not occur in the southern Delta and the SDWQ alternatives are not further discussed.

As discussed in Appendix B, changes in salinity would not result in substantial changes to visual character or quality and would not result in aesthetic impacts. Furthermore, the SDWQ alternatives would not be applicable to the reservoirs. In addition, the Vernalis salinity objective would be maintained as part of this alternative and the reservoirs would continue to operate to meet that objective, thereby maintaining flows. Therefore, impacts on visual quality are not further discussed.

10.4.3 Impacts and Mitigation Measures

REC-1: Substantially reduce recreational opportunities or the use of existing recreation facilities on rivers or at reservoirs

The LSJR alternatives may result in a reduction of existing recreational opportunities on the rivers or reservoirs. An increase in the magnitude of flows that could result from the LSJR alternatives may alter the in-water recreational uses of the rivers; leading to fewer opportunities for swimming and improved conditions for kayaking and whitewater rafting. In addition, increased flows may improve conditions for fish. It is unknown whether any increase in fish populations would be large enough to measurably enhance sport fishing opportunities, but some beneficial impact is anticipated. Reductions in reservoir water elevations that could result under the LSJR alternatives could make reservoirs less conducive to recreation and reduce the use of existing recreation facilities by increasing the distance between established facilities and the water, or reducing available reservoir area.

LSJR Alternative 1: No Project

The No Project Alternative would result in implementation of flow objectives identified in the 2006 Bay-Delta Plan. See Chapter 15, *LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*, for the No Project impact discussion and Appendix D, *Evaluation of LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*, for the No Project Alternative technical analysis.

LSJR Alternative 2: 20% Unimpaired Flow (Less than significant)

The flows for the three eastside tributaries and LSJR would generally be consistent with baseline, exhibiting little fluctuation in July, August, and September. The Tuolumne River and Merced River would generally experience fewer low flows in May and June, and more mid-range flows optimal for boating and fishing during this time. On the Stanislaus River in May and June, flows would be less that 1,500 cfs more frequently and more than 1,500 less frequently than under baseline conditions, potentially increasing opportunities for swimming, boating, and rafting, but potentially decreasing the abundance of fish in the river for sport fishing (see Chapter 7, *Aquatic Resources*). However, the seasonal monthly average frequency of flows within the ranges that support recreation would not decrease substantially (i.e. more than 10 percent) relative to baseline on any of the three eastside tributaries. Therefore, recreational opportunities and facilities are not expected to be substantially reduced under LSJR Alternative 2. The impact on river-based recreation patterns on the three eastside tributaries as a result of LSJR Alternative 2 would be less than significant.

The flows on the SJR at Vernalis are expected to be slightly reduced in May and June, but generally remain the same July–September. These flows would generally remain too high for swimming or wading, but motorized boating or advanced kayaking or rafting may continue. Therefore, impacts on recreation facilities and opportunities on the LJSR would be less than significant.

Modeled reservoir elevations would generally maintain recreational opportunities that are currently experienced at the reservoirs (e.g., boat launches) because they are generally expected to increase under LSJR Alternative 2 at the 30 percent cumulative distribution. The overall shoreline of the reservoirs and the surface area available for boating is expected to increase under this alternative. Impacts would be less than significant.

LSJR Alternative 3: 40% Unimpaired Flow (Significant and unavoidable)

Lower flows would be less frequent on the three eastside tributaries in May and June with LSJR Alternative 3. On the Merced and Stanislaus Rivers, this would correspond to an increase in the frequency of flows 1,500–2,500 cfs; while on the Tuolumne River flows greater than 2,500 cfs would be more common than under current and past conditions. The modeled seasonal monthly average frequency of low flow conditions known to support swimming and wading would decrease more than 10 percent on the Merced River and Tuolumne River. However, flows in July, August, and September would remain the same when compared to baseline conditions. Therefore, during the warmest months in the San Joaquin Valley, when swimming and wading are most popular, there would be relatively little change to baseline conditions. Nevertheless, the reduced opportunity for swimming and wading on the Merced and Tuolumne Rivers may displace recreationists; resulting in increased use of nearby facilities for swimming or a shift to water-enhanced activities (such as hiking) rather than swimming. Thus, significant impacts on low-flow recreation opportunities (e.g., swimming and floating) would occur on the Merced and Tuolumne Rivers under LSJR Alternative 3.

Reducing flows in May and June to maintain lower flows would reduce this significant impact but would directly contradict the purpose of LSJR Alternative 3 to provide additional flow February–June for the beneficial use of wildlife and fish. Furthermore, evaluating the effects of lower flows on the different rivers is part of other alternatives (i.e., LSJR Alternative 1 and 2) and is separately considered in this document. Requiring less flow cannot be independently applied under LSJR Alternative 3 as a mitigation measure because requiring additional flow would be inconsistent with the terms of LSJR Alternative 3 (i.e., requiring 40 percent of unimpaired flow on the Stanislaus River). Impacts would remain significant and unavoidable.

On the LSJR, water-dependent recreational opportunities would be expected to be similar to past and present conditions. Since there would be higher flows on the Merced River and Tuolumne River, the southern portion of the LSJR may experience higher flows in May and June when compared to baseline. This could create conditions more conducive to boating and fishing (increased flows may enhance fishing opportunities) than in-water uses, such as swimming. The impact on swimming would only occur in the early summer, and there are ample locations for swimming in the area, including the Upper SJR and area reservoirs. Overall, the LSJR currently has higher flows more conducive to boating, fishing, and advanced kayaking. Impacts on recreational activities would be less than significant.

LSJR Alternative 3 reservoir elevations would be similar to baseline seasonal elevations May–September. Surface elevations for New Melones Reservoir and New Don Pedro Reservoir would decrease under LSJR Alternative 3 at the 30 percent cumulative distribution; however, elevations are not expected to result in a summer seasonal average decrease in elevation of 10 feet or more relative to baseline. Furthermore, elevations would remain above 900 feet and 720 feet at New Melones Reservoir and New Don Pedro Reservoir, respectively, at the 30 percent cumulative distribution. Reservoir elevations at Lake McClure are expected to increase under LSJR Alternative 3 at the 30 percent cumulative distribution. Therefore, recreational opportunities and the use of recreational facilities are not expected to decline under LSJR Alternative 3 and would not result in a significant displacement of recreationists. Impacts would be less than significant.

LSJR Alternative 4: 60% Unimpaired Flow (Significant and unavoidable)

LSJR Alternative 4 flows would generally be higher than baseline flows. Therefore, the rivers would experience a reduction in the frequency of lower flows (particularly in May and June). Flows would generally be the same as baseline conditions July–September. The modeled average seasonal frequency of flows less than 500 cfs would decrease more than 10 percent on the Merced and Tuolumne Rivers, thus reducing the frequency of flows for lower flow recreational opportunities such as swimming. In addition, the modeled average seasonal frequency of flows 500–1,500 cfs would decrease more than 10 percent on the Tuolumne River, thus reducing the frequency of flows for boating, rafting and kayaking. As a result, the Merced River and Stanislaus River may support more advanced kayaking and rafting, while the Tuolumne River may provide an opportunity for advanced whitewater recreationists. Impacts on recreational opportunities at low flows would be significant on the Merced and Tuolumne Rivers, and impacts on recreational opportunities at mid-range flows would be significant on the Tuolumne River. As discussed above for LSJR Alternative 3, reducing flows in May and June to maintain baseline lower flows would minimize this effect, but would directly contradict the purpose of LSJR Alternative 4 to provide additional flow February–June for the beneficial use of wildlife and fish Furthermore, the evaluation of lower flows is part of other alternatives evaluated in this document. Impacts would remain significant and unavoidable.

Water-dependent recreational opportunities in the Stanislaus River would not be affected because the frequency of flows supporting various recreation types are not expected to vary more than 10 percent on average through the summer recreation season. Flows on the LSJR would remain generally too high for in-water recreational activities other than motorized boating and advanced rafting or kayaking at Vernalis in the northern extent of the plan area. As with LSJR Alternative 3, a shift to higher-flow recreational opportunities would be expected as more frequent higher flows on the Merced and Tuolumne rivers in May and June flow into the LSJR. This may result in more opportunities for boating on the LSJR and fewer opportunities for swimming and wading. During this time, recreationists would either undertake an alternative activity or recreate at a different

location. There is little known use of the southern portion of the LSJR for swimming, the impact would only occur in the early summer, and there are ample locations for swimming in the area, including the Upper SJR and area reservoirs. This impact would be less than significant.

The reservoir elevations predicted by the model for LSJR Alternative 4 would be similar to baseline seasonal elevations May–September. Generally, elevations for all three reservoirs are expected to decrease at the 30 percent cumulative distribution; however, elevations are not expected to result in a summer seasonal average decrease in elevation of 10 feet or more at the 30 percent cumulative distribution relative to baseline. Furthermore, Alternative 4 would not cause elevations to drop below any critical threshold for various recreation facilities and opportunities at the reservoirs relative to baseline. Therefore, recreational opportunities and the use of recreational facilities is not expect to be reduced under LSJR Alternative 4, and the alternative would not result in a significant displacement of recreationists. Impacts would be less than significant.

REC-2: Substantially degrade the functionality of existing recreation facilities on the rivers or at reservoirs

An increase in the magnitude and frequency of high-flow conditions could damage existing on-bank recreation facilities, such as canoe/kayak put-ins, picnic areas, campgrounds, restrooms, and parking areas. For example, flows greater than 5,000 cfs could inundate campsites at Caswell State Park. Reservoir recreation benefits decrease as receding water levels reduce water surface area, make boat ramps less accessible, and leave recreation facilities farther from shorelines (DWR 1994; USBR 1999).

LSJR Alternative 1: No Project

The No Project Alternative would result in implementation of flow objectives identified in the 2006 Bay-Delta Plan. See Chapter 15, *LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*, for the No Project impact discussion and Appendix D, *Evaluation of LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*, for the No Project Alternative technical analysis.

LSJR Alternative 2: 20% Unimpaired Flow (Less than significant)

The frequency and magnitude of higher flows on the Merced, Tuolumne, and Stanislaus Rivers and the LSJR would be similar to baseline under LSJR Alternative 2. Modeled frequencies of flows greater than 2,500 cfs under LSJR Alternative 2 would generally decrease or stay the same on the three eastside tributaries. These flows are not expected to result in more frequent inundation of on-bank recreation facilities during the recreation season. Furthermore, on-bank recreation facilities are purposely built adjacent to and in proximity to rivers, and currently experience periodic inundation by higher flows. Impacts would be less than significant.

Reservoir elevations are expected to increase when compared to the baseline 30 percent cumulative distribution as described above for REC-1. It is expected that these conditions would not significantly impact the existing recreation facilities because the elevations would remain below the maximum optimal elevations specified for New Melones Reservoir and New Don Pedro Reservoir. The Lake McClure modeled elevations may be expected support a more frequent use of the Bagby Boat Launch because elevations are expected to be greater than 793 feet May–July. Therefore, the change in elevations would not render existing recreation facilities inoperable. Furthermore, regular survey, maintenance, and construction of facilities at the reservoirs would continue to occur under

the supervision of facility owners and managers consistent with applicable licenses (e.g., FERC) and recreation management plans. Impacts would be less than significant.

LSJR Alternative 3: 40% Unimpaired Flow (Less than significant)

Under LSJR Alternative 3, modeled frequencies of flows greater than 2,500 would generally decrease on the Merced and Stanislaus Rivers. Thus, on-bank recreation facilities would not be susceptible to more inundation when compared to baseline conditions. Flows greater than 2,500 cfs would increase in frequency on the Tuolumne River in May and June but would remain the same July through September. Flood control releases of greater than 3,500 cfs would continue as under baseline conditions on the Tuolumne River. Although the flows on the Tuolumne River may result in an increase in the frequency of inundation of on-bank recreation areas during the recreation season (May and June), this inundation would not significantly degrade the functionality of the facilities. Recreation facilities constructed in close proximity of rivers and are capable of withstanding periodic inundation by higher flows. The functionality of these facilities, particularly Caswell Memorial Park, would not be substantially degraded because only a portion of the facilities would be inoperable. Moreover, the existing capacity of similar facilities in the region would allow use to shift to facilities at higher elevations during these periods of high flow. Impacts would be less than significant.

Reservoir elevations are expected to decrease for New Melones Reservoir and New Don Pedro Reservoir when compared to the baseline 30 percent cumulative distribution, as described above for LSJR Alternative 3 under REC-1. It is expected that these conditions would not result in a significant degradation of the existing recreation facilities. Although the elevations on these reservoirs would remain below the specified maximum optimal levels, LSJR Alternative 3 would not cause elevations to drop below any critical level for recreation facilities such as boat launches and onshore activities (e.g., picnicking) relative to baseline . The Lake McClure modeled elevations would increase slightly over past and present conditions and would support a more frequent use of the Bagby Boat Launch because elevations are expected to be greater than 793 feet in May. The changes in elevation at the reservoirs would not render existing recreation facilities inoperable. Furthermore, regular survey, maintenance, and construction of facilities at the reservoirs would continue to occur under the supervision of facility owners and managers consistent with applicable licenses (e.g., FERC) and recreation management plans (e.g., New Melones Lake Area Resource Management Plan). Impacts would be less than significant.

LSJR Alternative 4: 60% Unimpaired Flow (Less than significant)

Modeled frequencies of flows greater than 2,500 cfs under LSJR Alternative 4 would generally decrease on the Merced and Stanislaus rivers. Thus, on-bank recreation facilities would not be susceptible to more inundation when compared to baseline flows on these rivers during the recreation season. Flows greater than 2,500 cfs would generally increase in frequency on the Tuolumne River in May and June, but remain the same July–September. As discussed above, flows greater than 3,500 cfs would continue to be experienced on the Tuolumne River as part of managed flood releases. Furthermore, on-bank recreation facilities at all of these rivers are purposefully built adjacent to, and within close proximity of, rivers and are able to withstand periodic inundation by higher flows. The flows on the Tuolumne River may result in an increase in the frequency of inundation of on-bank recreation facilities during the recreation season, but inundation during May and June would not significantly degrade the functionality of the recreation facilities. Therefore, impacts would be less than significant.

Reservoir elevations are expected to decrease for all reservoirs when compared to the baseline 30 percent cumulative distribution as described above for LSJR Alternative 4 under REC-1. It is expected that these conditions would not result in a significant degradation of the existing recreation facilities because the elevations would remain below the maximum optimal elevations, but LSJR Alternative 4 would not cause elevations to drop below any critical level for recreation facilities such as boat launches and onshore activities (e.g., picnicking) relative to baseline, as described above under REC-1. Thus, the changes in elevation at the reservoirs would not render existing recreation facilities inoperable. Furthermore, regular survey, maintenance, and construction of facilities at the reservoirs would continue to occur under the supervision of facility owners and managers consistent with applicable licenses (e.g., FERC) and recreation management plans (e.g., New Melones Lake Area Resource Management Plan). Therefore, impacts would be less than significant.

REC-3: Substantially degrade the existing visual character or quality of the reservoirs

Low water levels at reservoirs can expose a less-visually pleasing shoreline to recreationists that is devoid of vegetation due to fluctuating water elevations (DWR 1994; USBR 1999). As summarized in Table 10-7 in Section 10.4.2, views are classified such that modification of views or visual character and quality are acceptable or retention of views is recommended. The views of Lake McClure and New Melones Reservoir are classified as Class II views and retention of the existing character of the landscape is recommended. The views of Don Pedro Reservoir are classified as Class III views and changes to the character of the landscape can be moderate.

LSJR Alternative 1: No Project

The No Project Alternative would result in implementation of flow objectives identified in the 2006 Bay-Delta Plan. See Chapter 15, *LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*, for the No Project impact discussion and Appendix D, *Evaluation of LSJR Alternative 1 and SDWQ Alternative 1 (No Project Alternative)*, for the No Project Alternative technical analysis.

LSJR Alternative 2: 20% Unimpaired Flow (Less than significant)

The change in the three reservoir elevations would not result in a substantial change to the existing visual character of the reservoirs. As described above under REC-1 and REC-2, elevations are not expected to decrease May–September when compared to baseline. Therefore, viewers would continue to experience the water land interface and would continue to see water from viewpoints. Impacts of LSJR Alternative 2 would be less than significant.

LSJR Alternative 3: 40% Unimpaired Flow (Less than significant)

The change in the three reservoir elevations would not result in a substantial change to the existing visual character of the reservoirs. Reservoir elevations are expected to decrease when recreationists are experiencing the visual character and quality of the reservoirs: May–July at New Don Pedro Reservoir and May–September at New Melones Reservoir. The seasonal average elevation levels would decrease less than 10 feet at the 30 percent cumulative distribution, however, and the visual characteristics of the reservoirs would be partially retained because reservoir elevation fluctuations are typical of this environment. Although the reservoirs would not be at these lower elevations during the time when recreationists are experiencing the visual character and quality of the reservoirs, the existing character of the reservoirs, which includes increases and decreases in elevations throughout the summer season and over time, would be retained. Furthermore, although

the water elevations would change, recreationists would continue to experience the water-land interface. Furthermore, the change in elevation would not represent a substantial degradation to the characteristic landscape (e.g., Sierra Nevada foothills and mountains) described as a Class II view at Lake McClure and New Melones Reservoir. The change would be considered low because viewers would still experience the reservoir, the existing fluctuation of elevation, and lack of vegetation within the fluctuation zone, all within the context of the foothills and mountains. Similarly, the changes to views of Don Pedro Reservoir, classified as Class III views, would also be considered low, and these views are more readily modified as a result of the Class III designation. Impacts would be less than significant.

LSJR Alternative 4: 60% Unimpaired Flow (Less than significant)

The change in the three reservoir elevations would not result in a substantial change to the existing visual character of the reservoirs. Reservoir elevations are expected to decrease May–July at Lake McClure and New Don Pedro Reservoir and May–September at New Melones Reservoir. Seasonal average elevation levels at the 30 percent cumulative distribution would decrease less than 10 feet. Although the reservoirs would be at these lower elevations during the time when recreationists are experiencing the visual character and quality of the reservoirs, their existing visual character, which includes increases and decreases in elevations throughout the summer season and over time, would be retained as described above under LSJR Alternative 3. Impacts would be less than significant.

10.5 Cumulative Impacts

10.5.1 Definition

Cumulative impacts are defined in the State CEQA Guidelines (14 Cal. Code Regs., § 15355) as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." A cumulative impact occurs from "the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (14 Cal. Code Regs., § 15355(b)).

Consistent with the State CEQA Guidelines (14 Cal. Code Regs., § 15130(a)), the discussion of cumulative impacts in this chapter focuses on significant and potentially significant cumulative impacts. The State CEQA Guidelines (14 Cal. Code Regs., § 15130(b)) state the following:

> The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

10.5.2 Past, Present, and Reasonably Foreseeable Future Projects

Chapter 16, *Cumulative Impact Summary*, *Growth-Inducting Effects, and Irreversible Commitment of Resources* includes a list of past, present, and reasonably foreseeable future projects considered for the cumulative analysis. Present and reasonably foreseeable future projects are projects that are currently under construction, approved for construction, or in final stages of formal planning. These projects were identified by reviewing available information regarding planned projects and are summarized in Chapter 16. Present and reasonably foreseeable future projects related to recreational resources and visual quality are listed in Chapter 16 and include the following.

- Bay–Delta Conservation Plan and Alternative Delta Conveyance Facilities
- Calaveras County General Plan Update
- Conveyance of Refuge Water Supply and Mendota Wildlife Area
- Dos Rios Ranch
- FERC Relicensing of the Don Pedro Project (FERC Project No. 2299)
- FERC Relicensing of the Merced River Hydroelectric Project (FERC Project No. 2179)
- Gravel Mining Reach Floodway Restoration
- Grayson River Ranch Conservation Easement
- Habitat Management Preservation and Restoration Plan for Suisun Marsh
- Habitat Restoration Plan for the Lower Tuolumne River Corridor
- In-Delta Storage Program (Delta Wetlands Project)
- Jensen River Ranch Habitat Enhancement and Public Access Project
- Knights Ferry Floodplain and Side-channel restoration
- Los Vaqueros Reservoir Expansion Project
- Lower Sherman Island Wildlife Area (LSIWA) Land Management Plan (LMP)
- Lower Tuolumne River Big Bend Project
- Merced County General Plan Update
- Merced River Ranch Floodplain Restoration
- Millerton Lake Resources Management Plan/General Plan
- USBR New Melones Lake Area Final Resource Management Plan
- Non-Structural Alternative at San Joaquin River National Wildlife Refuge: Refinement of Habitat Enhancement
- Restoration of the Ruddy Mining Reach
- San Joaquin County General Plan Update
- San Joaquin County Multi-Species Habitat Conservation and Open Space Plan
- San Joaquin River Parkway Plan

- San Joaquin River Partnership's San Joaquin River Blueway
- Upper San Joaquin River Restoration Program
- Stanislaus County General Plan Update
- Tuolumne County General Plan Update
- Tuolumne River Regional Park
- Tuolumne River Restoration Projects including Warner Deardorff Segment – Mining Reach Project No. 3

10.5.3 Significance Criteria

Two significance criteria must be met for an environmental consequence to have a significant cumulative impact: (1) the effect must make a cumulatively considerable incremental contribution to an overall cumulative impact, and (2) the overall cumulative impact (considering past, present, and reasonably foreseeable future projects) must be significant. (See Cal. Code Regs., tit. 14, §§ 15064, 15065, 15130.) The cumulative analysis uses the impact threshold topics discussed in the impact analysis (i.e., substantially reduce recreational opportunities, substantially degrade functionality, or substantially degrade visual character and quality).

10.5.4 Mitigation Measures for Significant Cumulative Impacts

As specified by Section 15130 of the State CEQA Guidelines (2012) the analysis of cumulative impacts will examine feasible options for mitigating or avoiding a project's contribution to any significant cumulative effects. With some projects, the only feasible mitigation for cumulative impacts may be the adoption of ordinances or regulations rather than the imposition of conditions on a project-by-project basis. Mitigation measures to reduce an alternative's contribution to significant cumulative effects are presented below where feasible and appropriate.

10.5.5 Cumulative Impact Analysis

Methodology

The methodology used to analyze cumulative impacts associated with recreational resources and visual quality entailed a qualitative description of the cumulative impacts expected from past, present, and reasonably foreseeable projects, including an analysis of several projects in the plan area. A project may contribute to a significant cumulative impact even if the impacts of the project are not significant, and significant project impacts are not inherently cumulative impacts. The determination of whether the LSJR and SDWQ alternatives would contribute to a significant impact is based on whether the project would make a cumulatively considerable incremental contribution to an impact when considered in concert with other identified projects, and whether the combined effects would result in a significant impact on visual or recreational resources.

Geographic Scope

The geographic scope of this analysis is approximately the plan area for the LSJR alternatives. The southern Delta is not included, as the water quality objectives would have no impact on visual and recreational resources. A decline or degradation of available on-bank or in-water recreational

opportunities and facilities or reduction in recreation facility function and capacity can result in cumulative impacts on recreational resources. Cumulative impacts on visual quality can result from project development around the reservoirs or a change in land use that influences the visual character or quality surrounding the reservoirs.

Analysis

The combined effects of some of the past, present, and reasonably foreseeable future projects would be expected to modify and enhance on-bank and in-water recreational opportunities. Specifically, there would likely be more recreation facilities and opportunities developed along the reservoirs and rivers because of the proposed future projects, such as the New Melones Lake Area Resource Management Plan, the Upper San Joaquin River Restoration flows, or the San Joaquin Blueway Plan. These plans call for new recreation facilities and maintenance of existing facilities, or implementation of additional flows on the rivers suitable for recreational purposes.

Past and present actions have gradually increased pressure on recreational resources, extracted water from the LSJR and three eastside tributaries, and altered the natural environment, including through urbanization of the viewshed. However, past projects and present actions have also increased the number of recreational opportunities for the general public along each of the three eastside tributaries, the LSJR, and at the reservoirs by developing trails, boat launches, campsites, and other recreational amenities.

Reasonably foreseeable future projects are expected to increase recreation opportunities. For example, the San Joaquin River Blueway Plan proposes improving access to the Upper SJR to create a blueway—a boating trail to camping, fishing, bird watching, and other kinds of recreation. The plan would provide additional shore-based recreation opportunities, which may result in increased opportunities for water-enhanced recreation. The plan would expand recreational opportunities and use of the SJR without degrading the functionality or visual character of the resource. Additionally, the Upper San Joaquin River Restoration Program is proposed for the Upper SJR, immediately upstream of the plan area, but also includes the LSJR since increased flows proposed under the program would influence this downstream portion of the river. The program would require the release of interim and restoration flows to promote use of the river by native fish, as well as channel modifications and reintroduction of Chinook salmon. No new projects or facilities would be constructed on the SJR between the Merced River and the Delta in the vicinity of existing recreation facilities or use areas; therefore, there would be no direct change to the functionality or visual character of these resources. The proposed reintroduction of Chinook salmon and improved water quality may have a beneficial impact on sport fishing on the LSJR and in the southern Delta, while restoration actions may decrease fishing opportunities in the Upper SJR. The proposed relicensing of New Don Pedro Reservoir and Lake McClure will include the maintenance of recreational facilities and potential changes to the release of water from the reservoir for power generation. If New Don Pedro Reservoir and Lake McClure are managed to release more water, the reservoirs could experience drawdown conditions, which can impact recreation and visual resources. However, recreational amenities would be managed under the FERC license to provide continued access to recreationists, and viewers anticipate the lack of vegetation that is created in the area of surface water fluctuation. Implementation of the New Melones Resource Management Plan would likely result in the development of more recreational facilities at New Melones Reservoir.

Because past, present, and reasonably foreseeable future projects have generally developed and promoted recreation, they have not had cumulatively considerable or significant effects on

recreational amenities. The reservoirs, agricultural lands, and urbanization of the watershed have had cumulatively considerable impacts on the views and viewshed experienced by recreationists and these impacts would be considered significant.

LSJR Alternative 2 would continue to support flows that are optimal for all types of recreation on the three eastside tributaries and the LSJR. Therefore, the incremental cumulative contribution of LSJR Alternative 2 to recreational resources on the rivers would be less than significant, and when combined with past, present, and reasonably foreseeable future projects, LSJR Alternative 2 would not result in a significant cumulative impact. LSJR Alternatives 3 and 4 may result in increased flows within the plan area that are greater than optimal for swimming and boating. Specifically, the LSJR currently experiences flows that are above optimal for boating. This would not significantly impact recreation on the LSJR because there are currently few opportunities for swimming that would be displaced. However, LSJR Alternatives 3 and 4 would reduce lower flows and moderate flows on the Tuolumne and Merced Rivers, which could affect swimming and lower-flow recreational activities on these rivers. The incremental contribution of this reduced flow during the recreation season would be considered cumulatively considerable and significant. As discussed in REC-1, the significant cumulative impacts on the Stanislaus River associated with recreational flows could be reduced or lessened with less flow, beyond that which is currently required by LSJR Alternatives 3 or 4. Evaluating the effects of less flow is part of other alternatives (e.g., LSJR Alternative 2) and is separately considered in this document. Therefore, it cannot be independently applied as mitigation measures. Therefore, there are no feasible mitigation measures to avoid, minimize, rectify or reduce or eliminate the impact, and this cumulative impact would remain significant and unavoidable.

LSJR Alternative 2 would not decrease reservoir elevations May–June at the 30 percent cumulative distribution. Therefore, the incremental cumulative contribution of LSJR Alternative 2 to visual resources and recreational resources at the reservoirs would be less than significant and when combined with past, present, and reasonably foreseeable future projects, LSJR Alternative 2 would not result in a significant cumulative impact. LSJR Alternatives 3 and 4 could change reservoir levels elevations May–July at the 30 percent cumulative distribution. This may result in a cumulative change to reservoir levels that would impact the visual character of the reservoir. However, this impact would not be significant because the recreational amenities would be managed under the FERC license to provide continued access to recreationists and viewers anticipate the lack of vegetation that is created in the area of surface water fluctuation. Furthermore, it is anticipated that recreational amenities, such as boat launches, would continue to operate under LSJR Alternatives 3 and 4 at the reservoirs. Therefore, the incremental cumulative contribution of LSJR Alternatives 3 or 4 to visual resources and recreational resources at the reservoirs would be less than significant. When combined with past, present, and reasonably foreseeable future projects, LSJR Alternatives 3 or 4 would not result in a significant cumulative impact.

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10.6.2 Personal Communications

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