

RECLAMATION

Appendix E Recreation

North-of-the-Delta Offstream Storage Investigation



July 2017

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Attachments

Attachment 1 Site Photos

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E.1 Introduction and Purpose

The purpose of this appendix is to provide a screening of candidate sites for recreation at Sites Reservoir. Six candidate sites are described in this appendix. A detailed analysis of the environmental impacts associated with these recreational facilities is provided in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the North-of-the-Delta Offstream Storage (NODOS)/Sites Reservoir Project. The evaluation in this appendix was the basis for selecting two to three recreation sites for inclusion into each of the Sites Reservoir alternatives.

Currently, there are four alternatives for Sites Reservoir under consideration: Alternatives A, B, and C, as previously developed by the United States Department of the Interior, Bureau of Reclamation (Reclamation) and the California Department of Water Resources (DWR), and Alternative D, developed by the Sites Project Authority (Authority).

The construction of any reservoir provides an opportunity to develop new recreational facilities. Recreation in the immediate vicinity of a new reservoir could include horseback riding, hiking, fishing, camping, boating, mountain biking, and off-road vehicle use. Horseback riding within the footprint for Sites Reservoir, including the surrounding hillsides, is an existing recreational activity by residents in the vicinity of the reservoir. Large metropolitan areas, such as nearby Sacramento, also have high demands for water-oriented recreational opportunities that would likely increase recreational use if a new reservoir were constructed. Some of the demand for water-based recreation is served by reservoirs on the western slope of the Sierra Nevada. However, as population increases in the Sacramento Valley, demands for flat-water, river, and land-based recreation are expected to increase.

Existing Conditions

Antelope Valley

The proposed Sites Reservoir would be located in the Antelope Valley in Colusa and Glenn Counties. Limited recreational opportunities currently exist in proximity to Antelope Valley. The majority of land in the area is privately owned and not accessible for public use. Consequently, current recreational use is limited to landowners, their families, friends, and employees, and totals an estimated 300 recreation visitor hours per year, or 25 recreation visitors per year (DWR 2000).

Hunting is the most common recreational activity in Antelope Valley. Upland game birds, deer, and wild boar are the most sought-after species. Horseback riding and occasional off-highway vehicle (OHV) use have been observed. Fishing is an infrequent activity because of the intermittent nature of the streams in Antelope Valley. However, children have been observed fishing in Stone Corral Creek downstream of the proposed Sites Dam area. There are several stock ponds throughout the NODOS/Sites Reservoir Project area, and some are large enough to support populations of bass, sunfish, and catfish; it is not known, however, if these ponds are used for recreational fishing (DWR 2000).

Existing Regional Recreation

Recreational opportunities and levels of recreational facility development vary in the region. The recreation areas available in the region include Black Butte Lake, East Park Reservoir, Stony Gorge Reservoir, Indian Valley Reservoir, Lake Berryessa, Folsom Lake, Lake Oroville, Lake Almanor, and Clear Lake. Recreation at Black Butte Lake, and East Park, Stony Gorge, and Indian Valley Reservoirs is comparable to that proposed for Sites Reservoir because of similarities in location, vegetation communities, elevation, remoteness, and topography. Although these recreation areas are considerably smaller than the proposed Sites Reservoir, all have seasonally fluctuating water levels, and peak use occurs between March and August (DWR 2000). A range of recreational facility development exists at these reservoirs. Lake Berryessa, Folsom Lake, and Lake Oroville are comparable in size to the proposed Sites Reservoir. Lake Almanor and Clear Lake have a mix of private and public facilities. These water recreation sites are those areas that could be affected by the addition of other recreational opportunities in the greater area, including the proposed development of Sites Reservoir. This section provides a review of the major reservoir-based recreational development in the greater region surrounding Sites Reservoir. Figure E-1 indicates the relative proximity of these recreation areas to the proposed Sites Reservoir. A description of each area is provided, with available visitor information, capacity, and water-related activities.

Shasta Lake

Shasta Lake, owned and operated by Reclamation, is California's largest reservoir and a major facility of the Central Valley Project (CVP). Shasta Lake is a major recreational area, with an annual visitation of more than 2.5 million people. In addition to recreation, it provides water, power, flood control, and fishery benefits. Redding, California, with a population of about 91,000 (and greater population in excess of 150,000), is the largest city in the vicinity of Shasta Lake. Shasta Lake provides vast opportunities for remote access and boat-in camping. The lake has more than 370 miles of shoreline and a maximum depth of 571 feet. Its fishery includes bass, trout, salmon, catfish, crappie, bluegill, sturgeon, and other species. In addition to fishing and boating, Shasta Lake offers extensive camping opportunities, including 18 developed and 12 non-developed campground areas managed by the United States Forest Service. There are also 11 marinas at various sites around the lake, some which offer private campgrounds; and miles of forest roads providing access to upland and upstream recreational opportunities.

Shasta Lake is considered more of a destination area, where visitors spend longer periods of time and travel from farther distances to enjoy the recreational/scenic diversity. This area offers a diverse range of recreational opportunities, but they are relatively different from those proposed at Sites Reservoir. Effects on the visitation and/or economic income to Shasta Lake by the potential development of Sites Reservoir are not expected to be notable due to distance and recreational/scenic diversity.

Folsom Lake

Folsom Lake, owned and operated by Reclamation, is also a major recreational area, located in the Greater Sacramento area. It is also a major facility of the CVP, but is located entirely within Folsom Lake State Recreation Area (SRA), administered by the California Department of Parks and Recreation. Folsom Lake SRA is one of the State's most popular recreation areas, with annual visitations averaging nearly 2.6 million people. The predominant recreational uses are

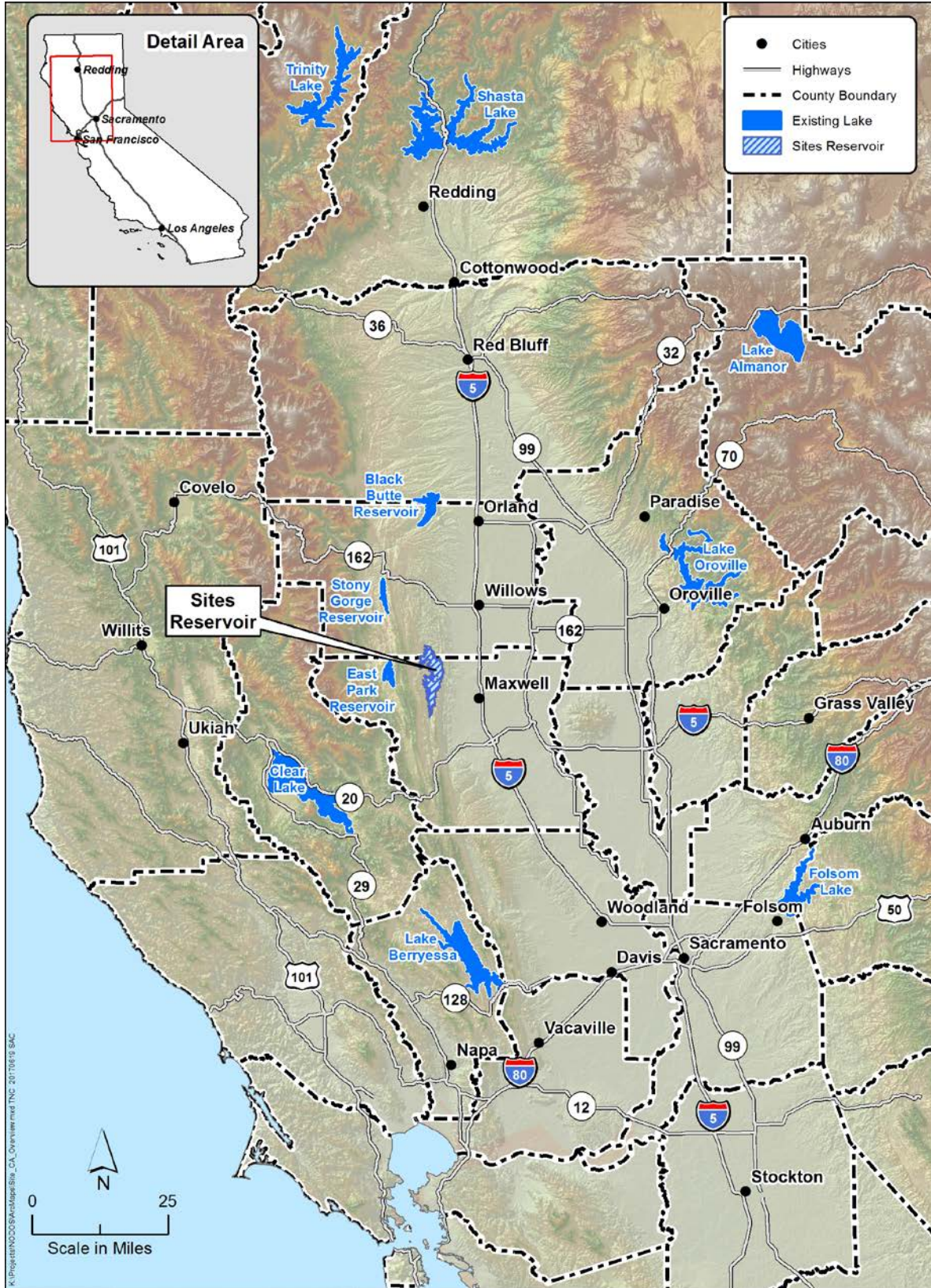


Figure E-1. Regional Reservoirs in the Vicinity of the Proposed Sites Reservoir

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water-related, such as boating and water skiing. Lake Natoma (the Folsom Dam afterbay), a unit of Folsom Lake SRA, is immediately downstream of Folsom Dam. Developed recreational facilities include picnic areas, bicycle and pedestrian trails, boat launch ramps, and campgrounds. On average, Lake Natoma supports approximately 500,000 visitor uses days per year; the predominant recreational activity is trail use.

Folsom Lake is considered more of a destination area, where visitors spend longer periods of time, and travel from farther distances to enjoy the diversity of the recreation. This area has a diversity of recreational opportunities, but the opportunities are relatively different than those proposed at Sites Reservoir. Effects on the visitation and/or economic income to Folsom Lake by the potential development of Sites Reservoir are not expected, due to distance and recreational/scenic diversity.

Lake Oroville

Lake Oroville, owned and operated by the State of California, is California's second-largest reservoir. As a major facility of the State Water Project, it provides water, power, flood control, fishery, and recreational benefits. Population centers nearest Lake Oroville include the City of Oroville (population 16,000) and Chico (population 88,000). Recreational facilities at Lake Oroville SRA provide for camping, picnicking, boating, fishing, hunting, horseback riding, hiking, bicycling, and a variety of other activities. In addition, there are several less-developed car-top boat-launching areas, 84 boat-in campsites, and 10 unique floating campsites.

Lake Oroville is a major recreation area, and was recently assessed for the ability to add additional facilities through the Federal Energy Regulatory Commission process for relicensing. This area has a diversity of recreational opportunities, with some similarities to those proposed at Sites Reservoir. This is one of the larger lakes in the same part of the state. Effects on the visitation and/or economic income to Lake Oroville by the proposed development of Sites Reservoir are not expected. These recreation areas would not compete with each other due to distance and differing recreational/scenic attributes. The recreational diversity that has come to identify Lake Oroville as a premier recreation area would not be overshadowed by the addition of Sites Reservoir.

Black Butte Lake

Black Butte Lake is a facility of the CVP, but operated by the United States Army Corps of Engineers (USACE). Located on Stony Creek approximately 8 miles west of the town of Orland in Glenn County, Black Butte Lake has six recreation areas, including a dam overlook and campground. There are more than 20 miles of hiking, mountain biking, and nature trails. Each recreational area includes restrooms and fishing access, with a range of other facilities. This reservoir has the most developed recreational facilities of the four smaller recreation areas evaluated. Recreation lands surrounding the reservoir total approximately 4,000 acres, and offer camping, hunting, fishing, hiking, OHV, all-terrain vehicle, and several other recreational opportunities.

Black Butte Lake is a local area recreation destination and is used regularly. Competition with the development of the proposed Sites Reservoir Recreation Areas may affect visitation and economics for Black Butte Lake in the short-term, because local area visitors may be inclined to visit the new Sites Reservoir facilities. However, with expected population growth in the area

and the need for additional recreational facilities, these areas are not expected to compete with each other over the long-term; would add to the recreational diversity in the northern region of the Central Valley; and would reduce overcrowding and natural resource impacts.

Stony Gorge Reservoir

Upstream of Black Butte Lake on Stony Creek is Stony Gorge Reservoir. Owned and operated by Reclamation, it is a facility of the CVP. This reservoir's primary purpose is to provide irrigation water for use by the Orland Unit Water Users' Association, but recreation is also a benefit of the reservoir. The water level at this reservoir fluctuates widely through the season, which affects recreational use. According to Reclamation, recreational use is high in the spring and early summer, but drops off in the latter half of summer and into autumn as the water level decreases. All of the recreation areas at Stony Gorge are accessible from State Route 162, and include group camping areas, picnic and day-use areas, boat ramps, and camping areas.

Stony Gorge Reservoir is a local area recreation destination, and it is used regularly. Competition with the proposed development of the Sites Reservoir Recreation Areas may minimally affect the visitation and economics of Stony Gorge Reservoir in the short-term, because local area visitors may be initially inclined to visit the newer facilities at Sites Reservoir. Each area would have a different spectrum of recreational opportunities. Eventually, with expected population growth in the area and the need for additional recreational facilities, these areas are not expected to compete with each other over the long-term, and would reduce overcrowding and natural resource impacts.

East Park Reservoir

East Park Reservoir is in the upstream area of the Stony Creek watershed, south of Stony Gorge Reservoir, approximately 20 miles west of Maxwell near the town of Stonyford. Owned and operated by Reclamation, it is a facility of the Orland Project. East Park is similar to Stony Gorge in size, level of development, ownership, operation, and purpose. Recreation management at the reservoir is administered by Colusa County. There are two zones of developed recreation at the lake: one on the west shore, and another along the east shore. Both are relatively primitive, although some permanent restrooms have been installed. There are six named recreation areas along the shore; however, several of them merge. The recreational opportunities include camping, group camping, and water access. This recreation area has been improved as demand has increased.

East Park Reservoir is a local area recreation destination, and is used regularly. Competition with the proposed development of the Sites Reservoir Recreation Areas may minimally affect visitation and economics for East Park Reservoir in the short-term, because local area visitors may be inclined to visit the newer facilities at Sites Reservoir, which would be closer to the Central Valley. Each area would have a different spectrum of recreational opportunities. Additionally, with expected population growth in the area and the need for additional recreational facilities, these areas are not expected to compete with each other over the long term and would reduce overcrowding and natural resource impacts.

Indian Valley Reservoir

Indian Valley Reservoir is on the North Fork of Cache Creek in a secluded area of the Coast Range. The reservoir is owned and operated by the Yolo County Flood Control and Water

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Conservation District, and surrounded by wildlands managed by the Bureau of Land Management (BLM). Main access to the reservoir is from the south via State Route 20 and Walker Ridge Road. This unpaved road provides scenic views of the surrounding country, and of Indian Valley Reservoir as it descends to the lake. The reservoir could also be accessed via Bartlett Springs Road from Bear Valley to the east. The recreation area has various recreational opportunities, including a marina, undeveloped campgrounds, hiking, and primitive camping areas. According to BLM, this is a popular camping area year-round. The northern end of the reservoir has no developed facilities, but several miles of shoreline access are provided by Bartlett Springs Road.

Indian Valley Reservoir is a local area recreation destination in the Coastal Mountains. Competition with the development of the Sites Reservoir Recreation Areas may minimally affect visitation and economics for Indian Valley Reservoir in the short-term, because local area visitors may be inclined to visit the newer facilities, which would be closer to the Central Valley. Each area would have a different spectrum of recreational opportunities. Additionally, with expected population growth in the area and the need for additional recreational facilities, these areas are not expected to compete with each other over the long-term, and would reduce overcrowding and natural resource impacts.

Lake Berryessa

Lake Berryessa is the largest lake in Napa County, California, and provides water and hydroelectricity to the North Bay region of the San Francisco Bay Area. Owned by Reclamation and operated under a cooperative agreement by the Solano County Water Agency/Solano Irrigation District, Lake Berryessa is a facility of the Solano Project.

The reservoir is approximately 15.5 miles long and 3 miles wide. It has approximately 165 miles of shoreline, and encompasses over 20,000 acres when full. The lake is heavily used for recreational purposes, and has a seaplane landing area that is open to the public. The potential development of Sites Reservoir is not expected to negatively affect the visitation and economic income of Lake Berryessa, due to its distance and recreational/scenic diversity.

Lake Almanor

Lake Almanor is a reservoir in northwestern Plumas County, in northeastern California. The reservoir has a capacity of 1,308,000 acre-feet, and a maximum depth of about 90 feet. Lake Almanor is formed by Canyon Dam on the North Fork of the Feather River, as well as Benner and Last Chance Creeks, Hamilton Branch, and various natural springs. The present dam was constructed by Great Western Power, from 1926 to 1927, damming the North Fork of the Feather River and flooding the meadow-filled valley generally known as Big Springs/Big Meadows. In the process, parts of the town of Prattville had to be moved to higher ground, while some structures were flooded over.

The dam is now owned by Pacific Gas and Electric Company (PG&E). PG&E uses it for hydroelectricity production, but the lake is also a popular recreational area, with fishing, boating, water skiing, swimming, and camping available. The potential development of Sites Reservoir is not expected to negatively affect the visitation and economic income of Lake Almanor by due to its distance and recreational/scenic diversity.

Clear Lake

Clear Lake is the largest natural freshwater lake entirely in California. It is in Lake County, and is fed by runoff flowing into many streams, as well as springs in Soda Bay. Its sole outlet is Cache Creek. There is a dam on Cache Creek to increase the lake's capacity and to regulate outflow.

With over 100 miles (160 kilometers) of shoreline, Clear Lake is a popular spot for water sports enthusiasts. Fishing, swimming, sailing, wind surfing, waterskiing, boating, and riding personal water craft are all popular activities, primarily in the summer. There are 11 free boat launch ramps around the lake that are open to the public. Individuals may rent boats and personal water craft from many businesses around the lake.

Clear Lake is sometimes called the “Bass Capital of the West.” Largemouth bass, which are farmed and planted in the lake by California Department of Fish and Wildlife, and other fish species, can be found in the county's lakes. Fishing boats can be rented, and many stores and facilities around the lake specialize in fishing equipment. Numerous fishing tournaments and derbies are held throughout the year. The potential development of Sites Reservoir is not expected to negatively affect the visitation and economic income of Clear Lake, due to distance and recreational/scenic diversity

Wildlife Refuges

The Sacramento Valley offers a complex network of Federal and State wildlife refuges along the Sacramento River that provide opportunities for fishing, hunting, and wildlife viewing via auto tours and trails. These include the Sacramento, Colusa, and Delevan National Wildlife Refuges, which are all west of the Sacramento River near the proposed Sites Reservoir. Fishing and hunting account for approximately 50 percent of the total visitor use. The remaining 50 percent is devoted to hiking and photography (CALFED 2000).

Conclusions on Competition with Other Recreation Areas

Development of one or more of the Sites Reservoir Recreation Areas described in this document would add to the diversity of the water recreation opportunities on the western side of Sacramento Valley. Due to the size and constraints of the development, these recreation areas would not compete with the surrounding area facilities in the long-term.

E.2 Potential Recreational Opportunities at Sites Reservoir

Development of Alternatives

The suitability of lands to support reservoir-based recreation is determined by several factors, including topography, access, physical/aesthetic setting, projected reservoir operations, anticipated use, and competing uses. Based on these factors, five potential recreation areas have been identified along the shoreline of the proposed Sites Reservoir (DWR 2001; Reclamation and DWR 2008). Most of the design concepts presented in this appendix were previously developed by DWR. This appendix describes additional recreational opportunities, such as a multi-use reservoir loop trail, vista point's access, fishing access, and the development of wayside areas where roadway alignment is adjacent to the shoreline.

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A combination of the United States Geologic Survey (USGS) topographical maps, published reports, and a field visit were used to evaluate the potential recreational opportunities for Sites Reservoir shoreline areas. The recreational potential of each proposed area was assessed, based on projections of a 1.27- and 1.81-million-acre-foot (MAF) reservoir, respectively. It is also assumed that features such as trees, shrubs, grasslands, and rock outcrops that contribute to the aesthetic qualities of the area would be preserved where possible.

Recreational opportunities at each recreation area would likely include boating, camping, picnicking, swimming, fishing, and hiking. Proposed facilities would include boat-launch areas, campsites, picnic tables, shaded picnic areas, campfire rings/barbeques, designated swimming and fishing access, trails, vault toilets, and dumpsters. Electricity and water may be available at a subset of recreation areas. All recreation areas would be fenced. Gravel parking space would be provided at each campsite. A larger, gravel parking lot would be provided at each recreation area for day-use and boat-launch areas.

Recreation Area Descriptions

Descriptions of each of the six potential recreation areas are provided below and summarized in Table E-1. The recreation areas are shown on Figure E-2.

Stone Corral Recreation Area

The proposed Stone Corral Recreation Area is a 235-acre site north of the Sites Dam location on a scenic ridgeline dominated by oak woodland. The site offers excellent views of the surrounding area and dam. The recreation area would be developed with camping and picnic sites connected by roads and hiking trails. Potable water for public use, electricity for access lighting, restroom facilities, kiosk and interpretive elements, parking, and a boat ramp would be provided (see Figure E-3). Interpretive information about the area's cultural and natural history could be presented at a reservoir/dam overlook that could be built at one of several expansive ridge-top vistas available throughout the recreation area. The overlook site would be surrounded by existing aesthetic rock formations, and could accommodate several interpretive displays, including pre-inundation photographs and information about Antelope Valley's history. The overlook could also be large enough to accommodate several benches and picnic tables. The overlook location and layout would be identified during the design development process. Access into the proposed Stone Corral Recreation Area would be from the existing Maxwell-Sites Road to the proposed Eastside Road, then west on the proposed Stone Corral Road. Stone Corral Road currently is a jeep trail, and would require upgrading. This access route would also facilitate maintenance of the proposed Sites Dam and associated waterworks.

Table E-1. Recreation Area Type and Maximum Number of Facilities Proposed

Recreation Areas	Components
Stone Corral Recreation Area Size: 235 acres Access: Stone Corral Road (new road)	50 campsites (car and recreational vehicle) 10 picnic sites (with parking at each site) Potential for a 2-lane boat-launch site Hiking trail Electricity Water 1 kiosk 10 vault toilets 35-acre overlook/interpretive
Saddle Dam Recreation Area Size: 329 acres Access: Saddle Dam Road (new road)	10 picnic sites (with parking at each site) 2 boat-launch sites (3 lanes each) Swim area (50 parking stalls) Fishing access parking (20 stalls) Hiking trails 1 kiosk 5 vault toilets
Peninsula Hills Recreation Area Size: 373 acres Access: Sites-Lodoga Road and new bridge/Peninsula Road	200 campsites (car and recreational vehicle) 1 group camp area ^a 10 picnic sites (with parking at each site) 4-lane boat launch site Hiking trail Electricity Water 1 kiosk 19 vault toilets Potential for additional boat launches
Sites Project Authority Modified Peninsula Hills Recreation Area Size: 516 acres Access: Sites-Lodoga Road and new bridge/Peninsula Road	100 campsites (car and recreational vehicle) 1 group camp area ^a 10 picnic sites (with parking at each site) Hiking trail Equestrian trails Electricity Water 1 kiosk 10 vault toilets Parking for equestrian use 2-Lane boat launch and parking area (this is outside of the Modified Peninsula Hills Recreation Area, and just off of the western end of the Sites Reservoir Sites-Ladoga Road bridge.
Antelope Island Recreation Area Size: 49 acres Access: Boat-in access only from Stone Corral or Lurline Headwaters boat ramps.	12 campsites (boat-in) Hiking trails 1 vault toilet
Lurline Headwaters Recreation Area Size: 219 acres Access: From Sulphur Gap Road to Lurline Road	50 campsites (car and recreational vehicle) 3 group camp areas ^a 10 picnic sites (with parking at each site) Fishing access parking (10 stalls) Hiking trails 1 kiosk 8 vault toilets

^a Each group camp area would accommodate up to 24 people.

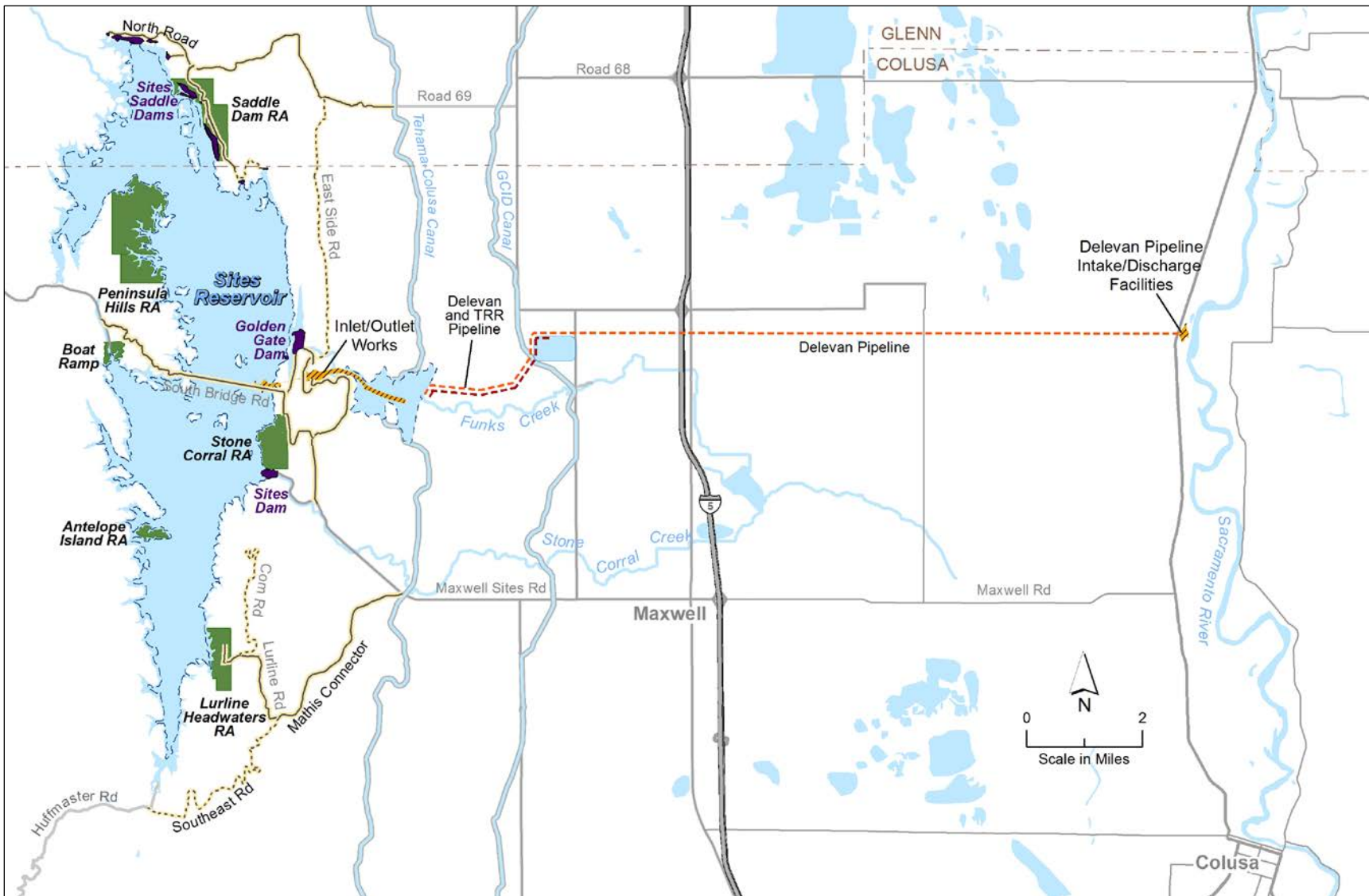


Figure E-2. Proposed Recreation Areas at Sites Reservoir

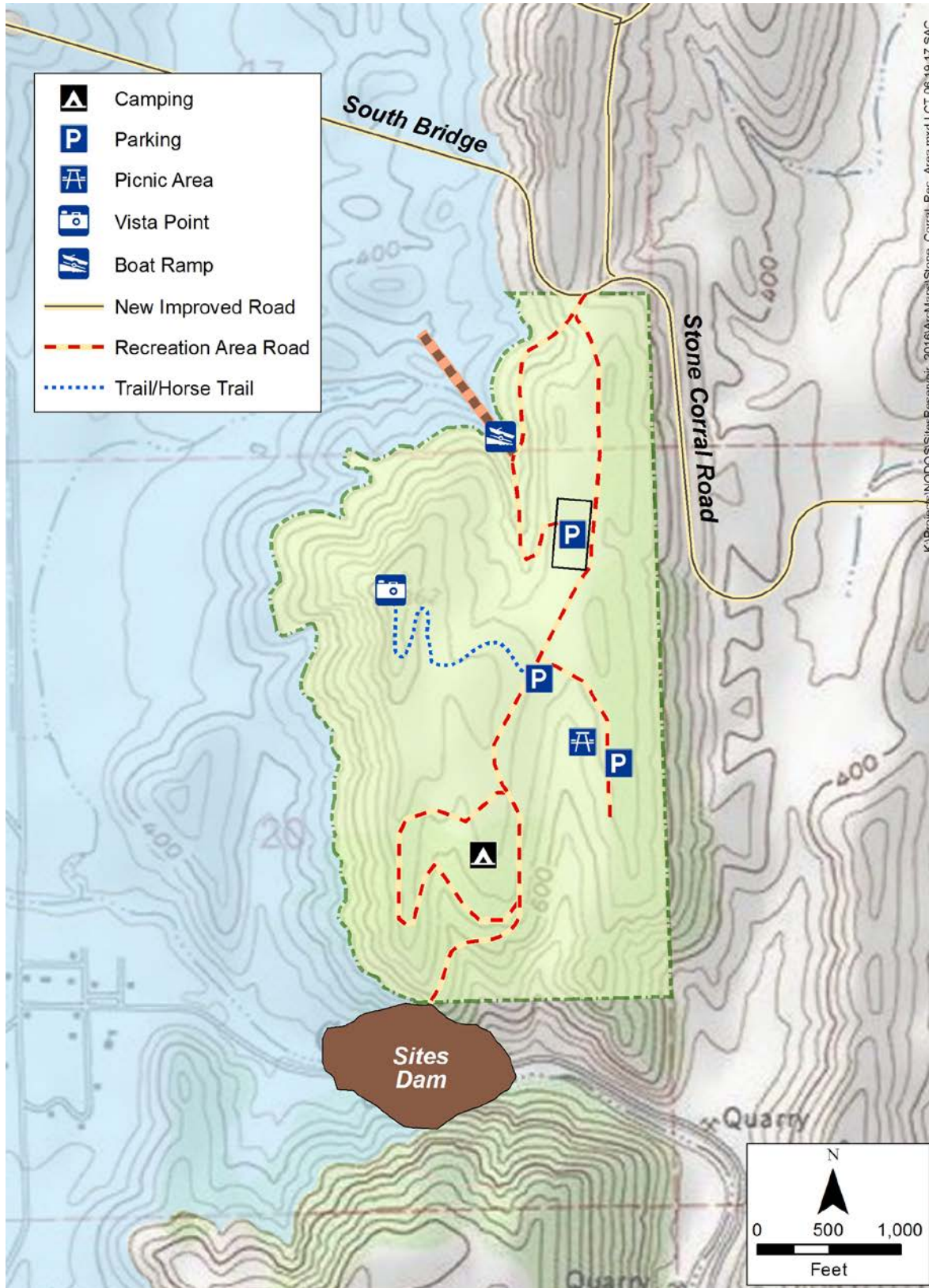


Figure E-3. Stone Corral Recreation Area

Saddle Dam Recreation Area

The Saddle Dam Recreation Area (see Figure E-4) is a 329-acre site north of the Stone Corral Recreation Area. It is the first recreation area visitors from the north would encounter. Included in previous planning descriptions are restroom facilities, swimming and fishing access, parking, electricity for road lighting, and a kiosk with interpretive elements. The proposed Saddle Dams Recreation Area would be on the northeastern side of the reservoir. Access would be provided from the proposed North Road via the proposed Saddle Dam Road, which would be relocated and widened.

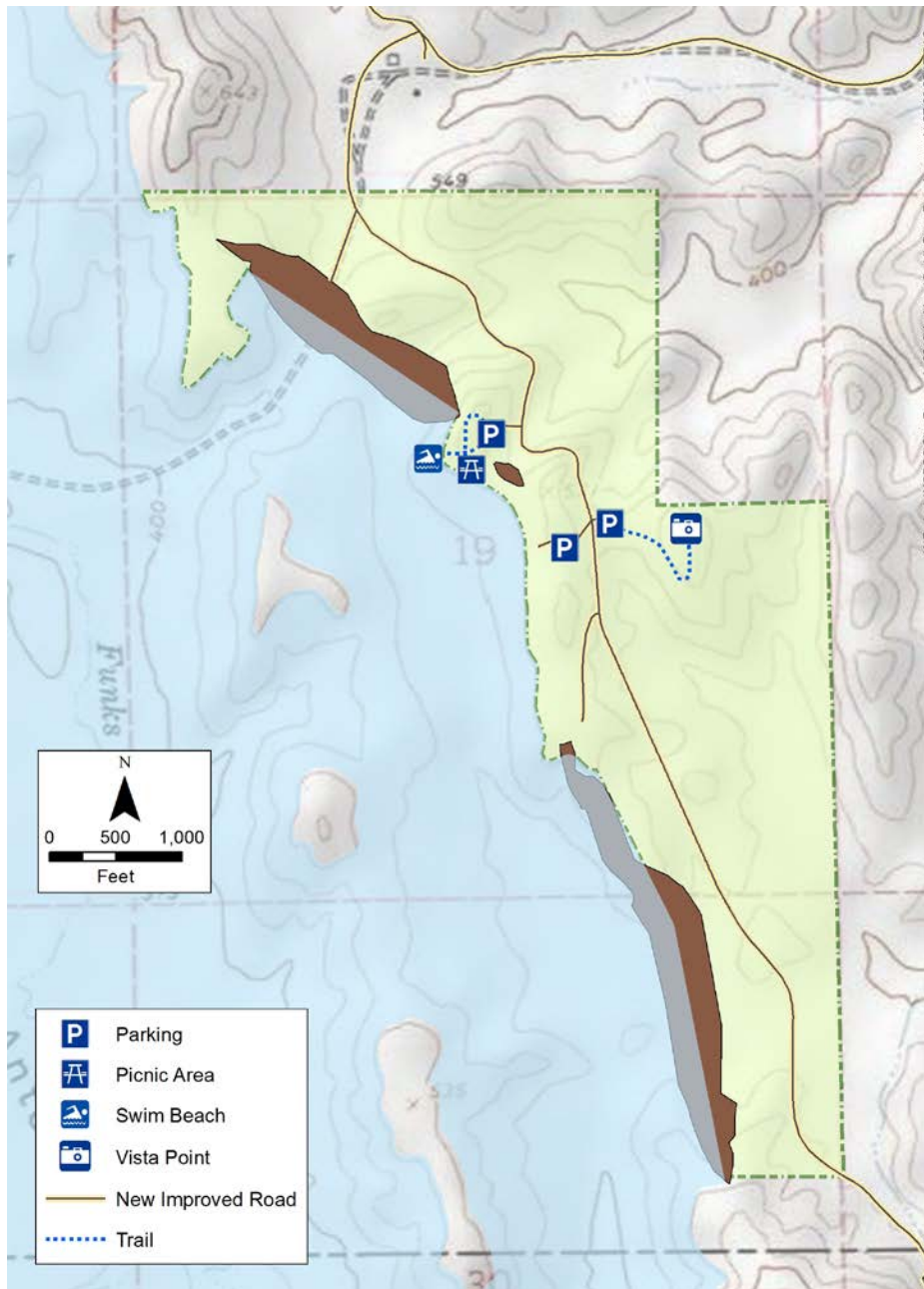


Figure E-4. Saddle Dam Recreation Area

Peninsula Hills Recreation Area

The proposed Peninsula Hills Recreation Area is an approximately 373-acre recreation area on the northwestern side of Sites Reservoir, on a peninsula that would form after inundation of Antelope Valley (see Figure E-5). Previous planning documentation included a large campground with more than 200 sites, several discrete loops, and some group facilities, as well as a four-lane boat ramp. The proposed recreation area would be to the north of the existing Sites-Lodoga Road, and directly across the reservoir from Saddle Dam Recreation Area. Access would be provided from Sites-Lodoga Road and new bridge via the proposed Peninsula Road. The proposed recreation area would be characterized by small coves and peninsulas that are sheltered from northern winds, and would provide excellent opportunities for fishing and hiking. Two small islands near the shoreline would also be created, and would add to the unique qualities of this area.

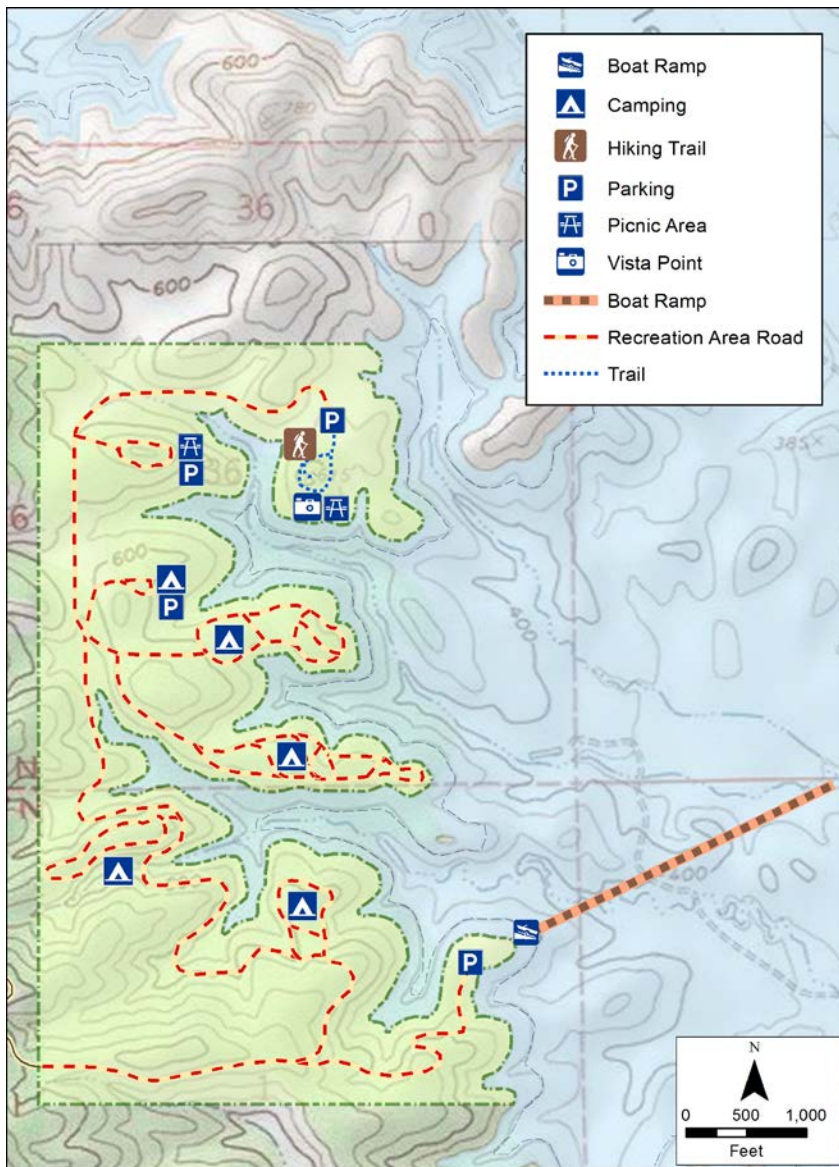


Figure E-5. Peninsula Hills Recreation Area

Sites Project Authority Modified Peninsula Hills Recreation Area

The proposed Modified Peninsula Hills Recreation Area, developed by the Authority, is an approximately 516-acre recreation area on the northwestern side of Sites Reservoir, on a peninsula that would form after inundation of Antelope Valley. Previous planning documentation included a large campground with more than 100 sites, several discrete loops, and some group facilities (see Figure E-6). The proposed recreation area would be to the north of the existing Sites-Lodoga Road, and directly across the reservoir from Saddle Dam Recreation Area. Access would be provided from Sites-Lodoga Road and new bridge via the proposed Peninsula Road. The proposed recreation area would be characterized by small coves and peninsulas that are sheltered from northern winds, and would provide excellent opportunities for fishing and hiking. Additionally, to be consistent with past and current use of this area, this recreation area includes equestrian trails and parking for equestrian users. Two small islands near the shoreline would also be created, and would add to the unique qualities of this area.

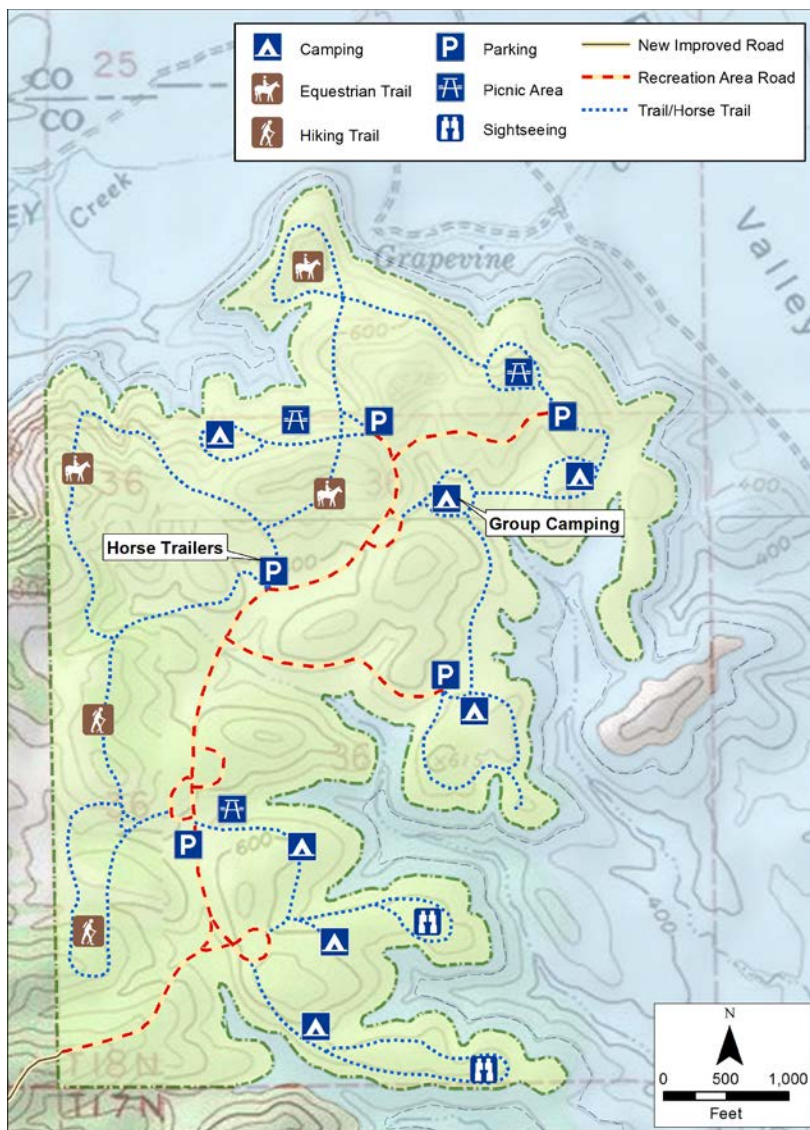


Figure E-6. Sites Project Authority Modified Peninsula Hills Recreation Area

The Authority is considering the installation of a separate boat-launch facility approximately 2 miles south of this recreation area, with access to the reservoir south of Sites-Lodoga Road. This facility would provide the same accommodations for boat launch and parking as cited in the Peninsula Hills recreation area described previously.

Antelope Island Recreation Area

The Antelope Island Recreation Area is a 50-acre site accessible only by water in the southwestern portion of the reservoir (see Figure E-7). Antelope Island would be the largest island formed by inundation of the Sites Reservoir area. Once completed, access to Antelope Island would be by water only; however, a temporary road would be built to provide construction access prior to inundation. Located off the southwestern shore, it would remain separated from the mainland until the reservoir was drawn down to approximately 470 feet. The anticipated frequency of drawdown of the reservoir is yet to be determined. The area would remain accessible by water to elevations of 380 feet; however, boat ramps would not be usable at reservoir water levels below 420 feet. This area would provide boaters with a secluded bay for camping off the mainland. The island has four distinct hilltops characterized by a mosaic of vegetation types, including manzanita, grey pine, blue oak, and seasonal grasses. Development of this area would be limited to only a few acres, and would be semi-primitive, with one restroom facility, approximately a dozen campsites, and no provided potable water supplies.

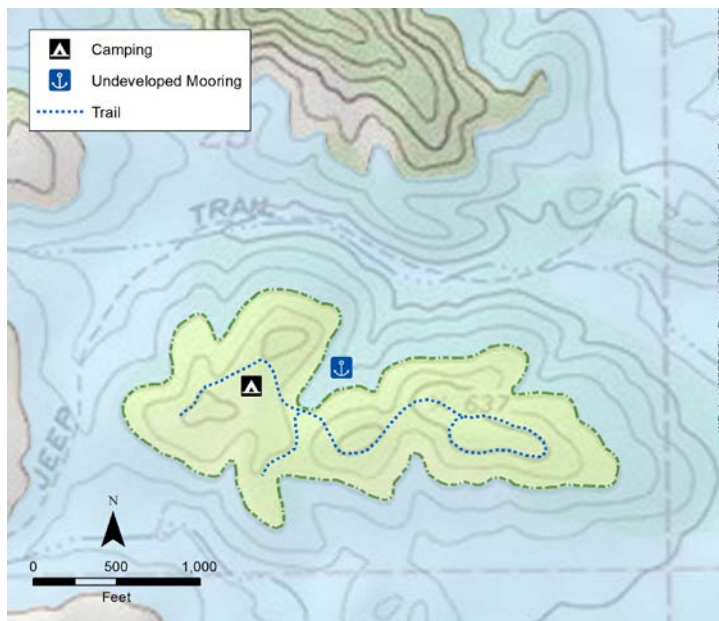


Figure E-7. Antelope Island Recreation Area

Lurline Headwaters Recreation Area

The proposed Lurline Headwaters Recreation Area is a 219-acre site on the southeastern end of Sites Reservoir (Figure E-8), in an open meadow surrounded by oak grassland along steep mountains with excellent views. The area could support both camping and day-use, and would create an opportunity for a trail to the top of an adjacent 1,282-foot (unnamed) peak that offers additional views of the reservoir. Access to this area would be provided through the proposed

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Lurline Road, and approximately 2 miles of upgrades to existing roads, to connect to the Sulphur Gap realignment of Huffmaster Road. Lurline Headwaters Recreation Area does not have any shoreline area suitable for boat-ramp development. Facilities likely would be located approximately 0.25 mile from the shoreline, because shoreline areas are generally too steep to allow construction of reasonable parking or turnaround areas. Despite limited shoreline access, Lurline Headwaters Recreation Area would be the area best suited for recreation development on the east shore. This 219-acre area contains roughly 50 acres of level land that could support approximately 50 campsites, approximately three group sites, one restroom facility, and 10 picnic units. Water supply and sanitary facilities may be required, depending on recreational needs. In addition, an existing Ranch Road could be used as a foot trail to the top of the existing unnamed 1,282-foot peak near the proposed recreation area.

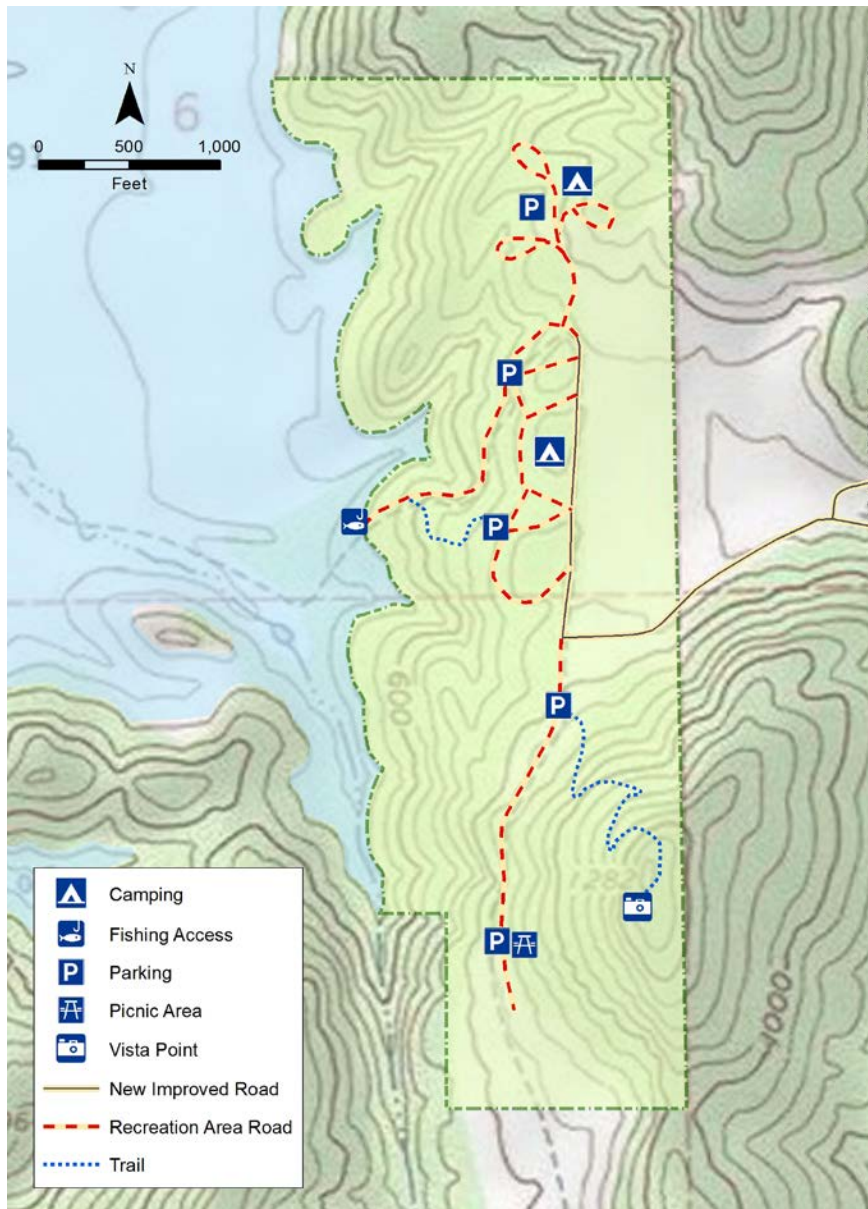


Figure E-8. Lurline Recreation Area

Basis of Analysis

The assumptions made in this document to characterize the potential recreational opportunities and benefits at Sites Reservoir include:

- The maximum design water-surface elevation of Sites Reservoir, 520 feet above mean sea level (msl), is associated with a 1.81 MAF storage capacity and is considered to be the baseline scenario.
- An alternative water elevation of 480 feet msl for Sites Reservoir represents the 1.27 MAF alternative.
- Estimates of construction, operation, and maintenance costs by alternative would be prepared as resources become available. Until these resources become available, the relative cost of developing, operating, and maintaining the recreation areas for Sites Reservoir would be assumed Low to Medium, as compared to a rural developed recreational facility.
- Specific management and maintenance requirements for the recreation areas have not been determined at this time.
- Potential environmental effects of the recreation areas were evaluated without consideration of potential mitigation measures except for avoidance.
- The reservoir's water level would fluctuate considerably during normal operations. The maintained portion of the proposed recreation area would be limited to a designated footprint above the maximum designed reservoir water elevation, and access would be provided to the reservoir.
- Recreation visitor-days (RVDs) for water use and recreation area would likely fluctuate with reservoir level.
- General recreational activities include those common to the region, and that are usually of normal quality. Normal quality refers to experiences and activities that could be found in a more common setting, such as a regular city park, but are not an extraordinary recreational experience. These activities include picnicking, camping, day-use visits, hiking, horseback riding, cycling, fishing, boating, and passive recreation.
- High-quality activities include those that are not common to the region and/or nation, and that are usually of high quality. High-quality activities refer to recreational activities that cannot be practiced at more common locations because of site or facility limitations, creating an extraordinary and memorable experience because of uniqueness of activity and the setting or beauty of the surrounding, cleanliness of water, presence of wildlife, etc.
- Likelihood of success at fishing and wildlife viewing enhance the value of a recreation site.
- Overuse may adversely affect the quality of recreational values. Major aesthetic qualities to be considered in assessing recreational opportunities include wildlife, geology and topography, water, and vegetation.

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- Factors to be considered that would lower the quality of a recreational experience include air and water pollution, pests, poor climate, and unsightly adjacent areas.
- In Figures E-2 through E-8, the scenario shown is for the 1.81 MAF reservoir capacity design.

Methodology and Selection Criteria

This section describes the methodology and selection criteria used to assess the recreation area development potential of six potential recreation areas at Sites Reservoir, and to recommend a preferred recreation area alternative. Selection criteria were applied in detail to each site for the 1.81 MAF Sites Reservoir design baseline condition, and summarized for the alternative 1.27 MAF reservoir design. Selection criteria included environmental effects, site-specific security requirements, recreation, and availability of opportunity. Selection criteria are described below. A preferred recreation area would generally be one with the highest score.

Avoidance of Environmental Effects

This environmental effect analysis assesses the potential for the conceptual recreation site designs—and potential associated recreational activities—to affect specific sensitive wildlife habitat or plant communities and cultural resources known to occur in the NODOS/Sites Reservoir Project area. This analysis does not include a detailed, project-level analysis of the potential environmental effects of construction, maintenance, or operational activities associated with the alternative recreation sites. This analysis focuses on the potential construction-related environmental effects of the development of the recreation areas' conceptual designs. Existing sensitive wildlife habitat or plant communities surrounding or near the proposed Sites Reservoir include, but are not limited to, golden and/or bald eagle nests and wetland habitat. Impact category classifications are based on the proximity of the proposed recreation sites to the existing resources, and the nature of the potential recreational activities at each site. The environmental effects rating considers significant, moderate, or minimal potential effects on existing sensitive wildlife habitat or plant communities, or cultural resources.

Active or inactive golden eagle nests are protected under the Bald and Golden Eagle Protection Act (Eagle Act) (16 United States Code [U.S.C.] 668-668c) and the Migratory Bird Treaty Act (MBTA), and are listed as a Federal and California Species of Special Concern. To comply with these acts, and for recreation area planning purposes, design and planning of recreation areas must refer and conform to the *National Bald Eagle Management Guidelines* (USFWS 2007). Pursuant to the Eagle Act, the take¹ limit for golden eagles per year is zero². Therefore, any recreation site development or recreational activities that have the potential to result in a taking of golden eagles would be classified as a High or significant adverse environmental effect.

Section 404 of the Clean Water Act regulates the discharge of dredged or fill materials into navigable waters of the United States, including wetlands: No discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment, or if the nation's waters would be significantly degraded. The United States

¹ Take means pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb.

² The take limit for bald eagles is 5 percent of their estimated annual regional productivity in each USFWS region, and therefore is less restrictive than the golden eagle take limits. As a result, this analysis focused on the more restrictive golden eagle requirements.

Environmental Protection Agency and the USACE have promulgated a number of regulations to implement the Section 404 permitting program. As described in the section titled “Basis of Analysis,” above, potential environmental effects of the recreation areas were evaluated without consideration of potential mitigation measures, except for avoidance. Therefore, the potential to affect wetlands would be considered a High or a significant adverse environmental effect.

Section 106 of the National Historic Preservation Act of 1966 requires Federal agencies to take into account the effects of their actions on historic properties, which are defined as properties that are included in the National Register of Historic Places or that meet the criteria for listing in the National Register of Historic Places, based on local, regional, or national significance. Historic properties include prehistoric and historic cultural resources, including structures, buildings, sites, districts, and objects, and traditional cultural properties, which are locations important to maintaining the cultural continuity of a contemporary American Indian community. Similar State regulations for cultural resources that are listed on or eligible for listing in the California Register of Historical Resources are found under Section 5024.5 of the California Public Resources Code. Any recreation site development or recreational activity that has the potential to negatively affect historic properties would be classified as having a High or adverse effect.

Security Requirements

The Low score for security requirements corresponds to an elevated level of security requirements associated with critical infrastructure such as dams, as required by the Department of Homeland Security, and therefore, a high level of effort to comply with the security requirements. The moderate score refers to a moderate level of security or setback requirements associated with water supply infrastructure, such as inlet or outlet works. The High score refers to a low-level security requirement in areas that would adequately set back from any structures.

Recreation

The recreational challenges criterion evaluated various factors such as the degree of visitor presence, visitor concentration, recreational diversity, visitor comforts, solitude and remoteness, and non-recreational use. Non-recreational use or passive recreational uses include experiencing open space in its natural setting. A Low score refers to a greater number of challenges to be overcome to develop proposed sites with minimal or no potential recreational opportunities. The Medium category refers to a moderate level of recreational opportunities and moderate challenges to develop recreational opportunities. The Low category refers to a greater level of desired visitor concentration, recreational diversity, and visitor comforts, facility design, and amenities, as well as the naturally occurring elements, such as shade by trees, exposure and microclimates, and views.

Economic Opportunities

The economic opportunities for a site were scored by comparing the economic benefits, based on recreational use, relative to the potential associated costs of developing, operating, and maintaining a recreational facility. The Low score refers to a low number of RVDs compared to the scope of developing, operating, and maintaining the recreation area. An RVD is defined as one person recreating for 12 hours, 12 people recreating for 1 hour, or any equivalent combination. The moderate score refers to a moderate number of RVDs compared to the cost of developing and maintaining the recreation area, but provides opportunities for facility expansion

to meet future needs. A high score refers to a high number of RVDs compared to the cost of developing and maintaining the recreation area. The assumed number of visitors per year is based on the Sites Reservoir potential to support an average of approximately 410,000 RVDs per year (DWR 2000), which is assumed to be a medium-high number, as compared to the range of reservoir sizes and visitation level of existing regional facilities such as Black Butte Lake and Folsom Lake. The availability of opportunity limitations are tabulated to consider access to the recreational experience, availability of opportunity, carrying capacity, accessibility, and environmental quality.

The recreational potential of each proposed recreation area is assessed based on a 1.81 MAF reservoir with a maximum water surface elevation of 520 feet msl (i.e., the baseline reservoir alternative). Each recreation area alternative is assessed in the section titled “Recreation Area Evaluation,” below.

E.3 Recreation Area Evaluation

This section includes the evaluation of the six recreation areas based on the criteria included in the section titled “Methodology and Selection Criteria,” above.

Stone Corral Recreation Area

The proposed Stone Corral Recreation Area is along the east-central perimeter of the proposed Sites Reservoir (Table E-2, Figure E-3).

Potential Environmental Effects

The proposed Stone Corral Recreation Area boundaries are within 0.5 mile of active and/or inactive golden eagle nests. The presence of active golden eagle nests may impose stringent requirements on the types and degree of development and use in this area, and any proposed developments on this site could result in a high level of potential adverse environmental effect on sensitive raptors. Proposed activities that are part of the development of this recreation site may fall under the *National Bald Eagle Management Guidelines* Category F, “Non-motorized recreation and human entry” (USFWS 2007), and accessibility to these areas may be restricted. If proposed recreational activities would be visible or highly audible from an active nest site, per the Eagle Act (16 U.S.C. 668–668c) and the MBTA, a 330-foot-radius restrictive buffer zone may be required during the breeding season, particularly where eagles are unaccustomed to such activities. No known alkali wetlands or sensitive cultural resources are located within the proposed Stone Corral Recreation Area boundaries. However, given the potential to affect nesting golden eagles, the potential for adverse environmental effects would be Medium.

Table E-2. Stone Corral Recreation Area Economic Benefits Assessment

Proposed Criteria	Proposed Elements	Existing Facilities/ Baseline	Future Use/ Outcome	Potential Future Value	Average Score
Recreational Experience	Numerous quality value activities; some general activities.	1 point – Some general private recreational activities, and no public recreational experience.	Overnight camping Day-use visitors Potential Boating Fishing Hiking Picnicking Swimming Viewing Educational	3 points – Visitor hours, cultural and natural history, wildlife, water and land recreation.	2
Availability of Opportunity	50 campsites 10 picnic sites 2-lane boat-launch site Hiking trail Swimming area Electricity Water Interpretive kiosk Interpretive signage 10 vault toilets Overlook Parking Native tree planting	2 points – Several within 1-hour travel time; East Park Reservoir and Delevan National Wildlife Refuge are the only available recreational opportunities within 30-minute travel time.	Overnight camping Day-use visitors Boating Fishing Hiking Picnicking Swimming Viewing Educational	3 points – No anticipated competition with other comparable regional recreational facilities.	3
Carrying Capacity	The high recreation area acreage can accommodate the proposed recreation elements.	1 point – No facility development for public recreation.	Dispersed over several spaces within total recreation area.	3 points – Expansive recreation areas and water facility.	2
Accessibility	Good access; good roads to site; good roads within site; upgraded jeep trail (Stone Corral Road); approximately 6 miles from Interstate 5	2 points – Fair access; poor-quality roads to site; limited access within site; accessible via Maxwell Road; approximately 6 miles from Interstate 5.	Camping and day-use visitors	3 points – Access road improvements needed.	3
Environmental Quality	Proposed roads, preservation of existing natural resources within project scope	3 points – Above average aesthetic quality; ridgeline with existing oak woodland and magnificent views of surrounding area and dam site.	Associated with camping, day-use, boating, and hiking.	3 points – Excellent existing natural resources within project scope.	3
Overall					3

Potential Security Requirements

This proposed recreation area would pose a Medium level of security requirements because of its relative proximity to the proposed Sites and Golden Gate Dams. Security measures that could be implemented to discourage public access to the dam sites include:

- No pathways between the edge of the proposed recreation area and the dams.
- Appropriate setbacks, and visible fencing and signage to deter people from wandering too close to the dams.

Potential Recreational Challenges

This proposed recreation area would have a rural, developed recreational setting; would be patrolled by ranger or other security; and would provide emergency phone service. Proposed recreational opportunities might include an overlook site offering excellent views of the surrounding area and the dam sites, campsites, shoreline fishing, picnicking, non-supervised swimming, hiking, and parking facilities. The plans also include a location for a potential boat ramp that could be added depending on the level of interest. These diverse recreational opportunities at this site would expand the overall number and diversity of recreational opportunities in the region. The regional system comprises water recreational opportunities within 200 miles of the proposed Sites Reservoir, including three large lakes (Shasta Lake, Folsom Lake, and Lake Oroville), and four smaller reservoirs in the eastern foothills of the Coast Range (Black Butte Lake, Stony Gorge Reservoir, East Park Reservoir, and Indian Valley Reservoir).

Stone Corral Recreation Area would have Medium recreational challenges, compared to the other proposed Sites Reservoir recreation areas, based on its higher degree of visitor presence, visitor concentration, recreational diversity, visitor comforts, and passive recreational use. The proposed Stone Corral Recreation Area site would have good access to Interstate 5, which serves as the primary north/south transportation corridor through the Sacramento Valley for major population centers in the region.

Potential Economic Opportunities

The proposed Stone Corral Recreation Area would offer a variety of recreation, and likely would attract the largest number of visitors compared to the other proposed recreation areas. The Stone Corral Recreation Area features have the potential to foster return visits because of its good access to Interstate 5, which ultimately may generate revenue to sustain a portion of the operation, maintenance, and replacement costs for the recreation site.

The potential economic opportunities of this recreation area alternative are High, based on various criteria such as recreational experience, availability of opportunity, carrying capacity, accessibility, and environmental quality.

Saddle Dam Recreation Area

The proposed Saddle Dam Recreation Area was not preferred for initial development because of distance from the main access road and bridge, and cost of providing accessibility, presence of sensitive wetland habitat and cultural resources, and reduced water accessibility and boat-ramp facilities development feasibility with the Saddle Dam alignment. The economic opportunities of this area were assessed to be High. Various considerations and evaluations to support this determination are provided below and summarized in Table E-3.

Potential Environmental Effects

The Saddle Dam Recreation Area has alkali wetlands that may be affected by proposed development. Wetlands are regulated by Federal and State law (Clean Water Act, Section 404). The ecological processes maintaining an alkali wetland are the dynamics between water inflow and evaporation (State of Washington 2005). There is a risk that the ecosystem may be affected if discharges are allowed into alkali wetlands. However, the recreational area may be developed around the alkali wetlands to minimize the environmental effects. In addition, there are sensitive

cultural resources in the vicinity that are protected by Federal and State law (National Historic Preservation Act of 1966, Section 106). The environmental effects for this recreational area are deemed High.

Table E-3.Saddle Dam Recreation Area Economic Benefits Assessment

Proposed Criteria	Proposed Elements	Existing Facilities/ Baseline	Future Use/ Outcome	Potential Future Value	Average Score
Recreational Experience	Numerous valuable activities; some general activities.	2 points – Some general recreational activities, and no public recreational experience.	Day-use visitors Boating Fishing Hiking	2 points – Visitor hours, water and land recreation, lack of shade throughout area.	2
Availability of Opportunity	10 picnic sites 12-lane boat-launch site Hiking trails Fishing access Electricity Kiosk 5 vault toilets Parking Designated swim area	2 points – Several within 1-hour travel time; East Park Reservoir and Delevan National Wildlife Refuges within 30-minute travel time.	Day-use visitors Boating Fishing Hiking Swimming	3 points – No anticipated competition with other comparable regional recreational facilities.	3
Carrying Capacity	Optimum facilities to conduct activity at site potential.	1 point – No facility development for public recreation and health and safety.	Dispersed over several spaces within recreation area.	3 points – Expansive recreation areas and water facility.	2
Accessibility	Good access; good roads to site; good roads within site; proposed Saddle Dam Road.	1 point – Limited access by any means to site or within site.	Camping and day-use visitors.	2 points – Access road improvements needed.	2
Environmental Quality	Proposed roads, preservation of existing natural resources within project scope.	2 points – Above-average aesthetic quality if implementing additional trees and planting.	Associated with camping, day-use, boating, and hiking.	2 points – Landscape has not as much variation, and needs shade.	2
Overall					2

Potential Security Requirements

This area would pose an elevated level of security requirements because of its close proximity to the proposed saddle dams. The high security requirements may cause recreational opportunities to be infeasible at this site.

Potential Recreational Challenges

This area is proposed to have a rural developed recreational setting. The recreational opportunities proposed for this area may include contact recreation, such as swimming and waterskiing, parking areas, boat ramps, and opportunities for facility expansion to meet potential future needs. The potential recreational challenges are deemed High because of difficult water accessibility during low water level conditions.

Potential Economic Opportunities

This is the only proposed recreation site that may facilitate contact water recreation, such as swimming and waterskiing. This area would be the first recreation area encountered for visitors arriving from the north. The topography in this area would support the construction of the largest

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boat ramp and support facilities, and is expansive enough to accommodate a 12-lane ramp (two three-lane ramps are recommended).

Peninsula Hills Recreation Area

The proposed Peninsula Hills Recreation Area was not preferred for initial development because of distance from the main access road and bridge; cost of providing accessibility; presence of a golden eagle nest within the footprint of the recreation area; and reduced water accessibility and boat ramp facilities development feasibility due to steep slopes. The economic opportunities of this area were assessed to be Medium. Various considerations and evaluations to support this determination are provided below and summarized in Table E-4.

Table E-4. Peninsula Hills Recreation Area Economic Benefits Assessment

Proposed Criteria	Proposed Elements	Existing Facilities/ Baseline	Future Use/ Outcome	Potential Future Value	Average Score
Recreational Experience	Numerous high-quality value activities; some general activities.	2 points – Some general recreational activities, and no public recreational experience.	Overnight camping Day-use visitors Boating Fishing Hiking Viewing	3 points – Visitor hours, water and land recreation.	3
Availability of Opportunity	200 campsites Group area 10 picnic sites 4-lane boat-launch site Hiking trails and loops Water Electricity Kiosk 19 vault toilets Parking	2 points – Several within 1-hour travel time; none within 30-minute travel time.	Day-use visitors Boating Fishing Hiking	2 points – Lack of shade throughout the area, no anticipated competition with other comparable regional recreation facilities.	2
Carrying Capacity	Optimum facilities to conduct activity at site potential.	1 point – No facility development for public recreation and health and safety.	Largest campground and multi-use facility.	3 points – Expansive recreational areas and water facility.	2
Accessibility	Good access; good roads to site; good roads within site; Sites-Lodoga/ Peninsula Road.	1 point – Limited access by any means to site or within site.	Camping and day-use visitors.	2 points – Bridge needed	2
Environmental Quality	Proposed roads, preservation of existing natural resources within project scope.	3 points – Above-average aesthetic quality; magnificent views of reservoir.	Associated with camping, day-use, boating, and hiking.	3 points	3
Overall					2

Potential Environmental Effects

The proposed Peninsula Hills Recreation Area has active or inactive golden eagle nests, which are protected by both the Eagle Act and the MBTA. To comply with these acts, and for recreation area planning purposes, design and planning of the recreation areas must refer and

conform to the *National Bald Eagle Management Guidelines* (USFWS 2007) as developed by the United States Fish and Wildlife Service (USFWS).

The presence of active golden eagle nests may pose stringent requirements on the degree of development in this area. Pursuant to the Eagle Act, the take limit for golden eagles per year is zero. As a result, any proposed developments on this site may cause a high level of potential environmental effect. Proposed activities that are part of the development of this recreation site may fall under the National Bald Eagle Management Guidelines' Category F, "Non-motorized recreation and human entry" (USFWS 2007). If proposed activities would be visible or highly audible from a nest, a 330-foot buffer during the breeding season may be required, particularly where eagles are unaccustomed to such activities.

Potential Security Requirements

The proposed bridge structure across the Sites Reservoir would be in close proximity to the inlet/outlet facilities associated with the reservoir.

Potential Recreational Challenges

This area is proposed to have a rural-developed to rural-natural recreational setting. The recreational facilities offered by this area may include large boat ramps, a large campground with as many as 200 sites, and parking spaces. The proposed bridge may offer opportunities for excellent views of the surrounding area and the dam, and would improve accessibility to the recreation area.

Potential Economic Opportunities

The economic opportunities of this area were assessed to be Medium. Key features include a large camping area, and boat ramps to support activity on the lake.

Sites Project Authority Modified Peninsula Hills Recreation Area

The modified location and facilities for Peninsula Hills Recreation Area is the locally preferred version of the Peninsula Hills Recreation Area. Similar to the previous Peninsula Hills recreation area, the economic opportunities of this area were assessed to be Medium. Various considerations and evaluations to support this determination are provided below and summarized in Table E-5.

Potential Environmental Effects

The Authority's proposed Peninsula Hills Recreation Area has active or inactive golden eagle nests, which are protected by both the Eagle Act and the MBTA. To comply with these acts, and for recreation area planning purposes, design and planning of the recreation areas must refer and conform to the *National Bald Eagle Management Guidelines* (USFWS 2007), as developed by the USFWS.

The presence of active golden eagle nests may pose stringent requirements on the degree of development in this area. Pursuant to the Eagle Act, the take limit for golden eagles per year is zero. As a result, any proposed developments on this site may cause a high level of potential environmental effect. Proposed activities that are part of the development of this recreation site may fall under the National Bald Eagle Management Guidelines' Category F, "Non-motorized recreation and human entry." If proposed activities would be visible or highly audible from a

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nest, a 330-foot buffer during the breeding season may be required, particularly where eagles are unaccustomed to such activities.

Potential Security Requirements

The proposed bridge structure across the Sites Reservoir would be in close proximity to the inlet/outlet facilities associated with the reservoir.

Potential Recreational Challenges

This area is proposed to have a rural-developed to rural-natural recreational setting. The recreational facilities offered by this area may include equestrian trails and parking, a large campground with as many as 100 sites, and parking spaces. The proposed bridge may offer opportunities for excellent views of the surrounding area and the dam, and improve accessibility to the recreation area.

Table E-5. Sites Project Authority Modified Peninsula Hills Recreation Area Economic Benefits Assessment

Proposed Criteria	Proposed Elements	Existing Facilities/ Baseline	Future Use/ Outcome	Potential Future Value	Average Score
Recreational Experience	Numerous high-quality value activities; some general activities.	2 points – Some general recreational activities, and no public recreational experience.	Overnight camping Day-use visitors Equestrian Fishing Hiking Viewing	3 points – Visitor hours, water and land recreation.	3
Availability of Opportunity	100 campsites Group area 10 picnic sites Hiking trails and loops Equestrian use Water and Electricity Kiosk 10 vault toilets Parking	2 points – Several within 1-hour travel time; none within 30-minute travel time.	Day-use visitors Horse riding Fishing Hiking	3 points – Lack of shade throughout the area, no anticipated competition with other comparable regional recreation facilities. Provides equestrian activities not available at other recreation areas.	3
Carrying Capacity	Optimum facilities to conduct activity at site potential.	1 point – No facility development for public recreation and health and safety.	Largest campground and multi-use facility.	3 points – Expansive recreation areas and water facility.	2
Accessibility	Good access; good roads to site; good roads within site; Sites-Lodoga/ Peninsula Road.	1 point – Limited access by any means to site or within site.	Camping and day-use visitors.	2 points – Bridge needed	2
Environmental Quality	Proposed roads, preservation of existing natural resources within project scope.	3 points – Above-average aesthetic quality; magnificent views of reservoir.	Associated with camping, day-use, boating, and hiking.	3 points	3
Overall					3

Potential Economic Opportunities

The economic opportunities of this area were assessed to be Medium. Key features include a large camping area and unique horseback riding opportunities to support activity on the lake.

Antelope Island Recreation Area

The proposed Antelope Island Recreation Area was preferred for initial development. The protection of existing vegetation would limit the number of available campsites. Although the distance from the main access road and bridge is lengthy, it would have scenic qualities. The cost of providing accessibility to the island is High, and potable water would be unavailable. The construction of boat-ramp facilities would be challenging. Various considerations and evaluations to support this determination are provided below and summarized in Table E-6.

Table E-6. Antelope Island Recreation Area Economic Benefits Assessment

Proposed Criteria	Proposed Elements	Existing Facilities/ Baseline	Future Use/ Outcome	Potential Future Value	Average Score
Recreational Experience	Medium – A few quality value activities; some general activities.	2 points – Some general recreational activities, and no public recreational experience.	Overnight camping Boating Fishing Hiking Viewing	2 points – Secluded location, natural and exclusive character; likely low use, low number of visitors served, and minimal facilities and activity opportunities offered.	2
Availability of Opportunity	12 campsites Hiking trails 1 vault toilet	1 point – No similar opportunity within 2-hour travel time.	Boating Fishing	1 point – Small area does not allow for many larger-scale opportunities.	1
Carrying Capacity	Optimum facilities to conduct activity at site potential.	1 point – No facility development for public recreation and health and safety.	Small natural campground, only accessible via water	2 points – Smaller useable area, more difficult to reach.	2
Accessibility	Limited access by any means to site or within site.	1 point – Limited access by any means to site or within site.	Camping and boating	1 point – Accessible only via water.	1
Environmental Quality	Preservation of existing natural resources within project scope.	Medium aesthetic quality; some natural environment.	Associated with camping, day-use, boating, and hiking	1 point	1
Overall					1

Potential Environmental Effects

The proposed Antelope Island Recreation Area would be on an island that would be created during construction of the reservoir. This site has no notable cultural or environmental concerns.

Potential Security Requirements

This area would be a large, natural area accessible only through water, and would be far from any dams or other structures.

Potential Recreational Challenges

This area is proposed to have a semi-primitive recreational setting. This area would offer boaters a secluded bay for camping off the mainland. The island has four distinct hilltops characterized by a mosaic of vegetation types, including Manzanita, grey pine, blue oak, and seasonal grasses. The area may have a few campsites; however, the island's primitive setting offers few visitor comforts, and the island's degree of solitude and remoteness may deter or attract visitors.

Potential Economic Opportunities

Because the island is in the Sites Reservoir, the development of this area would not require any additional acquisition of land. The island is proposed to be maintained in a primitive condition, with development limited to a few acres. The island offers a lot of natural resources, and a natural ambiance would dominate. Development of this area is deemed High because of likely low use, low number of visitors served, and minimal facilities and activity opportunities offered.

Lurline Headwaters Recreation Area

The proposed Lurline Headwaters Recreation Area was not preferred for initial development because of distance from the main access road and bridge, and cost of providing accessibility; presence of a golden eagle nest; and reduced potable water accessibility, and boat-ramp facilities development feasibility (there is no suitable boat ramp at this recreation area). The economic benefits of this area are Medium. Various considerations and evaluations to support this determination are provided below and summarized in Table E-7.

Potential Environmental Effects

The proposed Lurline Headwaters Recreation Area has active or inactive golden eagle nests, which are protected by both the Eagle Act and the MBTA. To comply with these acts, and for recreation area planning purposes, design and planning of the recreation areas must refer and conform to the *National Bald Eagle Management Guidelines* (USFWS 2007), as developed by the USFWS.

The presence of active golden eagle nests may pose stringent requirements on the degree of development in this area. Pursuant to the Eagle Act, the take limit for golden eagles per year is zero. As a result, any proposed developments on this site may cause a High level of potential environmental effect. Proposed activities that are part of the development of this recreation site may fall under the National Bald Eagle Management Guidelines' Category F, "Non-motorized recreation and human entry." If proposed activities would be visible or highly audible from a nest, a 330-foot buffer during the breeding season may be required, particularly where eagles are unaccustomed to such activities. In addition, there are potential sensitive cultural resources in the vicinity that are protected by Federal and State law (Section 106 of the National Historic Preservation Act of 1966). The environmental effects for this recreation area are deemed High.

Potential Security Requirements

This area would have a rural-natural to semi-primitive setting. This area would be far from any dams or other structures, and would have minimal security requirements.

Table E-7. Lurline Headwaters Recreation Area Economic Benefits Assessment

Proposed Criteria	Proposed Elements	Existing Facilities/ Baseline	Future Use/ Outcome	Potential Future Value	Average Score
Recreational Experience	Numerous high-quality value activities; some general activities.	1 point – Some general recreational activities, and no public recreational experience.	Overnight camping Day-use visitors Fishing Hiking Viewing Educational	2 points – Visitor hours, cultural and natural history, wildlife, water and land recreation.	2
Availability of Opportunity	50 campsites 3 group camp areas 10 picnic sites Fishing access Hiking trail Interpretive kiosk 8 vault toilets Parking	2 points – Several within 1-hour travel time; none within 30-minute travel time.	Overnight camping Day-use visitors Fishing Hiking Viewing	2 points – No anticipated competition with other comparable regional recreational facilities.	2
Carrying Capacity	Medium facilities to conduct activity at site potential – low boat-ramp potential.	1 point – No facility development for public recreation or health and safety.	Dispersed over several spaces within recreation area.	3 points – Expansive recreation areas and water facility.	2
Accessibility	Good access; good roads to site; good roads within site; Sulphur Gap Road to Lurline Road.	2 points – Fair access; poor-quality roads to site; limited access within site; accessible via Maxwell Road; approximately 6 miles from Interstate 5.	Camping and day-use visitors.	1 point – Access road improvements needed, steep slopes do not support boat ramp.	2
Environmental Quality	Proposed roads, preservation of existing natural resources within project scope.	3 points – Above-average aesthetic quality;	Associated with camping, day-use, boating, and hiking.	3 points	3
Overall					2

Potential Recreational Challenges

This area is proposed to have a rural-natural recreational setting. Although far away from any developments, the area allows various views of the reservoir. The area could support both camping and day-use, and would create an opportunity for a trail to the top of an adjacent peak offering additional views of the reservoir. This area might accommodate 50 campsites and 10 picnic units, despite limited or no shoreline access. The Lurline Headwaters Recreation Area does not have any shoreline area suitable for boat-ramp development, as indicated in DWR's (2000) *North of Delta Offstream Storage Investigation Draft Progress Report*; however, an existing ranch road might serve as a foot trail (DWR 2000).

Potential Economic Opportunities

Access to this area would involve upgrading 2 miles of existing roads to connect to the Sulphur Gap realignment of Huffmaster Road. The economic benefits of this area are Medium.

Summary of Recreation Site Analysis

The proposed Sites Reservoir would offer opportunities for six recreation development areas at different locations along the perimeter of the reservoir. Each of the recreation areas was evaluated using the selection criteria for two reservoir-level scenarios: a 1.81 MAF alternative (maximum water surface elevation of 520 feet), and a 1.27MAF alternative (maximum water surface elevation of 473 feet).

Stone Corral, Modified Peninsula Hills, and Lurline Headwaters are recommended for potential development. Table E-8 summarizes the recreation site analysis. It was found that when comparing the results for the two reservoir-level scenarios, the potential environmental effects, security requirements, recreational challenges, and economic opportunities of the recreation areas are similar.

Based on the existing topography, the recommended recreation areas could support the proposed planning and site features, and can be situated at the lower elevation adjacent to the water. This analysis assumes that potential planning measures could be incorporated into recreation area design development to avoid any environmental effects associated with potential golden eagles in the vicinity.

E.4 Conclusion

The inclusion of new recreation sites into the Sites Reservoir alternatives is described below.

Alternatives A, B, and C

Stone Corral, Lurline Headwaters, and Antelope Island were selected for inclusion in these three alternatives. Stone Corral is the closest to Maxwell Road off of Interstate 5, and the most accessible of the recreation areas, with its location immediately to the south of the new bridge. Stone Corral would be immediately constructed for public use. Lurline Headwaters is proposed as a second phase of these alternatives, and would be implemented if and when there is sufficient interest in additional recreation. Antelope Island would be similarly implemented as a potential third phase.

Table E-8.Recreation Area Assessment

NODOS Project Recreation Site Options		Selection Criteria				
		Environmental Effects	Security Requirements	Recreation	Economic Opportunities	Total
Stone Corral (235 acres)	Level	2	2	3	3	10
	Status	Selected with potential planning measures to comply with the Bald and Golden Eagle Act.				
Saddle Dam (329 acres)	Level	1	2	2	2	7
	Status	Not selected because of distance from the main access road and bridge and cost of providing accessibility; presence of sensitive wetland habitat and cultural resources; and reduced water accessibility and boat-ramp facilities development feasibility with the Saddle Dams alignment.				
Peninsula Hills (373 acres)	Level	1	2	2	2	7
	Status	Not selected because of cost of providing accessibility, presence of golden eagle within the footprint of the recreation area, and reduced water accessibility due to steep slopes (does not include adjoining boat ramp).				
Modified Peninsula Hills (516 acres)	Level	1	2	3	3	9
	Status	Selected because of improved accessibility to main access road and bridge, and potential for an adjoining boat ramp for improved water accessibility. However, there is potential presence of golden eagle within or near the footprint of the recreation area.				
Antelope Island (50 acres)	Level	3	3	1	1	8
	Status	Selected as alternate because of low economic benefits of this area. The area has restricted numbers of available campsites; a lengthy distance from the main access road and bridge, which may provide scenic qualities; associated cost of providing accessibility to the island; and reduced water accessibility.				
Lurline Headwaters (219 acres)	Level	1	3	2	2	8
	Status	Selected because of distance from the main access road and bridge, and cost of providing accessibility; presence of golden eagle; and reduced water accessibility and boat-ramp facilities development feasibility.				

NODOS = North-of-the-Delta Offstream Storage

Alternative D

Alternative D is the Locally Preferred Alternative, developed by the Authority. The most likely operator/maintainer for the recreation facilities is Authority member Colusa County. Colusa County prefers the development of two recreation areas: Stone Corral, and a modified Peninsula Hills recreation site with a nearby boat ramp on the existing Sites-Lodoga Road. Both locations are readily accessible at the eastern and western ends of the new bridge. Horseback riding would likely be emphasized at both locations, due to historical interest in horseback riding in this area. This alternative would include a total of two, 2-lane boat ramps (one on the eastern side of the reservoir and one on the western side). Water-surface elevations would fluctuate somewhat less under Alternative D operations.

These recreation areas could potentially be developed and commissioned in a phased approach to match recreational interest at Sites Reservoir. Should recreational use remain low, only the Stone Corral Recreation Area and west side Boat Ramp would be constructed.

E.5 References

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Acronyms and Abbreviations

Authority	Sites Project Authority
BLM	Bureau of Land Management
CVP	Central Valley Project
DWR	California Department of Water Resources
Eagle Act	Bald and Golden Eagle Protection Act
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
MAF	million acre-feet
MBTA	Migratory Bird Treaty Act
msl	mean sea level
NODOS	North-of-the-Delta Offstream Storage
OHV	off-highway vehicle
PG&E	Pacific Gas and Electric Company
Reclamation	United States Department of the Interior, Bureau of Reclamation
RVD	recreation visitor-day
SRA	State Recreation Area
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USGS	United States Geological Survey

Appendix E Recreation

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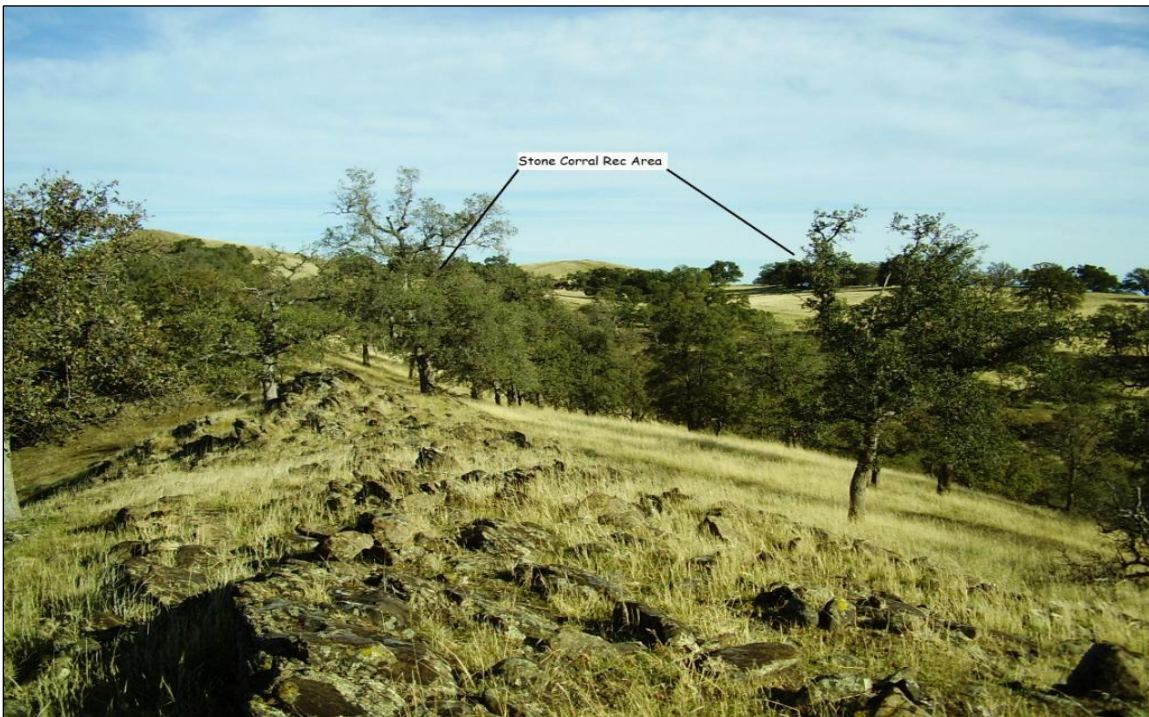
Attachment 1 Site Photos

Appendix E Recreation

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Photograph 1: Stone Corral Recreation Area showing centerline of Sites Dam along center abutment.



Photograph 2: Stone Corral Recreation Area.



Photograph 3: Saddle Dam Recreation Area showing approximate alignment of Saddle Dam #3.



Photograph 4: Saddle Dam Recreation Area.



Photograph 5: Peninsula Hills Recreation Area.



Photograph 6: Peninsula Hills Recreation Area showing access road.



Photograph 7: Antelope Island Recreation Area.



Photograph 8: Antelope Island Recreation Area close-up view.



Photograph 9: Lurline Headwaters Recreation Area.



Photograph 10: Lurline Headwaters Recreation Area close-up view.

Appendix E Recreation

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