US Army Corps of Engineers ®
San Francisco District

Lake Sonoma Master Plan
Revised 2019

Sonoma County, California
U.S. Army Corps of Engineers
San Francisco District

PUBLIC RELEASE DRAFT

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APPROVAL

I reviewed this Master Plan and Environmental Assessment for Lake Sonoma and Warm Springs Dam for the guidance of future development for recreation and environmental stewardship efforts within the Lake Sonoma Project located near the City of Healdsburg, Sonoma County, California.

This Master Plan is technically sound, environmentally acceptable, and is in compliance with ER/EP 1130-2-550, Project Operations, Recreation Operations and Maintenance Policies.

Therefore, I approve this Master Plan for the Lake Sonoma and Warm Springs Dam Project, subject to updates, as needed.

_____
Date

_____
John D. Cunningham
Lieutenant Colonel, U.S. Army
District Commander and Engineer

Executive Summary

The Lake Sonoma Master Plan (MP) provides the U.S. Army Corps of Engineers (USACE) a vision and direction to manage Lake Sonoma and its resources. The original MP for Lake Sonoma was approved in 1979, prior to the completion of the Warm Springs Dam in 1983. It served as the guiding document for USACE responsibilities to preserve, conserve, restore, maintain, manage, and develop the project lands and associated resources.

This revision to the 1979 MP and the associated National Environmental Policy Act (NEPA) Environmental Assessment (EA) describe the existing conditions at Lake Sonoma and identify recreational opportunities and measures to preserve and protect natural and cultural resources.

The MP and EA provide a synopsis of the history of the area and recreational development of Lake Sonoma. This MP presents a comprehensive inventory of natural, cultural, and recreational resources; land use classifications to guide future management; modernization of existing park facilities; resource objectives for each management unit (MU); and an evaluation of existing and future needs required to provide a balanced management plan to improve outdoor recreation opportunities and sustain natural resources. The MP makes recommendations for future improvements to Lake Sonoma's facilities based on the land use classifications. It provides guidance to balance recreation opportunities and the preservation of cultural and historic resources for current and future generations.

Public participation is an important aspect of the development of the MP. The USACE held public scoping meetings in the City of Ukiah and at the Lake Sonoma Visitor Center in Geyserville, California, in February 2018, to provide information to the public on the master planning process and to identify changes and future improvements the public would desire to see in the future at Lake Sonoma. Coordination with Tribal partners was also an integral part of the MP development process.

An additional public meeting and a formal public review period are scheduled to be held in October 2019 to review and comment on the draft MP. The final MP and accompanying EA will incorporate additional Tribal input, public comments and feedback received during the public involvement process.

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ACRONYMS

AF	Acre-feet
ACHP	Advisory Council for Historic Preservation
ARPA	Archeological Resource Protection Act
BO	Biological Opinion
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CORP	California Outdoor Recreation Plan
CRMP	Cultural Resources Management Plan
DM	Design Memorandum
DSAP	Dam Safety Assurance Program
DSM	Dam Safety Modification
EA	Environmental Assessment
EM	Engineer Manual
EMS	Environmental Management System
EOPs	Environmental Operating Principles
EP	Engineer Pamphlet
ER	Engineer Regulation
ESA	Endangered Species Act
HQUSACE	Headquarters, U.S. Army Corps of Engineers
MOU	Memorandum of Understanding
MP	Master Plan
MPU	Maximum Practical Use
MU	Management Unit
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
OHWM	Ordinary High Water Mark
O & M	Operations and Maintenance
OMP	Operational Management Plan
RWQCB	Regional Water Quality Control Board
SHPO	State Historic Preservation Officer
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SW	Sonoma Water (also known as Sonoma County Water Agency)
SWRCB	State Water Resources Control Board
T&E	Threatened and Endangered Species
USACE	United States Army Corps of Engineers
USC	United States Code
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service
VERS	Visitation Estimation Reporting System
WRDA	Water Resources Development Act

Chapter 1 – Introduction

1.1 PROJECT AUTHORIZATION

The Flood Control Act of 1962, Public Law 87-874, authorized the Dry Creek Dam and Channel Improvements, also known as the Warm Springs Dam and Lake Sonoma Project. The Chief of Engineers Report recommending authorization of the project is included in House Document No. 87-547.

1.2 PROJECT PURPOSE

The authorized purposes of the Warm Springs Dam and Lake Sonoma project are flood risk management, water supply, and recreation. Secondary benefits of the project include wildlife management and hydropower.

1.3 PURPOSE AND SCOPE OF THE MASTER PLAN

The Lake Sonoma Master Plan (MP) describes the resources, land uses, recreation facilities, operations and management of the project lands. USACE regulations and policies were followed in the preparation of this MP, which is a revision of the original 1979 Lake Sonoma MP.

MPs are required for civil works projects and other fee-owned lands for which the USACE has administrative responsibility for management of natural and historic resources. The MP provides a programmatic approach to the management of all of the lands included within the project boundary.

The MP is the basic guiding document outlining the responsibilities of USACE, pursuant to Federal laws, to preserve, conserve, restore, maintain, manage, and develop the project lands and associated resources. The MP is a planning document anticipating what could and should happen, with the flexibility to adapt to changing conditions over the life of the plan.

The primary goals are to prescribe an overall land management plan, resource objectives, and associated management concepts that (1) Provide the best possible combination of responses to regional needs, resource capabilities, suitability, as well as expressed public interests or desires consistent with authorized project purposes; (2) Contribute to a high degree of recreation diversity within the region; (3) Emphasize the particular qualities, characteristics, and potentials of the project; and (4) Exhibit consistency and compatibility with national objectives and other state and regional goals and programs.

The MP identifies recreational opportunities and measures to preserve and protect natural and cultural resources. The MP also outlines development needs, analyzes special problems, and provides guidance on public use, water quality, invasive species, natural areas, and historic properties within the USACE boundaries. The MP does not address reservoir water levels beyond stating the allocations stipulated in the Water Control Manual.

Detailed management and administration functions are addressed in the Operational Management Plan (OMP), which translates the concepts of the MP into operational terms. Any action that is recommended in this MP that is pursued to a greater level of detail for consideration or implementation will have a separate document describing the appropriate level of design and corresponding environmental evaluation and compliance.

1.4 WATERSHED AND PROJECT DESCRIPTION

The Warm Springs Dam and Lake Sonoma Project consists of a dam across Dry Creek (a major tributary of the Russian River in Sonoma County, California), reservoir, spillway, outlet facilities, fish hatchery, and erosion protection measures on Dry Creek downstream of the dam.

Figure 1 shows a map of the Lake Sonoma project area. The project includes 17,615 acres of land and water, various public recreation facilities and approximately 8,000 acres of Wildlife Management Areas, which are managed by the California Department of Fish and Wildlife and operated in cooperation with the USACE. Lake Sonoma provides a variety of physical and biological resources enjoyed by recreationists using the lake.

Figure 2 shows the Russian River Watershed. The Warm Springs Dam, works in conjunction with the Coyote Valley Dam upstream in the Russian River Watershed, to hold back water for flood risk reduction and other purposes. Mendocino and Sonoma Counties use water in the watershed for residential, municipal, agricultural and industrial use. The City of Santa Rosa is allotted 50 million gallons of water per day from the two reservoirs (Coyote Valley Dam and Warm Springs Dam). The non-Federal partner in both USACE projects, Sonoma Water (SW), manages water supply.

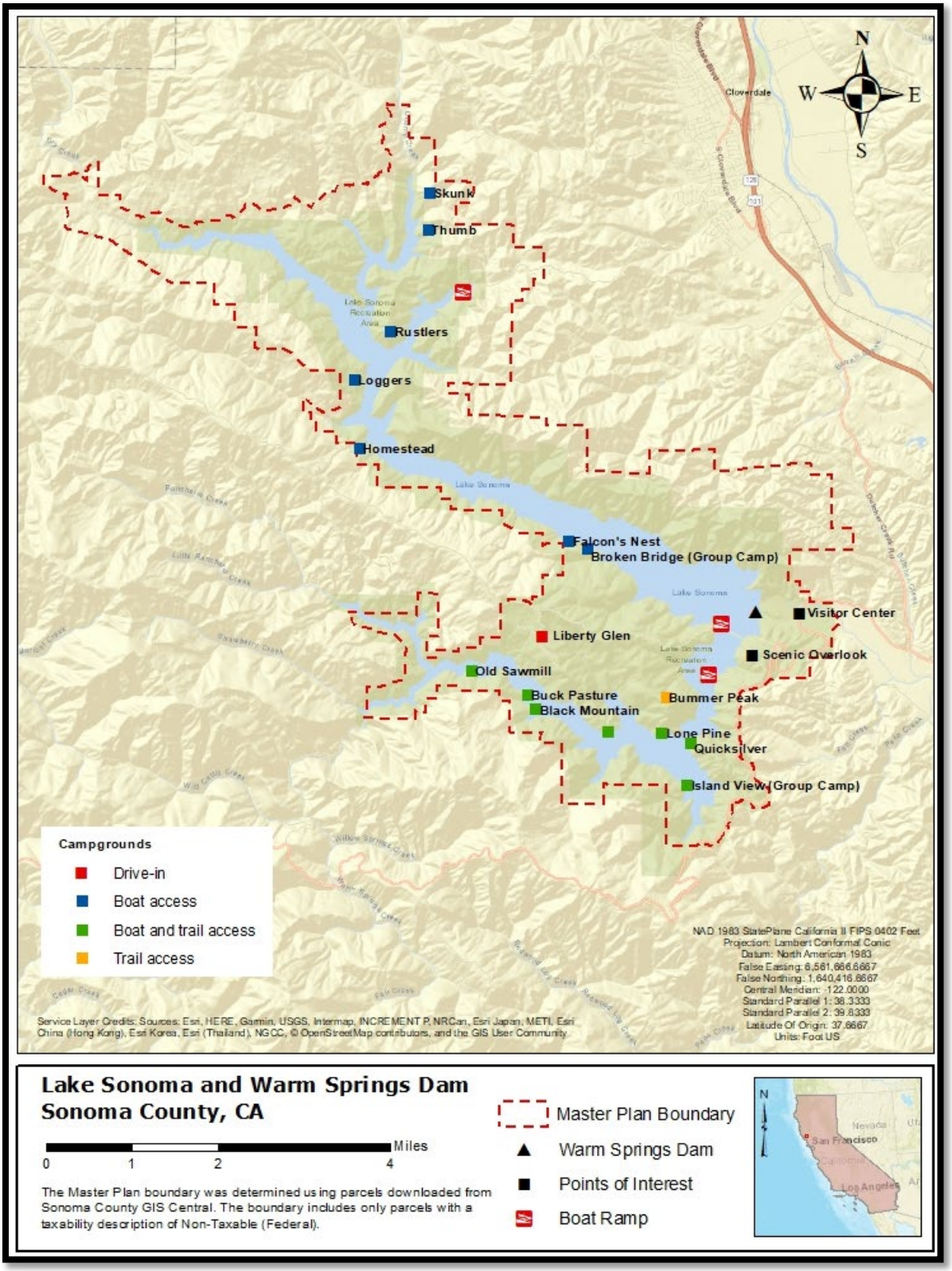

Figure 1 - Project Map of Lake Sonoma and Warm Springs Dam

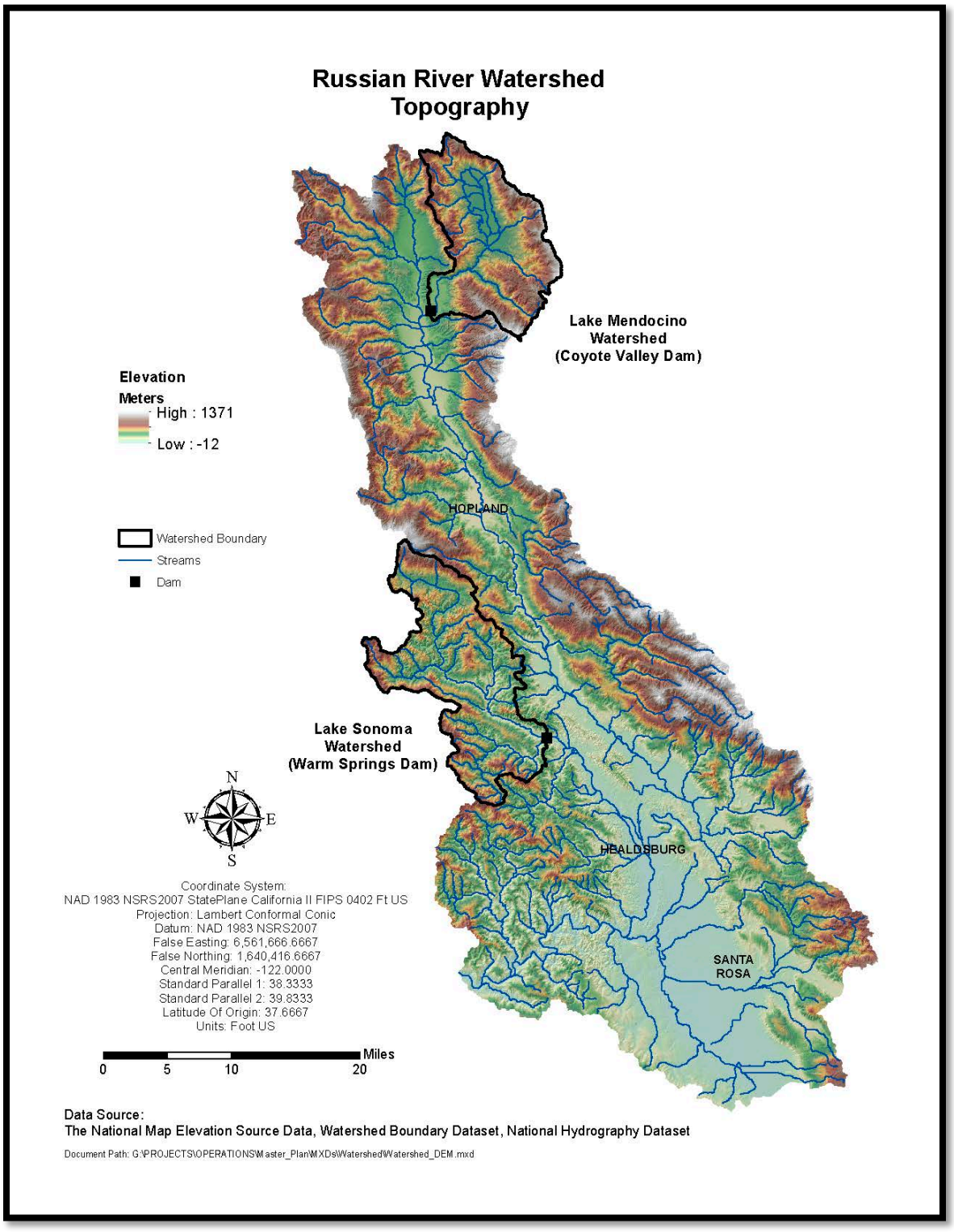

Figure 2 - Watershed map of the Russian River

1.5 LISTING OF PRIOR DESIGN MEMORANDA, MASTER PLAN HISTORY

A resolution of the House Committee on Public Works adopted July 1, 1958 authorized the study of Dry Creek for the purposes of "flood control, water conservation, and other purposes." Initial concepts for recreational development were set forth in a Preliminary MP (1966). During detailed reservoir design, presented in a General Design Memorandum, 1967, the project was modified to optimize benefits in accordance with Senate Document 87-97 (Policies, Standards, and Procedures in the Formulation, Evaluation, and Review of Plans for Use and Development of Water and Related Land Resources, 1962).

In 1979, Design Memorandum #14 presented a final MP that included recreational facilities associated with the construction of the project. This MP is a revision to the original 1979 MP, and incorporates information from the OMP signed in 2013. Table 2 shows a list of the prior Design Memoranda applicable to Warm Springs Dam and Lake Sonoma.

Table 1 - List of Prior Design Memoranda for Warm Springs Dam and Lake Sonoma

DM #	Title	Approved
1	Preliminary Master Plan	Jul-66
2	Hydrology and Hydraulics Analysis	Sep-67
3	General Design Memorandum	Mar-68
4	Relocations, Phase 1	Apr-67
5	Real Estate, Partial	Apr-67
6	Relocations, Phase 1 Supplement	Sep-67
7	Cemetery Relocation, Parcels	Jun-67
8	Real Estate, Final	Jun-68
9	Cemetery Relocation, Final	Dec-67
10	Geology	Nov-67
11	Relocations, Phase II	
	Supplement No. 1-Warm Springs Ck. And Cherry Ck. Bridge	Jul-68
	Supplement No.2 - Utilities	May-70
12	Administrative Facilities	Mar-68
13	Fish and Wildlife Facilities	
	Supplement No. 1	Jul-74
14	Spillway and Outlet Works	Sep-70
	Supplement No. 1	Jun-72
	Supplement No. 2	Oct-72
15	Lake Sonoma Master Plan	Jan-80
16	Soils, Construction Materials and Dam Embankment Design	Jan-71
17	Instrumentation	Jan-71
18	Reservoir Clearing	Jan-73
	Supplement No. 1	Jan-80
19	Dry Creek Channel Improvements	Jun-81
20	Concrete Aggregate Investigation	Jul-80
21	Project Overlook	Oct-79
22	Vegetation Management Overlook	n.d.
23	Boat Launch/Beach, Marina and Warm Springs Beach	n.d.
24	Buzzard Rock and Oak Knolls Campground	n.d.
25	Hot Springs Road Relocation Areas	n.d.
26	Interpretive Program	n.d.
	Monitoring of Initial Lake Filling	n.d.
	Warm Springs Dam Recreation Area	n.d.
28	Miscellaneous Recreation Facilities	n.d.

1.6 LISTING OF PERTINENT INFORMATION

Table 2 provides a list of pertinent information for Warm Springs Dam and Lake Sonoma.

Table 2 - Listing of Pertinent Information for Warm Springs Dam and Lake Sonoma

GENERAL PROJECT AREA	
Location	Confluence of Warm Springs Creek and Dry Creek, approximately 14 miles northeast of Healdsburg, in Sonoma County, California
Operating and Managing Agency	U.S. Army Corps of Engineers, San Francisco District
Authorized Purposes	Flood Control, Water Supply and Recreation
Authorization	Flood Control Act of 1962, Public Law 87-874
Construction Completed	1983
Drainage Area	130 square miles (337 square meters)
Capacity	381,000 acre-feet (af) (124 billion gallons)
Flood Management Allocation	130,000 af
Water Supply Allocation	212,000 af
Sediment Accumulation Allocation	26,000 af
Fishery Maintenance Allocation	13,000 af
MAIN DAM	
Type	Compacted Earthfill
Height	319 feet (97 meters)
Crest elevation	519 feet mean sea level (msl)
Crest length	3,000 feet (916 meters)
Crest width	30 feet (9 meters)
Volume	30 million cubic yards (23 million cubic meters)
SPILLWAY	
Type Gate	Ungated overflow
Crest Elevation	495 feet msl
Capacity	29,600 cubic feet per second (cfs)
RESERVOIR	
Elevations:	
Flood Pool	495 feet msl
Conservation Pool	451 feet msl
Minimum Pool	292 feet msl
OUTLETS	
Tunnel: Intake Length	500 feet (152 meters)
Tunnel: Intake Diameter	10.5 feet (3.6 meters)
Tunnel: Outlet Length	2,900 feet (884 meters)
Tunnel: Outlet Diameter	14.5 feet (4.3 meters)
Shaft: Height	207 feet (63 meters)
Shaft: Diameter	36 feet (11 meters) to 56 feet (17 meters)
Intake Levels (Elevations)	350 feet msl, 390 feet, msl, 430 feet msl
Intake Diameter	5 feet (1.5 meters)
FISH HATCHERY	
Operating and Maintaining Agency	California Department of Fish and Wildlife & USACE
Annual Production: Steelhead	300,000 yearlings
Annual Production: Silver (Coho) Salmon	110,000 yearlings

Chapter 2 – Project Setting and Factors Influencing Resource Management and Development

2.1 DESCRIPTION OF RESERVOIR

Warm Springs Dam is a rolled earth embankment located at the confluence of Warm Springs Creek and Dry Creek, approximately 14 miles northwest of Healdsburg (Sonoma County) and 70 miles northwest of San Francisco, California.

The dam crest elevation is 519 feet above mean sea level (msl). The top of the dam is about six feet above the maximum water surface in the reservoir. Curved on a 6,000 foot radius, the dam crest extends approximately 3,000 feet across the stream channel, and measures 30 feet wide. The upstream face of the dam is covered with rock for protection against wave action. The downstream face is covered with six inches of topsoil and seeded.

The reservoir has a capacity of 381,000 acre-feet (af) at the spillway crest and an elevation 495 feet msl. Of this total capacity, 130,000 af is allocated to flood risk management; 212,000 af to water conservation; 26,000 af to sediment accumulation during the 100-year economic life of the project; and 13,000 af for maintenance of minimum pool. With the water level at the spillway crest (495 feet msl), Lake Sonoma has a surface area of 3,600 acres, extends 12 miles up Dry Creek and seven miles up Warm Springs Creek, and provides 73 miles of shoreline. With the pool at conservation level (450 feet msl), the impoundment covers 2,700 acres, extends nine miles along Dry Creek and four miles along Warm Springs Creek and provides 53 miles of shoreline. At minimum pool elevation (292 feet msl), the water surface area is 486 acres, extends five miles up Dry Creek and two miles up Warm Springs Creek and creates 17 miles of shoreline.

2.2 HYDROLOGY

The drainage above Lake Sonoma encompasses 130 square miles. Heavy winter rains can cause flood flows on upper Dry Creek. These flows have sharp, high peaks, are usually short in duration, have comparatively small volume, and can occur in rapid succession. The run-off is not greatly affected by snowmelt. Low flows prevail in the Dry Creek basin from June through October.

The northwest-trending Dry Creek basin is 32 miles long and seven miles across at its widest point, with elevations ranging from 3,000 feet at the drainage divide to 70 feet near the confluence with the Russian River. Dry Creek is the second largest tributary by area within the Russian River basin, but contributes the largest amount of annual runoff (USACE, 1984). Average annual precipitation in the basin is illustrated in Figure 3.

Warm Springs Dam reduces maximum stream flow to 8,000 cubic feet per second (cfs) on lower Dry Creek[1], which flows past 87 square miles of unregulated catchments downstream of the dam. Prior to the construction of the dam, Dry Creek near the Geyserville stream gage showed a median annual peak flow of 16,600 cfs second, with peak flows regularly exceeding 7,500 cfs. After dam completion, median annual peak flow fell to 3,900 cfs and dam operations did not exceed 7,500 cfs from water year 1984 to water year 2013.

[1] https://nwis.waterdata.usgs.gov/ca/nwis/peak/?site_no=11465200&agency_cd=USGS

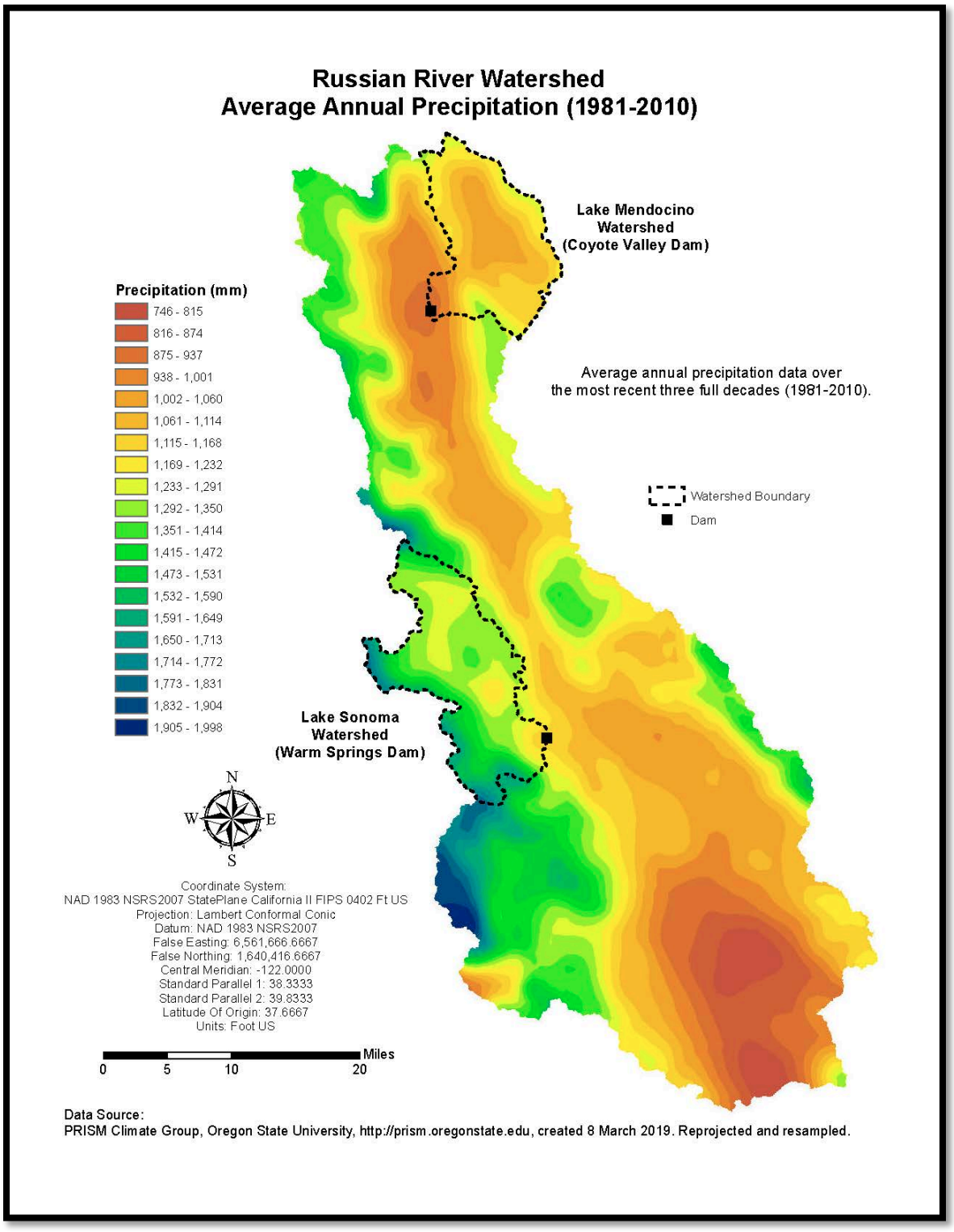

Figure 3 - Average Annual Precipitation in the Russian River Watershed

2.3 CLIMATE

The Dry Creek Valley has a temperate, semiarid climate characterized by cool wet winters and warm dry summers. Annual precipitation averages about 46 inches in the watershed. About 87 percent of the precipitation occurs during the months of November through April. Almost all precipitation occurs as rain. Area temperatures average 59 degrees Fahrenheit, and range from an average low of 36 degrees Fahrenheit in December to an average high of 90 degrees Fahrenheit in July (U.S. Climate Data, n.d.).[2] Figure 4 shows average precipitation in the Geyserville area, which is the closest gauge to the project location. Figure 5 shows the average annual mean temperature in the Russian River watershed.

The amount of rainfall falling on-site is affected by topographic variation. As moisture-laden air masses move in from the ocean, they are forced to rise over the mountains, where they cool, condense, and precipitate. Greatest precipitation will be associated with those higher ridges having a more direct access to the ocean. Lower precipitation is found in the sheltered valleys and on secondary lower ridges.

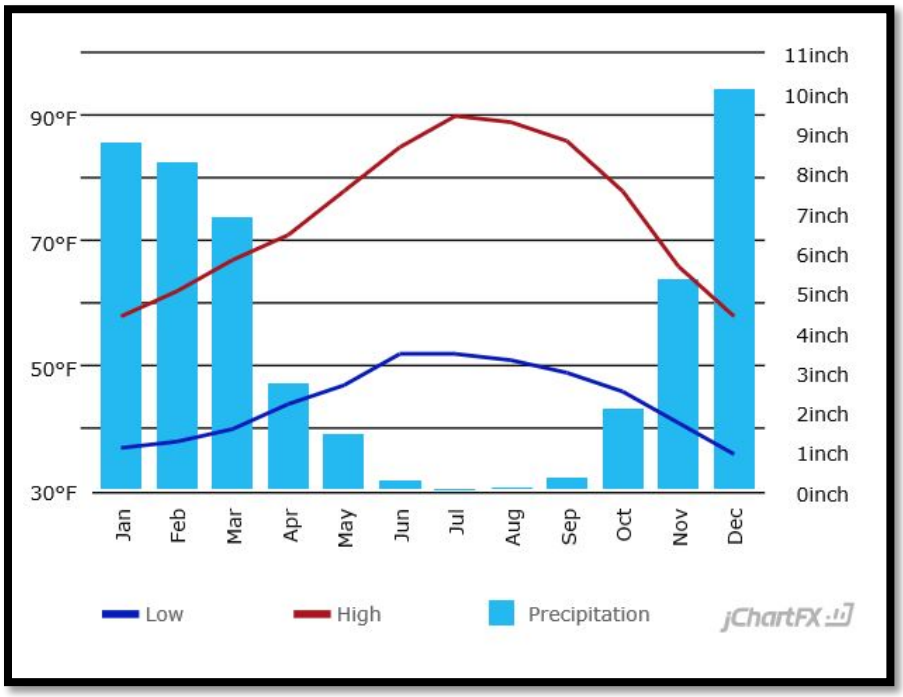

Figure 4 - Average Precipitation and Temperature Data for Geyserville, near Lake Sonoma

[2] https://www.usclimatedata.com/climate/geyserville/california/united-states/usca1900

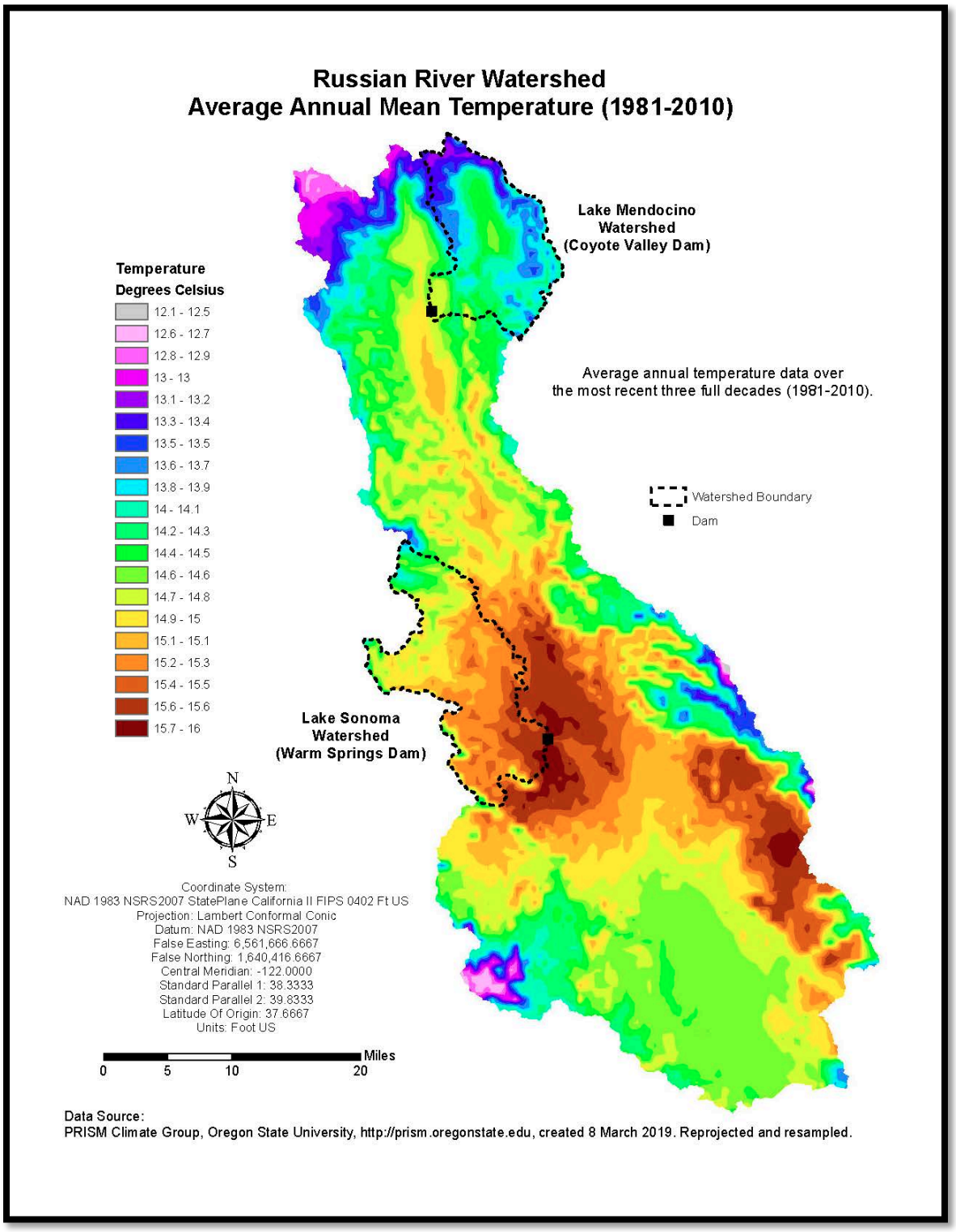

Figure 5 - Average Annual Mean Temperature in the Russian River Watershed

2.4 TOPOGRAPHY, GEOLOGY, SOILS, AND SEISMICITY

2.4.1 Topography

Steep terrain, cliffs, and rock outcrops occupy a large portion of the project boundary. Much of this area has a slope of over 25%. This makes much of the land unsuitable for intensive use. The region surrounding the project is a generally mountainous area lying within the Coast Ranges, with several inter-mountain valleys. Topographically, the Dry Creek drainage area is characterized by nearly parallel northwestward trending ridges, with a trellis type of drainage pattern following the intervening valleys and short dendritic (branching) tributary drainage cutting the ridges at sharp angles to the main valleys. Crests of the ridges reach 2,000 feet elevation.

Figure 6 illustrates the aspect of lands (North facing = 0 degrees, East Facing = 90 degrees, etc.) within the project area. Figure 7 illustrates the slope of lands within the project area.

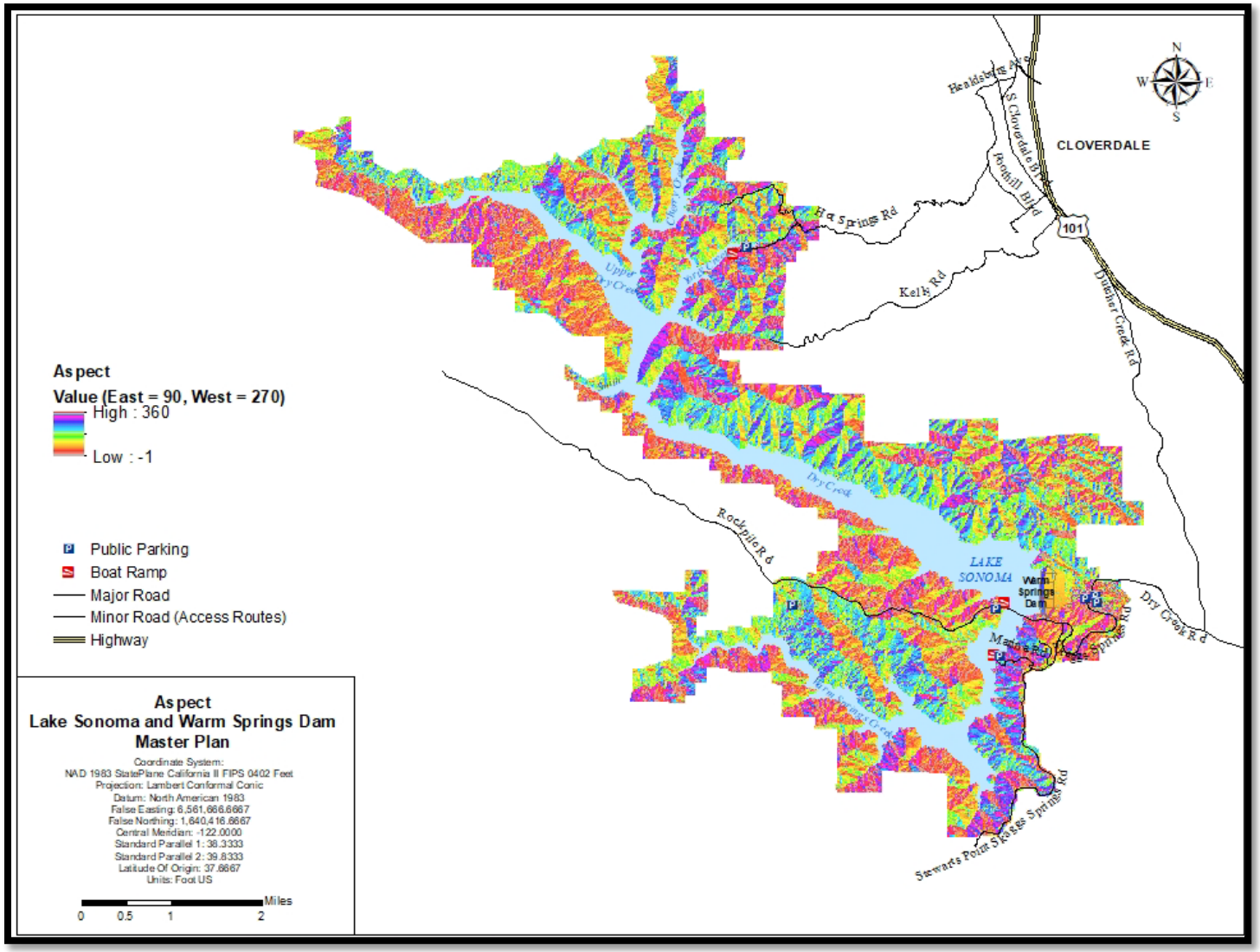

Figure 6 - Lake Sonoma Aspect Map

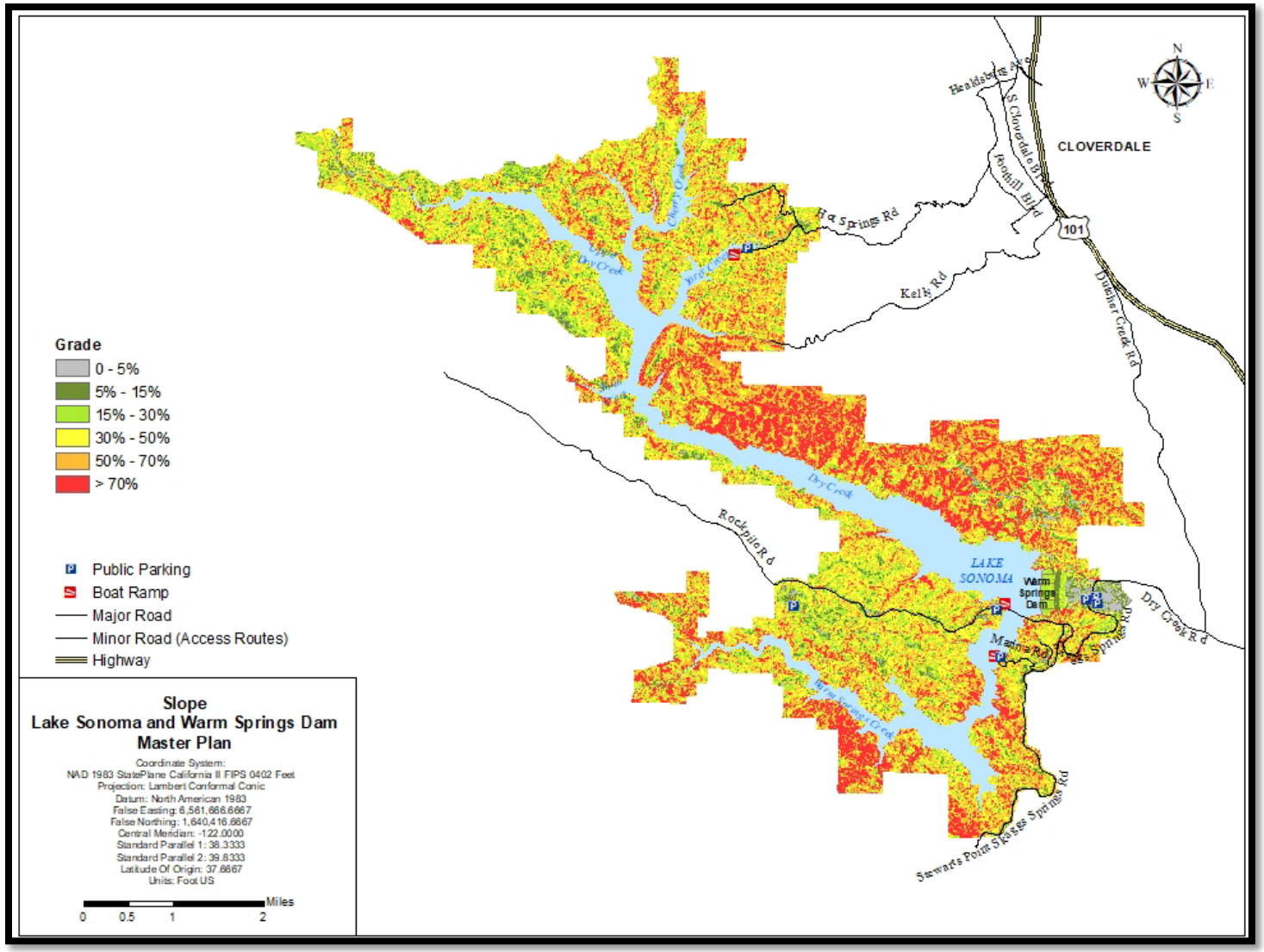

Figure 7 - Lake Sonoma Slope Map

2.4.2 Geology

Lake Sonoma is situated in steep-sided canyons cut into the Mendocino Plateau by Dry Creek and the Warm Springs side of Dry Creek Valley. Terrace deposits outcrop primarily along the northeastern side of Dry Creek valley and represent Pleistocene erosional remnants. Deposits of Sonoma volcanics underlie the terraces downstream from the dam, but are not present in the reservoir area. The major geologic feature in the area is a series of outcrops rising to an elevation of about 1,800 feet (1,350 feet above the conservation pool of Lake Sonoma). Other rock outcrops such as Black Mountain (see Figure 8) and Buzzard Rock on Warm Springs Creek are especially prominent when compared to the generally rounded, grassy slopes of the project area.

Figure 8 - Black Mountain Camp, viewed from Warm Springs Arm of Lake Sonoma

The presence of intrusive and volcanic rock of the Coast Range ophiolite within the Dry Creek Valley is thought to be caused from depositional contact with the sedimentary rock of the Great Valley Complex, and is limited to the western flank of the valley. Therefore, it can be assumed that underneath the alluvial deposits the bedrock of the Dry Creek Valley is composed of sedimentary rock associated with the Great Valley Complex (Harvey and Schumm, 1985).

2.4.3 Soils

Survey data for the Dry Creek watershed shows eight major soils groupings on the project area. The ridge tops and north slopes are generally characterized by moderately deep to deep soils of the Hugo and Josephine associations with occasional pockets of shallow soils of the Henneke-Montara and Maymen

associations. South facing slopes are generally made up of shallow to moderately deep soils of the Laughlin, Yorkville, and Los Gatos associations (USACE, 1979).

The soils found in the Lake Sonoma area are alluvial terraces and channels are sand, gravel, and cobbles of varying types originating from tributaries and the adjacent deposits from Coast Range ophiolite, Great Valley Complex, and Franciscan Complex assemblages (Inter-Fluve, 2010). The Yolo-Cortina-Pleasanton Association is the soil association found within Dry Creek Valley (Miller, 1972).

Figure 9 illustrates the soils and soil types within the project area.

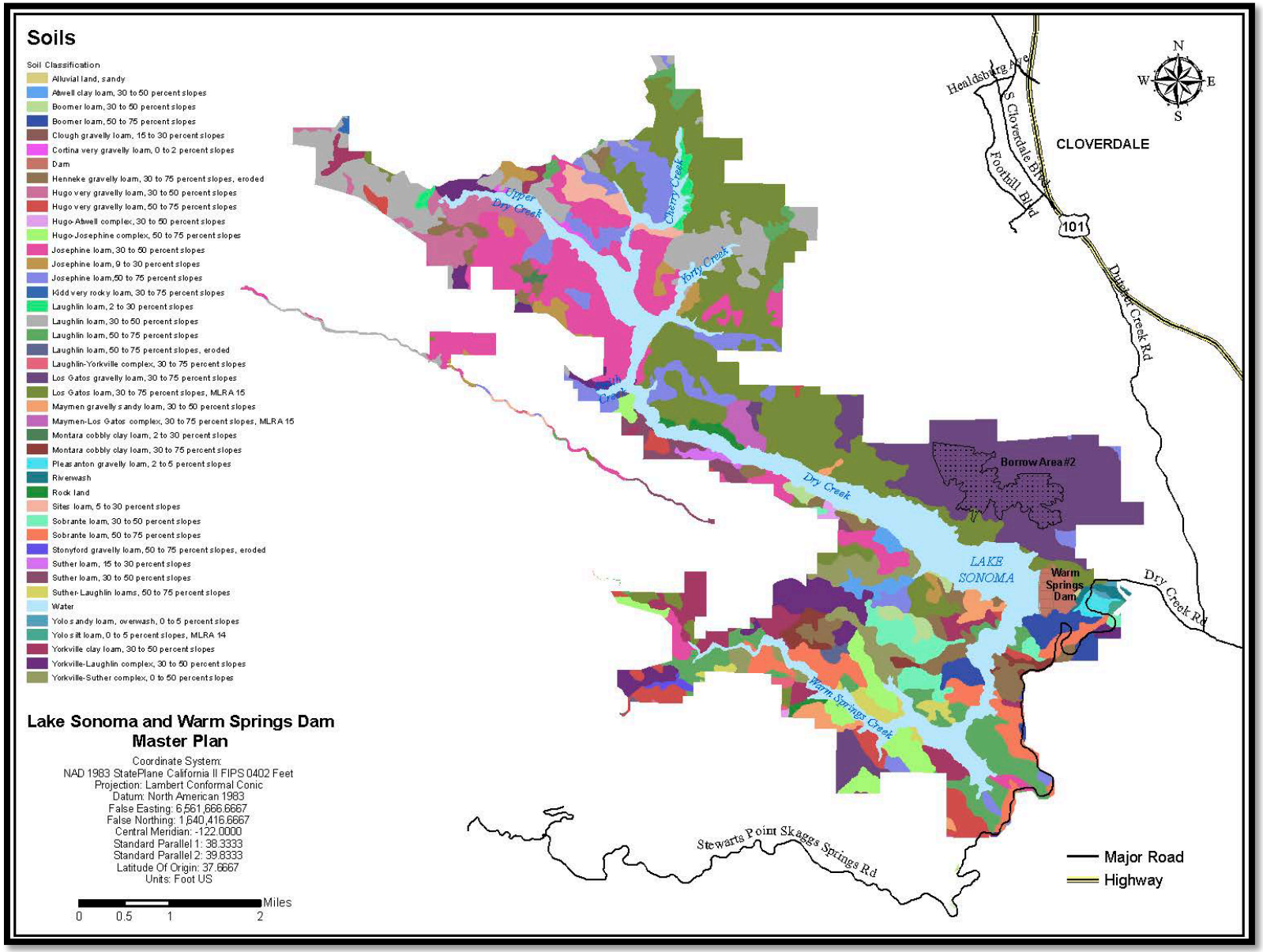

Figure 9 - Lake Sonoma Soil Types

2.4.4 Seismicity

The seismic environment in the Lake Sonoma area is characterized by the San Andreas Fault system, which lies at the boundary between the Pacific Plate and the North American Plate. The major active faults in the vicinity of the study area include the San Andreas, Rodgers Creek, Healdsburg, and Maacama Faults. The 1997 Uniform Building Code locates the study area and the greater San Francisco Bay Area within Seismic Risk Zone 4; areas within Zone 4 are expected to experience maximum magnitudes and damage in the event of an earthquake (International Conference of Building Officials, 1997).

Several strands of the Healdsburg Fault are located within and immediately adjacent to Dry Creek (Bryant, 1982). The Healdsburg fault system is a northwest trending, 1 to 2 kilometer wide extension of the Rodgers Creek fault to the south and is connected to the Maacama fault to the east by a lateral step-over (McLaughlin and Sarna-Wojcicki 2003). Although the Healdsburg fault is not listed as active under the California Alquist-Priolo (AP) Earthquake Fault Zoning Act (Bryant and Hart, 2007), both the Rodgers Creek and Maacama systems are zoned as active. Based on the evidence of structural relationship of the Healdsburg Fault to the Rodgers Creek and Maacama Fault systems, the Healdsburg Fault should be considered potentially active (Inter-Fluve, 2010).

Based on stereoscopic analysis of the aerial photos and digital imagery of the watershed, Inter-Fluve (2010) found that the Lake Sonoma area may be structurally controlled along traces of the Healdsburg fault or other features inferred to be associated with the fault. Several sections of lower Dry Creek basin have unusually low sinuosity for a stream in a dominantly alluvial drainage; Inter-Fluve interpreted these reaches to coincide with or parallel mapped strands of the Healdsburg fault.

2.5 WATER QUALITY AND WATER MANAGEMENT

As stewards of a significant percentage of the nation's aquatic environment, the USACE is responsible for preserving, protecting, and, where necessary, restoring water quality altered by its projects. This requires a comprehensive understanding of the interactions of uses and users of the resource.

The USACE Water Quality Management Program for Civil Works Projects is described by Engineer Regulation (ER) 1110-2-8154, *Water Quality Management*. the USACE's primary water quality regulation. ER 1110-2-8154 encourages a holistic ecosystem approach to water quality management.

The release of water from Lake Sonoma is not only regulated for flow, but also for temperature. Water released from the lake through a combination of inlet structures positioned at various depths provides for water temperatures that are suitable for hatchery operations. These temperatures are consistent in lower Dry Creek. At the USGS Dry Creek stream gage below Lambert Bridge (USGS 11465240) in 2012, 2013 and 2014, maximum temperatures were observed to range from approximately 54°Fto 62°F.

SW holds water right permits issued by the State Water Resources Control Board (SWRCB) to divert Dry Creek flows and to re-divert water stored and released from within Lake Sonoma. The Lake Sonoma conservation pool holds 245,000 af, which constitutes the principal municipal, domestic and industrial water supply for most of the lower Russian River and parts of Sonoma and Marin counties (SWRCB, 1986; NMFS, 2008). Whenever the lake elevation is within the water conservation pool, Sonoma Water directs the USACE to release from Lake Sonoma into Dry Creek and downstream into the Russian River. In 1986, the SWRCB released Decision 1610, which updated all minimum instream flow requirements for normal, dry and critically dry water years for the Russian River basin. In normal water years, the California State mandated minimum instream flow requirement in Dry Creek between Warm Springs Dam and the Russian River varies between 105 cfs in winter months and 80 cfs in the summer months. In dry and critically dry year conditions, the required summer instream flow on Dry Creek is 25 cfs. Flow rates are typically higher than these limits, because of water supply requirements downstream of the Dry Creek and the mainstem Russian River confluence or because of flood risk management operations. Sonoma Water sets release levels to meet water supply needs in accordance with its water rights permits, SWRCB Decision 1610, and the NMFS 2008 Biological Opinion for Water Supply, Flood-control Operations, and Channel Maintenance, which sets maximum flow levels to avoid take of endangered species.

2.6 RESOURCE ANALYSIS

2.6.1 Fish and Wildlife Resources

According to the 1979 MP, the estimated present annual spawning migration in the total Dry Creek drainage included 8,000 steelhead trout and 300 Coho salmon.

As Warm Springs Dam blocked the annual upstream migration of steelhead trout and Coho salmon to spawning areas, a fish hatchery was built to mitigate fishery losses. The hatchery is also utilized to support a Chinook salmon egg collection facility located below Lake Mendocino.

Agreements between SW, the State of California Department of Fish and Wildlife (CDFW) and the USACE allow for additional water releases from the dam for the benefit of fisheries.

To compensate for loss of wildlife habitat resulting from filling Lake Sonoma and for the 180 acres of additional habitat taken for roads, parking areas and similar permanent features, a wildlife management area was established on approximately 3,200 acres of land, located adjacent to the reservoir in the Pritchett Peaks area north of Dry Creek. Another wildlife management area is located to the west of Cherry Creek along upper Dry Creek. In total, approximately 8,000 acres is set aside for wildlife management.

2.6.2 Vegetative Resources

Vegetation communities and wildlife habitats at Lake Sonoma include a mosaic of herbaceous-, shrub-, and tree-dominated types, as well as aquatic and developed types. Broad vegetative community categories within the watershed include scrubs and chaparrals, oak savannas and woodlands, coniferous forests and woodlands, grasslands, vineyards, and riparian communities. Historically, these communities provided habitat for a rich diversity of terrestrial and wetland plant and animal species. Although many of the species that historically occupied the watershed are still present, some are now non-existent, extremely rare, or have had their numbers substantially reduced. Such loss or reduction in species diversity is attributed to habitat loss and a variety of other complex factors (Sonoma County Water Agency and Circuit Rider Productions, Inc., 1998).

Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) identifies three dominant vegetation communities in the Dry Creek Valley and several vegetation communities in the surrounding hills. The dominant vegetation communities in the surrounding hillsides at Lake Sonoma as classified by CALVEG and the CDFW's California Wildlife-Habitat Relationships System, include: vineyard, montane hardwood, redwood, montane hardwood-conifer, Douglas-fir, and mixed chaparral. Developed and landscaped riparian forest and woodland are the primary vegetation communities in the project area. Riparian vegetation occupies lands adjacent to streams, creeks, and rivers where water may be permanent or ephemeral. The composition of riparian vegetation is greatly influenced by the physical processes of the adjacent aquatic habitat; species that are found in the active channel are usually not the same as those found on the floodplain. The vegetated sections of stream banks within the project area are dominated by an overstory of red, arroyo, and sandbar willows (Salix laevigata, S. lasiolepis, and S. exigua), white alders (Alnus rhombifolia), cottonwood (Populus fremontii); and occasional box-elders (Acer negundo), buckeyes (Aesculus californica), and coast live oaks (Quercus agrifolia).

Typical understory species around Lake Sonoma include a mixture of Himalayan blackberry (Rubus armeniacus), California blackberry (Rubus ursinus var. ursinus), escaped grape (Vitis vinifera), mugwort (Artemisia douglasiana), and periwinkle (Vinca major). A few open areas without an overstory component exist within the project area. These open areas are typically dominated by annual grasses (Avena fatua, Bromus diandrus, Hordeum murinum, Lolium multiflorum) and other herbaceous plants (Verbascum thapsus, Melilotus albus, Hirschfeldia incana). Figure 10 is a vegetation map of the Lake Sonoma project area.

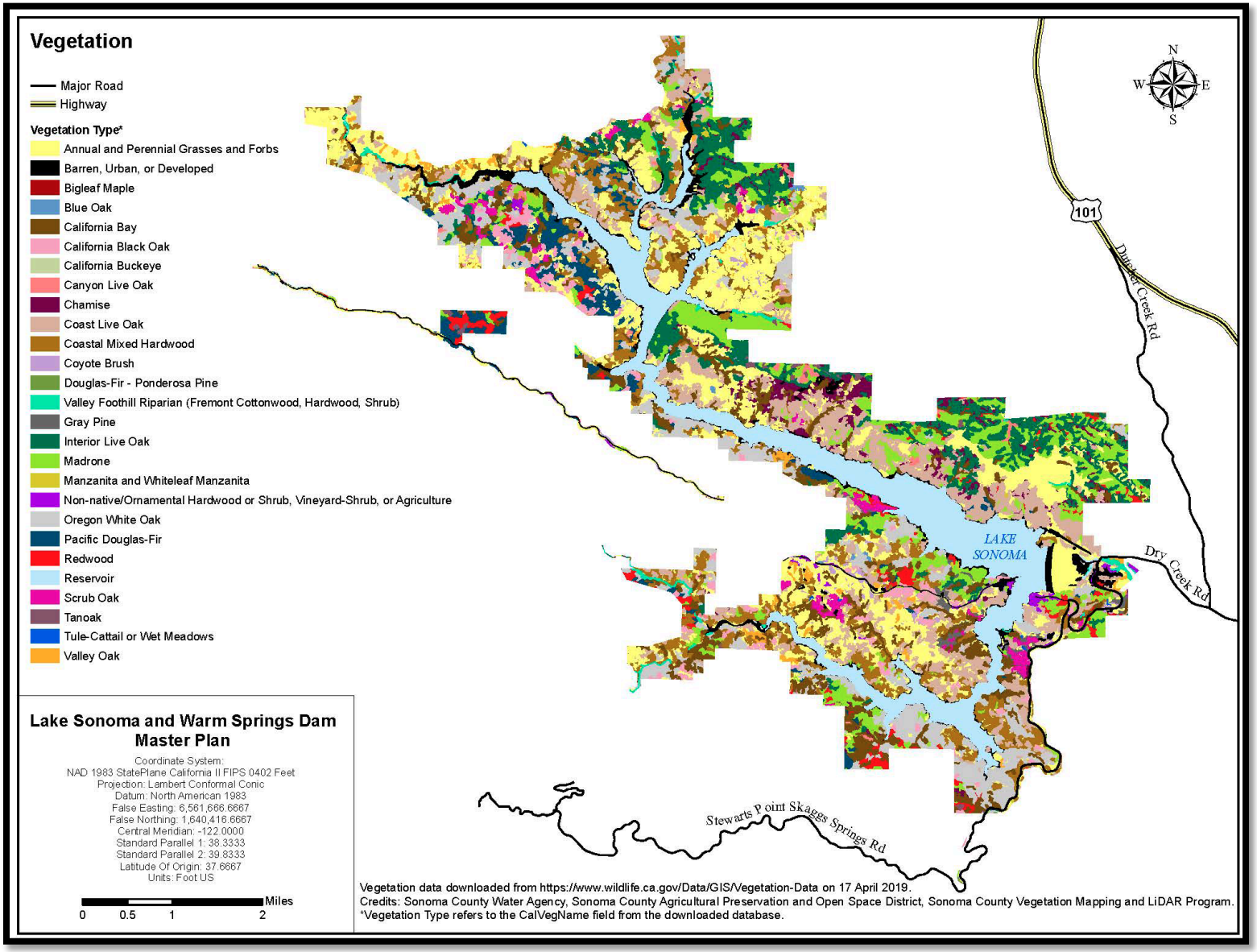

Figure 10 - Vegetation map of Lake Sonoma

2.6.3 Threatened and Endangered Species

The species list obtained from the USFWS contained two terrestrial species with a potential to be present in the project area, the marbled murrelet (Brachyramphus marmoratus) and the northern spotted owl (Strix occidentalis caurina). Both of these species require closed canopy old-growth conifer forest for habitat, primarily redwood for the murrelet.

Lake Sonoma is 30 kilometers from the coast. Marbled murrelets have only rarely been found nesting this far inland in California. There are some pockets of coniferous forest that could be suitable as habitat in the unlikely event that any birds venture this far inland to nest. These areas could also contain potential marginal habitat for the spotted owl, which requires closed-canopy forest with multiple layers. The land being added to Lake Sonoma donated by the Save the Redwoods League contains some developed second-growth redwood forest. This land will be classed as Environmentally Sensitive area to afford the greatest protection. Other areas of mature conifer forest are present at Lake Sonoma high on the north facing slopes. They are a significant distance from the areas used by visitors and are difficult to access since no roads lead to them. No critical habitat for either the marbled murrelet or the northern spotted owl is present within the boundaries of the project area.

Three federally-listed fish species and their critical habitats have the potential to occur in the Lake Sonoma area, including: California Coastal Chinook salmon (federal threatened), Central California Coast coho salmon (federal endangered), and Central California Coast steelhead (federal endangered). In addition, critical habitat for all three species is present within the watershed. Critical habitat includes habitat which contains physical or biological features essential to conservation and those features that may require special management considerations or protection as well as specific areas outside the geographical area occupied by the species if the agency (NMFS) determines that the area itself is essential for conservation (NMFS 1999). Construction of Warm Springs Dam created a barrier to the passage of salmonids and they no longer occur above the dam. The hatchery at Lake Sonoma and the egg collection facility at Lake Mendocino were created to mitigate for the loss of salmonid habitat in the Russian River watershed from the construction of the dams.

The list identified Pennell's birds-beak (*Cordylanthus tenius ssp. Capilliaris*) as having the potential to be in the area. This plant is known from two populations at Camp Meeker and the Harrison Grade Ecological Reserve over 20 miles to the south of Lake Sonoma. The species is a root parasite that occupies serpentine flats among chaparral between 150 and 800 feet in elevation (USFWS 98). This plant has not been identified within the project boundaries.

Fifteen terrestrial animal species not Federally listed as threatened or endangered, but considered to be species of concern at the Federal or state level, have moderate-to high-potential to occur in the Lake Sonoma area. Table 3 shows a list of these special status species.

Continual monitoring of habitat is part of ongoing stewardship of the resource, per the Resource Objectives. At such a time as either a listed species is discovered, or a species known to be in the project boundary becomes listed, this MP will reflect the change in status. Table 3 provides a list of special status species and applicability to the Lake Sonoma project area.

Table 3 - Special Status Species and Applicability to Lake Sonoma

Species of Concern	Description of Status, Applicability to Lake Sonoma
Bald eagle (*Haliaeetus leucocephalus*)	Listed as endangered and fully protected by the State of California. A pair is known to have maintained an active nest at Lake Sonoma from 2001 to the present. May occasionally forage in the Russian River area.
Allen's hummingbird (*Selasphorus sasin*)	On the USFWS birds of conservation concern list and previously categorized as a Federal species of concern. Confirmed nesting in inland Sonoma County and the Dry Creek Valley.
Olive-sided flycatcher (*Contopus cooperi*)	Species of special concern in California. Observed in the vicinity of Lake Sonoma during summer bird surveys and is known to be a summer resident in Sonoma County.
Osprey (*Pandion haliaetus*)	On the California watch list, known to nest at Lake Sonoma, as well as throughout the Russian River. Possible breeding occurrences recorded in Dry Creek Valley; however, Dry Creek itself is largely covered by tree canopy and presents hazards because of a swift current, reducing the likelihood that osprey would forage in the immediate area.
Red-breasted sapsucker (*Sphyrapicus ruber*)	On the California (CDFW) special animals list and is common in the winter in Sonoma County. It was observed in the vicinity of Lake Sonoma during bird surveys.
Yellow warbler (*Dendroica petechia*)	Species of special concern by CDFW and a bird of conservation concern by USFWS. Considered a fairly common summer resident of riparian woodland from April through October.
Yellow-breasted chat (*Icteria virens*)	Species of special concern by CDFW. Is considered an uncommon summer resident, present from April to early September in thick riparian woodland with heavy undergrowth.
White-tailed kite (*Elanus leucurus*)	Fully protected species by the State of California and is a fairly common permanent resident and fall migrant in Sonoma County with numbers peaking in the winter.
Cooper's hawk (*Accipiter cooperii*)	On the California watch list. Is known to be a year-round resident of Sonoma County, and suitable breeding habitat was identified in the vicinity of Lake Sonoma.
Peregrine falcon (*Falco peregrinus anatum*)	On the USFWS list of birds of conservation concern. Is considered a fully protected species in California. Suitable foraging habitat is present at Lake Sonoma.
Merlin (*Falco columbarius*)	Categorized by CDFW as a state species of special concern. It is an uncommon winter migrant from September to April.
Loggerhead shrike (*Lanius excubitor*)	On the USFWS list of birds of conservation concern and categorized by CDFW as a state species of special concern. Considered an uncommon permanent resident in Sonoma County with numbers declining over the last few decades.
Pallid bat (*Antrozous pallidus*)	Federal species of concern. May roost in mature trees around Lake Sonoma.
Western pond turtle (*Actinemys [Emys] marmorata*)	California species of special concern. Suitable aquatic and upland habitat along with the lake area exists for this species.
Foothill yellow-legged frog (*Rana boylii*)	California species of special concern. 71 occurrences were reported in several locations throughout Sonoma County.

2.6.4 Invasive Species

The Lake Sonoma project area contains a number of invasive plant species that interfere with both economic activities and ecologic functions. Some of the species that most threaten native ecosystem function and structure include: giant reed (Arundo donax), yellow starthistle (Centaurea solstitialis), jubata and pampas grass (Cortaderia sp.), Scotch broom, (Cytisus scoparius), cape-ivy (Delairea odorata), French broom (Genista monspessulana), Tamarisk species, Vinca species, water primrose (Ludwigia sp.), Spanish broom (Spartium junceum), pepperweed (Lepidium latifolium), and gorse (Ulex europaeus).

2.7 CULTURAL RESOURCES

The USACE has a continued responsibility for the protection, preservation, and management of the cultural resources within the boundaries of the project. The Dry Creek-Warm Springs region is the traditional homeland of the Mihilakawna, or Dry Creek Pomo, the Makahmo, or Cloverdale Pomo, and the Kashaya Pomo Native American groups. Historically, the region was used for mining and homesteaded for use as livestock grazing lands, and agriculture.

In 1985, at the conclusion of the late 1970s and early 1980s studies, a draft archaeological management plan was written; however, the plan was never implemented. The USACE completed the 2001 Cultural Resources Management Plan (CRMP) to guide management of known cultural resources by providing a summary of the cultural resources present in the recreation

areas; noting their conditions and providing possible preservation recommendations; outlining USACE regulatory requirements to ensure proper cultural resources management responsibilities; and making recommendations for interpretive outreach opportunities (Newland, 2001).

2.7.1 Past Archeological Work at Lake Sonoma

According to Basgall and Bouey (1991), archaeological studies at Lake Sonoma began as early as 1947. The 1947 work was done as part of a proposed flood risk management dam on Dry Creek. The inventory methodology and area actually examined were never reported on and the work concluded with an erroneous statement that "no archaeological remains of any importance were found" in the lake area (Basgall & Bouey, 1991:2). This statement can be attributed to the standards of the time period and the high threshold of what constituted important archaeological remains. Later in 1964, prior to the establishment of Lake Sonoma and construction of the Warm Springs Dam, San Francisco State College (now California State University San Francisco) conducted a brief cultural resources reconnaissance survey of the lake area. The College identified several prehistoric sites; however, none were deemed significant enough to merit additional research through data recovery or additional mitigation measures.

Construction on the Warm Springs Dam began in 1967. Seven years into the project, construction was halted through the issuance of court order, which cited safety concerns and environmental effects including potential impacts to unidentified cultural resources. The cultural resources impact was of primary concern following the passage of two important pieces of Federal legislation: The National Environmental Policy Act (NEPA) of 1969 and the National Historic Preservation Act (NHPA) of 1966. Even with the construction of the dam underway, the USACE prepared an Environmental Impact Statement for Lake Sonoma and Warm Springs Dam. As part of the study, the USACE agreed to complete a comprehensive cultural resources inventory of the lake impoundment area and the dam area, and to mitigate potential adverse effects on the identified historic properties.

Archaeologists and historic archaeologists inventoried the Lake Sonoma project area between 1974 and 1984. The work focused on identifying cultural resource sites within the project area, evaluating potential project impacts, and providing management recommendations to minimize impacts or document information that would otherwise be lost. As a result of the inventory work, 120 cultural resources sites were identified within or near the project area that ranged from areas of prehistoric occupation to historic-era ranching sites. In addition to the cultural resources work, an ethnographic study was completed concurrently for the project area. The study recorded pre-contact, historic, and contemporary Native American use of the Lake Sonoma area. The collective works culminated in the identification of the Dry Creek-Warm Springs Valleys Archaeological District in 1977. The Dry Creek-Warm Springs Valleys Archaeological District includes lands managed by the USACE and private properties located downstream of Lake Sonoma and was originally made up of 85 prehistoric sites, 24 historic sites, and 8 ethnographic sites.

From August 2010 through September 2010, a Section 110 inventory and National Register of Historic Places (NRHP) eligibility recommendations for sites was conducted on fee-title land around Warm Springs Dam and Lake Sonoma. The goal was to relocate and conduct a condition assessment of previously recorded sites located above the current lake level of 440 feet above mean sea level and perform a judgmental survey of select areas to locate new historic properties. As a result, 34 archaeological sites including 28 previously recorded and 6 newly discovered sited were documented. The finalized report was completed in June 2011.

2.7.2 Protection of Cultural Resources

The archaeological studies at Lake Sonoma resulted in the identification of 99 sites within the established project boundary. The number of sites was determined through a record search for the 2001 CRMP (Newland, 2001). The records search was performed at the Northwest Information Center of the California Historical Resources Information System, which is housed at Sonoma State University. It appears that no additional archaeological studies have occurred in the project area since the record search was completed (Ungvarsky, 2019, personal communication). The record search also included viewing records housed at the USACE San Francisco District and at the Anthropological Studies Center of Sonoma State University. Several forms of traditional cultural properties and sacred sites exist or have existed within the project area. Among them are ethno-botanical resource sites, petroglyph sites, sacred rock outcrops, and burial locations.

The potential effects of any undertaking of the Federal government on the archaeological sites that contribute to the Dry Creek-Warm Springs Valleys Archaeological District must be taken into account as part of the NHPA Section 106 process [36CFR800§.3(a)]. More information and recommendations on cultural resources management and protection can be found in Chapter 6.

2.8 ECONOMICS

2.8.1 Employment

Key drivers of the Sonoma County economy include government and public administration, healthcare services, and manufacturing. Retail, healthcare services, and government are the top three generators of employment, together accounting for approximately a third of all jobs in the county. Farm employment accounts for 2.2 percent of jobs. Figure 11 provides an overview of employment by sector in the county and compared to the State of California as a whole. Tourism plays an important role in the economy and supports approximately 11 percent of employment. Visitors to Sonoma County spent an estimated $1.9 billion in 2017. Median household income in Sonoma County in 2017 was $80,409[3].

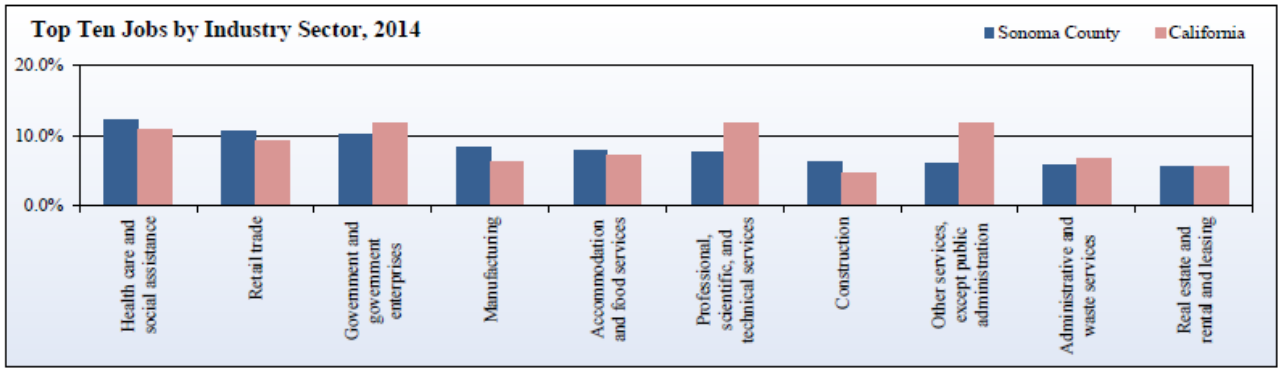

Figure 11 - Distribution of Jobs by Sector in Sonoma County and the State of California
Source: Center for Economic Development at the California State University, Chico

2.8.2 Population and Demographics

California has 67 cities with populations exceeding 100,000, of which 20 cities have populations exceeding 200,000. Cities are getting larger, squeezing out the open spaces for parks and disconnecting the state's biological resources. The five county market area illustrated in Figure 12, comprising the majority of the visitation base for Lake Sonoma, was home to approximately 1.1 million residents in 2018. The population in this market area is projected to grow approximately 10 percent, to nearly 1.2 million people by 2040, as indicated in Table 4. It is anticipated that growth in population will have a direct impact on visitor use at Lake Sonoma in the future.

[3] https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_17_1YR_S1903&prodType=table

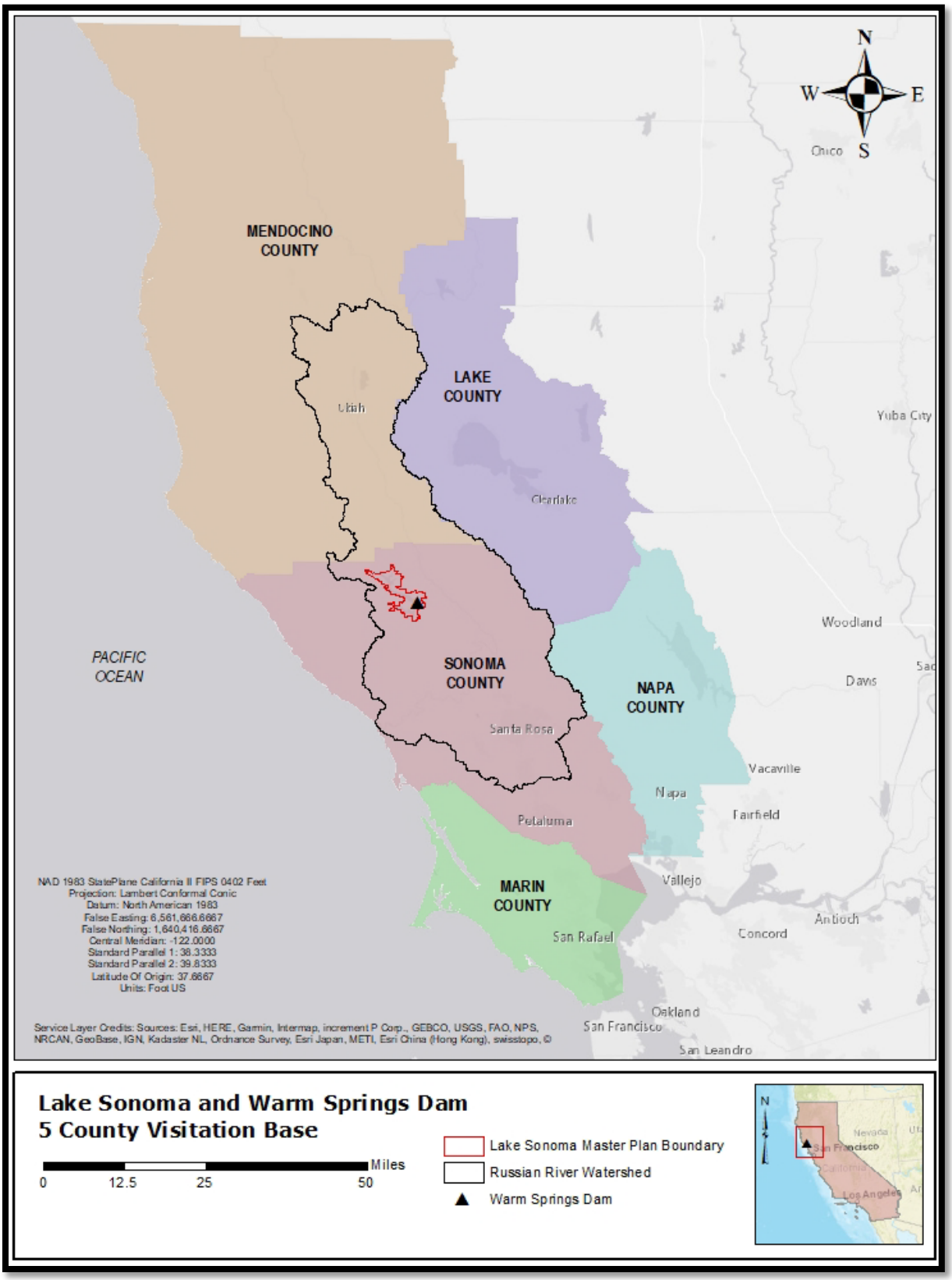

Figure 12 - Map of Northern California Counties: Sonoma, Mendocino, Napa, Lake and Marin

Table 4 - Current and Projected Population in Sonoma and Surrounding Counties

County	2018 Population	2020 Population Estimate	% Change 18-20	2040 Population Estimate	Population Growth (2018-2040)
Sonoma	503,332	515,486	2.4%	583,517	13.7%
Mendocino	89,299	90,175	1.0%	95,124	6.1%
Napa	141,294	143,800	1.8%	160,521	12.0%
Lake	65,081	65,302	0.3%	70,093	7.2%
Marin	263,886	265,152	0.5%	277,087	4.8%
Total	***1,062,892***	***1,079,915***	***1.6%***	***1,186,342***	***10.4%***

Source: State of California Department of Finance

2.9 RECREATION FACILITIES, ACTIVITIES AND NEEDS

2.9.1 Zones of Influence

Approximately 78 percent of the visitors to Lake Sonoma come from areas within 75 miles of the project. This is considered the market area for Lake Sonoma. The area encompasses Sonoma, Mendocino, Napa, Lake and Marin counties. The larger population centers of the San Francisco Bay Area and Sacramento metropolitan area lie to the south and east, respectively.

Other major lakes in the local vicinity include Clear Lake, a naturally occurring lake in Lake County; Lake Mendocino, operated by the USACE; and Lake Berryessa, operated by the U.S. Bureau of Reclamation. These lakes do not noticeably compete with Lake Sonoma for recreational use. Several state and county parks in the area offer excellent recreational opportunities for camping, horseback riding, hiking, and picnicking. Additionally, local wineries offer picnicking facilities and tours. Many visitors come to Lake Sonoma as an extension of wine tasting excursions in nearby Healdsburg and other surrounding areas.

2.9.2 Visitation Profile

Visitation records have been kept for Lake Sonoma since 1979, when the project was under construction. Since 1982, all data, including visitor hours and visits, have been entered into the Visitation Estimation and Reporting System (VERS). Based on VERS data, Lake Sonoma averages nearly two million visitor hours. The peak recreation months are in the summer, as shown in Table 5.

Table 5 - Average Monthly Visitation at Lake Sonoma, 1986 - 2012

MONTH	VISITOR HOURS	% OF ANNUAL
October	113,164	6%
November	81,165	4%
December	56,481	3%
January	63,662	3%
February	80,556	4%
March	113,868	6%
April	154,588	8%
May	244,992	12%
June	263,586	13%
July	329,522	17%
August	287,415	15%
September	187,161	9%
TOTAL	***1,976,160***	***100%***

Source: USACE Natural Resources Management Gateway, VERS data

Many events draw large numbers of visitors to the lake each year, such as the Iron Man competition and the annual Steelhead Festival. The 2018 Iron Man event reportedly nearly two thousand people and an estimated[4] $13 million dollars in revenue to the region. These events are often held in cooperation with partners and stakeholders (such as the Friends of Lake Sonoma), and high visibility and advertising serves as a draw to the region and a boost to the tourism economy.

2.9.3 Recreation Analysis

Surveys of recreational use at Lake Sonoma provided considerable data, which was used to estimate that peak month use would continue to be approximately 17 percent of the total annual use. Fifty percent of the visitation occurs on weekends.

California State Parks Office of Grants and Local Service (OGALS) develops the Statewide Comprehensive Outdoor Recreation Plan (SCORP), which is a statewide vision for parks, outdoor recreation, and open space. The SCORP provides guidance to all outdoor recreation providers, including Federal, state, local, and special district agencies that administer and manage outdoor recreational lands, facilities and services throughout California. The SCORP is also the primary tool for prioritizing Land and Water Conservation Fund grant allocations to local governments.

At the time of this MP revision, three elements from the SCORP were available and used to characterize the recreational trends and use in California and the area surrounding Lake Sonoma: The 2012 *Survey of Public Opinions and Attitudes on Outdoor Recreation*[5], the 2013 *Outdoor Recreation in California Regions*[6], and the 2015 SCORP[7].

Meeting the park and recreation needs for all current and future residents should be a goal of all park and recreation providers in California. To that end, it is essential that all park and recreation stakeholders have a basic understanding of both the state's demographics and the trends that are likely to influence the demand for outdoor recreation now and in the future.

One of the greatest challenges affecting park and recreation providers is the increase in population, as evidenced in the Economics section of this MP. Most of California's growth has been in its major metropolitan areas, including the San Francisco Bay Area, which will continue to affect recreational use and its impact on natural resources management at Lake Sonoma.

2.9.4 Recreational Carrying Capacity

The five year average (2014-2018) for visitor use of the lake and surrounding recreation lands is 515,000 annual visits, per USACE Visitation Estimation and Reporting System (VERS). Current methodologies for calculating visitation is aligned with other federal agencies that offer recreational opportunities and provides a consistent reporting mechanism.

The current visitation at Lake Sonoma is not an indication of possible future use, which is dependent upon facilities and staff capacity to serve the future visitation estimate. Maximum Practical Use (MPU) is an estimation tool, used to estimate the total capacity of land and water areas needed to accommodate anticipated visitation, while considering crowding and projected use patterns. The MPU is regarded as the amount of use which can exist without detriment to environmental resources or to the quality of recreational experiences. A description of the methodology for calculating MPU is available in the OMP.

According to the most current analysis in the 2013 Lake Sonoma OMP, the MPU for the lake and surrounding recreation land would be 800,000 annual visits if adequate recreational facilities are constructed. If no additional facilities are constructed, the MPU is currently 280,000 annual visits. Therefore, based on VERS data, current average visitation exceeds the current carrying capacity.

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[4] https://www.pressdemocrat.com/news/8318625-181/santa-rosa-ironman-triathletes-brave?sba=AAS
[5] http://www.parks.ca.gov/pages/795/files/2012%20spoa.pdf
[6] http://www.parks.ca.gov/pages/795/files/2013%20regions.pdf
[7] http://www.parks.ca.gov/?page_id=29741

2.10 REGIONAL ACCESS AND TRANSPORTATION

2.10.1 Road Access

The proximity of the project to U.S. Highway 101 places it at the northern end of the Golden Gate Corridor, the major north-south transportation and transit corridor linking the urbanized areas of Marin and Sonoma Counties to San Francisco. U.S. Highway 101 provides freeway services from a point just south of Cloverdale to Healdsburg, Santa Rosa, Petaluma and southward through Marin County to the Golden Gate Bridge and San Francisco. Access from U.S. Highway 101 to the project area is by county-designated arterial roads.

Traveling north along Highway 101, the first access point is Dry Creek Road, from its intersection with U.S. Highway 101 at Healdsburg. Further to the north, both Lytton Springs Road and Canyon Road connect U.S. Highway 101 to Dry Creek Road. Canyon Road at Geyserville provides the most direct access to the lake via Dry Creek Road.

Traveling south along U.S. Highway 101 from Cloverdale, the first improved access route is via Dutcher Creek Road, the only other county-designated collector from U.S. Highway 101 leading to Warm Springs Dam. Two unimproved roads, Hot Springs Road and Kelly Road (a private road), provide access from the Cloverdale area to the northern portion of the reservoir, including the Yorty Creek Recreation Area. Although Hot Springs Road is paved, it is narrow, winding, and is not built to accommodate trailers.

Access to the project from the coast and CA Highway 1 is via Stewarts Point-Skaggs Spring Road, a county-designated arterial. The Sonoma County General Plan has designated Stewarts Point-Skaggs Spring Road, Dry Creek Road and Dutcher Creek Road as Rural Scenic Highways.

2.10.2 Public Transportation

With the exception of Greyhound Bus Service along U.S. Highway 101 and Golden Gate Transit bus service along U.S. Highway 101 between San Francisco and Santa Rosa, there is limited transit service available in the area. Sonoma County Transit provides bus service from Santa Rosa to Cloverdale via Healdsburg. There is no public transportation serving the project area; the closest bus stop to the project is approximately 5.5 miles away at the intersection of Canyon Road and U.S. Highway 101. The Sonoma-Marin Area Rail Transit[8] currently extends to nearby Windsor, with expansion plans to Geyserville, Healdsburg and Cloverdale. It is not expected that the future train service will result in a significant impact on visitation to the lake.

2.10.3 Non-motorized Transportation

A popular bicycle touring route parallels U.S. Highway 101 south along Dutcher Creek Road and Dry Creek Road to the dam. This route coincides with the County-designated Roadway Bicycle touring route. There is not a dedicated bike bath that is used for commute or transportation to and from the project area.

2.11 REAL ESTATE

All land use zoning in the immediate vicinity of the project is under the jurisdiction of the County of Sonoma. According to the 1979 MP, original zoning in the project area was primarily for agriculture, with some limited recreation. Current zoning was reviewed for all lands contiguous to the project boundaries, including the lands to the east as far as U.S. Highway 101 and the south through the Dry Creek Valley toward the city of Healdsburg.

2.11.1 Real Estate Acquisition Policy

Under the Flood Control Act of 1962 (Public Law 87-874), Congress authorized the USACE to acquire lands for the flood risk management, water conservation, and recreation purposes of the project. Over the life of the project, the USACE analyzes lands for its needs in relation to the Project. The Government currently owns 14,316 fee acres within the Project

[8] https://sonomamarintrain.org/about-smart

boundary, and has easement rights on 153 acres. The USACE has management rights and responsibilities on Government owned lands. A more detailed description of the types of easements can be found in section 4.3 of this MP.

2.11.2 Real Estate Management

Periodic boundary inspections detect encroachments and trespassers. These are resolved at the lowest level possible. Unmarked monument boundaries and fence monument boundaries are surveyed where feasible. Project lands are made available to public agencies and individual interests under lease, permit, license, or easement agreement for industrial/commercial, public utility, scientific, or recreational purposes. The length of these agreements ranges between 5 and 50 years, depending upon the type of real estate instrument and purpose involved. Presently, there are 22 agreements to use Project lands. All requests for real estate related actions are made to the Lake Sonoma Park Manager, who makes a recommendation through the San Francisco District Chief, Operations and Readiness Division to the Sacramento District Chief, Real Estate Division. The Sacramento District Real Estate Division maintains all current information on real estate agreements. Other management activities include creating Geospatial (GIS) products and data for Civil Works property land tracts accountable or managed by the USACE to include fee, easement, licensed and disposed tracts. The real estate products and data support the USACE CorpsMap system.

2.11.3 Encroachments

Encroachments on USACE-managed Federal lands directly conflict with the Project's purpose. The USACE is, therefore, committed to resolving encroachments by the most expedient and effective means available. It is the intent of Sacramento District Real Estate Division to recapture use of encroached upon public lands for Federal project operating purposes and general use and enjoyment of the public. The general policy is to require removal of encroachments, restore the premises, and collect appropriate administrative costs and fair market value for the term of unauthorized use.

2.12 PERTINENT PUBLIC LAWS AND POLICIES

Development and management of Federal reservoirs are regulated by a number of statutes and guided by USACE documents. A comprehensive list of Federal public laws and Executive Orders pertaining to authorization of the project, its present and future development, and the operation of project lands and waters, can be found in Appendix B.

Rules and regulations governing public use of water resources development projects administered by the USACE are contained in Title 36, Part 327 of the Code of Federal Regulations.

As stated in Title 36, Section 327.0 Applicability *"…All other federal, state and local laws and regulations are in full force and effect where applicable to water resources development projects".*
Section 327.1 (a) Policy states, *"It is the Policy of the Secretary of the Army, acting through the Chief of Engineers, to manage the natural, cultural, and developed resources of each project in the public interest, providing the public with safe and healthful recreational opportunities while protecting and enhancing these resources."*
Section 327.1 (c) Policy also states, *"The term "project" or "water resources development project" refers to the water areas of any water resources development project administered by the Chief of Engineers, without regard to ownership of underlying land, to all lands owned in fee by the Federal Government and to all facilities therein or thereon of any such water resources development project".*

Persons designated by the District Commander have the authority to issue citations for violations of rules and regulations governing public use of the USACE water resources development projects. If a citation is issued, the person charged with the violation may be required to appear before a U.S. Magistrate.

Except as otherwise provided in Title 36 or by Federal law or regulation, state and local laws and ordinances shall apply on project lands and waters. Enforcement of state and local laws, and ordinances will be handled by the appropriate state and local law enforcement agencies. These include, but are not limited to, the following:

- Operation and use of motor vehicles, vessels, and aircraft;
- Hunting, fishing, and trapping;
- Display or use of firearms or other weapons;
- Camping, starting or tending fires, and use of fireworks;
- Civil disobedience and criminal acts;
- Littering, sanitation, and pollution; and
- Control of animals.

The National Historic Preservation Act of 1966 (NHPA), as amended (16 U.S.C. §§ 470 et seq.), requires that Federal agencies consider the effect of their undertakings, including Federally licensed activities or programs, on properties eligible for the National Register of Historic Places. Under Section 106 of the National Historic Preservation Act, a Federal agency establishes an undertaking and determines whether Section 106 review is needed for the proposed undertaking. If it is determined that Section 106 review is needed for the established undertaking, the Federal agency then works to identify potential historic properties by defining the Area of Potential Effects (APE) and working with the State Historic Preservation Office and interested Native American tribes to survey for any potential cultural resources within the APE. The Federal agency then works to assess whether or not the proposed undertaking will result in any adverse effects to historic properties within the APE. If it is determined that the proposed undertaking will result in adverse effects to historic properties, the Federal agency then works to either avoid or minimize those effects through the development of an agreement document.

The Section 106 process will be followed prior to the authorization of any projects that result from the implementation of the Lake Sonoma Master Plan Revision. This means that future projects will either be designed in such a way that they do not damage or otherwise impact significant cultural resources; or the damage they may cause will be mitigated. Section 110 requires that Federal agencies be good stewards of the cultural resources located on their lands. This includes a responsibility to maintain and preserve any historic structures, to conduct surveys to identify cultural resources on their lands and evaluate the significance of those resources.

Chapter 3 – Resource Objectives

3.1 GOALS AND OBJECTIVES

In the context of this MP, goals express the overall desired end state of the resource and its management, while objectives are the specific tasks or actions necessary to achieve overall goals. The following excerpt from EP 1130-2-550, Chapter 3, expresses the goals for the Lake Sonoma MP:

GOAL A - Provide the best management practices to respond to regional needs, resource capabilities and suitability, and expressed public interests consistent with authorized project purposes.

GOAL B - Protect and manage project natural and cultural resources through sustainable environmental stewardship programs.

GOAL C - Provide public outdoor recreation opportunities that support project purposes and public demands created by the project itself, while sustaining project natural resources.

GOAL D - Utilize the particular qualities, characteristics and potentials of the project.

GOAL E - Provide consistency and compatibility with national objectives and other Federal, state, and local laws and regulations. Assure accountability for enforcement of these laws and regulations.

Objectives are clearly written statements that respond to identified issues and specify measurable and attainable activities for resource development and/or management of the lands and waters under USACE jurisdiction. The objectives stated in this MP support the goals, Environmental Operating Principles (EOPs), and applicable national performance measures.

The objectives are consistent with authorized project purposes, Federal laws and directives, regional needs, resource capabilities, and take public input into consideration. Recreational and natural resources carrying capacities are also accounted for during development of the objectives found in this MP. The objectives in this MP aim to maximize project benefits, meet public needs, and foster environmental sustainability for Lake Sonoma, to the best extent possible. The objectives were reviewed and screened by the MP Project Delivery Team, including USACE staff located at Lake Sonoma.

Although many objectives overlap, the objectives are generally divided into categories of Recreation, Natural Resources Management, Environmental Compliance, Visitor Information and Education, Economic, General Management, and Cultural Resources. Table 6 provides a list of objectives specific to Lake Sonoma, with marks for each of the goals that each objective aims to address. If implementation of any proposed or recommended action in this MP is considered, the list of resource objectives should be considered, along with an evaluation of the uses appropriate within the Land Classification for the area.

Table 6 - Resource Objectives for the Lake Sonoma Master Plan

Type		LAKE SONOMA MASTER PLAN - OBJECTIVES	MASTER PLAN GOALS				
			A	B	C	D	E
Recreation	R1	Evaluate the need for improved recreation facilities (i.e. campsites, picnic facilities, viewing areas, trails, dog off-leash area, courtesy docks, interpretive signs/exhibits, and parking lots) and increased public access on USACE-managed public lands and water for recreational activities (i.e. camping, walking, hiking, biking, fishing, wildlife viewing, etc.)	x		x		
	R2	Optimize recreational development on the land resources within the project boundary, while maintaining or improving the environmentally sustainable resources.	x		x		
	R3	Regularly monitor recreational resources to ensure the recreational experience, environmental quality, and public safety are maintained.	x		x		
	R4	Follow the Environmental Operating Principles associated with recreational use of waterways for all water-based management activities and plans.		x	x		x
	R5	Increase universally accessible facilities on Lake Sonoma.	x		x		x
	R6	Evaluate need for commercial facilities, including concessionaires, on public lands and waters.	x		x		
	R7	Evaluate flooding to address potential impact to recreational facilities (i.e. campsites, etc.). Note that water level management is not within the scope of the MP.	x	x	x	x	
	R8	Ensure consistency with the USACE Recreation Strategic Plan and seek out partnership opportunities.					x
Natural Resources Management	NRM1	Evaluate flood/conservation pool levels to optimize habitat conditions, as long as there is no interference with the Project's other authorized purposes, i.e. flood risk management and water supply. Note that water level management is not within the scope of the MP.	x	x		x	
	NRM2	Actively manage and conserve fish and wildlife resources, with an emphasis on special status species, by implementing ecosystem management principles.	x	x		x	x
	NRM3	Use watershed approach during decision-making process.					x
	NRM4	Optimize resources, labor, funds, and partnerships for protection and restoration of fish and wildlife habitats.		x			x
	NRM5	Optimize resources, labor, funds, and partnerships for the prevention, monitoring, and management of invasive species in Lake Sonoma, including zebra/quagga mussels.	x	x			x
	NRM6	Minimize activities that disturb the scenic beauty of the lake.	x	x	x	x	
	NRM7	Implement erosion reduction measures, such as planting vegetation whenever practical.	x	x			x
	NRM8	Identify and protect unique or sensitive habitat areas.	x	x		x	x
	NRM9	Increase visitor awareness of impacts caused by misuse of natural resources through improved public participation programs, media information programs, and interpretive activities	x	x	x	x	
	NRM10	Stop unauthorized uses of public lands such as building of unpermitted structures, clearing of vegetation, uncontrolled animals, unauthorized roadways, Off-Highway Vehicle use, trash dumping, wildlife poaching, and marijuana growing in the wildlife area by unknown parties.	x	x	x	x	x
	NRM11	Employ professionals in the fields of recreation, biology, forestry, landscape architecture, ecology, and related sciences to implement and monitor resource management programs.	x	x	x	x	
	NRM12	Protection of borrow area, wildlife management area, possible mitigation land. Additional protection for wildlife management areas.		x	x		
	NRM13	Improve, enhance, restore or rehabilitate vegetation and other environmental conditions, including existing structures and features, for wildlife, fisheries, recreation, aesthetics, woodland, and grassland to promote compatible multiple uses in the project boundary.	x	x	x		
Environmental Compliance	EC1	Ensure compliance with Engineer Regulation (ER) 200-2-22.	x	x			x
	EC2	Comply with the USACE sustainability requirements.		x			
	EC3	Improve the lake's water quality to sustain healthy fish and wildlife populations, habitat conditions, recreation opportunities, and avoid negative effects to public water supply, ensuring public health and safety.	x	x	x	x	x
	EC4	Include both point and non-point sources of water quality problems during decision-making.	x	x		x	x
	EC5	Improve coordination, communication, and cooperation between regulating agencies and non-governmental organizations to resolve and/or mitigate environmental problems.	x	x		x	x
	EC6	Address non-Federal sponsor's environmental quality needs, goals and missions.	x	x	x	x	x

Resource Objectives for Lake Sonoma Master Plan (continued)

Visitor Information and Education	VE1	Provide additional opportunities (i.e. town hall meetings) for collaboration between agencies, special interest groups, Tribes and the general public.	x			x	x
	VE2	Implement additional educational and outreach programs at the lake. Topics may include: water quality, history, cultural resources, water safety, recreation, nature, and ecology.	x	x	x	x	x
	VE3	Establish a network among local, state, Federal and Tribal entities concerning the exchange of lake policy and regulation-related information for public education and management purposes.	x			x	x
	VE4	Increase public awareness of special activities at the facility.	x	x	x		
	VE5	Promote the USACE water safety messaging.	x		x	x	x
	VE6	Educate visitors and volunteers on laws, regulations, and policies regarding, vegetation modification, earth moving activities, and control of animals (e.g. trail maintenance, erosion control, facility improvements, and leash laws).	x	x	x	x	x
	VE7	Address and incorporate education goals of the Dry Creek Band Pomo Indians.	x	x	x	x	x
Economic	E1	Balance economic and environmental interests at the Project.	x	x	x	x	x
	E2	Manage additional commercial development compatible with national USACE policy on both recreation and non-recreation outgrants on public lands classified for High Density Recreation.	x	x	x	x	x
	E3	Work with local communities to promote tourism and recreation use of the lake and lands to positively affect socioeconomic conditions In the region.	x	x	x	x	x
	E4	Provide for economic growth of the region, adjacent communities benefit from park activities. Increase use of project lands by the public. Provide advertising in town/wine region to draw more people to the lake.	x	x	x	x	x
General Management	GM1	Survey and mark the project boundaries to ensure they are clearly recognized in all areas.	x	x		x	
	GM2	Develop year round access to remote park lands in order to better manage all of the park resources during all seasons.	x	x		x	
	GM3	Establish access agreements with neighboring communities for their access to project lands.	x	x		x	
	GM4	Maintain consistency with the USACE Campaign Plan (national level), Implementation Plan (Regional level), and Operations Plan (District level).					x
	GM5	Ensure consistency with Executive Orders 13423 and 13514.					x
	GM6	Manage non-recreation outgrants, such as utility easements, in accordance with national guidance set forth in ER 1130-2-550.					x
	GM7	Ensure compliance with 36 CFR Section 327.					x
	GM8	Seek out partnership opportunities or other non-profits	x				
Cultural Resources	CR1	Increase public awareness of regional history.		x		x	x
	CR2	Maintain full compliance with Section 106 and 110 of the National Historic Preservation Act; the Archeological Resources Protection Act; and the Native American Graves Protection and Repatriation Act on public lands within the project boundary.		x		x	x
	CR3	Work with the Dry Creek Band of Pomo Indians to develop public outreach to educate the public regarding the traditional cultural landscapes and Native American interests	x	x			

Chapter 4 – Land Allocation, Land Classification, and Project Easement Lands

4.1 LAND ALLOCATION

Lands are allocated by their congressionally-authorized purposes. Unless there is a specific change indicated, the original acquisition of property and land allocation remains the same throughout the life of the project. There are only four land allocation categories applicable to USACE projects: *Operations, Recreation, Fish & Wildlife, or Mitigation*.

1. *Operations*. These are the lands acquired for the congressionally authorized purpose of constructing and operating the project. Most project lands are included in this allocation.

2. *Recreation*. These lands were acquired specifically for the congressionally authorized purpose of recreation. These lands are referred to as separable recreation lands. Lands in this allocation can only be given a land classification of "Recreation."

3. *Fish and Wildlife*. These lands were acquired specifically for the congressionally authorized purpose of fish and wildlife management. These lands are referred to as separable fish and wildlife lands. Lands in this allocation can only be given a land classification of "Wildlife Management."

4. *Mitigation*. These lands were acquired specifically for the congressionally authorized purpose of offsetting losses associated with development of the project. These lands are referred to as separable mitigation lands. Lands in this allocation can only be given a land classification of "Mitigation."

No changes to land allocation are recommended in this MP. Any proposed changes are to be fulfilled within the original land use allocation.

4.2 LAND CLASSIFICATION

Land classification designates the primary use for which project lands are managed. Project lands are zoned for development and resource management consistent with authorized project purposes and the provisions of the NEPA and other Federal laws.

Land Classification is a subset of allocated project land and is based on the current and expected management of the resource. Unless there is a specific change indicated, the land classification remains the same as stated in the former MP. A Management Unit (MU) may have multiple land use classifications, all of which must be consistent with the land allocation under which the Government purchased lands. The current classifications are: *Project Operations, High Density Recreation, Mitigation, Environmentally Sensitive Areas, Multiple Resource Management Lands,* and *Water Surface.*

1. *Project Operations*. This category includes those lands required for the dam, spillway, offices, maintenance facilities, and other areas that are used solely for the operation of the project.

2. *High Density Recreation.* Lands developed for intensive recreational activities for the visiting public, including day use areas and/or campgrounds. These could include areas for concessions (marinas, comprehensive resorts, etc.), and quasi-public development.

3. *Mitigation*. This classification will only be used for lands with an allocation of Mitigation and that were acquired specifically for the purposes of offsetting losses associated with development of the project.

4. *Environmentally Sensitive Areas*. These are areas where scientific, ecological, cultural or aesthetic features were identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the ESA, the NHPA, or applicable state statues. These areas must be considered by management to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration. These areas are typically distinct parcels located within another, and perhaps larger, land classification, area.

5. *Multiple Resource Management Lands*. This classification allows for the designation of a predominant use, understanding that other compatible uses may also occur on these lands (e.g., a trail through an area designated as wildlife management). Land classification maps must reflect the predominant sub-classification, rather than just Multiple Resource Management.

(a) *Low Density Recreation*. These lands are designated for dispersed and/or low impact recreation use. Development of facilities on these lands is limited. Emphasis is on providing opportunities for non-motorized activities such as hiking, biking, fishing, sight-seeing, or nature study. Some limited facilities are permitted, including trails, parking areas and vehicle controls, as well as primitive camping and picnic facilities.

(b) *Wildlife Management*. These lands are designated specifically for wildlife management, although all project lands are managed for fish and wildlife enhancement in conjunction with other land uses. Wildlife management lands are actively managed or enhanced to create valuable habitat suitable for game and/or non-game species. These activities are conducted as identified by the managing agency's forest and wildlife management plans.

Wildlife lands are available for dispersed uses such as sightseeing, wildlife viewing, and nature study, hiking, and biking. Consumptive uses of wildlife, such as fishing are encouraged when compatible with the wildlife objectives for a given area and with Federal and state fish and wildlife management regulations.

(c) *Vegetative Management:* Management activities in these areas focus on the protection and enhancement of forest resources and vegetative cover. The USACE conducts active vegetation management activities, protects water quality, improves aesthetics, and enhances wildlife habitat.

(d) *Future or Inactive Recreation Areas:* This sub-classification addresses areas and lands for which recreation areas are either currently in the planning stages, are held in an interim status for future recreation possibilities, or are closed. These lands are managed for multiple purposes unless they are developed as recreation areas.

6. *Water Surface*. If the project administers a surface water zoning program, then it should be included in the MP.

(a) *Restricted*. Water areas restricted for project operations, safety, and security purposes.

(b*) Designated No-Wake*. To protect environmentally sensitive shoreline areas, recreational water access areas from disturbance, and for public safety.

(c*) Fish and Wildlife Sanctuary.* Annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning.

(d) *Open Recreation.* Those waters available for year round or seasonal water-based recreational use.

4.3 ACQUISITION OF NEW LANDS AND CHANGES TO LAND CLASSIFICATION

In 2009, a parcel of land was acquired by the USACE from the Save the Redwoods League. A description of the parcel is included in this MP, and will be incorporated into the next update of the OMP, consistent with the stipulations of land transfer. The map on Figure 13 illustrates the parcel, which will be included in the Management Unit (MU) #3 and managed under a classification of Ecologically Sensitive Area, in order to fulfill the obligations stipulated in the deed transfer. A copy of the deed is included in Appendix C of this MP.

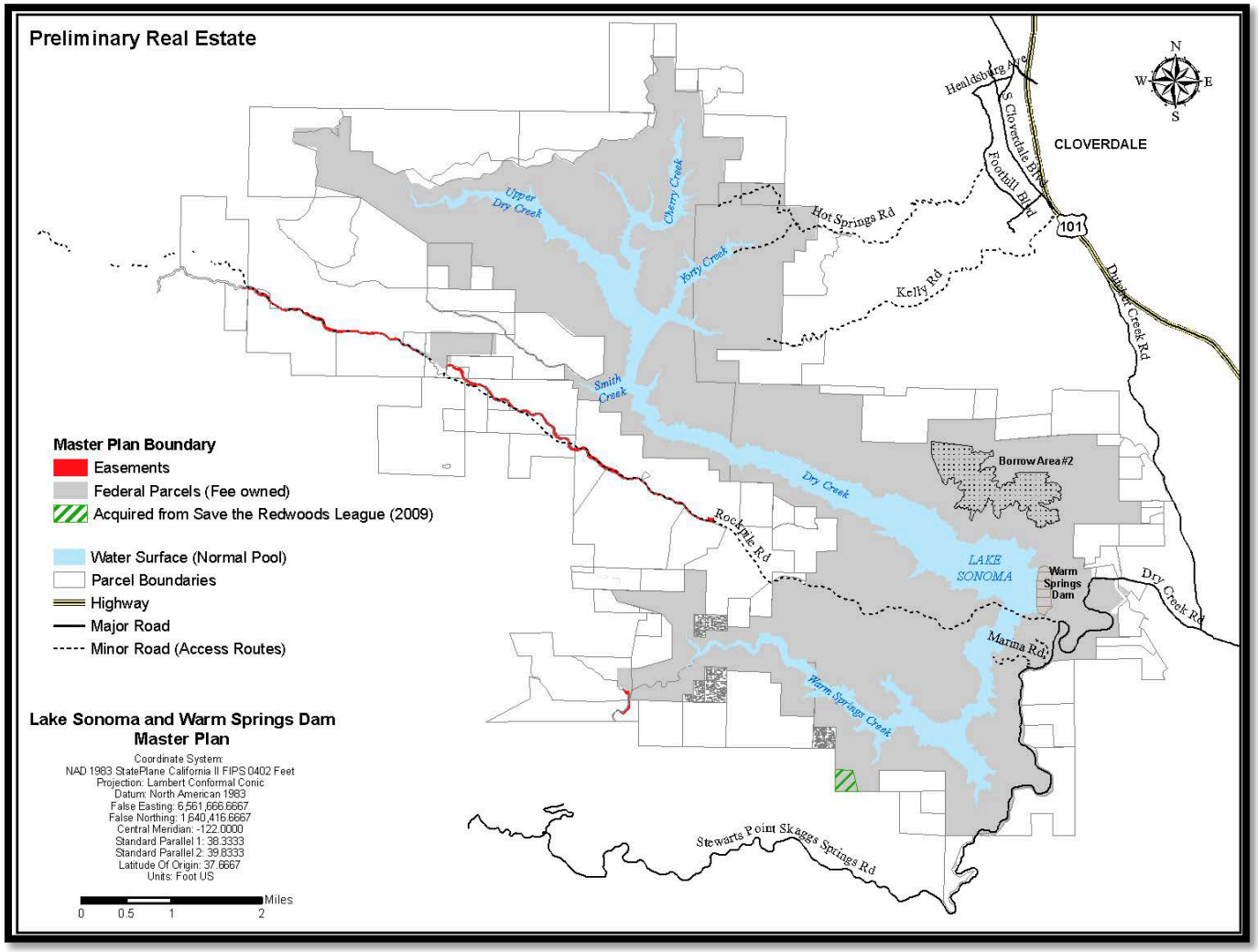

Figure 13 - Preliminary Real Estate map of Lake Sonoma project area.

In order to meet the current Land Classification definitions, maps included in the 1979 MP were reviewed and new classification language was applied to each Management Unit (MU). In some cases, small changes were made to account for new development around the project. Such changes resulted in lands that were classified as Wildlife Management or Low Density Use being reclassified as Recreation. There is no substantive change to the overall intent of use types within specific management units. Approximately 3,200 acres of MU #7 (Pritchett Peaks Wildlife Management Area) will be reclassified from Wildlife Management to Mitigation, to more firmly establish and articulate the environmental commitment to mitigate for the loss of habitat resulting from the impoundment of water. Approximately 200 acres of property reserved as a borrow area for dam construction, within the same MU, will be classified as Wildlife Management. Approximately 12 acres of the

former borrow area will be reclassified as Operations. A description of the changes is found in Chapter 6, and a background on the agreements for these properties is in Appendix D. The map on Figure 13 illustrates the area that was initially designated for use of materials to construct the dam, also known as Borrow Area #2 in former planning and design documents.

The 1979 MP designated three types of use for water surface: Low, Moderate, and High Intensity Use. The current classifications for water surface allow for more detailed designations as needed, and the MU for this portion of the project is classified as *Operations, Water Surface,* and *High Density Recreation,* due to the existence of a marina that extends into the water surface.

The 1979 MP did not designate a use of Project Operations, but instead focused only on the aspects of anticipated recreational use upon project completion. The MP explained that primary and secondary resource use objectives for land use are assigned to areas of Lake Sonoma and classifications are assigned as a secondary objective. Figure 14 is a map of the Resource Use Plan from the 1979 MP, illustrating rough land use classifications. Figure 15 and Figure 16 show the current land use classifications and management units, respectively. Table 7 provides a cross reference of original (1979) and current classifications for each MU.

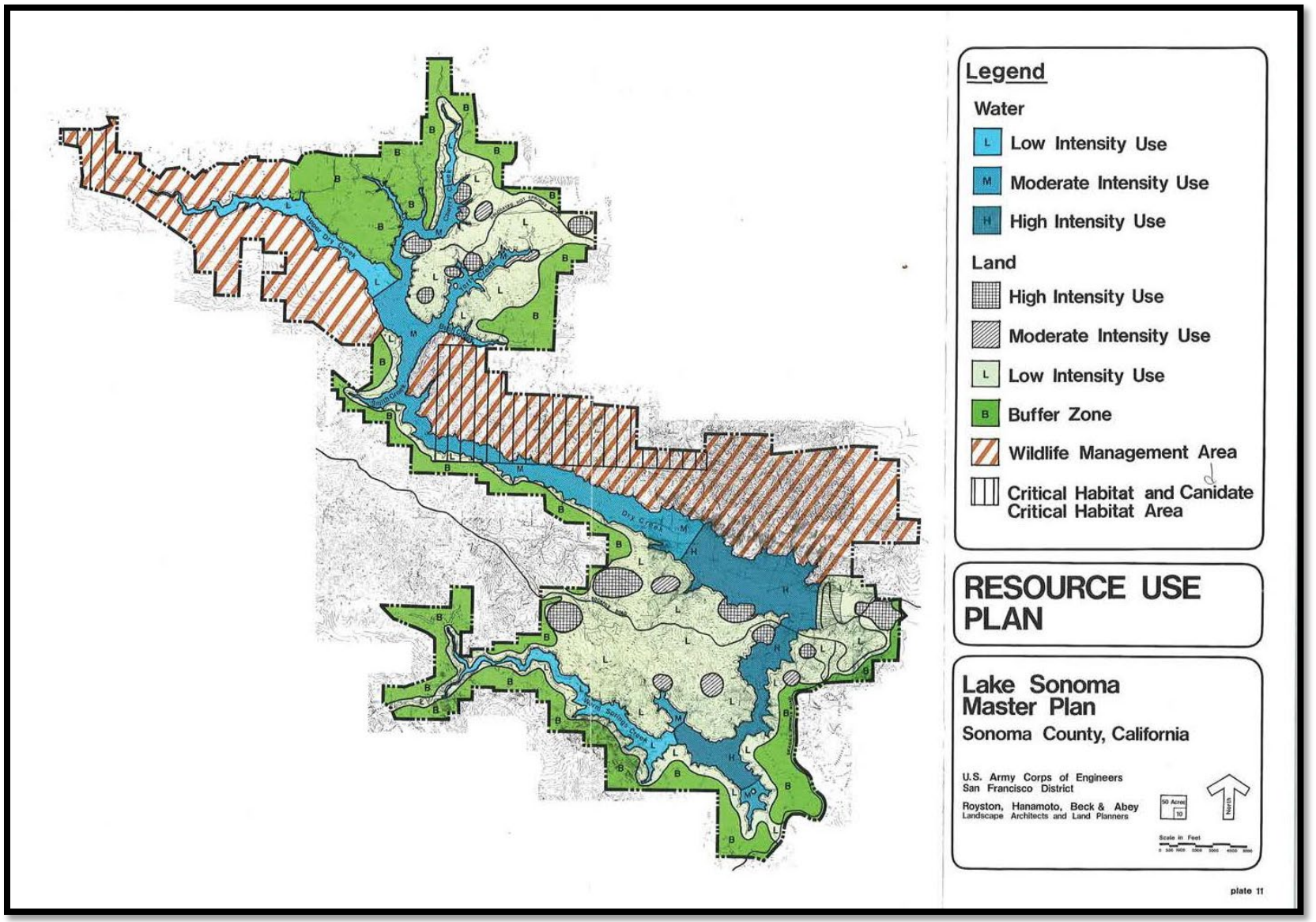

Figure 14 - 1979 Lake Sonoma Master Plan - Resource Use Plan

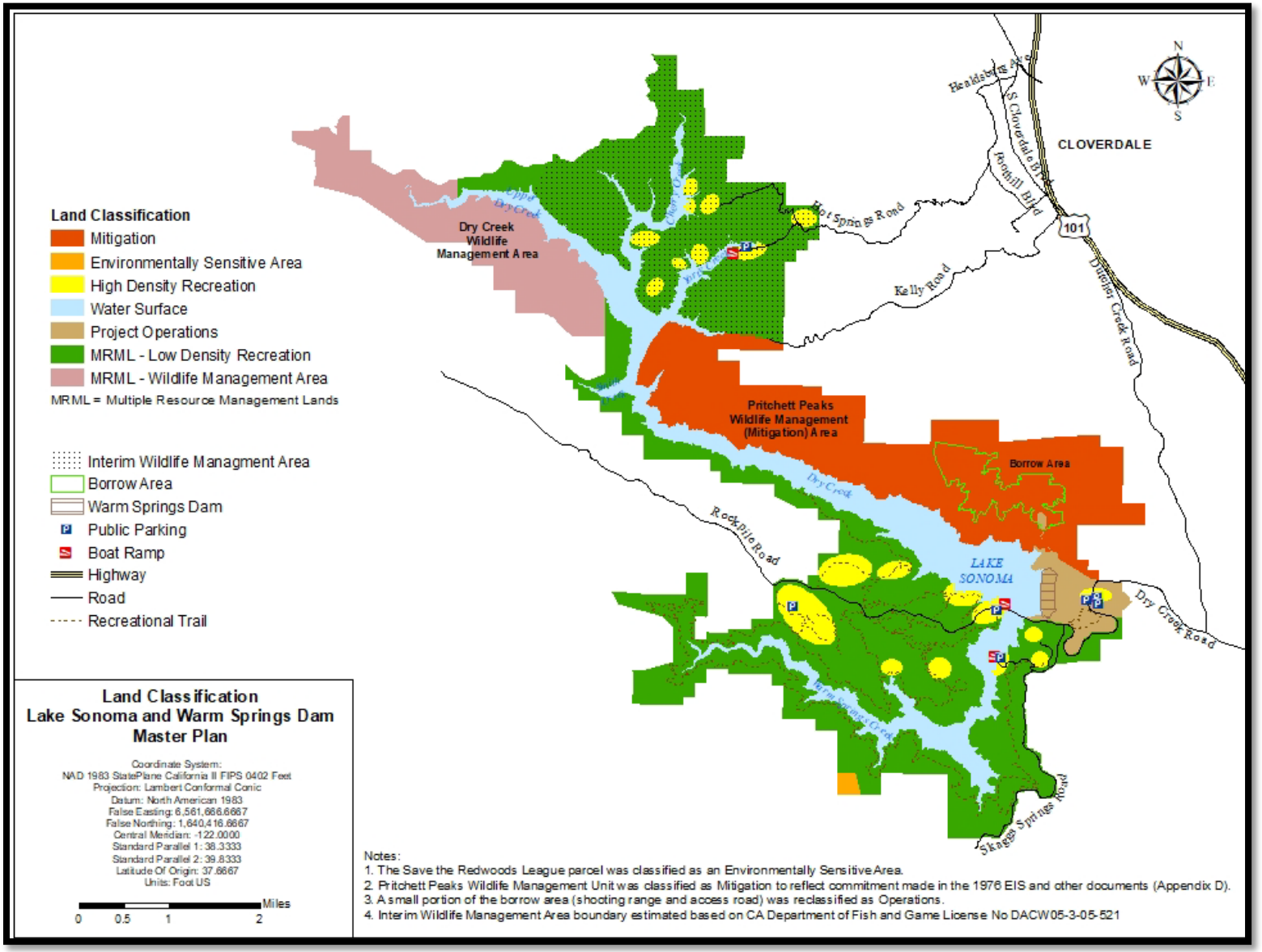

Figure 15 - Lake Sonoma Master Plan - Land Classifications

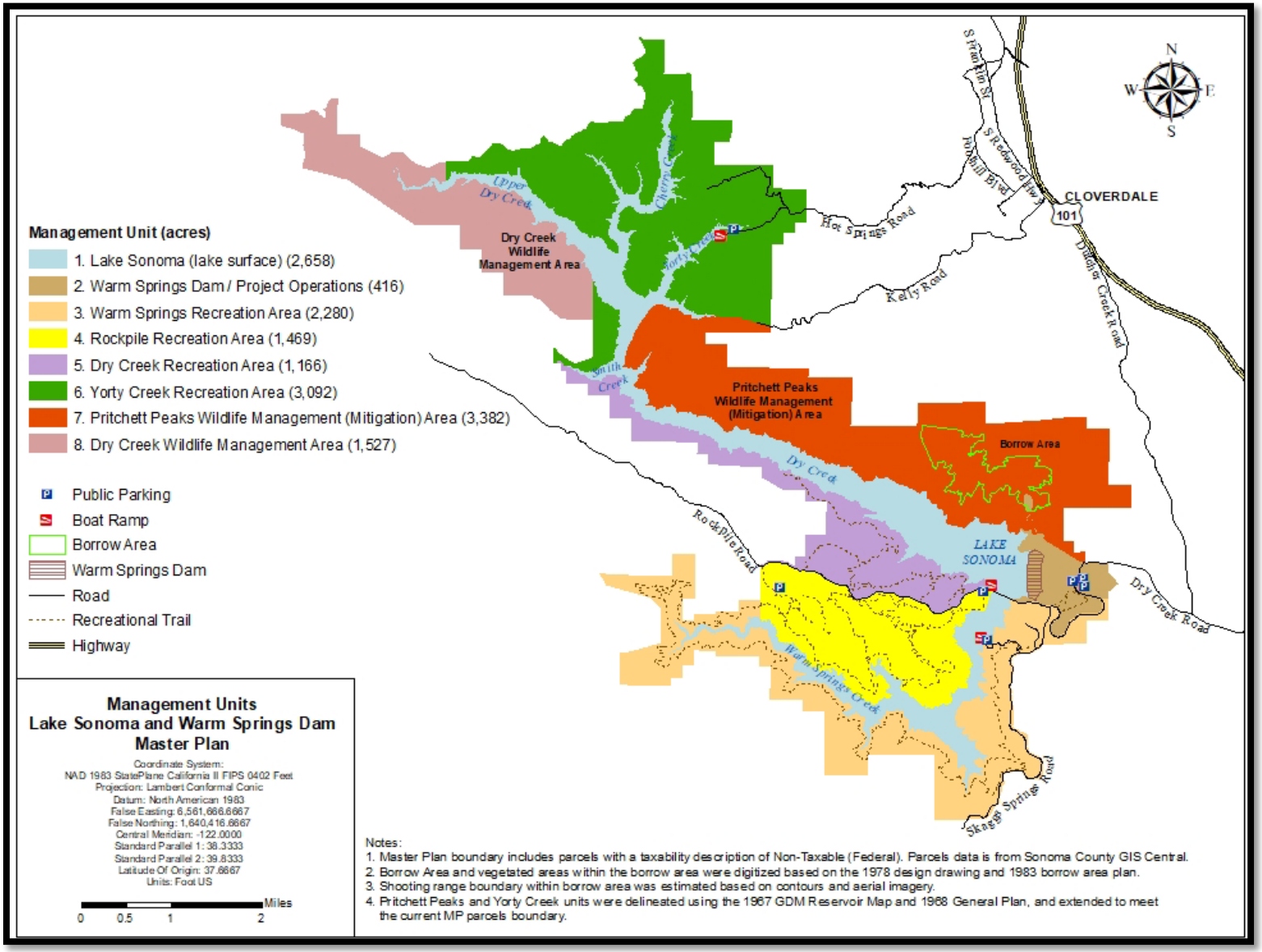

Figure 16 - Lake Sonoma Master Plan - Management Units

Table 7 - Comparison of 1979 Land Use Classifications and Current Land Use Classifications

Management Unit (MU) #	Management Unit Name	1979 Land Use Classifications	Current Land Use Classifications
MU#1	Lake Sonoma (lake surface)	*Water Surface: Low Intensity, Moderate Intensity, High Intensity Use*	*Operations; Water Surface, High Density Recreation*
MU#2	Warm Springs Dam (Dam, Control Tower, Spillway), Project Headquarters, Visitor Center and Fish Hatchery	*High Intensity Use; Moderate Intensity Use; Low Intensity Use*	*Operations; High Density Recreation*
MU#3	Warm Springs Recreation Area	*High Intensity Use; Moderate Intensity Use; Low Intensity Use; Buffer Zone*	*High Density Recreation; Multiple Resource Management Lands: Low Density Recreation, Future Recreation; Ecologically Sensitive Areas*
MU#4	Rockpile Recreation Area	*Low Intensity Use; Moderate Intensity Use*	*Multiple Resource Management Lands: Low Density Recreation, Future Recreation*
MU#5	Dry Creek Recreation Area	*High Intensity Use; Moderate Intensity Use, Low Intensity Use; Buffer Zone*	*High Density Recreation; Low Density Recreation; Multiple Resource Management Lands: Future Recreation*
MU#6	Yorty Creek Recreation Area	*High Intensity Use; Moderate Intensity Use; Low Intensity Use; Buffer Zone*	*High Density Recreation; Low Density Recreation; Multiple Resource Management Lands: Future Recreation*
MU#7	Pritchett Peaks Wildlife Management Area (East shore of Dry Creek)	*Wildlife Management Area; Critical Habitat Zones and Sensitive Wildlife Areas*	*Mitigation; Multiple Resource Management: Wildlife Management, Future Recreation, Low Density Recreation*
MU#8	Dry Creek Wildlife Management Area (North end of Dry Creek)	*Wildlife Management Area; Critical Habitat Zones and Sensitive Wildlife Areas*	*Multiple Resource Management: Wildlife Management, Future Recreation, Low Density Recreation*

4.3 PROJECT EASEMENT LANDS

All lands for which the USACE holds an easement interest, but not a fee title, are categorized as project easement lands. Planned use and management of easement lands will be in strict accordance with the terms and conditions of the easement estate acquired for the project. Easements are acquired for specific purposes and do not convey the same rights or ownership to the USACE as other lands.

(1) *Operations Easement*. The USACE retains rights to these lands necessary for project operations.

(2) *Flowage Easement*. The USACE retains the right to inundate these lands for project operations.

(3) *Conservation Easement*. The USACE retains rights to lands for aesthetic, recreation, and environmental benefits.

This MP does not distinguish between the different types of easement that the USACE holds at Lake Sonoma. The project boundary in this MP does not include lands for which USACE may have easements; only fee-owned lands are included in the project boundary, and the USACE makes no recommendations involving management of easement lands.

Chapter 5 – Resource Plan

5.1 RESOURCE PLAN

A wide variety of factors must be considered when developing project lands and resources, including physical characteristics, land and lake access, compatibility with adjacent land uses, existing and projected visitation levels and visitor-use pattern, the economics of operation and maintenance, and Federal, state and local initiatives. The overall objective in development at Lake Sonoma is to maximize the recreation benefits, while preserving the natural resources and scenic qualities.

The purpose of the MP is to provide a long-range view of area management and development. As such, it is important to (1) examine the various segments of the project and their potential for development and (2) examine each management area within the various segments and determine how each area can be developed to fit with the overall goals of Lake Sonoma. New and emerging recreation uses would be analyzed on a case-by-case basis for appropriate land use classifications.

A Management by Unit approach is described in this MP, as set forth in Engineer Pamphlet (EP) 1130-2-550, Change 5, 2013. Chapter 3, *Project Master Plans and Operational Management Plans*. The following sections describe how project lands and resources are currently managed, with descriptions of the resource and development needs or special considerations for future management of the MUs.

5.2 MANAGEMENT UNITS

This section describes the MUs established for Lake Sonoma. A number is assigned to each MU within the project area. Implementation of any actions recommended in this section should draw from resource objectives articulated in Chapter 3 of this MP and help to satisfy identified regional needs and desires of agencies and the public, within the limits and capabilities of the management agency.

1979 Land Use Classification – This section lists the applicable classifications for each Management Unit, as was put forth in the 1979 Lake Sonoma Master Plan.

Current Land Use Classification – This section lists the current classification language for each Management Unit, based on guidance from EP 1130-2-550.

Location – This section provides a brief description of the location of the management unit in the project boundary.

Development Needs – This section provides a summary description of the techniques that can or should be undertaken to implement the area resource objectives. The concepts discussed under this component are not all-inclusive; rather, they convey an understanding of the range of development and management strategies that could be used to implement the resource objectives. The development needs will be further refined and detailed in subsequent planning and design documents, including OMPs. The ultimate decisions regarding the methods that are actually implemented will result from coordination between the USACE, state, local agencies, non-governmental organizations, and the public, where appropriate, and as opportunities arise. Any applicable environmental compliance associated with these decisions would be carried out at the time of consideration for implementing any development activities.

Special Considerations – This optional component is used when there are very specific issues that apply to the MU that may affect the overall management outcome of the unit.

5.2.1 MANAGEMENT UNIT #1 – LAKE SONOMA (LAKE SURFACE)

1979 Land Use Classification – *Water Surface Low Intensity Use, Moderate Intensity Use, High Intensity Use*

Current Land Use Classification – *Operations, Water Surface* and *High Density Recreation*.

Location /Acreage - Lake Sonoma is located on Dry Creek in the eastern foothills of the Coast Range, with a drainage area of 130 square miles.

Description –Steep terrain, cliffs, and rock outcropping occupy a large portion of the shoreline. Much of the eastern shoreline is precipitous, while the northern and western shores have generally rolling terrain with gentle to moderate slopes. Reservoir capacity is 381,000 af, with water allocations to flood risk management (130,000 af), water supply (212,000 af), sediment accumulation (26,000 af) and fishery maintenance (13,000 af). Figure 17 is a view of both arms of Lake Sonoma, from the project overlook.

Figure 17 - View of Lake Sonoma from the Overlook

The lake surface is divided into two arms, according to the two tributaries of the lake: Dry Creek Arm and Warm Springs Arm. Dry Creek Arm is the longer and larger of the two arms. The upstream portion can be characterized as a hand with several radiating fingers coming together in a large palm. The arm then begins to gradually widen as it nears Warm Springs Dam. This arm of the lake is calm in the fingers and palm and can become windy in the canyon approaching the dam. Wave action moves down the canyon towards the dam frequently making the wider portion of the arm unusable for water skiing and other towed activities. It would support activities like water skiing if trees were removed from the channel.

Warm Springs Arm is the smaller arm and is characterized by narrow channels and secluded fingers of lake water. Within this area is an open area that is suitable for water skiing and can become a safety concern on busy days when it is the only area of the lake not affected by winds. The small fingers provide good fishing opportunities and locations for houseboats. Table 8 shows a list of primitive boat-in or hike-in only campsites available around the lake, divided by the two arms.

Table 8 - Primitive Boat-In and Hike-In Campsites at Lake Sonoma

Primitive Boat-In and Hike-In Campsites at Lake Sonoma	
Dry Creek Arm	**Warm Springs Arm**
Broken Bridge	Bummer Peak
Falcons Nest	Quicksilver
Homestead	Lone Pine
Loggers	Madrone Point
Rustlers	Black Mountain
Skunk	Buck Pasture
Thumb	Old Sawmill

Development Needs – The area on the back arm of Dry Creek arm near Loggers camp, where the lake surface is normally calm, is currently closed to high-speed boat traffic. It is possible to open this area for water skiing, but doing so would require the removal of some submerged trees that pose a safety hazard.

Special Considerations – In 2000, during the peak recreation season, Colorado State University conducted a boating capacity study at Lake Sonoma. A draft report was received in 2001, followed by a stakeholders meeting. If implemented, management decisions informed by the survey data would likely change the design loads, establish limits or change use patterns of certain regions of the lake.

Zebra-Quagga mussels are an invasive species that have not yet been discovered in Lake Sonoma, but active management and monitoring is necessary to prevent the spread of mussels in the lake. The U.S. Fish and Wildlife Service analyzes plankton DNA to identify mussel DNA.

The current Zebra-Quagga mussel inspection program at Lake Sonoma includes mussel DNA net drags, substrate inspections, and using mussel sniffing dogs. Inspection and management efforts are expected to expand in the future. There is discussion of mandatory inspection of boats before being allowed to launch at the lake.

5.2.2 MANAGEMENT UNIT #2 – WARM SPRINGS DAM (DAM, CONTROL TOWER, SPILLWAY), PROJECT HEADQUARTERS, VISITOR CENTER AND FISH HATCHERY

1979 Land Use Classification – *High Intensity Use, Moderate Intensity Use, Low Intensity Use*

Current Land Use Classification – *Operations, High Density Recreation*

Location – South end of the lake, below Warm Springs Dam, along Dry Creek Road.

Description – The area around the Warm Springs Dam is at the entrance to the project area, is the most visited portion of the project, and has the most buildings and infrastructure to accommodate visitors as well as project operations. This MU contains the Park Headquarters which is open to the public but visited less frequently than the Visitor Center. This MU also contains a maintenance yard and a District technical support staff office, which are not open to the public.

The Warm Springs Recreation Area is a highly landscaped area that includes covered picnic areas, a dog park, a disk golf course, and an outdoor gym area. This day use area accommodates large special events ranging from 2,000-14,000 participants.

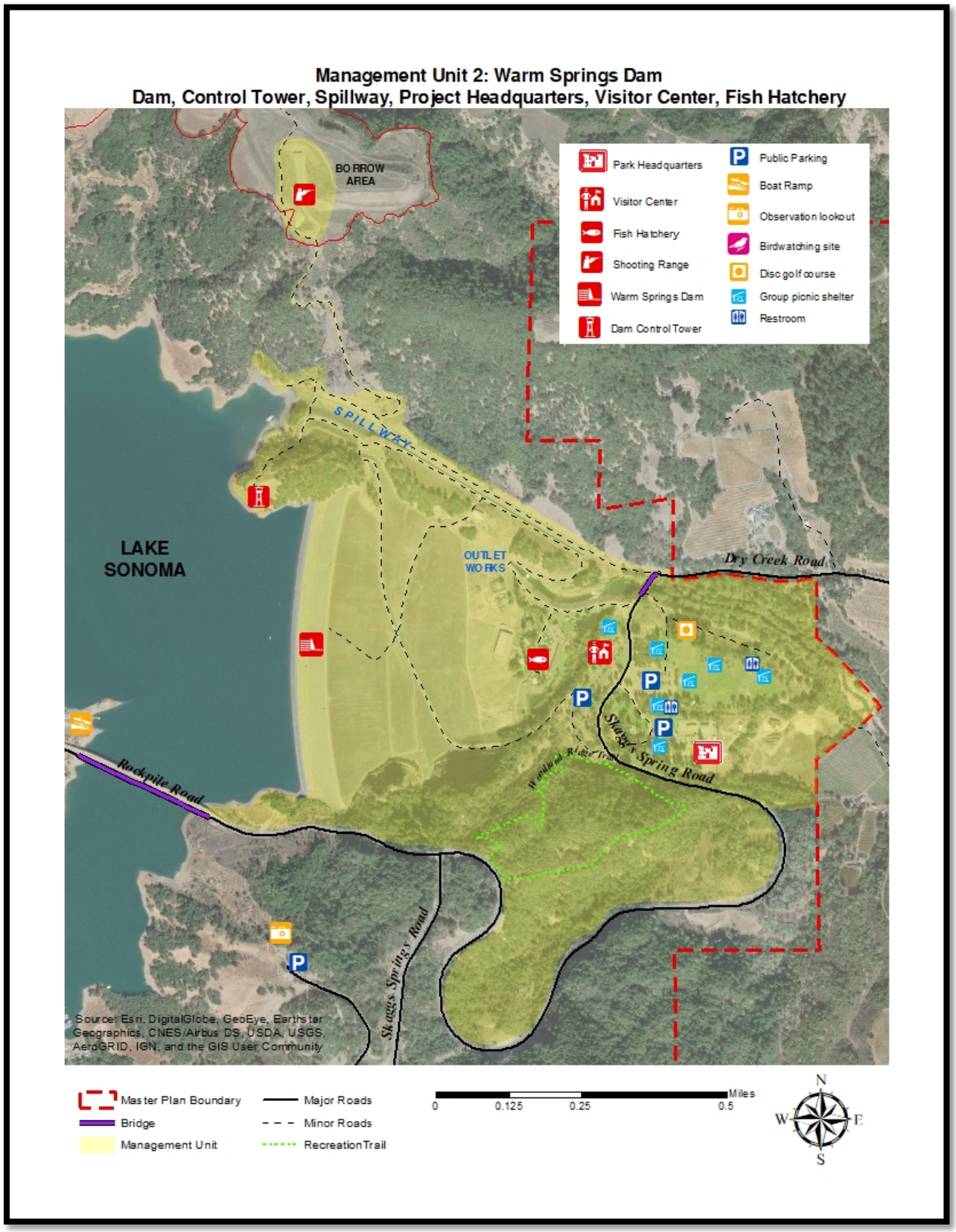

Figure 18 - - Lake Sonoma Management Unit 2 - Warm Springs Dam

The Milt Brandt Visitor Center and the Congressman Don Clausen Fish Hatchery are both open to the public. Exhibits in both the visitor center and the hatchery tell the story of Warm Springs Dam, explain the natural and early history of Dry Creek Valley, and offer a variety of audio-visual and ranger-led programs. Volunteer docents staff the information desk, and a conference room to the side of the visitor center accommodates large group meetings and presentations.

Figure 19 - Lake Sonoma Milt Brandt Visitor Center entrance

Figure 20 - View of the Don Clausen Fish Hatchery from the Back of the Milt Brandt Visitor Center

The Don Clausen Fish Hatchery was built by the USACE to mitigate impacts to salmon and steelhead spawning grounds. It is operated under contract by the CDFW. Group tours are arranged through the Visitors Center, and a section of the hatchery is open to the public for viewing the operation, which also provides space for interpretive programs.

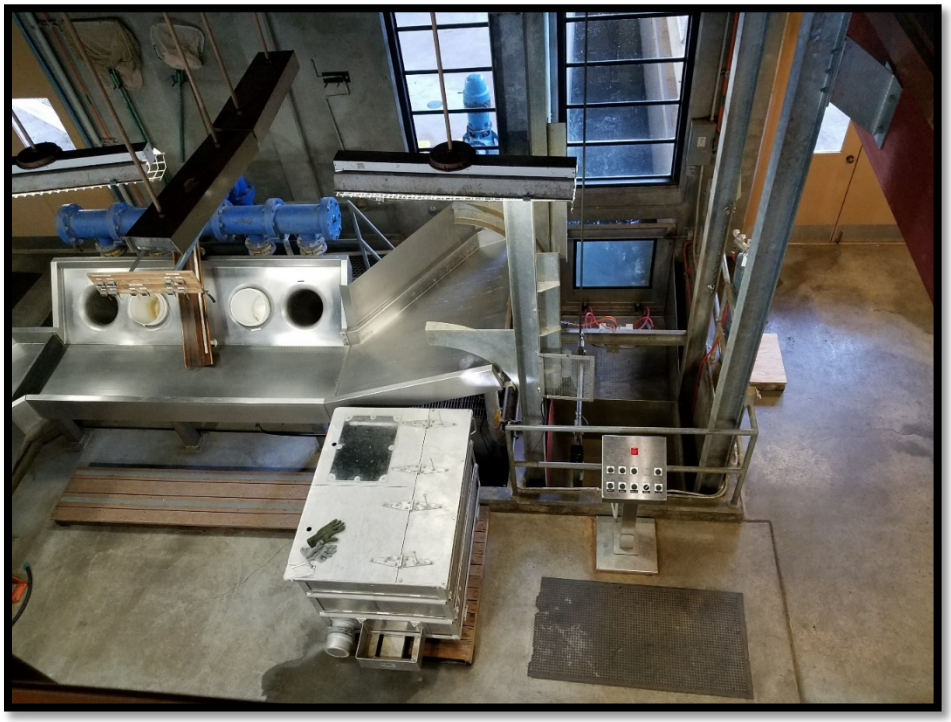

Figure 21 - View of egg collection facility from viewing area of the Don Clausen Fish Hatchery

Figure 22 - Interpretive Program Area of the Don Clausen Fish Hatchery

Figure 23 - Salmonids Program: Egg Collection

Figure 24 - Salmonids Program: Tagging

Development Needs – Much of the development envisioned in the original 1979 MP has been built and is currently supporting both recreational and operational goals. Future proposed development or improvement may be described in this MP, but readers are also encouraged to review the original MP for additional information. Figure 25 shows recreational development envisioned for this area in the 1979 Master Plan.

Dam and Spillway, Outlet Works
The road near the control tower of the dam is degrading and sliding. It is in need of repair or replacement with an alternate road to access the control tower.

Visitor Center and Hatchery
The footbridge from the visitor center to the hatchery is in need of repair or replacement. It is recommended that when this repair takes place, the new footbridge accommodate bird watching areas with viewing stands.

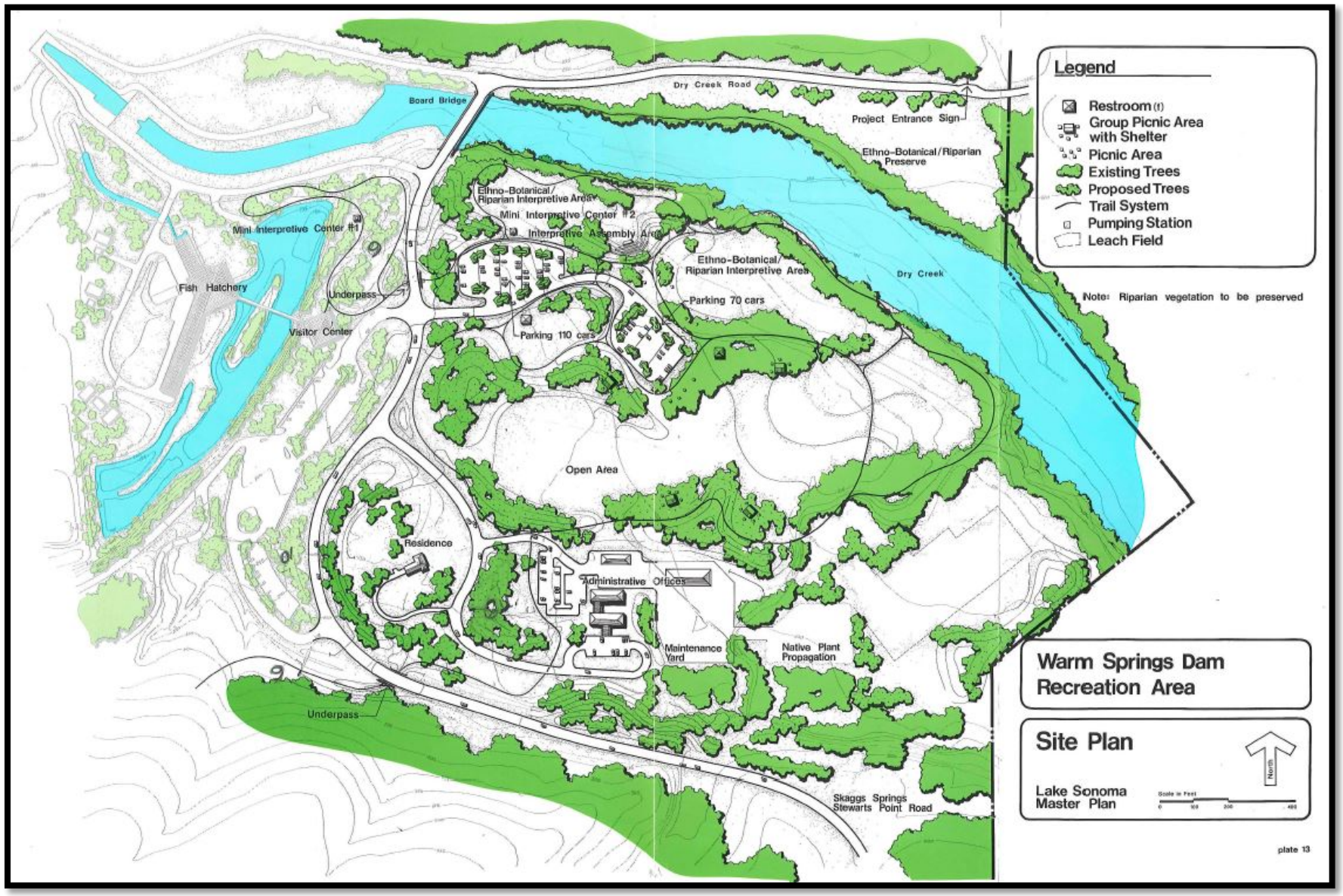

Figure 25 - 1979 Lake Sonoma Master Plan Site Plan for Warm Springs Dam

Recreation Areas
A new interpretive trail for school groups is recommended adjacent to Dry Creek Road, and accessible from the current recreation area.

Park staff reported a significant increase in attention from Sonoma County since the Ironman race event was hosted in this recreation area. Development of the area, including additional parking immediately across the road from the visitor center to accommodate such large groups, is consistent with the current land use classification.

This management unit serves as the gateway to the entire park and is the destination point for formal recreation activities like group picnics and social events. The area could be redesigned to cater to live events like weddings, reunions, etc. that would benefit from a gazebo, band stand trellis, or other architectural features. Additionally, adding a pavilion, water fountain, and shelter in the location of the outdoor gym would increase use in that area. Plant and tree identification signs along Woodland Ridge Trail may increase the interpretive quality of the visitor experience.

Rockpile Road / Bridge
Stairs leading to the water's edge near the south east part of the bridge should be maintained and improved, to increase the safety of visitors. An improved viewing area for visitors to watch nesting ospreys near the bridge is likely to increase bird watching visitation in this area.

Special Considerations –

Water drawn from a pollution control pond is used to irrigate the large group area to maintain a grassy space for recreation use. Water source is needed to keep grass alive in this large area.

A dance arbor in the lower area of the MU is maintained by the Dry Creek Band of Pomo Indians. This area is under a lease to the Tribe and is expected to be preserved and managed in its current use. Some annual events are hosted by the Tribe and are open to the public, but general use of the area is limited. Any consideration of any future proposed use will include close coordination and engagement with the Tribe beforehand.

A change in classification and management of a gun range located to the north and east of the dam (see Chapter 5, section 5.2.7 and Chapter 6, section 6.2) will withdraw it from MU #7 and incorporate this small portion of the former borrow area and the access road into this MU.

5.2.3 MANAGEMENT UNIT #3 – WARM SPRINGS RECREATION AREA

1979 Land Use Classification – *High Intensity Use, Moderate Intensity Use, Low Intensity Use, Buffer Zone*

Current Land Use Classification – *High Density Recreation, Multiple Resource Management Lands: Low Density Recreation, Proposed Recreation*

Location – South shore of Warm Springs Arm of Lake Sonoma, to the south and west of MU #2 (Warm Springs Dam and park headquarters).

Description – The south shoreline of the Warm Springs arm of Lake Sonoma is primarily a north facing slope, predominated by oak woodland. The eastern portion features a project observation deck, marina concessionaire, equestrian facility, campgrounds and day use areas. The western portion is less used, and contains several boat-in or hike-in primitive campgrounds, and one group use campground accessible by trail only.

Starting at the northeast boundary of this MU, there are high use recreation activities. Moving east, this arm quickly becomes remote and more suitable for lower density recreation activities like hunting.

Primitive Boat-In and Hike-In Campsites at Lake Sonoma, along the Warm Springs Arm, include: Bummer Peak; Quicksilver; Lone Pine; Madrone Point; Black Mountain; Buck Pasture; and Old Sawmill. There is also a group camp (Island View) that accommodates 30-50 visitors.

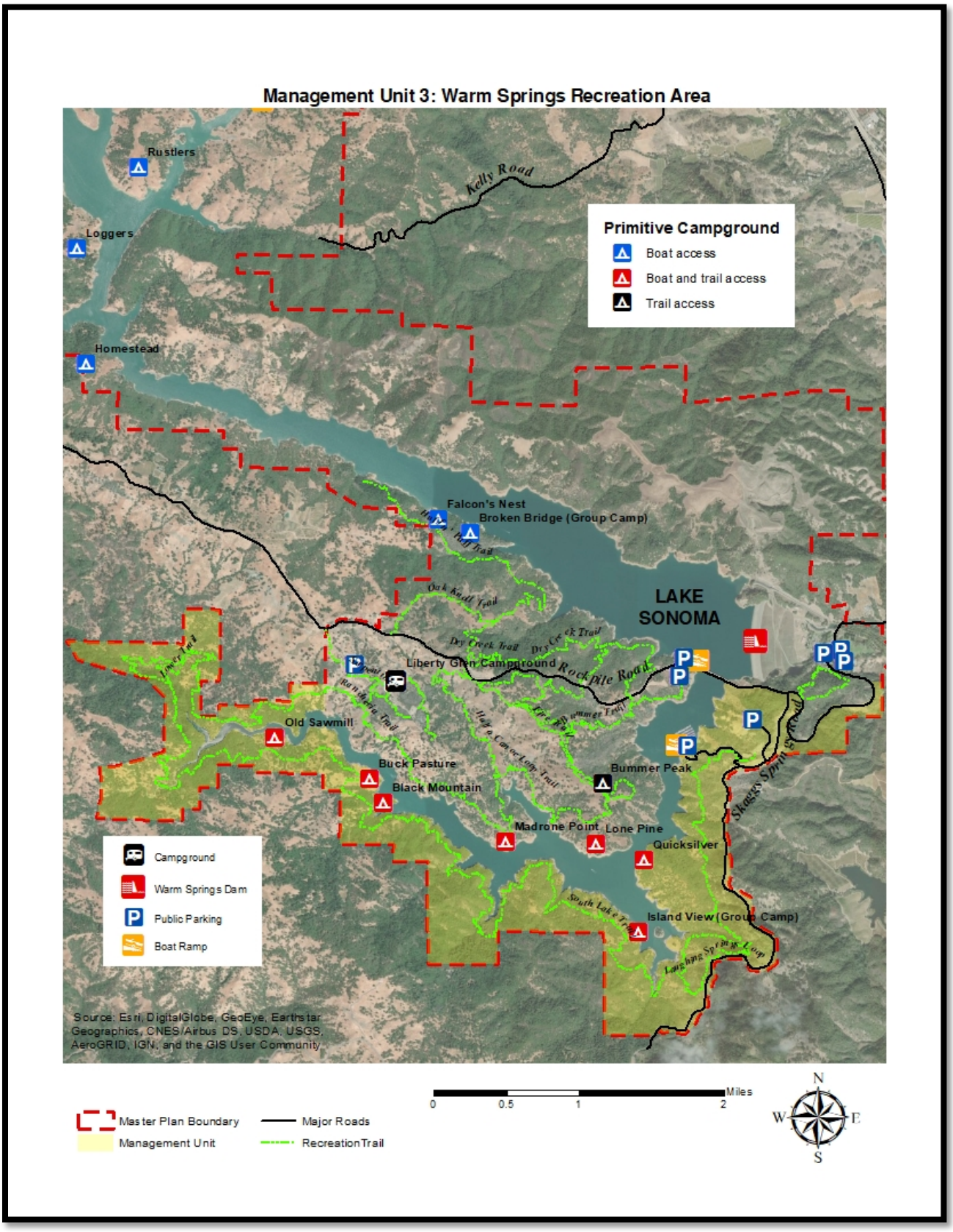

Figure 26 - Lake Sonoma Management Unit 3 - Warm Springs Recreation Area

Development Needs –

Marina

The marina concessionaire has invested in covered slips and other improvements, in anticipation of growing demand for boats and visitors. The concessionaire expressed interest in expanding the marina to include a restaurant. Doing so would require removing language from the existing lease that prohibits restaurants.

Figure 27 - View of Lake Sonoma Marina looking east

Figure 28 - Marina Concession Store at Lake Sonoma

Figure 29 - Entrance to the Ranch at Lake Sonoma equestrian center

High-Density Area (eastern portion)
The northeast portion of this MU has the potential to contain a leased destination resort overlooking the lake and the wine growing valley below the dam. Coupled with the existing marina concessionaire and equestrian facilities, there is potential to develop a resort in this area for overnight accommodations.

An existing informal lake access point could be formalized by adding facilities such as a paved parking lot and a new bridge.

There is interest expressed in developing a zip line in an area near the current parking lot and barn area of the equestrian facility. See Figure 29 for an image of the entrance to the equestrian center.

Low-Density Area (western portion)

The west portion of the MU can be developed to accommodate increased visitor use, while still retaining the primitive, low-density visitor use experience. The equestrian concessionaire would like to see a horse camp developed at Old Sawmill. At the far west edge of this MU, an informal access point is a site that has development opportunities to add a new bridge, paved parking lot, and a campsite for horse camping.

Special Considerations – A portion of land was acquired by Save the Redwoods League and transferred to the USACE for inclusion into the south portion of this MU in 2009, and is being established as an ecologically sensitive area, consistent with the stipulations of the transfer. See Chapter 6 for more details and Appendix C for a copy of the deed transfer from Save the Redwoods League.

5.2.4 MANAGEMENT UNIT #4 – ROCKPILE RECREATION AREA

1979 Land Use Classification – *Low Intensity Use, Moderate Intensity Use*

Current Land Use Classification – *Multiple Resource Management Lands: Low Density Recreation, Proposed Recreation*

Location – Section south of Rockpile Road, west of the dam across the bridge.

Description – The south side of Rockpile Road includes the southern half of a peninsula that divides the two arms of Lake Sonoma. It is located above the Warm Springs Arm of Lake Sonoma. It is predominantly a south facing slope with grass and oak woodland interspersed with deep canyons. Most of the easily hiked trails are located here as well as the park's only vehicle accessible campground.

Figure 30 - Group Picnic Area at the Liberty Glen Campgroun

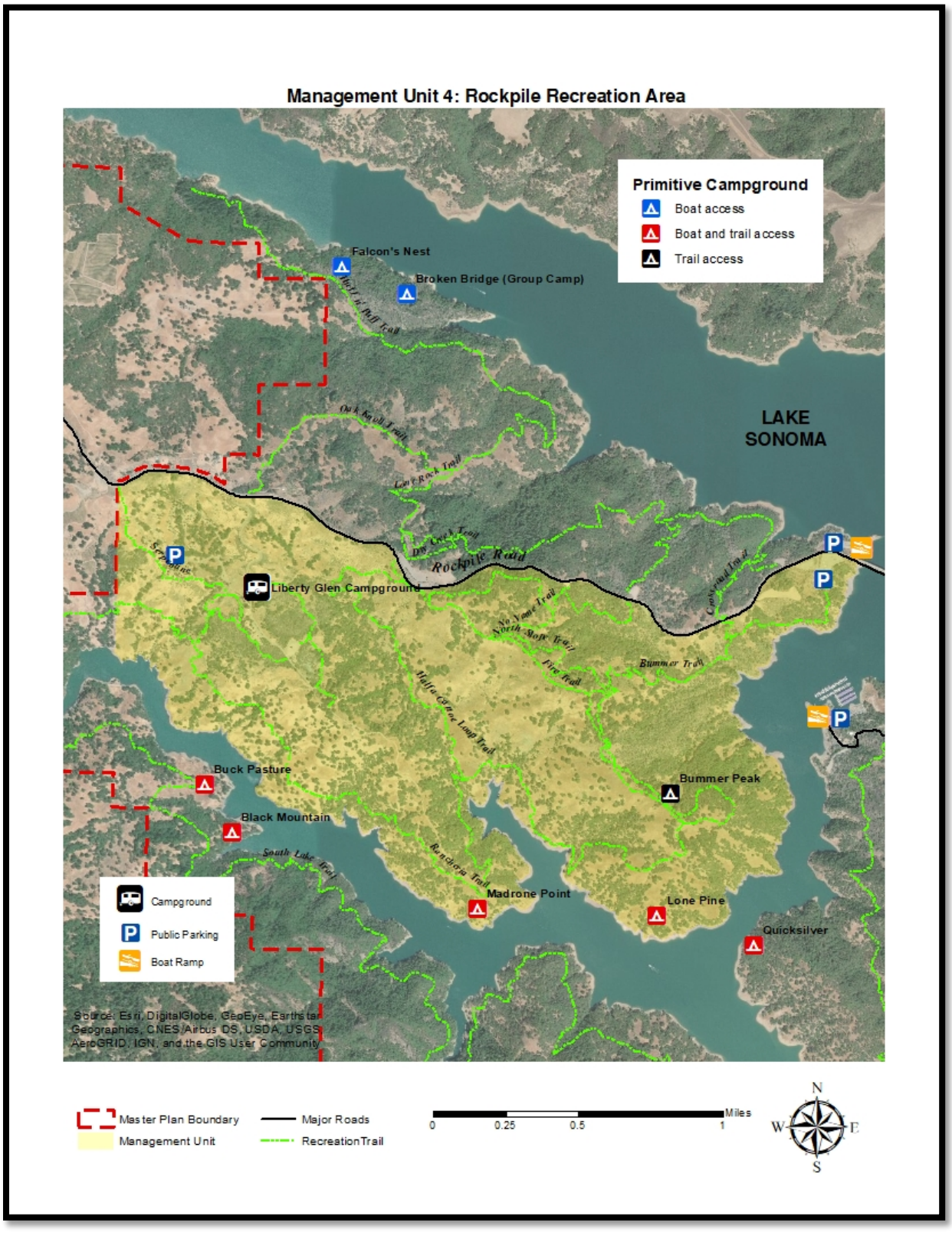

Figure 31 - Lake Sonoma Management Unit 4 - Rockpile Recreation Area

Development Needs –

Liberty Glen Campground:
The Liberty Glen campground is located on a ridge, and Lake Sonoma is accessible via a one-mile trail. There are several single and double campsites, in addition to one cabin that is available to reserve. Flush toilets, showers, and drinking water are available within the campground. The Madrone Service Road, which provides access to Liberty Glen Campground, is in need of repair as the surface is cracking. It is recommended that the road be upgraded to an all-weather road. Since this is a high use campground, it is recommended that the road be repaired to provide adequate access to the campground. There is also pump equipment located along the road that is used for the campground and for firefighting; therefore, it is essential that this road be accessible.

It is recommended to convert campsites within Liberty Glen to full hookup, including sewer, water, and electric service. It is also recommended to add more substantial campground facilities such as the cabin pictured in Figure 32. It is recommended to improve the host campsites, and to repair the road within the campground. It is recommended to add a switchback trail along the Madrone Service Road that will provide easier access to the lake.

Figure 32 - Example of Improved Camping Facility at Lake Sonoma

Bummer Peak Campground:
It is recommended that this campground be eliminated. There are only two campsites that are very difficult to access. The access difficulty is challenging for USACE staff, especially with potential firefighting needs that might occur in the campground.

Rockpile Road:
The Rockpile Recreation area sees high visitation and has several development needs to meet current and anticipated future usage. The original 1979 MP called for development of a marina and a mini general store along the western shoreline of the lake just south of the Rockpile Road Bridge. The marina was ultimately constructed on the southeastern shoreline instead. The Rockpile Recreation Area abuts Rockpile Road to the south. Several improvements are needed in areas along the road.

1. The parking area at the air gun range is currently gravel. It is recommended that the parking area be paved as there are multiple trailheads in the area and it is frequently used by visitors.

2. There is currently a large dirt overflow parking lot located between the air gun range and the boat launch. It is recommended that this parking lot be paved, and a trail be added to provide additional access from the parking lot to the boat launch.

Boat Launch Area:
This area provides a boat launch and large parking lot. The trailhead for the Lake Sonoma Little Flat Trail is located in the area, in addition to a swimming beach.

1. The dock that is currently located near the boat launch is broken and poses many safety hazards. This is a high use area. So, it is recommended that the current dock be replaced.
2. There is a wooden staircase in the area that also poses a safety hazard. The wooden staircase should be replaced, ideally with a concrete staircase.
3. There is currently an informal swimming area located just south of Rockpile Road. This area should become a formal beach and swimming area with signage. Additional access from the parking lot to the swimming beach should be added as this is a very steep area.

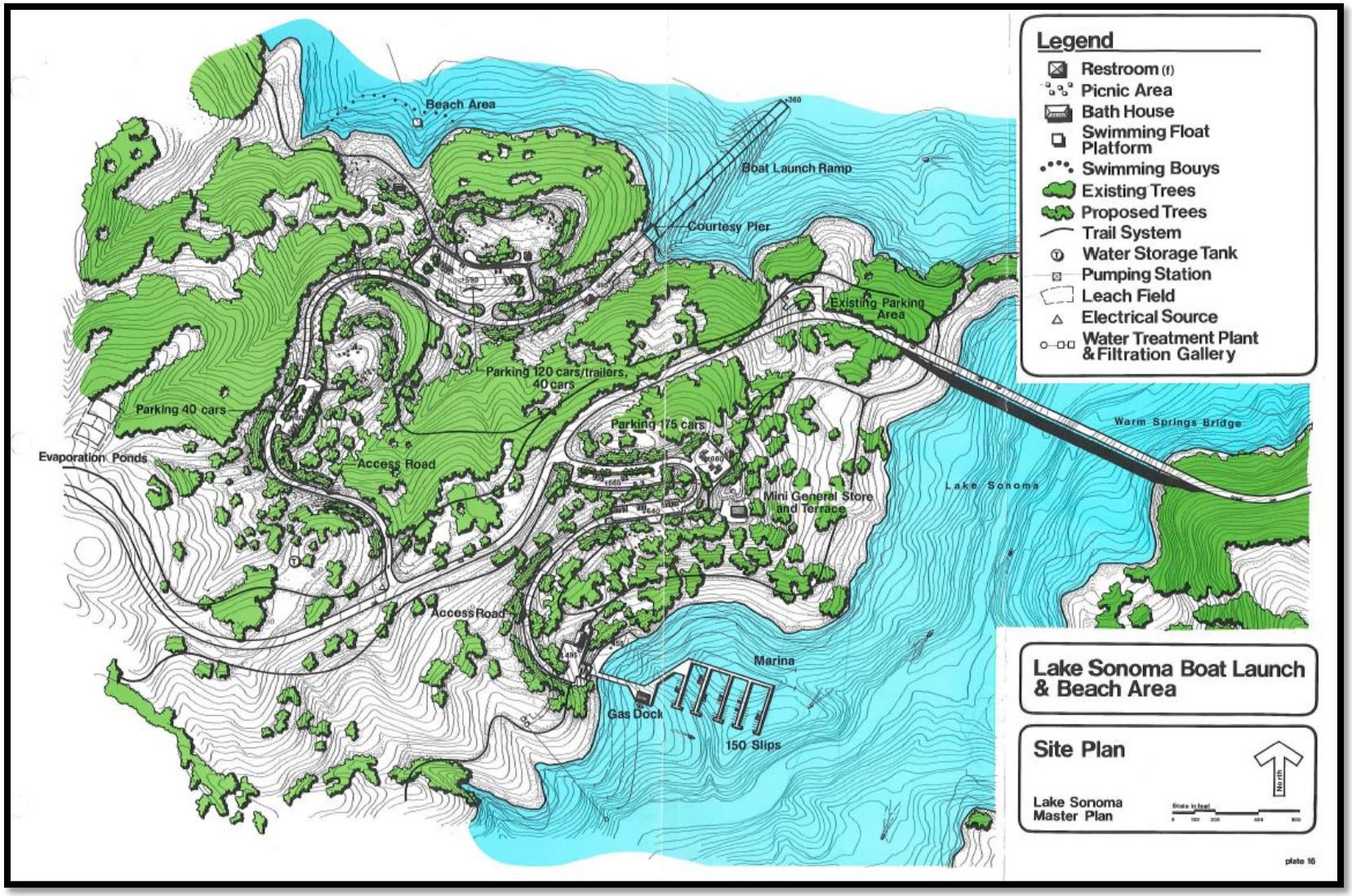

Figure 33 - 1979 Master Plan Site Plan for Lake Sonoma Boat Launch

Special Considerations – With website access to the National Recreation Reservation Service, Lake Sonoma's campgrounds are reaching a larger public. A balance of family campsites and group campsites will be needed, with an estimate of more than 350 family campsites needed to accommodate current and future use. The Rockpile Recreation area, and particularly Liberty Glen campground, provide space for growth in overnight camping accommodations.

5.2.5 MANAGEMENT UNIT #5 – DRY CREEK RECREATION AREA

1979 Land Use Classification – *High Intensity Use, Moderate Intensity Use, Low Intensity Use, Buffer Zone*

Current Land Use Classification – *High Density Recreation, Low Density Recreation, Multiple Resource Management Lands: Proposed Recreation*

Location – North side of Rockpile Road to the southern shoreline of Dry Creek.

Description – The south side of the Dry Creek arm of Lake Sonoma to Rockpile Road includes the northern half of the peninsula that divides the two arms of Lake Sonoma. It is predominantly a north facing slope with oak woodland, redwood and Douglas fir stands with some pure stands of madrone. The Dry Creek arm contains several hike-in or boat-in only primitive campsites.

The Dry Creek arm contains several boat-in only primitive campsites and one hike-in campsite. Other recreation features in this area include Little Flat Trailhead that serves as both a trailhead and overflow parking for the public boat ramp.

Grey Pine parking lot serves as a trailhead and access point to an air rifle range in the adjacent MU #4 (Rockpile Recreation Area). Lower Lone Rock parking lot is a horse staging area and group camp that includes a shade shelter, pit toilet and fireplace/food preparation area. A public archery range accessed by Lone Rock Trailhead is operated and maintained by Sonoma County Bowmen. The license was last renewed in 2016 and extends to 2021[9].

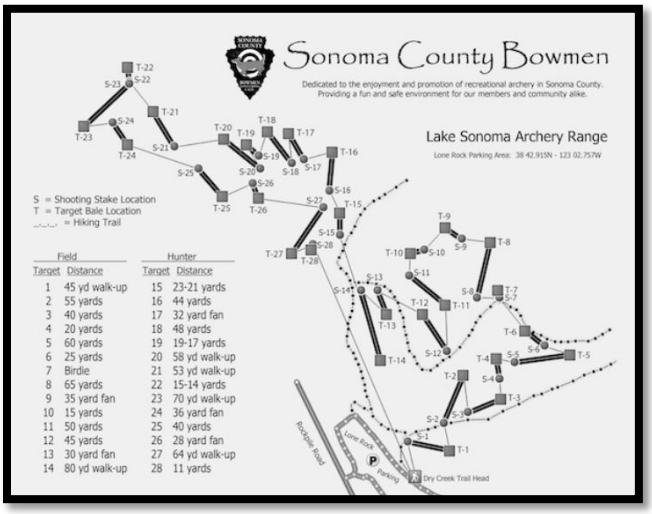

Figure 34 - Sonoma Public Archery Range

[9] http://www.scbarchery.net/ranges/range-lake-sonoma/

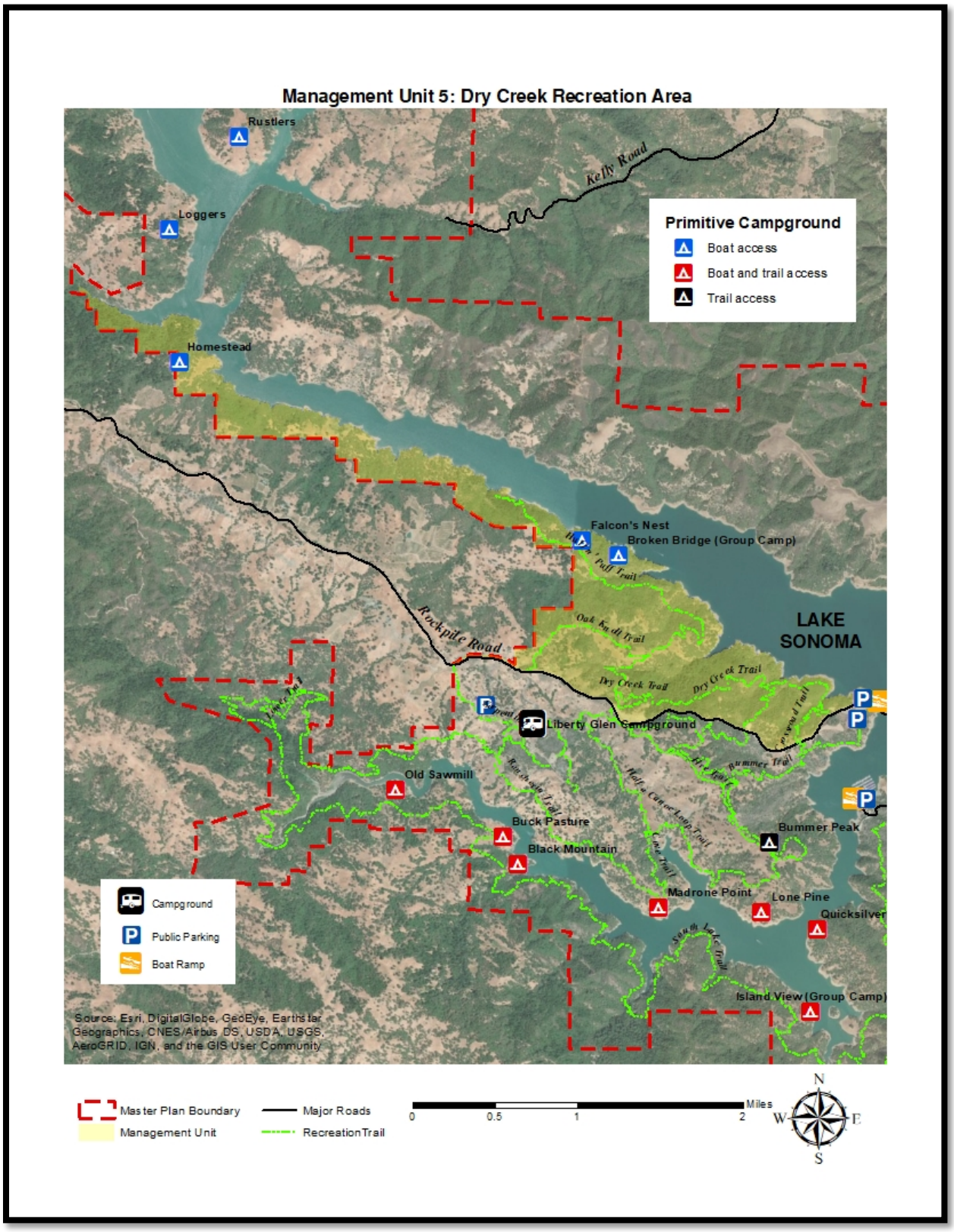

Figure 35 - Lake Sonoma Management Unit 5 - Dry Creek Recreation Area

Development Needs –

Beach Access
It is recommended that the trail for access to lakeside fishing near the current public boat launch be repaired and improved. A boat dock may also be added to the area adjacent to the boat launch. It is recommended to pave and stripe the parking areas next to the boat launch, further up the ridge in the Grey Pine area, and still further in the Lone Rock parking area. The original 1979 MP envisioned additional boat launch facilities, as well as an amphitheater, in the area encompassed by this MU.

Camping
Near Broken Bridge, cabins could be built to accommodate high-end camping.

Special Considerations – none.

5.2.6 MANAGEMENT UNIT #6 – YORTY CREEK RECREATION AREA

1979 Land Use Classification – *High Intensity Use, Moderate Intensity Use, Low Intensity Use, Buffer Zone*

Current Land Use Classification – *High Density Recreation, Low Density Recreation, Multiple Resource Management Lands: Proposed Recreation*

Location – Northeastern part of the project area. This area is accessible from the town of Cloverdale via Hot Springs Road/Shady Lane.

Description – The Yorty Creek Recreation Area consists of a day use area, swimming beach, covered picnic sites, a playground, hiking trails and a car top boat launching ramp. Also within this unit are Rustler's, Thumb and Skunk boat-in campgrounds. Yorty Creek Recreation area is a high use formal recreation area, while the remainder of the area receives sparse use. The topography is primarily oak and grassland intermixed with dense chaparral.

Figure 36 - Panoramic View of Yorty Creek Recreation Area

Figure 37 - Day Use areas at Yorty Creek, Lake Sonoma

Figure 38 - Boat Launch at Yorty Creek, Lake Sonoma

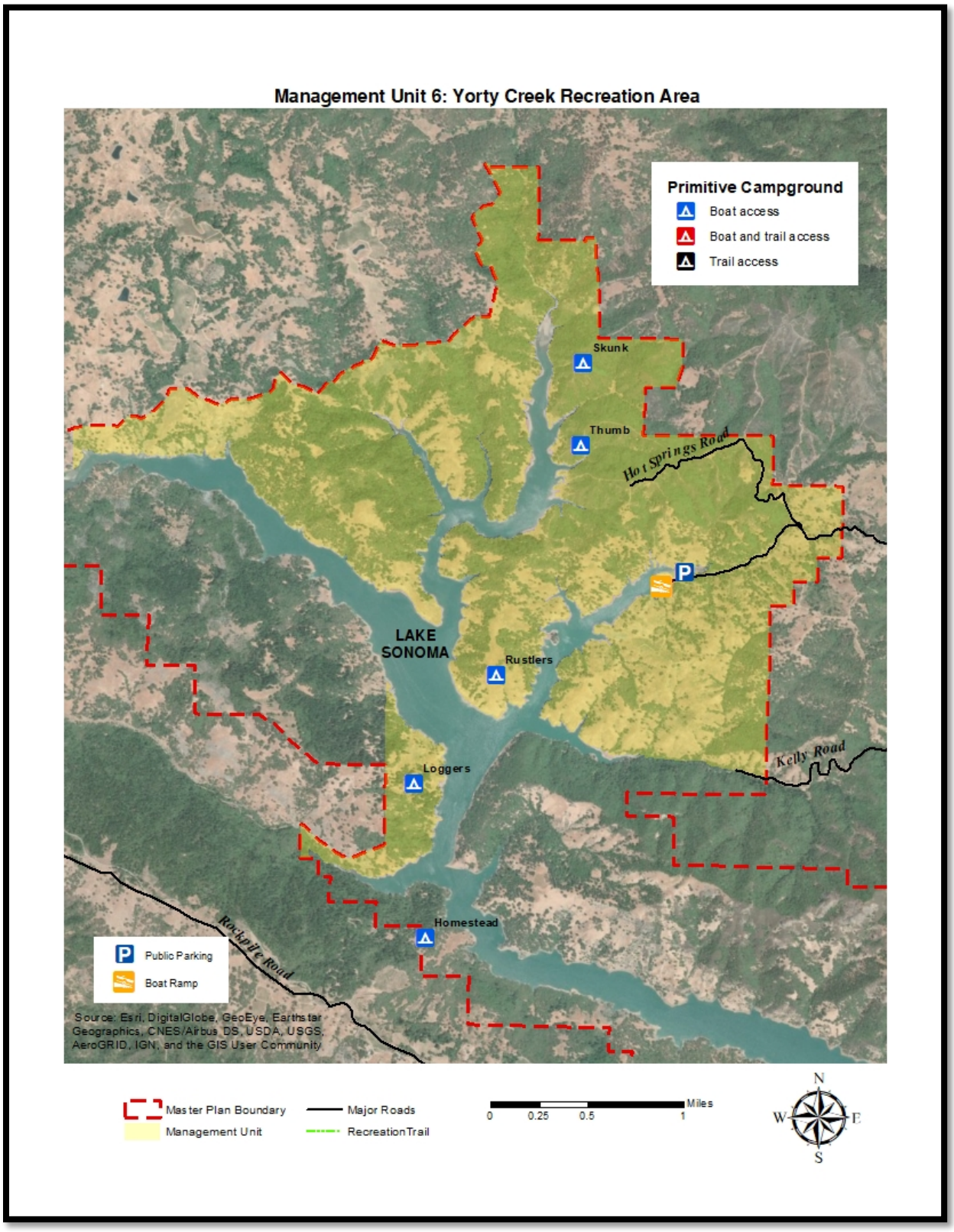

Figure 39 - Lake Sonoma Management Unit 6 - Yorty Creek Recreation Area

Development Needs – Yorty Creek Recreation Area plays an increasingly important role as a location for the gateway community of Cloverdale, and for potential visitation from Ukiah and other areas to the north on highway 101. This area has the potential for more formal recreation activities like camping, boat rentals, or value-added swimming activities. The project staff also recommends the development of a trail system linking the recreation area and campgrounds to improve the recreational experience of visitors and open the area to a more diverse recreational user group.

Parking Area / Beach Access / Boat Launch
There is currently no land access to the other side of the water from the parking lot. A pedestrian bridge would be needed to connect recreationists from the parking area to cross Yorty Creek to the north side of the area. Development of a shoreline trail from the parking area to Rustler's campground, and splitting off to Thumb and Skunk campgrounds is recommended. The original MP outlined a proposed shoreline trail for this area along the northern shoreline of Yorty Creek. A trail would allow visitors to park and hike to the three campgrounds, rather than the campgrounds being boat-in only. Development of trail systems would potentially increase the visitor use at these campgrounds.

It is recommended that USACE continue to maintain this area for recreational purposes such as boating, kayaking, standup paddle boarding (SUP), and other non-motorized water recreation purposes.

A second boat ramp/launch area may be developed as the existing ramp (see Figure 38) is often overcrowded during peak times. Additionally, an area may be designated to allow for boat access to the shore, particularly a roll on/roll off dock system for kayaks and canoes only. This will increase safety for kayakers/canoers as they will not need to compete with motorized boat use of the boat ramp.

It is recommended to designate dog-friendly areas along the beach at Yorty Creek by adding signage. Visitors currently bring their dogs to this area, but it is recommended that there be official designation of areas open to dogs.

Due to the heavy recreational use of the Yorty Creek area by kayakers, swimmers, and other non-motorized recreation, it is recommended that certain areas within Yorty Creek ban motorized boat use. Signs and maps of where motorized boats are not allowed should be posted at boat launches and other visitor service areas.

Road access to Yorty Creek Recreation Area is limited – a paved road connects to the parking area and boat launch, but no trailers are currently allowed on the access road, and the condition of the road is poor. Improvements made would involve extensive environmental and cultural assessment, and the result of improved roads would encourage the use of motorized boat traffic in this area.

Campgrounds

There are no recommendations to alter the current campgrounds (Skunk or Rustler's). It is recommended that the service road from the main parking area in the Yorty Creek Recreation Area leading to Skunk and Thumb campgrounds be improved, and that a trail be added to allow better access to the campground for hikers.

Development of a primitive hike-in campground northeast of the parking area, and primitive campsites just south of the main Yorty Creek parking/beach access area, close to the shoreline, are indicated in the 1979 MP, and are recommended. Situating a campground away from the lake in this MU would diversify the camping opportunities offered at Lake Sonoma.

Interpretive Education

An outdoor education center was initially envisioned in the area south and west of the boat launch, near Rustlers camp area, as illustrated in Figure 40 and Figure 41. Development of recreational facilities in this area may also support the consideration of interpretive and educational facilities.

Special Considerations –

Currently, vehicle access is a prohibiting factor, as trailers are not permitted on the road. Development of the area for increased recreation use would likely necessitate a substantial investment in improved vehicle access. The 1979 MP envisioned many developments to enhance recreation in this area, including an equestrian area with a trail system, a more developed camping area near Cherry Creek (see Figure 42), and an outdoor education center to be run by Sonoma County. Investigation into these proposals is warranted, as this area is of interest and has a mix of high density and low density recreation.

As is the case with all of the proposed actions in this MP, any development recommendation considered will include an evaluation of recreational, biological and cultural resources in the area and an assessment of the lands for species of concern and/or sensitive habitat. Additionally, all consideration of development requires the appropriation of funds for both the study of feasibility and the design and construction of such facilities.

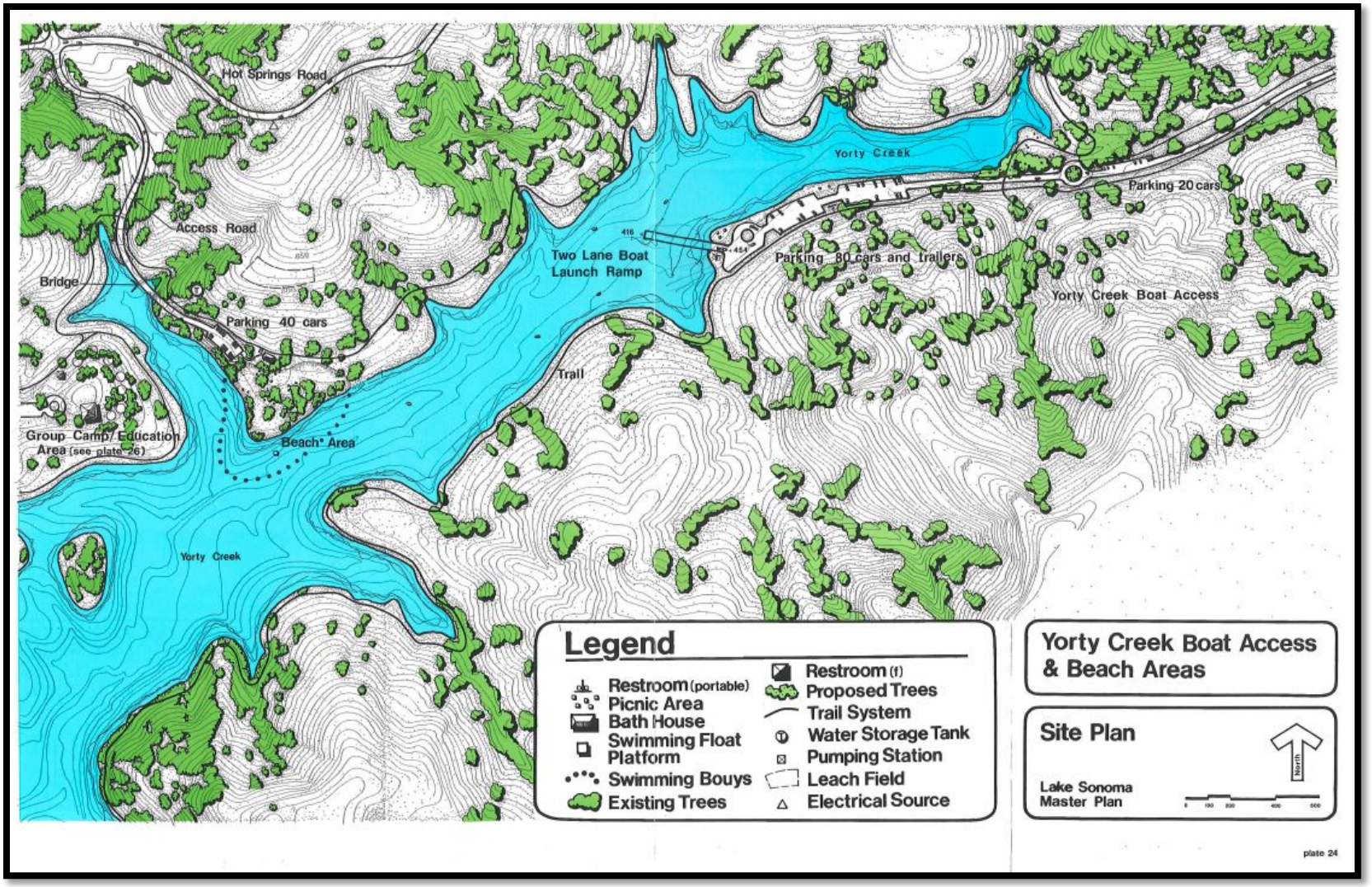

Figure 40 – 1979 Master Plan Site Plan for the Proposed Yorty Creek Boat Access and Beach Areas

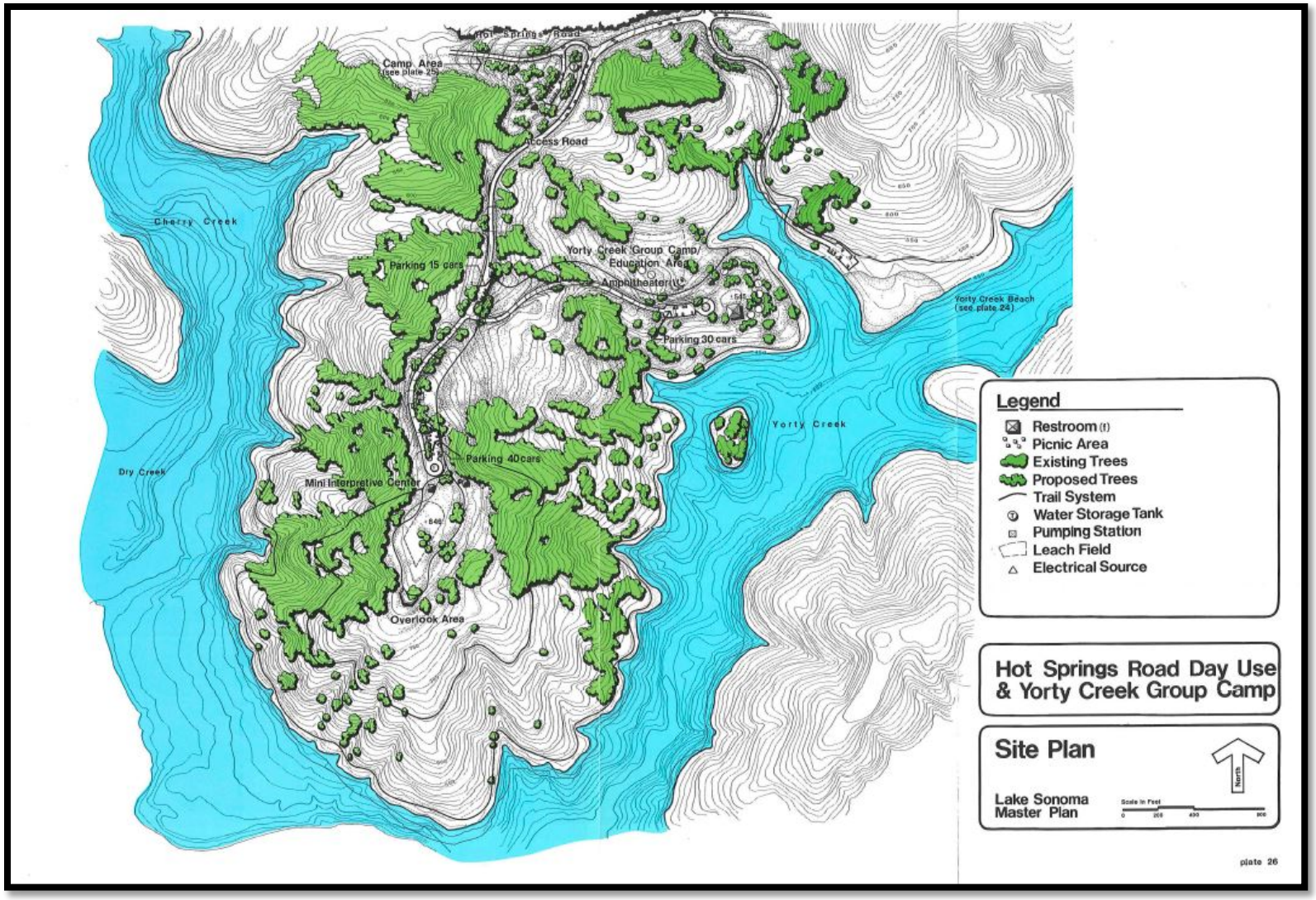

Figure 41 - 1979 Master Plan Site Plan for Hot Springs Road Day Use & Yorty Creek Group Camp

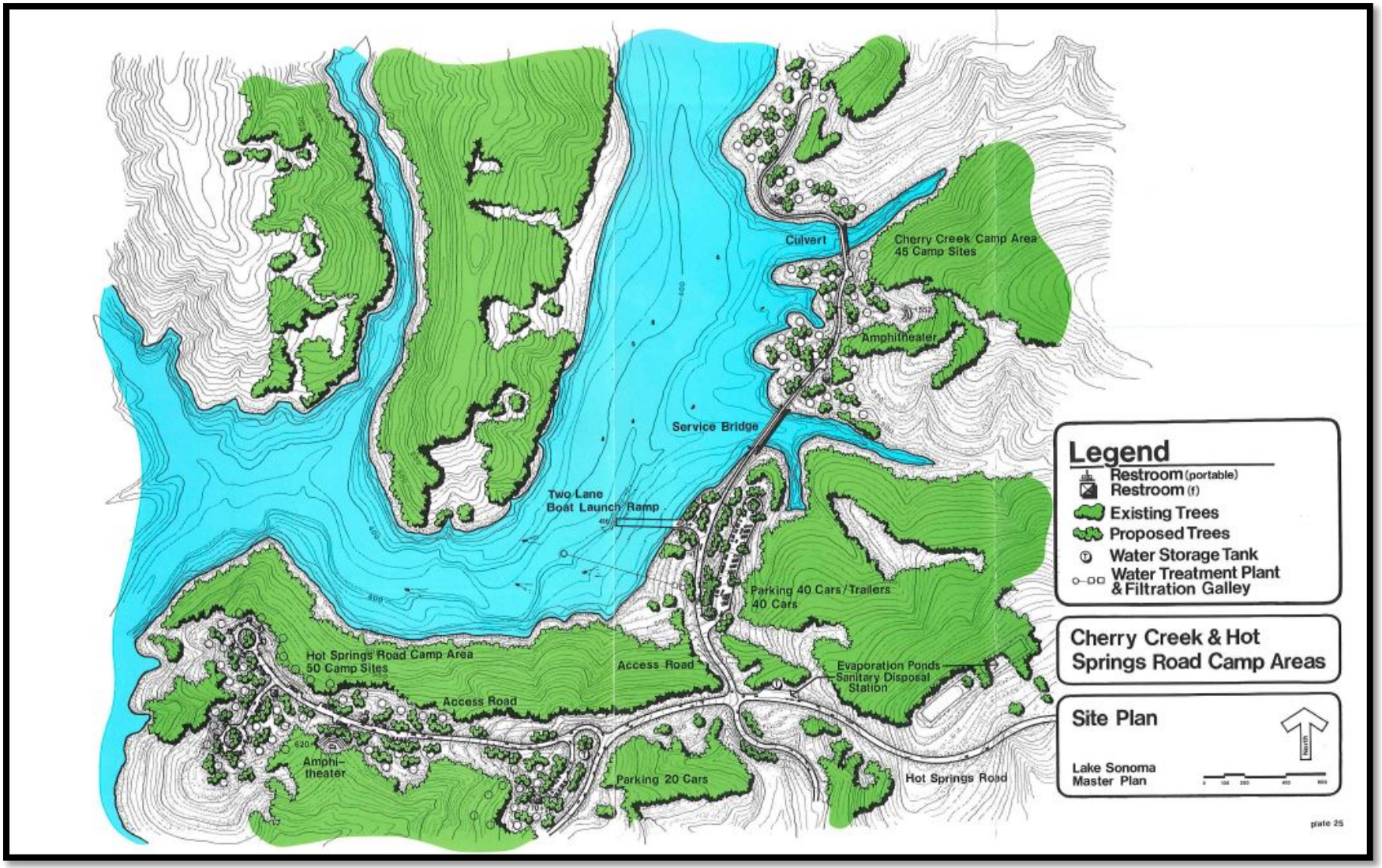

Figure 42 - 1979 Master Plan Site Plan for Cherry Creek Camp Areas

5.2.7 MANAGEMENT UNIT #7 – PRITCHETT PEAKS WILDLIFE MANAGEMENT AREA

1979 Land Use Classification – *Wildlife Management Area, Critical Habitat Zones and Sensitive Wildlife Areas*

Current Land Use Classification – *Multiple Resource Management: Wildlife Management, Proposed Recreation, Low Density Recreation*

Location – East shore of Dry Creek, to the north of the dam and the park headquarters.

Description – This MU has rugged, mountainous terrain that was originally set aside as mitigation for loss of wildlife habitat as a result of filling the lake and relocation of roads. This area is closed to the general public and receives very limited use in the form of special guided hunts and guided special use groups.

Figure 43 – Image of Pritchett Peaks Wildlife Management Area from Overlook

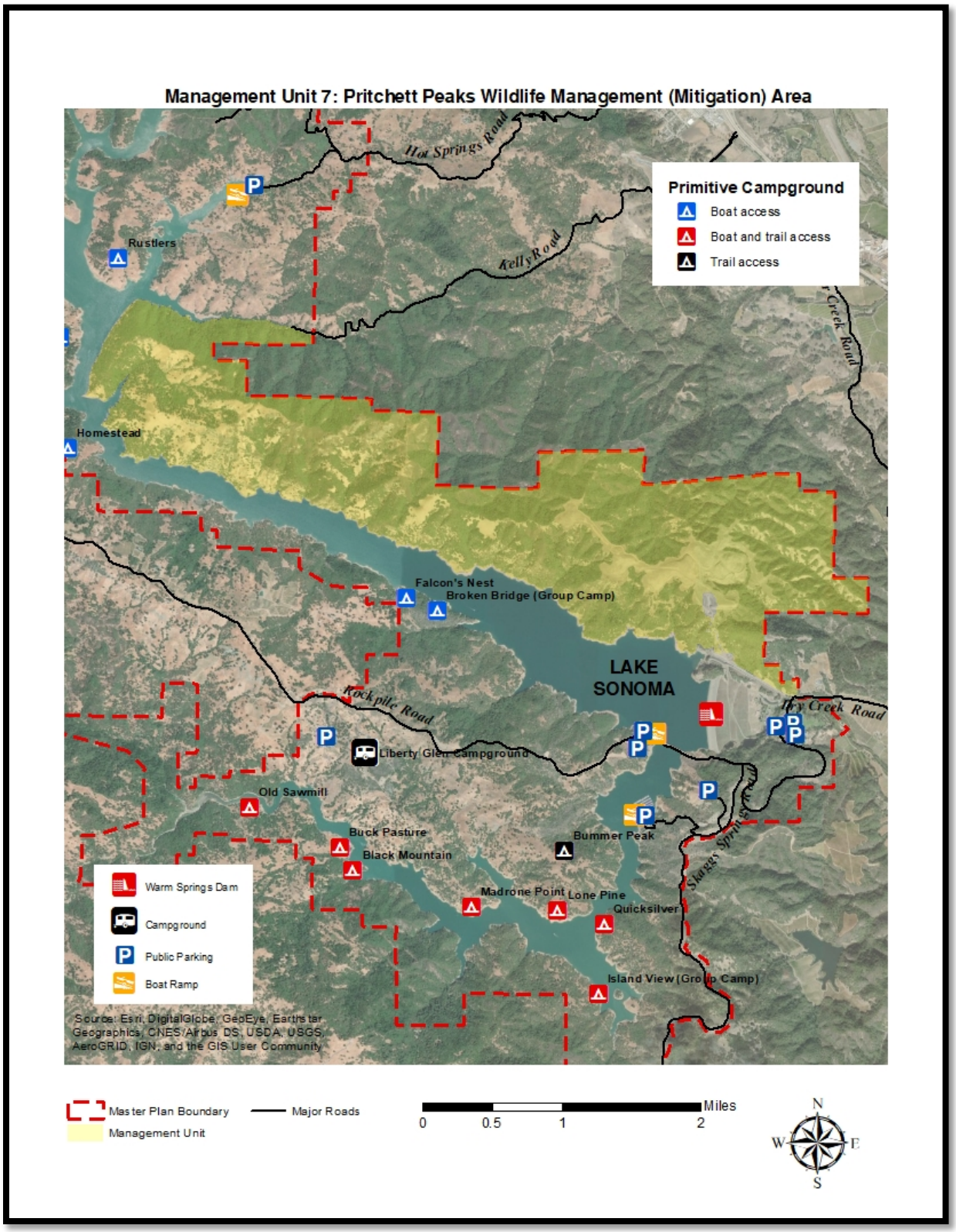

Figure 44 - Lake Sonoma Management Unit 7 – Pritchett Peaks Wildlife Management Area

Development Needs –

After the completion of the project, a firing range was established inside the established borrow area perimeter at the southeastern edge of the wildlife area. This firing range is not open to the public, but has been used by the County Sheriff's office, with permission from the USACE, for practice. This range is currently closed to all access, but there is a desire to reopen it. Plans have also been proposed to develop a solar power array in the area. Chapter 6 describes the change to the land classification of this area, from Wildlife Management to Operations, and a change of management from MU #7 to MU #2.

Special Considerations –

There is a current separate parcel land north of MU#7 (Pritchett Peaks Wildlife Management Area) maintaining fee ownership of land by the Government, which will be retained for potential future development of radio repeaters.

The commitment to the public to provide Mitigation for wildlife habitat lands lost as a result of filling the lake, and from relocated roads and development of facilities, is realized in this MU. Therefore, a classification of Mitigation is applied to most of the land in this MU, including the majority of the former borrow area designated as land to be used for dam construction.

5.2.8 MANAGEMENT UNIT #8 – DRY CREEK WILDLIFE MANAGEMENT AREA

1979 Land Use Classification – *Wildlife Management Area, Critical Habitat Zones and Sensitive Wildlife Areas*

Recommended Future Land Use Classification – *Multiple Resource Management: Wildlife Management, Proposed Recreation, Low Density Recreation*

Location – North end of Lake Sonoma, northwest of Yorty Creek Recreation Area

Description – This land borders the headwaters of Dry Creek and is a mixture of north and south facing slopes with varying vegetation. A boat-in campground (Loggers) is just past the southern border of this area and receives limited public use, largely from hunters in the winter months. The area can be accessed by Cooley Ranch Road. The USACE has an easement to access public property from the road.

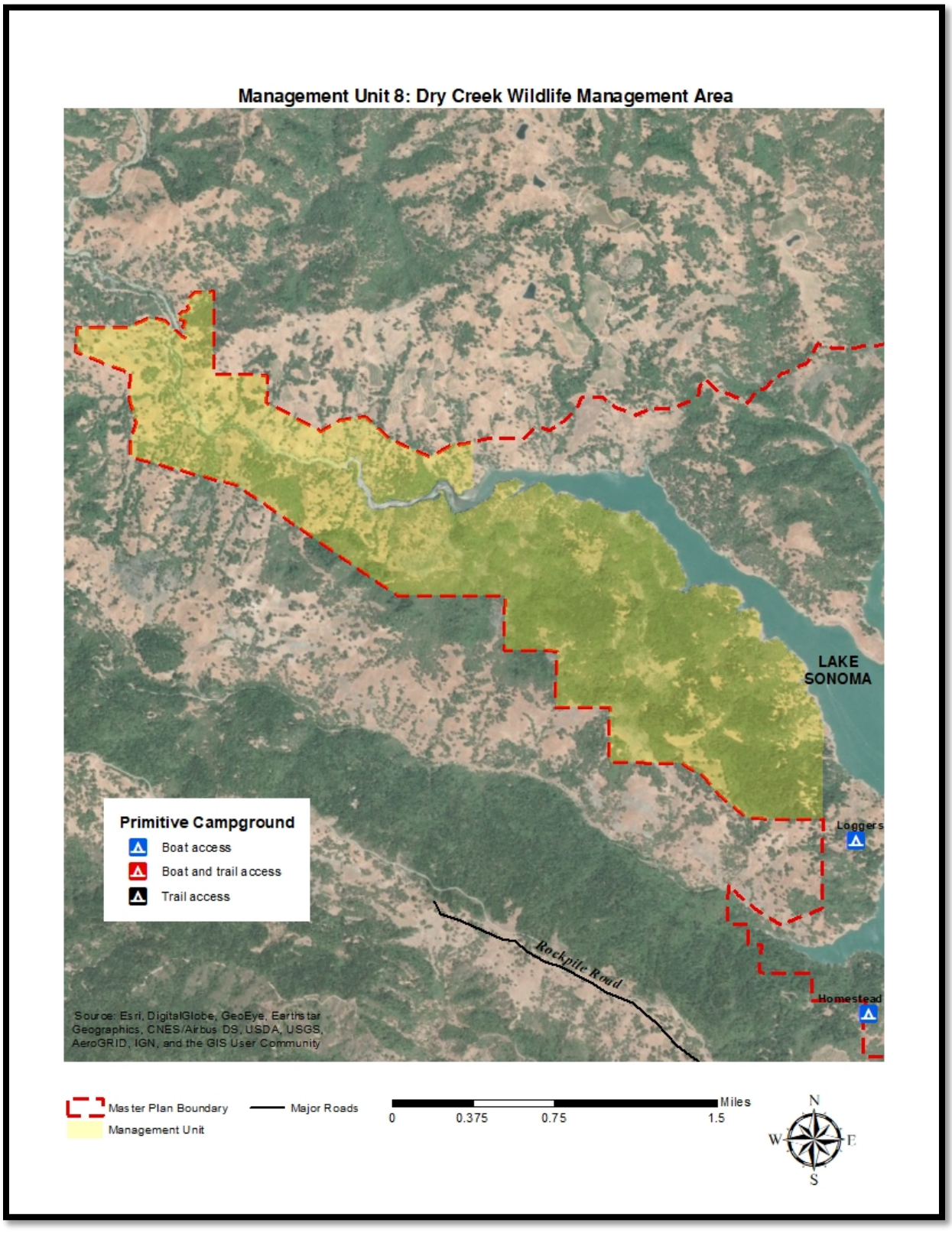

Figure 45 - Lake Sonoma Management Unit 8 – Dry Creek Wildlife Management Area

Development Needs –

There are no proposed development needs for this MU. See Special Considerations for suggestions on the current and future management of the area.

Special Considerations – Bald eagles have been seen in the area north of Loggers campground. Maintaining this habitat for eagles is an important resource objective and a stewardship goal of this MP.

Although the land ownership is Federal and the management agency in charge of the project is USACE, the State of California Department of Fish and Wildlife administers access to the Wildlife Management Areas, which are open during specific seasons for hunting deer and feral pigs. The 1979 MP suggests this resource agency controls the wildlife management area in its entirety. Some questions exist as to the ability of the State to allow or prohibit Federal action (e.g., closing of a campground), and the limit of authority in each management agency's responsibility. See Chapter 6 for more details.

Chapter 6 – Special Topics, Issues, and Considerations

This chapter discusses the special topics, issues, and considerations the PDT identified as critical to the future management of Lake Sonoma. Special topics, issues, and considerations are defined in this context as any problems, concerns, and/or needs that could affect or are affecting the stewardship and management potential of the lands and waters under the jurisdiction of the San Francisco District, Project Office Area of Responsibility (AOR).

6.1 ACCESS AND TRANSPORTATION

Currently, transportation to the project area is only available by automobile. Public comments indicated a desire to establish a bus route that would bring visitors to the project area, or that the local tourism interests establish some alternative transportation options for residents and visitors. Dutcher Creek Road, Canyon Road and Lytton Springs Road, all of which connect U.S. Highway 101 with Dry Creek Road, have all been upgraded. The Sonoma County General Plan includes the upgrading of the Stewarts Point-Skaggs Spring Road as an east-west artery, as well as Dry Creek Road. The Cloverdale bypass was constructed by the Department of Transportation and an intersection at Kelly Road was designed but not built, which would provide access to the northern portion of project area.

6.2 LAND CLASSIFICATION CHANGES, ADOPTION OF NEW PROJECT LANDS

A 3,200-acre portion of MU #7 (Pritchett Peaks Wildlife Management Area) will be classified as Mitigation, which accurately represents the agreements between the Department of the Army and the Department of the Interior, initially set forth in 1968, establishing the California Department of Fish and Wildlife (CDFW) as the management agency, with a renewed agreement currently in place until 2025. The 1976 Supplement to the Environmental Impact Statement reiterated the commitment to secure the 3,200 acres to compensate for the loss of wildlife habitat resulting from the inundation of the lands and from development of roads and other facilities, and the commitment stated inclusion of the 400 acres of borrow area. However, without the benefit of accurate mapping or a certainty of what areas would actually be disturbed (versus vegetation preserved or not used), the area had not been clearly delineated, and a total acreage was not confirmed until the revision of this MP. The Agreement with CDFW and background information are in Appendix D.

The MU #2 (Warm Springs Dam) will be expanded to the north by approximately 12 acres to include both the access road and a small portion of the former borrow area that was heavily disturbed by construction of the dam, and has been used recently as a firing range. This area will be classified as Operations to more accurately reflect the use and condition of the parcel. This portion of land is taken out of MU #7 (Pritchett Peaks Wildlife Management Area). The change in classification does not significantly affect the Mitigation lands set aside as compensation for loss of wildlife habitat, as the balance of 3,200 acres is maintained. The portion reclassified to Operations will continue to be managed as part of the wildlife management area under the CDFW agreement until the agreement is revised or expires in 2025. Future management of this area will be described in the revised OMP.

The USACE acquired from Save the Redwoods League approximately 40 acres of land, adjacent and to the south of MU #3 (Warm Springs Recreation Area). The lands will be managed according to the terms and conditions of the donation as well as the purpose for acquisition/donation (Appendix C). Consistent with the terms and conditions of the donation, this land will be incorporated into the MU#3 and classified as an Ecologically Sensitive Area. No development is recommended for the area. Lands adjacent to this parcel are classified as Low Density Recreation.

6.3 CULTURAL RESOURCES MANAGEMENT AND PROTECTION

Table 9 presents the number of cultural resource sites by MU; however, some of the sites presented are in two different MUs. In these instances, the site was counted as being in the MU that contained the largest percentage of the site. The vast majority of the 99 previously recorded sites in the project area are within MU #1 (Lake Surface). MU #1 would have represented most of the relatively level areas adjacent to Dry Creek and Warm Springs Creek. These areas were in close proximity to water with riparian environment resources and aquatic subsistence making them attractive for prehistoric human use and habitation. These areas were also preferable for the historic use and habitation of the area as well. The close proximity of these sites to the creeks indicates that many of the sites in MU #1 are under water much of the time and/or were severely affected by erosion related to reservoir operation cycles.

Both MU #3 and MU #7 contained the next largest grouping of sites. Both of the MUs encompass the upland headwaters of Dry Creek and Warm Springs Creek. The sites in these areas are primarily along the upland portions of the creeks and on terraces above the creek. These area were likely preferred for prehistoric habitation because of access to water, subsistence sources, and hunting, as evidenced by the presence of at least one hunting blind. The area also contained lithic sources, as quarry sites were also identified in the areas.

Table 9 - Distribution of Cultural Resources by Management Unit

MU	MU Name	Site Count
1	Lake Sonoma (Lake Surface)	48
2	Warm Springs Dam, Control Tower, Spillway, Headquarters, Visitor Center, and Fish Hatchery	1
3	Warm Springs Recreation Area	16
4	Rockpile Recreation Area	6
5	Dry Creek Recreation Area	1
6	Yorty Creek Recreation Area	8
7	Pritchett Peaks Wildlife Management Area	1
8	Dry Creek Wildlife Management Area	18

Cultural resources at the lake and dam are a public and physical legacy that can contribute to the development and appreciation of regional and local history and prehistory. Local Native American Indian Tribes have a special interest in these sites that relate to their history. The main management objectives for these resources is to protect their legacy from losses attributed to vandalism, theft and project undertakings, and to contribute to public appreciation of the legacy. This is especially relevant to sites within specific MUs as land use changes within these units may have adverse effects on existing historic properties.

Previous archaeological studies identified the majority of the sites comprising potential historic properties that are present within the boundaries of project area; however, several of these were early studies. Several of the previously identified sites (18) are unevaluated. It has yet to be determined the level of significance these sites hold archaeologically and to the Native American Community. Neither has it been determined if these sites are contributing or not contributing to the NR-District defined at the lake, nor have they been evaluated for their individual significance. Section 110 of NHPA states that “historic properties under the jurisdiction or control of the agency, are identified, evaluated, and nominated to the National Register” (NHPA Section 110 [a][2][A]). To fulfill the USACE’s responsibilities under Section 110, the eligibility of these sites to the National Register should be formally evaluated. In addition, the previous archaeological studies in the project area are dated and older than 10 years. A Section 110 inventory for the lake area is highly recommended for a better

understanding and management of historic properties managed as part of the USACE's responsibilities.

Cultural resources in the project area that are at the highest risk for deterioration from erosion and inundation need to be revisited to determine the level of adverse effects these agents are having on these resources. A Memorandum Of Agreement (MOA) was executed in June 1976 outlining management strategies for sites within the project area. The MOA states that "Continued monitoring of the sites will be done to insure the integrity of protection, and that no cultural material is inadvertently exposed." The 2001 CRMP, however, determined that the "USACE is in a position where it needs to implement procedures to ensure that the stipulations agreed to in the MOA are carried out. To date, very little follow-up work has been carried out in regards to the cultural resources in project area." Visits to inundated sites should be planned during lake draw-down periods. At that time, updates to the condition of the site, including vandalism and looting impacts to sites should be recorded. One possible monitoring effort might include placing reference points, such as stakes or metal rebar, on defined sites with a series of photographs taken from each reference point to document the site's current condition. A regular monitoring program at these sites should take place and documented using photographs from previously established reference points.

Cultural Resources within the project area are primarily afforded protection under three main laws: the *Archaeological Resources Protection Act of 1979 (ARPA)*, the *National Historic Preservation Act of 1966 (NHPA), and the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA)*. The ARPA applies to the Project's fee lands, and sets forth a process for permitting the excavation or collection of archaeological resources on public or Native American Indian lands and establishes criminal penalties, including fines and incarceration, for the unauthorized excavation or collection of such resources.

The NHPA applies to both fee and less-than-fee lands at Lake Sonoma. Section 106 of the NHPA requires Federal agencies to consider effects of their undertakings (actions that are funded or permitted by the government) on eligible (i.e. significant and with integrity) historic properties. For their undertakings, Federal agencies must identify and evaluate cultural resources for significance; consult with the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officer (SHPO), Native Americans, and the public; and seek resolution of any adverse effects their projects might have on significant resources. The Section 106 process shall be followed before any projects within the project area are undertaken. This means that future projects will either be designed in such a way that they do not damage or otherwise impact significant cultural resources; or the damage they may cause will be mitigated, potentially through archaeological data recovery or site protection projects. Section 110 requires that Federal agencies be good stewards of the cultural resources located on their lands. This includes a responsibility to maintain and preserve any historic structures, to conduct surveys to identify cultural resources on their lands and evaluate the significance of those resources. Operationally, to achieve these objectives, the project staff should work closely with the San Francisco District archaeological staff.

The NAGPRA requires Federal agencies, and institutions that receive Federal funding, to return Native American "cultural items" to lineal descendants and culturally affiliated Indian Tribes and Native Hawaiian organizations. Cultural items include human remains, funerary objects, sacred objects, and objects of cultural patrimony. The act also establishes procedures for the inadvertent discovery or planned excavation of Native American cultural items on Federal or Tribal lands. Moreover, the Act makes it a criminal offense to traffic in Native American human remains without right of possession or in Native American cultural items obtained in violation of the Act.

6.4 INTERPRETATION AND EDUCATION

The feedback from public meetings and discussions with stakeholders and staff members supports the recommendation of increased signage, interpretive programming, and cultural and environmental education. The initial proposals of interpretive centers at both the Visitor Center (MU #2) and at Yorty Creek (MU #6) suggest that this desire has been long standing, even since the initial design of the project. Additional interpretive signage has been suggested along Dry Creek below the dam.

Figure 46 - Artistic interpretive signage at the entrance to the Dry Creek Band of Pomo dance arbor, along Dry Creek below Lake Sonoma and Warm Springs Dam

With increased visitation expected in the following decades, it is important to update, develop and implement interpretive plans for the project. Investment in this aspect of the project will be subject to financial limitations, but partnership with local agencies, entities, and interests may provide desired outcomes and education opportunities.

Chapter 7 – Agency and Public Coordination

In 2018, the USACE began revising the Lake Sonoma MP, the last version of which was approved in 1979. In addition to project site visits by key members of the study team, preliminary meetings were held with state and local government officials that have direct involvement in management of the resources of the Project.

The USACE held two separate public meetings in February 2018 in Ukiah, California and at the Lake Sonoma Visitor Center in Geyserville, California. The purpose of these meetings was to initiate the information seeking effort and gain public input to inform the long-range goals for the MP and the vision for management and development of project lands and water at Lake Sonoma. Input from user groups, Tribes, and concessionaires was incorporated into this draft MP.

The draft MP will be circulated for public and agency review in fall of 2019. Comments on the MP and the accompanying EA will further inform the final MP and EA, which are expected to be signed and published at the end of 2019.

The accompanying EA, found in Appendix A of this MP, lists all of the Federal and state agencies that might be included in the coordination process for a proposed project at Lake Sonoma. The table also lists the resources included in each agency's purview. It should be noted that similar agencies and groups exist at the local level and should be included in the planning process. Further agency coordination is critical to the success of this policy-based, programmatic document and associated NEPA documentation.

Chapter 8 – Summary and Recommendation

8.1 SUMMARY OVERVIEW

The proposals made in this MP are for recommended courses of action to manage the natural resources at Warm Springs Dam and Lake Sonoma. Actions set forth in this MP can promote the future health and sustainability of the lake's natural resources while still allowing for continued use and development. The factors considered cover a broad spectrum of issues including public use, the environment, socioeconomic considerations, and staffing levels. Information on each topic was thoroughly researched and discussed before any recommendation was made.

This MP is a strategic land use management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of the water resource project. It aims to establish the basic direction for development and management of the lake consistent with the capacity of the resources present and public needs. The plan is flexible in that MP supplements may be prepared through a formal process to address unforeseen needs or updated information. The MP will be reviewed annually and, as necessary, updated every five years, to facilitate the evaluation and utilization of new information as it becomes available, subject to funding. Section 8.5 describes the process for updating the MP. The overall MP provides guidelines for land use activities, improvement of environmental quality, and protection of cultural resources. Additionally, the MP provides USACE management with critical information necessary to determine funding levels for operations, maintenance, and staffing needs.

8.2 LAND CLASSIFICATIONS

As described in detail in Chapter 5, the PDT strived to achieve a balanced approach in making the land classification recommendations. The PDT took environmental constraints, regulations, ordinances, opportunities, and public concerns into consideration when determining land classification for the MP revision, which included, but was not limited to:

- Previous land classification
- Land allocations
- Environmental and cultural considerations
- Existing Federal, state, and local laws and regulations
- Development or non-development adjacent to USACE property
- Activities adjacent to USACE property
- Recreational trends and emerging needs
- Public and agency input
- Funding and staffing constraints

8.3 RECOMMENDATION

It is recommended that the Lake Sonoma MP be adopted and used to direct future decisions on management of the lands and resources at the project. The objectives within this MP are consistent with authorized project purposes, land allocations, and resource capabilities. The MP objectives accommodate Federal, state, and local needs. The MP represents sound stewardship of resources and will result in increased opportunities for public enjoyment of outdoor recreation activities.

8.4 USING THIS MASTER PLAN

This MP provides a vision for the future use of the lake resource, and it informs other plans that direct the management of Lake Sonoma, such as the OMP. This MP sets the stage for the update of many of the USACE resource management plans. The Resource Objectives contained in this MP can serve as a basis for developing plans to manage resources within the project boundary. The Resource Objectives approved in this plan can serve as a basis for developing more specific management plans at the project. Regular supplements or updates to the MP may allow the project to maintain updated resource management plans.

The document also serves as a land use tool, since this MP provides USACE, other management partners, and the public with current Land Classifications, recommended future development, and resource objectives as they may be applied to project lands. The current classification of project lands allows the USACE, other management partners, and the public to visually evaluate the distribution of uses for project lands. Supplementing and/or revising the MP allows the USACE to respond effectively to development plans made internally or by outside parties.

This MP and the accompanying environmental documentation sets goals and objectives but does not establish detailed development plans. As potential projects are considered for implementation, additional NEPA documents will be developed to evaluate the impacts of an action and any applicable environmental compliance requirements will be completed. As new recommendations for consideration emerge, they may be introduced in supplements or updates to the MP.

8.5 UPDATING THE MASTER PLAN

Regular reviews will help prepare for a general revision or significant update to the MP. Any revision or update will be accompanied by the appropriate NEPA documentation, if applicable. The revision may be as simple as revisiting the Resource Objectives, or it may be as complex as changing Land Classifications presented in this MP. The process through which the plan is evaluated and updated will follow guidance set forth in EP 1130-2-550.

The information obtained during regular revisions of this MP also serve to benefit other activities at the project. Data may be applied to updating a specific resource management plan, improving educational programs, or informing project staff about relevant issues. This MP emphasizes the need for coordination with regulatory agencies prior to implementing any element of the MP. Coordination also may occur in updating the MP and obtaining additional data sources to inform the plan.

Chapter 9 – References

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Appendix A – Environmental Assessment for 2019 Lake Sonoma Master Plan

Appendix B – Pertinent Public Laws and Executive Orders

Appendix C – Deed from Transfer of Land from Save The Redwoods League

Appendix D – Agreement with California Department of Fish and Wildlife for Management of Wildlife Mitigation Lands