LAKE SONOMA MASTER PLAN

SONOMA COUNTY, CALIFORNIA

APPENDIX A

DRAFT ENVIRONMENTAL ASSESSMENT

1.0 INTRODUCTION

This environmental assessment (EA) is written in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. § 4321 *et seq*), as amended, the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the NEPA (40 C.F.R. §§1500-1508), and U.S. Army Corps of Engineers (USACE) Planning Regulations (Engineering Regulation (ER) 200-2-2). It presents an evaluation of the potential impacts associated with the proposed update to the Lake Sonoma Master Plan.

1.1 **Project Location and Setting**.

Lake Sonoma is located on Dry Creek, a major tributary to the Russian River, west of Healdsburg in Sonoma County, California. Warm springs dam is located 13.9 miles above the confluence of Dry Creek and the Russian River. The drainage area above the dam is about 130 square miles. Lake Sonoma is situated in steep-sided canyons cut into the Mendocino Plateau by Dry Creek and Warm Springs Creek. Most of the Lake Sonoma site consists of steep terrain, cliffs and rock outcrops with a slope of over 25%.

1.2 **Purpose and Need for Action**.

Master Plans 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 Master Plan provides a programmatic approach to the management of all of the lands included within the Lake Sonoma boundary. The Master Plan is the basic guiding document outlining the responsibilities of the USACE, pursuant to federal laws to preserve, conserve, restore, maintain, manage, and develop the project lands and associated resources. The Master Plan is a planning document anticipating what could and should happen, with the flexibility to adapt to changing conditions over the life of the plan. Detailed management and administration functions are handled in the Operational Management Plan (OMP), which translates the concepts of the Master Plan into operational terms.

The primary goals of the Master Plan are to prescribe an overall land management plan, resource objectives, and associated management concepts, which (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 towards providing 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 Plan identifies recreational opportunities and measures to preserve and protect natural and cultural resources. The Plan 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 Plan does not address reservoir water levels and should not be confused with the on-going Dam Safety Modification Project or the Water Control Manual.

1.3 **Scope of the Action**.

A preliminary master plan was prepared for public recreational development in March 1966 and was last updated in 1979. The proposed action (Agency-preferred Plan) would revise the 1979 Lake Sonoma Master Plan providing an updated land management plan and resource objectives for Lake Sonoma. It is focused on the management of land and water surface related to the project's purposes of recreation and the environmental stewardship of natural and cultural resources. The Master Plan does not make recommendations related to the management of Warm Springs Dam and associated operations.

The Master Plan presents current data on existing conditions, anticipated recreational use, type of facilities needed to service the anticipated use, and an estimate of future needs. Over the last 30 years, many of the construction projects from the 1979 update of the Master Plan have either been completed or have been found to not be the best use of project resources. Over that time, USACE has also updated its policies directing the development and implementation of master plans. This includes updating the prescribed categories of Land Classifications that must be used in master plans to define project lands. In order to meet these new directives and comply with USACE policy requiring regular updates to a Master Plan, the District proposes to revise the Master Plan at Lake Sonoma.

This EA addresses the proposed adoption and implementation of the revised Master Plan for Lake Sonoma. This EA further analyzes the potential impact that implementing the Master Plan would have on the natural, cultural, and human environment. This EA relies on the attached Lake Sonoma Master Plan for cross reference.

The intention of the proposed Master Plan update is to develop land classifications that will guide the sustainable development of resources within the Lake Sonoma Project in

the future. It is not feasible to define the exact nature of potential impacts for all potential actions prior to the development of specific project proposals. Therefore, environmental consequences may be less than, or may, in fact, exceed what is described in this EA. To ensure future environmental consequences are identified and documented as accurately as possible, additional NEPA coordination will be conducted, as appropriate, for future projects that are proposed to be carried out in accordance with this proposed Master Plan update.

2.0 ALTERNATIVES

This section of the EA describes alternatives for updating the Master Plan. This EA examines two alternatives: the Agency-preferred Alternative (Proposed Action) of adopting the Master Plan update and a No Action Alternative in which the 1979 Master Plan would remain the management guidance document. The Preferred Alternative would update existing inventories, development needs and land use classification, while providing a programmatic approach to the future management of the reservoir.

During the past year, the District and other management partners have worked to develop options for classifying project lands and identifying Resource Objectives (Master Plan, Chapter 3) for these lands. The data collection, public comments, and findings of the planning team revealed that there was only one action alternative that would meet the purpose, need, and objectives of the master planning process. This alternative is the Proposed Action and is discussed in detail in Section 2.2 of this EA. The Proposed Action is the Agency-preferred Alternative because it would meet the need for sustainable management and conservation of natural resources within the project, while also providing for current and future quality outdoor recreational needs of the public, and meeting update USACE regulations associated with master plans.

2.1 No Federal Action.

Inclusion of the No Action Alternative is prescribed by CEQ regulations and serves as the benchmark against which Federal actions can be evaluated. Under the No Action Alternative, the District would not approve the adoption or implementation of the updated Lake Sonoma Master Plan and would not meet current USACE regulations or goals of making regular updates to a master planning document. The 1977 Master Plan would continue to provide the only source of comprehensive management guidance and philosophy for Lake Sonoma. Information provided in the 1977 plan is out of date and no longer adequately addresses the needs of the District, other management partners, or users of Lake Sonoma. Furthermore, the 1977 Master Plan does not include the revised Land Classifications. Future major developments or resource management policies would require approval on a case-by-case basis without the benefit of evaluation in the context of an overall plan.

2.2 Proposed Action: Adopt the updated Lake Sonoma Master Plan (Preferred Alternative).

Adoption of the proposed Master Plan update is the Agency-preferred Alternative. Under this Preferred Alternative, the District would adopt and implement the revised Lake Sonoma Master Plan. The Master Plan seeks to replace the 1979 Master Plan and provide a balanced, up-to-date management plan that follows current Federal laws and regulations while sustaining Lake Sonoma's natural resources and providing outdoor recreational experiences. The proposed revised plan would update the land use classification of Lake Sonoma's Management Units (MU) from the 1979 system to be compliant with current USACE policy guidelines contained in ER-1130-2-550. The updated land classification and Management Units are shown in figures 13 and 14 in the main report. The revised plan also lays out future recommendations for management of both recreation and natural resources. These recommendations are summarized in table EA-1 below.

The primary element of the Preferred Alternative is the new land classifications that would be applied to all project lands. The proposed land classifications are accompanied by resource objectives which recommend future management actions on Lake Sonoma lands.

The land classifications presented in this Master Plan revision, as well as the recommended future uses, are consistent with the land classifications and policies included in the 1979 Master Plan. The intent of the land classification process is to fully utilize project lands in accordance with authorized project purposes, consideration of public desires, and regional and project specific resource requirements and capabilities. For many MUs, the land classification has solely been changed from the 1979 Master Plan classification to the corresponding land classification identified in current USACE master planning guidance contained in ER-1130-2-550. While the terminology has changed, the overall intent of how these specific MUs are to be used and managed remains the same. The updated classification system also allows for more detailed designations as needed. These changes in land classification are consistent with the land allocations that were adopted when the project was authorized. The changes are described in detail in Chapter 5 of the attached Master Plan and is summarized below.

The 1979 MP designated three types of use for water surface and upland areas: Low, Moderate, and High Intensity Use. In addition, there were land use classifications for Critical Habitat, Wildlife Management and for Buffer Areas.

The land classification system used in the revised plan would be as follows:

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 National Historic Preservation Act 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.

The proposed changes in the land use classification nomenclature for the MUs are summarized in Table EA-1 below.

Table EA-1. Future Recommendations of Management Actions by Management Unit

Management Unit	Land Use Classification Name Change	Recommendations
Management unit I – Lake Sonoma (Lake Surface)	From Water Surface Low, Medium and High intensity use to Water Surface, Project Operations and High Density Recreation.	-Partner with stakeholder groups to develop a quagga and zebra mussel management plan at the lake that would minimize the potential for the introduction of these species and to respond rapidly if they are detected on site. -Remove submerged trees in the Dry Creek Arm near Logger's Camp and open the reach to water skiing.
Management Unit 2 – Dam Operations, Dam Control Tower and Spillway, Project Headquarters, Visitor Center and Fish Hatchery	From Low, Moderate and High Intensity use to Project Operations, High Density Recreation.	-Repair control tower access road or re-route the alignment. -Renovate the footbridge from the visitor center to the hatchery to include viewing stands for wildlife viewing.

		-Develop a new interpretive trail, accessible from the recreation area, running along Dry Creek Road. -Development of the recreation area to accommodate the larger crowds that occur during events. This includes expanding the existing parking lot and possibly the addition of a band-stand and gazebo. Improve the outdoor gym with the addition of a water fountain, shelter and pavilion. -Stairs should be constructed leading to a viewing platform at the southeast end of the Rockpile Road Bridge to increase the safety and viewing experience for those watching the osprey nests nearby.
Management Unit 3 – Warm Springs South Shore	From Low, Moderate and High intensity use to High Density Recreation, Multiple Resource Management Lands: Low Density Recreation, Proposed Recreation	-There is the potential to develop a leased destination resort for overnight accommodations overlooking the lake and Dry Creek Valley. I t would be compatible with the marina and equestrian facilities nearby in this high density recreation area. -An informal lake access point at the east end of the Rockpile Road Bridge could be formalized with the addition of a paved parking lot and boat ramp. -There is interest in building a zip line near the equestrian facility. The Old Sawmill are could be improved to enhance the horse camping that is occurring there. -An informal access point at the west end of the MU could be improved to support horse camping with the addition of a bridge, paved lot and horse campsite.
Management Unit 4 – Rockpile Recreation Area	From Low and Moderate Intensity use to Multiple Resource Management Lands: Low Density Recreation, Proposed Recreation	- Upgrade the Madrone Service road to an all-weather road to provide reliable access to the Liberty Glen campground and firefighting equipment. -Convert Liberty Glen campsites to full hookup including sewer, water and electric. -Repave the Liberty Glen Camping loops. -Add additional sites at Liberty Glen with camping cabins. Improve the host campsites at Liberty Glen. -Add a switchback trail providing for

		easier lake access by foot from the Madrone Service Road. -Take the Bummer Peak Camp out of service due to its inaccessibility and fire concerns. -The parking lot at the archery and air gun range should be paved to accommodate the high number visitors to the ranges and trailheads. -Pave the large dirt parking lot above the boat ramp and provide a trail, removing the dangerous existing stairs, to provide a safe connection to the boat ramp. -Replace the worn out dock at the boat launch. The informal swimming area to the south of the boat launch could be formalized with signage and a safe access trail.
Management Unit 5 – Dry Creek Recreation Area	From Low, Moderate and High Intensity use, Buffer Zone to High Density Recreation, Low Density Recreation, Multiple Resource Management Lands: Proposed Recreation	-The lakeside fishing access trail near the boat launch should be repaired and improved. -An additional boat dock could be placed near the launch. -The parking areas at the boat launch should be paved and striped. -The unpaved parking areas at Grey Pine Flat and Little Flat should be paved and striped to accommodate overflow from the boat launch. -Camping cabins such as the one at Liberty Glen could be installed near Broken Bridge. -There is still the potential to include additional boat launch facilities and an amphitheater in this MU.
Management Unit 6 – Yorty Creek Recreation Area	From Low, Moderate and High intensity use, Buffer Zone to High Density Recreation, Low Density Recreation, Multiple Resource Management Lands: Proposed Recreation	-A pedestrian bridge from the parking area across Yorty Creek is needed to provide access to the north side. -Develop a shoreline trail linking the parking area to the three boat-in camps (Rustler's, Skunk, and Thumb) to allow walk in campers to stay at these underutilized campgrounds. -USACE should pursue a formal agreement with a concessionaire to provide non-motorized recreation in the form of kayaks, canoes, stand-up paddleboards etc. -A second boat launch area should be developed to ease peak time overcrowding.

		-Develop a roll on/roll off launching area for human powered craft only. -Designate dog-friendly areas with signage along Yorty Creek. -Designate some portions of the Yorty Creek area for personal powered craft only and provide signage at all launch areas describing these restricted areas. -The service road from the parking area to Thumb and Skunk camps needs to be improved. -Develop a primitive hike-in environmental campground northeast of the parking lot. -Add several primitive hike-in campsites southwest of the parking lot close to the shoreline as indicated in the original Master Plan to be accessed by a new shoreline trail. -Look into the feasibility of developing the North Lake Equestrian -Area and trail system throughout the area and a campground with full amenities at Cherry Creek as envisioned in the original Master Plan.
Management Unit 7 – Wildlife Management Area I (East shore of Dry Creek)	From Wildlife Management Area, Critical Habitat Zones and Sensitive Wildlife Areas to Multiple Resource Management: Wildlife Management, Proposed Recreation, Low Density Recreation	-Repair the boat dock and relocate it away from the spillway. -Release land allocation at Pritchett Peaks from federal ownership. -Remove the part of the borrow area historically used by the Sheriff's Department as a shooting range from this MU and put it MU2 Operations. The Sherriff's Department would conduct any coordination to permit and re-open this area as a shooting range for law enforcement officers.
Management Unit 8 – Wildlife Management Area II (North end of Dry Creek)	From Wildlife Management Area, Critical Habitat Zones and Sensitive Wildlife Areas to Multiple Resource Management: Wildlife Management, Proposed Recreation, Low Density Recreation	No recommendations

2.1.1 Removal of Critical Habitat Areas.

Two areas of the project were designated as critical habitat zones for the peregrine falcon in the 1979 Master Plan. These zones were contiguous with adjacent non-federal lands that had the same designation. These areas were designated as such

due to the rocky cliffs they contain which are ideal nesting habitat for peregrine falcons.

The peregrine falcon and its associated critical habitat were removed from the endangered species list on August 20, 1999 due to the success of recovery efforts. Accordingly, the lands labeled as Critical Habitat Zones in the 1979 Master Plan have been removed in the proposed update to the master plan (Proposed Action). No changes have been made to the way that the area will be managed and the peregrine falcon continues to nest in these cliffs and thrive at Lake Sonoma.

2.1.2 Addition of Lands.

The Save the Redwoods League donated a 40-acre parcel on the southern edge of the recreation area in 2009 for the purposes of preservation and restoration of natural habitat on the property, and for the protection of its conservation values. USACE is obligated to manage the parcel consistent with the purposes of donation.

The deed places the following restrictions on the use of the property.

- USACE will not permanently alter the Property by the construction of roads, structures or other physical improvements unless essential to meet public health and safety, or public use needs that are consistent with the purposes of Donation.
- USACE will ensure the protection of the Property's hydrologic and aquatic systems and will not alter the Property's water courses or the free flow of water, unless consistent with the Purposes of Donation, except as necessary to protect public health and safety.
- USACE will not permit use of motorized vehicles outside of established public roadways or waterways, except to the extent necessary to achieve the "Purpose of Donation," or if essential to public health and safety.
- USACE will not issue any future grazing permits on the Property unless such grazing is necessary to achieve the Purposes of Donation, or for public health and safety, such as for fire control purposes.
- USACE will not permit any timber harvest on the Property except under emergency conditions such as fire, insect, and disease and in cases where needed for restoration purposes.

Under the Proposed Action (Preferred Alternative) the USACE would classify this added land as Environmentally Sensitive Area to ensure that the property is managed in accordance with the deed restrictions.

2.1.3 Changes to Land Use Classification.

The Environmental Impact Statement for the creation of the dam and reservoir committed USACE to setting aside 3200 acres of land to mitigate for the loss of the habitat that the project would cause through inundation and facilities construction.

The Master Plan revision (Proposed Action) would reclassify 3200 acres of the Pritchett Peaks Wildlife Management Area (MU#7) from Wildlife Management to Mitigation to better reflect this commitment. No change would occur to the management of these lands, which are essentially inaccessible to the public. The California Department of Fish and Wildlife (CDFW) would continue to manage the area under an existing land management agreement between USACE and CDFW for the 8,000-acre Lake Sonoma Wildlife Area.

Under the Proposed Action, the border between MU#7 and the Warm Springs Dam project Operations Area (MU#2) would also be realigned slightly. Twelve acres of land including the borrow pit at the south end of the borrow area, its access road, and a twelve foot band on each side of the road would be changed from a Wildlife Management to Operations classification. The borrow pit has been scraped to bare earth and is surrounded by berms on three sides. Extensive excavation has occurred throughout the borrow area which removed the surface soils and the resulting vegetation is sparse and of very poor quality. The actual borrow pit is devoid of vegetation.

The Sonoma County Sheriff's Department has used several sites in the borrow area as shooting ranges for training purposes in the past with the permission of USACE. Use of these ranges is no longer allowed. The Sherriff's Department has expressed an interest in maintaining a 100 yard range within the bermed confines of the borrow pit. Any planning, environmental coordination, and permitting efforts would be led by the Sheriff's Department if they were to pursue such an action. If established, the range would be for law enforcement officers only.

3.0 AFFECTED ENVIRONMENT

Lake Sonoma includes the lake, an approximately 8,000-acre Lake Sonoma Wildlife Area, which is managed by the California Department 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. This section discusses the existing physical and biological resources present at the lake.

3.1 Physical Environment

Physical resources in the Lake Sonoma region provide the climate, geology, soils, water flows, and water quality which support various biological and social resources at the lake. The physical resources are discussed below.

3.1.1 Climate. Lake Sonoma lies within a region of Mediterranean climate, characterized by warm, dry summers and cool, wet winters. Average monthly temperatures range from 47 degrees Fahrenheit in December to 71 degrees Fahrenheit (°F) in July (Figure EA-1). Mean annual precipitation ranges from 41 inches (Healdsburg) to 45 inches (Lake Sonoma), to greater than 60 inches in the coastal mountains that form the western boundary of the watershed. More than 90 percent of the

precipitation falls between the months of October and April, with approximately 70 percent occurring between November and February (Western Regional Climate Center 2009). Snowfall is uncommon except in the highest elevations of the Coast Range.

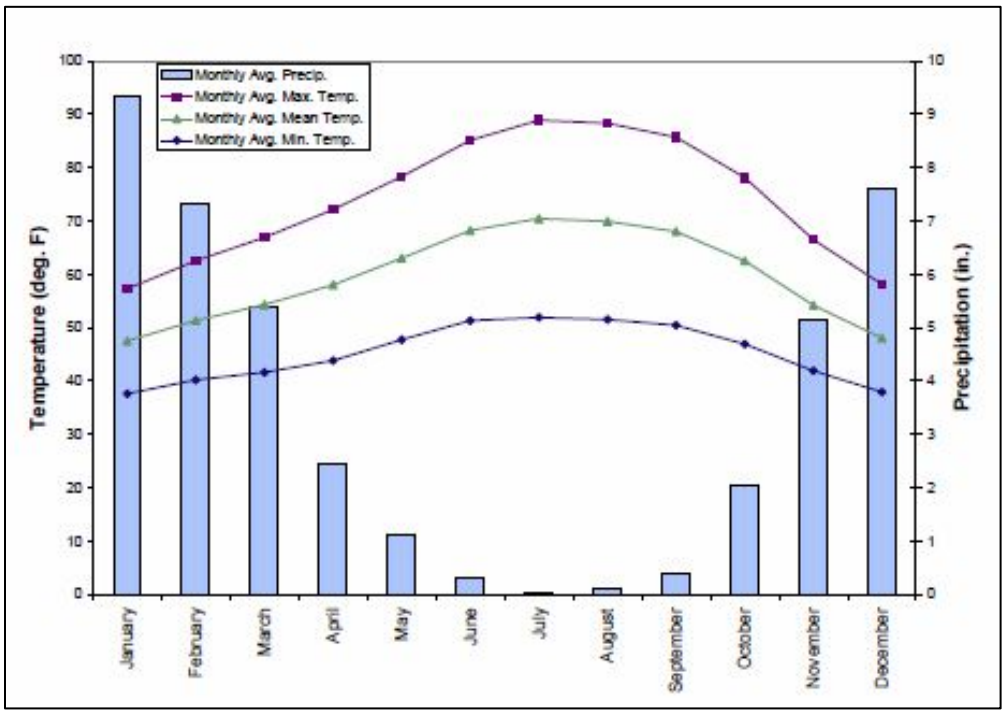


Figure EA-1. Mean monthly temperature and precipitation at Healdsburg (Station 043875) for the period 1893-2009.

3.1.2 Geology and Soils. The Lake Sonoma area is a structurally controlled valley bordered by the Great Valley Complex (Healdsburg terrane) to the east and Coast Range ophiolite and metamorphic rock units of the Franciscan Complex to the west (Inter-Fluve 2010). The sedimentary (Great Valley Complex) and volcanic and intrusive rock (Coast Range ophiolite) formations lie beneath the Quaternary alluvium of the lower Dry Creek floodplain. These alluvial deposits include the most recent stream channel and floodplain deposits and up to three terrace deposits dating back approximately 1,000 years (Harvey and Schumm 1985). 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).

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). Surficial soils exhibit various characteristics that depend on location, slope, parent rock, climate, and drainage.

3.1.3 Seismicity and Seismic Hazards. 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 aforementioned San Andreas Fault, as well as the 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, 1-2 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 and the Rodgers Creek and Maacama fault systems, it 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, and Inter-Fluve interpreted these reaches to coincide with or parallel mapped strands of the Healdsburg fault.

3.1.4 Hydrology. Lake Sonoma is formed by the Warm Springs Dam, which was constructed across Dry Creek (a major tributary of the Russian River). The lake is part of the Dry Creek basin watershed, which drains approximately 217 square miles from the interior coast ranges of northern Sonoma and southern Mendocino counties before entering the Russian River near the

city of Healdsburg, 30 miles upstream of the Pacific Ocean (Figure EA-2); Harvey and Schumm 1985). This area includes a 130 square mile area regulated by Warm Springs Dam and 87 square miles of unregulated catchments downstream of the dam.

The northwest-trending Dry Creek basin is 32 miles long and 7 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).

Lake Sonoma and the Warm Springs Dam bisects and controls the upper 130 square miles of the basin (USACE 1984). The dam is located 13.9 miles upstream from the confluence of Dry Creek with the Russian River. Terrain upstream of the dam is steep and mountainous, with hillslopes exceeding 30 percent and channel slope ranging from 0.2 to 4 percent (Inter-Fluve 2010). Downstream of the dam, Dry Creek flows through a flat, relatively narrow alluvial valley with a channel slope ranging from 0.2 percent downstream near the Russian River to greater than 2 percent upstream near the dam (Inter-Fluve 2010). Major tributaries to Dry Creek are Cherry and Warm Spring creeks upstream of the dam and Pena and Mill creeks below the dam. Construction of Warm Springs Dam altered basin hydrology by reducing peak flows during wet periods and increasing base flow during dry periods. Dam emplacement also interrupted sediment transport, leading to incision and bed coarsening in downstream reaches (USACE 1987).

The watershed has a seasonal hydrology pattern consistent with the Mediterranean climate and regulation by Warm Springs Dam. Dam releases are the greatest during late-fall and early winter and the lowest from summer to early-fall.

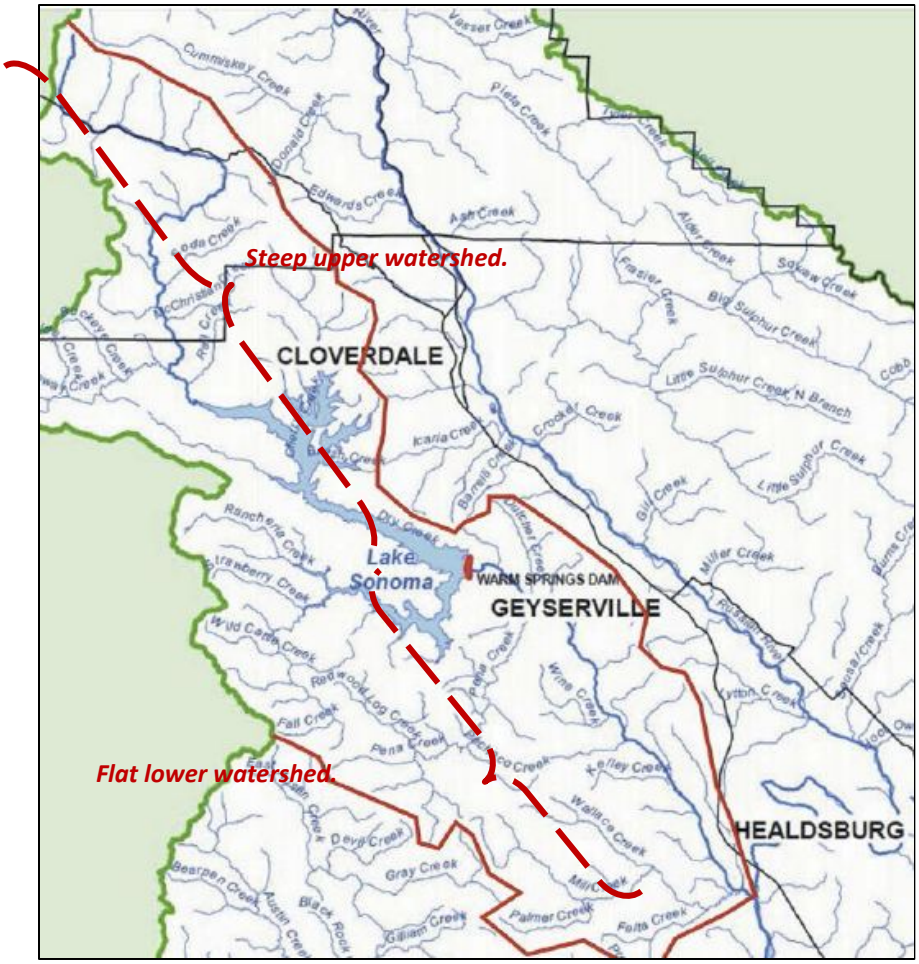


Figure EA-2. Dry Creek Watershed Boundary (in red)

Regional hydrology dominated by winter floods still occur in this November to March timeframe; however, the magnitude of such floods are severely reduced compared to the unregulated period preceding dam construction. Prior to the construction of Warm Springs Dam, Dry Creek near the Geyserville stream gage showed a median annual peak flow of 16,600 cubic feet per second, with peak flows regularly exceeding 7,500 cubic feet per second (Figure EA-3). After dam completion, median annual peak flow fell to 3,900 cubic feet per second and dam operations did not exceed 7,500 from water year 1984 to water year 2013 (Figure EA-4).

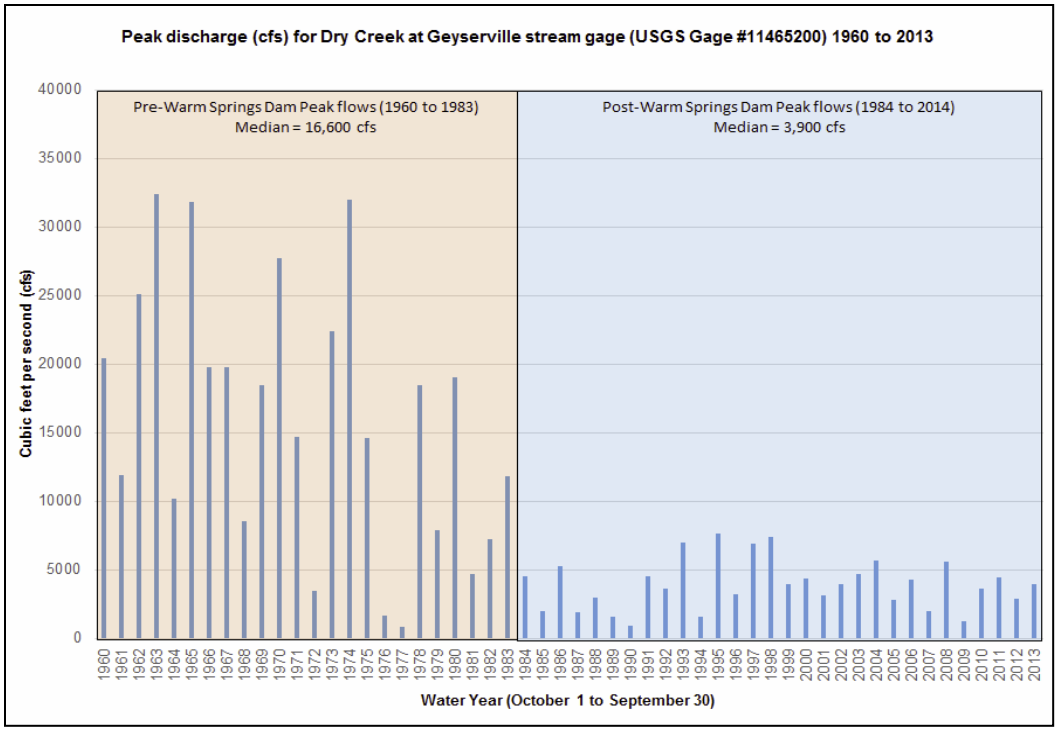


Figure EA-3. Pre- and Post-Warm Springs Dam Peak discharge (cubic ft per second) for Dry Creek at Geyserville stream gage (United States Geological Survey Gage #11465200) 1960 to 2013.

In addition to reducing the magnitude of peak flows by a factor of about four, regulation by Warm Springs Dam has substantially elevated base flow during the summer and fall seasons Sonoma County Water Agency (SCWA) 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 acre feet 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, the SCWA directs USACE to release from Lake Sonoma into Dry Creek and downstream into the Russian River. In 1986, the State Water Resources Control Board (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, California State mandated minimum instream flow requirement in Dry Creek between Warm Springs Dam and the Russian River varies between 105 cubic feet per second in winter months and 80 cubic feet per second in the summer months. In dry and critically dry year conditions, the required summer instream flow on Dry Creek is 25

cubic feet per second. Typical flow rates are generally higher than these limits because of water supply requirements downstream of the Dry Creek and the mainstem Russian River confluence or because of flood control operations. The SCWA sets release levels to meet water supply needs in accordance with its water rights permits, SWRCB Decision 1610, and the biological opinion which sets maximum flow levels to avoid take of endangered species.

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 the hatchery operations. These temperatures persist 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°F (12°C) to 62°F (17°C).

3.2 Biological Resources

Biological resources include the vegetation, fish, and wildlife present in and around Lake Sonoma. These resources are discussed below.

3.2.1 Vegetation Communities.

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 or extremely rare, or have had their numbers substantially reduced. Such loss or reduction in species diversity has been 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 in 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 study 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 study 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 study areas. 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*).

The quality and range extent of plant communities in the watershed have been affected by: habitat conversion and disruption of natural hydrological and geomorphological processes, timber harvest, altered flood frequency, fire suppression, lack of regeneration and disease, overgrazing, invasion by exotic plant species, and altered hydrology. The combination of flood regulation and water supply operations, in particular, has resulted in extensive vegetative colonization of formerly active bar surfaces, stabilizing succession trends and leading to homogenous mature stands.

Special Status Plant Species

A list of status species was requested from the USFWS and is included in Appendix EA-1. 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 in the project boundaries.

Invasive Plant Species

Lake Sonoma 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 grass 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*).

3.2.2 Fisheries

Construction of Warm Springs Dam has decreased natural flow variability and simplified basic geomorphic processes below the dam. Along with land use impacts in the surrounding area, the dam has contributed to the reduction of aquatic habitat complexity along the lower Dry Creek mainstem important for native aquatic and riparian species. This has led to a reduction of aquatic areas with low velocity summer and winter flows for native species to rest and a reduction in cover for fish and wildlife. It has also resulted in a fish passage barrier from Dry Creek upstream of the dam.

Native fish species that currently inhabit, or that have historically inhabited Dry Creek, Cherry Creek, or Smith Creek include steelhead (*Oncorhynchus mykiss*), fall-run chinook salmon (*Oncorhynchus tshawytscha*), Central Coastal coho salmon (*Oncorhynchus kisutch*), coastal rainbow trout (*oncorhynchus mykiss irideus*), hardhead (*Mylopharodon conocephalus*), Pacific lamprey (*Entosphenus tridentata*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomas occidentalis occidentalis*), and the Russian River tule perch (*Hysterocarpus traskii pomo*).

Numerous non-native species also inhabit the lake and tributaries, including: bluegill (*Lepomis macrochirus*), brown bullhead (*Ameiurus nebulosis*), common carp (*Cyprinus carpio*), golden shiner (*Notemigonus crysoleucas*), green sunfish (*Lepomis cyanellus*), largemouth bass (*Micropterus salmoides*), redear sunfish (*Lepomis microlophus*), smallmouth bass (*Micropterus dolomieu*), and western mosquitofish (*Gambusia affinis*) (UC Davis 2019).

Construction of the Warm Springs Dam created a barrier to upstream migration for anadromous salmonids resulting in the loss of spawning habitat above the dam. The Don Clausen Fish Hatchery at Lake Sonoma traps 3,000 to 5,000 Steelhead adults annually. These efforts provide for the release of 300,000 steelhead smolt annually below the dam into Dry Creek. There is also a coho salmon captive brood stocking program that rears fish from egg through adulthood in order to maintain the species despite low numbers returning to spawn each year to the hatchery. Through the captive brood stocking program 5,100 juvenile coho salmon were released into Dry Creek in December 2018, with varying amounts released into other sub watersheds of the Russian River Watershed. To date, more than 80,000 progeny have been released. These releases of coho and steelhead from the hatchery and captive brood stock programs are to mitigate for the loss of upstream spawning habitat.

Fish habitat in the area inundated by the dam has been significantly altered. Summertime temperatures raise the surface water temperature and oxygen is drawn from the cooler deep water, resulting in lowered dissolved oxygen throughout the lake. Water temperatures and oxygen levels no longer support cold water species such as rainbow trout. In addition, reservoir

management normally causes 20 feet of annual variation in water levels. This prevents the establishment of emergent and submerged vegetation around the lake perimeter. The resulting lack of cover and food sources has created challenges for fisheries management at the lake. Various methods of providing cover along the shore have been employed in coordination with the California Department of Fish and Wildlife (CDFW), including the placement of brush structures, Christmas trees and concrete tiles.

Common species in Lake Sonoma now include largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), rainbow trout (*Oncorhynchus mykiss*), black crappie (*Pomoxis nigromaculatus*), channel catfish (*Ictalurus punctatus*), and a variety of non-game species.

Fish Stocking Practices

The CDFW, through their inland fisheries division, has the overall responsibility for the fishery program at Lake Sonoma, including the Don Clausen Fish Hatchery. The fish management program is supervised by professionally trained fisheries biologists. The goal of the state's fisheries program is to produce the best fishing possible for the maximum number of people. The fisheries management program is geared to test, evaluate and provide a greater variety of fishing opportunities by using techniques to primarily favor native species. The USACE's policy is to cooperate with and support studies and subsequent fisheries management recommendations of the reservoir fishery biologist where mutually beneficial and consistent with established goals.

3.2.3 Special Status Fish Species

As mentioned, 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 (federally endangered), and Central California Coast steelhead (federal endangered). In addition, critical habitat for all three species is present within the watershed. However, there is no critical habitat for any listed species at Lake Sonoma. 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). Although salmonids are not likely to be present upstream of the Warm Springs Dam barrier, the lake is managed to protect water quality requirements of salmonids. As such, listed salmonids are discussed herein.

Dry Creek historically supported populations of endangered CCC coho (*Oncorhynchus kisutch)* and threatened CCC steelhead (*Oncorhynchus mykiss)*. Coho and steelhead are present in Dry

Creek year-round. Adult coho and steelhead enter Dry Creek to spawn in the late fall and winter. Eggs deposited in gravel nests called redds incubate through the winter and early spring, and fry emerge in springtime. Juvenile coho and steelhead rear in Dry Creek for a minimum of one year before emigrating to the sea the following late winter or spring. Furthermore, Dry Creek currently supports a robust population of threatened CC Chinook salmon (*O. tshawytscha*).

Because of their complex life cycles and habitat requirements, salmonids are recognized as important proxy species for determining habitat suitability for a suite of native aquatic and riparian species. Furthermore, with respect to contemporary conditions in the Russian River basin, lower Dry Creek is seen as a potential resource that is a key component of the regional recovery plan for ESA-listed coho and steelhead. This is because of the relative abundance of cool streamflow during the late summer months, which is regarded as a limiting factor for recovery of these fish in a region where water is scarce during the summer months and typically has water temperatures adverse to salmonid survival. Therefore, the status of each species as well as an assessment of the habitat requirements for the various life stages of listed salmonids native to Dry Creek is provided below.

California Coastal Chinook Salmon Status

Chinook salmon in the Dry Creek watershed are part of the Evolutionarily Significant Unit (ESU) which includes coastal watersheds from Redwood Creek in the north (Humboldt County) down to and including the Russian River basin (Bjorkstedt, et al. 2005). Dry Creek is identified as critical habitat for recovery of this ESU (NMFS 2005). Chinook salmon in the CC ESU are currently all fall-run; however, historical information suggests that spring-run Chinook salmon existed in the northern part of their range (Bjorkstedt, et al. 2005).

Historical records indicate that since 1881 over eight million Chinook salmon were planted in the Russian River watershed; most of these from out-of-basin stocks including the Sacramento, Mad, and Klamath Rivers. The DCFH began operation in 1980 to mitigate for the loss of spawning and rearing habitat for anadromous salmonids in upper Dry Creek following the construction of Warm Springs Dam. From 1980 to 1989 only 15 percent of the Chinook salmon juveniles planted in the Russian River watershed were from adults returning to the hatchery at Warm Springs Dam. Beginning in 1990 only locally returning fish were used for hatchery spawning. The enhancement goal for Chinook salmon returns at the hatchery was set at 1,750 adult/year. But from 1980-1999 the return rates were only 0-765 fish (USACE and SCWA 2004). The hatchery no longer produces Chinook salmon broodstock: since 2002 all fish returning to the hatchery are naturally produced in the Dry Creek watershed (Chase et al 2007).

California Central Coast Coho Salmon Status

Coho salmon within the Russian River basin are part of the central CCC ESU and are listed as endangered under the Federal ESA and by the California ESA (NMFS 2005). Critical habitat for CCC coho salmon encompasses all river reaches and estuarine areas accessible to coho salmon within the ESU's geographic area, including the Dry Creek watershed (NMFS 1999). Spence et al. (2008) categorized the CCC ESU and CCC coho salmon within the Russian River basin as having at least a high risk of extinction. Historical records indicate that coho salmon are native to the Russian River basin and spawned in Dry Creek, although it only provided marginal habitat compared to other tributaries closer to the coast (Hopkirk and Northen 1980).

The CCC Coho Salmon Recovery Plan (NMFS 2012) places CCC coho salmon within the North-Central California Recovery Domain and identifies the Russian River basin coho salmon as a historically functionally independent population within the Coastal diversity stratum. The CCC Coho Salmon Recovery Plan (NMFS 2012) lists the greatest threats to coho salmon in the Russian River basin as those related to urban development and water diversion and impoundment. The CCC Coho Salmon Recovery Plan (NMFS 2012) identified Dry Creek as a Core Area, which has the highest priority for near-term restoration projects and threat abatement actions.

The hatchery produced an average of 70,000 coho salmon annually between 1980 and 1998 (USACE and SCWA 2004). Broodstock sources for hatchery coho salmon included the Noyo, Klamath, Eel and Russian rivers and some out-planting of coho salmon from Oregon and Washington into the Russian River occurred (USACE and SCWA 2004). Returns of adult coho salmon to the hatchery did not meet the enhancement goal of 1,000 fish per year leading to the termination of the program in 1998.

The Broodstock Program formed in 2001 with the goal of reestablishing self-sustaining runs of coho salmon in tributary streams of the Russian River (Obedzinski et al 2008). The program captures wild juvenile coho salmon, rears them to adulthood, and spawns them at hatchery, releasing their progeny into streams that historically supported coho salmon. In 2004, the Broodstock Program began releasing progeny into three streams in the Russian River basin: Mill (a tributary of lower Dry Creek), Ward, and Sheephouse creeks (Conrad et al 2006). Currently, the Broodstock Program releases coho salmon juveniles into mainstem Dry Creek, and several of its tributaries Grape, Peña, Mill, and Palmer creeks.

The SCWA began monitoring downstream migrating salmonids in Dry Creek in 2009. The number of coho salmon captured in downstream migrant traps and the number originating from Broodstock Program increased from 10 coho salmon (7 originating from the Broodstock Program) in 2009 to 214 (113 originated from the Broodstock Program) in 2011, and most

recently 780 juvenile coho salmon (760 originated from the Broodstock Program) in 2013 (Manning and Martini-Lamb 2011, 2012, and 2014).

California Central Coast Steelhead Status

Steelhead found in the Dry Creek basin belong to the CCC Distinct Population Segment (CCC DPS) (NMFS 2008), which includes coastal drainages from the Russian River to Aptos Creek and the drainages of San Francisco and San Pablo Bays, excluding the Sacramento-San Joaquin River watershed. The CCC DPS is federally listed as threatened under the ESA. Dry Creek is identified as critical habitat for the recovery of the CCC DPS (NMFS 2008). Steelhead are native to the Russian River basin, but stocking of out-of-basin fish has occurred since the 1890s and continued until 1982 (USACE and SCWA 2004).

The timing and magnitude of the steelhead run in Dry Creek are unclear. Steelhead spawn in Dry Creek tributaries from December through March and parr occur throughout the summer in mainstem Dry Creek (Obedzinski, Pecharich, Davis, Lewis, and Olin 2008). A downstream migrant trap operated by the SCWA at the mouth of Dry Creek from March through June captured between 2,082 and 5,422 juvenile steelhead per year over the past five years (Martini-Lamb and Manning 2014).

Although Dry Creek and its tributaries are generally accessible to salmonids, Warm Springs Dam is a complete barrier to migration, and some small seasonal dams on tributaries may block migration. Flow in Dry Creek, augmented by Warm Spring Dam releases, is usually sufficiently deep to allow fish to easily pass most shallow areas. Water temperatures are generally sufficiently cool and suitable for migrating adult salmonids. However, because of a loss of riparian vegetation resulting in increased solar inputs to the stream, water temperature in the lower portion of Dry Creek in the late summer is not optimal for adult Chinook salmon that sometimes immigrate as early as September. Nevertheless, the majority of adult Chinook salmon migrate in October and November, a time with generally adequate water temperatures. Coho salmon and steelhead migrate later in the fall and winter; water temperatures in Dry Creek are adequate for immigration of adult coho salmon and steelhead.

Limited rearing habitat hinders the conservation of coho salmon and steelhead. Although conditions will be favorable for spawning and migrations of both adults and smolt stages, growth and survival of juvenile salmonids is minimal in Dry Creek because suitable and optimal quality habitats are limited. Salmonid fry are weak swimmers that aggregate in shallow, low-velocity areas along stream margins (Chapman and Bjornn 1969; Everest and Chapman 1972; Bjornn and Reiser 1991). Current (and anticipated future) water releases from Warm Springs Dam in the summer and fall create high water velocities that severely limit the quantity and

quality of salmonid rearing habitat in the Dry Creek mainstem. Sustained summer flows combined with the single channel characteristic of lower Dry Creek result in consistent areas of velocity above a suitable range for refuge of juvenile coho during summer months.

Coho salmon redds, which are constructed from November through January, are more subject to scour because they are subjected to more frequent high winter flows. Such flows occurring in the latter part of the spawning and incubation season (January) have the greatest potential to scour the most redds and incubating alevins (USACE and SCWA 2004). In an evaluation of potential scouring of salmonid redds conducted by the SCWA, coho salmon redds had the highest frequency of scour potential in Dry Creek. Water temperatures are good in Dry Creek for incubation and Dry Creek provides adequate depth and flow for salmonid spawning. However, pool/riffle habitat, which serves as prime spawning habitat for steelhead and salmon, is limited. Still, lack of cover and complexity has not precluded relatively large numbers of Chinook salmon from spawning in Dry Creek. Stream bank erosion on Dry Creek has caused increased delivery of fine sediment, negatively affecting the quality of spawning habitat. The availability of spawning habitat in Dry Creek is less for coho than for steelhead or Chinook salmon because coho salmon use smaller gravels for spawning than steelhead or Chinook salmon (USACE and SCWA 2004). These smaller gravels may be transported out of the upper reach of Dry Creek more readily because of the high flows in this creek (USACE and SCWA 2004).

3.2.4 Wildlife

Lake Sonoma and the wildlife area provide habitat for several wildlife species. The availability of water, the diversity and abundance of plant life, and the complex vegetation structure provide a number of animal species with food, water, and cover as well as breeding and resting sites. Riparian corridors also and facilitate wildlife movement (i.e., dispersal, seasonal migration, and local movements within home ranges).

Terrestrial mammals, such as mule deer (and the Coast Range subspecies, black-tailed deer), use the cover of the riparian forests and woodlands for protection from predators as they move between foraging areas. Similarly, amphibians and reptiles use the protective cover of this habitat as they disperse from their aquatic breeding sites. Migratory waterfowl use the waters and wetlands for their food supplies during their seasonal migration. Animals typically found in riparian habitats include birds, such as Bewick's wren (*Thryomanes bewickii*), spotted towhee (*pipilo maculatus*), and tree swallow (*Tachycineta bicolor*); mammals, such as brush rabbit (*Sylvilagus bachmani*), deer mice (*Peromyscus maniculatus*), dusky footed woodrat (*Neotoma fuscipes*), and raccoon (*Procyon lotor*); and amphibians such as foothill yellow-legged frog (*Rana boylii*) (Warner and Hendrix 1984).

Although many of the species that historically occupied the watershed are still present, some have had their numbers substantially reduced. Such loss or reduction in species diversity has been attributed to habitat loss and a variety of other complex factors. The riparian corridor of modern Dry Creek is narrower, the channel more incised, and the interaction with the floodplain greatly reduced compared to before European settlement. The overall effect in the Dry Creek Valley is degraded riparian habitat and greatly reduced acreage of both streamside and floodplain wetlands.

Large Mammals

Blacktailed deer and feral pigs are the most prevalent large mammal species. Deer and pigs are most abundant in the oak woodlands within the wildlife area where forbs, annual grasses, acorns and palatable shrubs provide ample food. Their populations are currently maintained by hunting which is permissible with a permit. Each year the California Department of Fish and Wildlife performs a population survey and then issues a limited number of hunting permits to maintain the populations at the desired sizes.

Many predatory mammals inhabit the interspersed chaparral/oak woodland/grassland plant communities. Occasionally observed are coyotes, bobcats,raccoons and weasels, preying upon abundant small mammal and bird populations. There have been rare sightings of mountain lions and black bears.

Small Mammals

Many species of rodents are common to all areas of the project. The brushier areas are inhabited by jackrabbits, ground squirrels, Sonoma chipmunks, and western harvest mice are frequently observed in the wooded camping areas. Many species of bats are common, preying on the insects attracted by the lake environment.

Avian Fauna

The project supports varied and abundant avian fauna throughout all seasons of the year. In the fall and winter months, the lake serves as habitat for migratory waterfowl, such as Clark's grebe, wood duck, and many other ducks and geese. Whereas great blue herons are year-long residents, along with feral domestic ducks and geese. Unlike the herons, the feral birds pose a management problem as they compete with native species for resources, and may transmit

disease and parasites to them. Yet the domestic waterfowl are popular with the public, who continually add to their populations.

Turkeys inhabit the upland oak woodlands/grasslands, and feed on mast and other seeds from annual and perennial grasses and forbs. Turkeys (*Meleagris gallopavo*) were introduced to the area several years ago by the CDFW, and have since become an important game species in the wildlife area. The CDFW by-drawing-only hunts are held in the fall and spring. Fall turkey hunts are less successful as the turkeys cannot be called as easily.

In the open grasslands, towhees, Brewer's blackbird, cowbirds, robins, sparrows, goldfinches, meadowlarks, phoebes, king birds, juncos, thrush, kinglets, larks and warblers are all abundant during the various seasons.

Chaparral-covered hills provide habitat for quail, several hummingbird species, wrentits, California thrashers, and northern mocking birds.

Special Status Species

The species list obtained from the USFWS contained two 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.

Fifteen terrestrial animal species that are not federally listed as threatened or endangered, but are considered to be species of concern at the federal or state level, have moderate-to high-potentials to occur in the Lake Sonoma area. These species include:

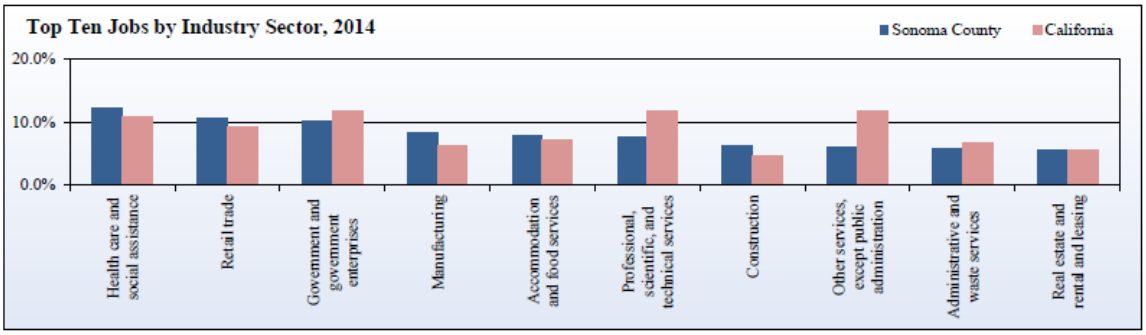
- Bald Eagle (*Haliaeetus leucocephalus*), is state listed as endangered and fully protected. A pair is known to have maintained an active nest at Lake Sonoma from 2001 to the present. The species may occasionally forage in the Russian River area.
- Allen's hummingbird (*Selasphorus sasin*), currently included on the USFWS birds of conservation concern list and previously categorized as a federal species of concern, has been confirmed nesting in inland Sonoma County and the Dry Creek Valley.
- Olive-sided flycatcher (*Contopus cooperi*), a California species of special concern, has been 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*), a species on the California watch list, is 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*) is on the CDFW special animals list and is common in the winter in Sonoma County. It has been observed in the vicinity of Lake Sonoma during bird surveys.
- Yellow warbler (*Dendroica petechia*), considered a species of special concern by CDFW and a bird of conservation concern by USFWS, is considered a fairly common summer resident of riparian woodland from April through October.
- Yellow-breasted chat (*Icteria virens*), considered a 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*) is considered a 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 has been identified in the vicinity of Lake Sonoma.
- Peregrine falcon (*Falco peregrinus anatum*) is included on the USFWS list of birds of conservation concern and is considered a fully protected species in California. Suitable foraging habitat is present at Lake Sonoma.
- Merlin (*Falco columbarius*), a species categorized by CDFW as a state species of special concern, is an uncommon winter migrant from September to April.
- Loggerhead shrike (*Lanius excubitor*), currently included on the USFWS list of birds of conservation concern and is categorized by CDFW as a state species of special concern, is considered an uncommon permanent resident in Sonoma County with numbers declining over the last few decades.

- Pallid bat (*Antrozous pallidus*) a federal species of concern, may roost in mature trees around Lake Sonoma.
- Western pond turtle (*Actinemys [Emys] marmorata*), Suitable aquatic and upland habitat along with the lake area exists for this California species of special concern.
- Foothill yellow-legged frog (*Rana boylii*), a California species of special concern, 71 occurrences have been reported in several locations throughout Sonoma County.

3.3 Socionomic Characteristics

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 employments, together accounting for approximately a third of all jobs in the county. Farm employment accounts for 2.2% of jobs. Figure provides an overview of employment by sector in the county and compared to the State of California on the whole. Tourism plays an important role in the economy of Sonoma County and supports approximately 11% of employment. Visitors to Sonoma County spent an estimated $1.9 billion in 2017.

Figure EA-4 - Distribution of Jobs by Sector in Sonoma County and the State of California



Source: Center for Economic Development at the California State University, Chico

3.3.1 Population and Demographics

California now has 67 cities with populations exceeding 100,000 and 20 cities with populations exceeding 200,000. Cities are getting larger, squeezing out the open spaces for parks and disconnecting the state's biological resources. In 2000, California had an average of 217.2 persons per square-mile compared to the US average of 79.6. The five county market area was home to approximately 1.1 million residents in 2018, and the population is projected to grow to an estimated 1.2 million people by 2040, as detailed in Table EA-2. Median household income across the counties in the market area is $74,452; provides a breakdown of income distribution by county.

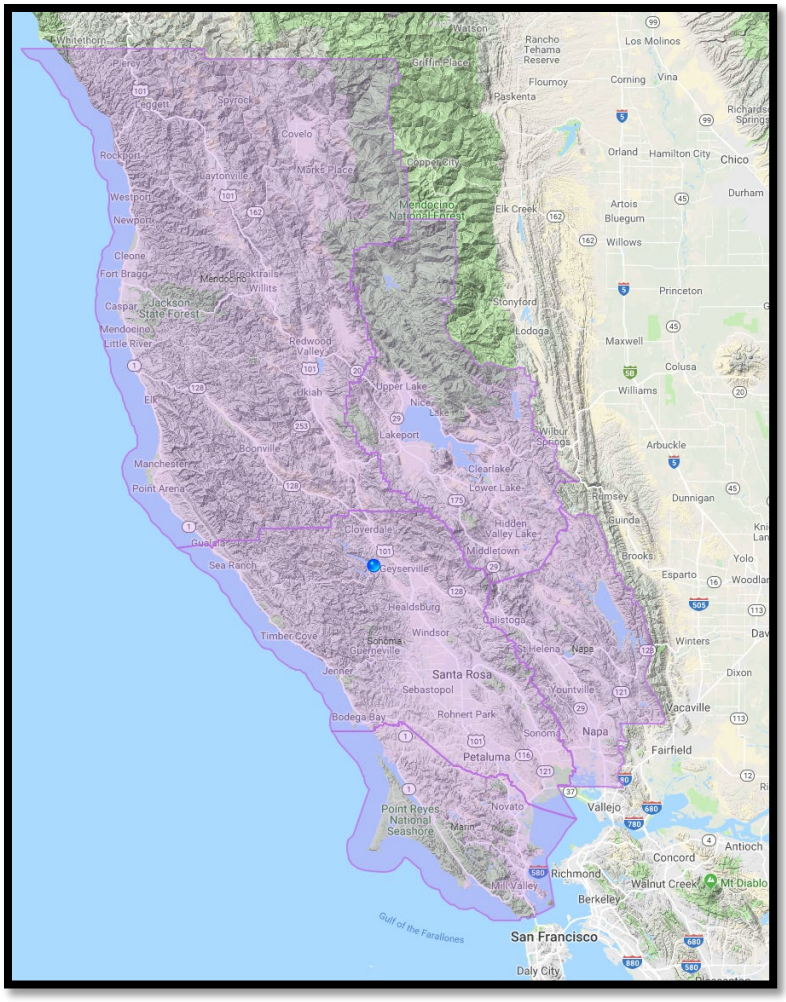


Figure EA-5 - Map of Northern California counties: Sonoma, Mendocino, Napa, Lake and Marin

Table EA-2 - 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

Table EA-3 - Household Income Distribution

	Sonoma		Mendocino		Napa		Lake		Marin		Total	
Income Range	**Households (HH)**	**Percent of Total**	**HH**	**Percent of Total**	**HH**	**Percent of Total**	**HH**	**Percent of Total**	**HH**	**Percent of Total**	**HH**	**Percent of Total**
Less than $25,000	30,857	16.3%	10,361	30.0%	7,243	14.7%	9,083	34.7%	13,300	12.7%	70,844	17.6%
$25,000 to $34,999	15,539	8.2%	4,377	12.7%	3,478	7.0%	3,793	14.5%	6,008	5.8%	33,195	8.2%
$35,000 to $49,999	23,022	12.2%	4,401	12.7%	5,779	11.7%	3,277	12.5%	8,887	8.5%	45,366	11.2%
$50,000 to $74,999	34,588	18.3%	6,410	18.5%	8,316	16.8%	4,059	15.5%	12,714	12.2%	66,087	16.4%
$75,000 to $99,999	25,349	13.4%	3,635	10.5%	6,413	13.0%	2,832	10.8%	11,122	10.7%	49,351	12.2%
$100,000 to $149,999	30,967	16.4%	3,576	10.3%	8,728	17.7%	1,929	7.4%	17,747	17.0%	62,947	15.6%
$150,000 to $199,999	14,650	7.7%	1,045	3.0%	4,245	8.6%	652	2.5%	11,224	10.8%	31,816	7.9%

$200,000 or more	14,071	7.4%	789	2.3%	5,173	10.5%	569	2.2%	23,398	22.4%	44,000	10.9%
Total	189,043	100%	34,594	100%	49,375	100%	26,194	100%	104,400	100%	403,606	100%

Source: US Census Bureau, American Community Survey

3.3.2 Cultural Resources

The term cultural resources is broadly defined as the buildings, structures, objects, sites, districts, and archeological resources associated with historic or prehistoric human activity. Cultural resources that are listed in, or eligible for listing in, the National Register of Historic Places (NRHP) are referred to as "historic properties." Such properties may be significant for their historic, architectural, scientific, or other cultural values and may be of national, state, or local significance.

Cultural resources are representative of broad patterns, themes, events and people in prehistory and history. Both pre and post construction archaeological studies have been completed at the dam and lake location, beginning in the 1940's, with a majority of the significant studies completed in the 1970's. Although some additional studies were completed in 2001 and 2010, few studies have been conducted since then. These past studies have determined that the environment was favorable during the prehistoric period with riparian and other inland resources accessible along the Russian River and other water sources flowing through the region. Past studies indicate that Native American occupation intensively occupied the region 2,000–5,000 years before the present. However Native American presence likely predated this time span, and in some cases continues into the present. Additionally, the research completed in the 1970's included an ethnographic study that recorded pre-contact, historic, and contemporary histories of Native American use of the Lake Sonoma area. Studies suggest that prehistoric populations increased over time in the region, with a shift from a hunter-gather regimen to more permanent settlements with the development of stable and predictable subsistence procurement and food storage. The sites types identified, indicate that loci attributed to Native American occupation were sought for proximity to available resources, accessibility, and protection from seasonal flooding in the area. Additionally, the lithic material procurement evident at the sites that have been studied indicates the area may have played a role in an important trade network between the Clear Lake Basin and the coast (Basgall and Bouey 1991, Newland 2001). The types of sites in the area are made up of lithic scatters, tool material procurement, habitation sites, rock art sites, and subsistence processing sites including bedrock mortars or other milling features. Several ethnobotanical resources, ethnographic sites, and historic-era sites have also been identified in the region. These collective works culminated in the identification of the Dry Creek-Warm Springs Valley Archaeological District in 1977. The District includes lands managed by the USACE and private properties located downstream of Lake Sonoma. The district originally consisted of 85 prehistoric sites, 24 historic sites, and 8 ethnographic sites, though some newly identified sites have been added to the district, and the destruction of others has been confirmed and recorded.

The most recent archaeological study conducted in the Lake Sonoma Recreation Area (LSRA) was completed in 2010 (Reddy et al. 2011) and consisted of revisiting 34 of the

previously recorded archaeological sites to perform condition assessments and risk assessments. The study was completed pursuant to Section 110 of the National Historic Preservation Act (Section 110). Under Section 110, USACE is required to take responsibility for historic properties by establishing a program to identify, evaluate, and nominate (if appropriate) these sites to the National Register of Historic Places (NRHP). Identification and evaluation of these properties are to be performed by individuals qualified under the *Secretary of the Interior's Standards for Archaeology and Historic Preservation* (36 CFR 61 Appendix A). To comply with Section 110, a survey of USACE fee-title lands around Warm Springs Dam and Lake Sonoma Reservoir was completed (Reddy 2011). As part of this undertaking, an updated records search was completed for the project, which determined that 117 cultural resources had been previously identified in and around LSRA over a 50 to 60 year period (Basgall and Bouey 1991). A survey was performed in order to relocate the 48 previously recorded sites that were recorded at or above the 440-foot pool level of the reservoir at that time. This resulted in the relocation of 28 of the previously recorded sites, as well as the identification of six newly identified archaeological sites that had not been previously recorded within the project area. The report indicated that the remaining 20 sites that were recorded above the pool level had either been submerged by the reservoir or destroyed. The report provides National Register of Historic Places (NRHP) recommendations of eligibility for the 34 sites that were located, indicating that 21 of the sites are recommended as eligible for listing on the NRHP, 12 are recommended not eligible, and the eligibility of one was not able to be determined without further research. Finally, the 2010 study included risk-assessment observations that were recorded to inform the Corps' management and protection of the cultural resources in the LSRA to comply with Section 110.

Recent archaeological studies in the region that have resulted in the development of cultural and chronological interpretations of the study area are not be presented here. The interested reader is referred to the most relevant of these outlining Native American prehistoric and historic-period occupation of the dam and lake area, Basgal and Bouey (1991) Jones and Klar (2007), Praetzellis et al. (1985), Newland (2001), and Reddy et al. (2011).

4.0 ENVIRONMENTAL CONCEQUENCES

This section of the EA describes the environmental consequences associated with the alternatives presented in Section 2.0. NEPA requires consideration of context, intensity, and duration of adverse and beneficial impacts (direct, indirect, and cumulative) and measures to mitigate for impacts. These elements are considered in the following impact analysis.

It is important to note that this EA assesses the impacts of adopting the land classifications included in the proposed Master Plan revision but not the recommendations for future management actions and opportunities mentioned in Table EA-2 for each MU. Adoption of

the proposed Master Plan revision would help define the approval process for future actions affecting project lands, depending on whether the actions are 1) specifically included in the revised Master Plan, 2) not included in the revised Master Plan, but consistent with the Plan, or 3) not included and not consistent with the recommendations, objectives and policies stated in USACE regulations (USACE, 2009).The recommendations will be part of the Operational Management Plan and identified as actions which will be reviewed and completed at a later date. Because of the wide variety of possible future actions that could be proposed to carry out the MU recommendations, additional evaluation to determine consistency with the stated site objectives and further NEPA consideration on a project-by project basis would be required as these tasks are undertaken. Prior to such actions being carried out, NEPA documentation and any other applicable environmental compliance specific to those proposed actions would be completed.

4.1 Environmental Impacts.

The implementation of the land classifications included in the revised Master Plan would not result in any irreversible environmental conditions. Environmental resource categories that experience impacts as a result of the No Action and Agency-preferred Alternative (to adopt the revised Master Plan) are displayed in table EA-7. Only resources that experience either a beneficial or possible adverse impact will be discussed further in Section 4.1.

Table EA-7. Environmental Impacts

	NO-ACTION IMPACTS			PREFERRED ALTERNATIVE		
Resource	**No Impact**	**Beneficial Impact**	**Adverse Impact**	**No Impact**	**Beneficial Impact**	**Adverse Impact**
Physical Environment						
Geology, Topography, Soils	X			X		
Water Resources	X			X		
Air Quality	X			X		
Climate	X			X		
Noise				X		
Hazardous Materials	X			X		
Recreation and Aesthetics					X	
Natural Resources						
Vegetation					X	
Fish and Wildlife					X	
Threatened and Endangered	X			X		
Wetlands	X					
Invasive Species					X	
Socioeconomics						
Community Growth	X			X		
Community Cohesion	X			X		
Displacement of People	X			X		
Environmental Justice	X			X		
Property Value/Tax Base	X			X		
Public Facilities & Services	X			X		
Employment	X			X		
Business Growth	X			X		
Farm Displacement	X			X		
Transportation	X			X		
Safety	X			X		
Cultural Resources	X			X		

4.1.1 **Effects on Water Resources.** Implementation of the No Action Alternative would not result in any changes the existing effects on water quality since the Master Plan would remain unchanged.

The land reclassifications and updated resource objectives to be implemented by the Agency-Preferred Plan would allow land management and land uses to be compatible with the goals of good stewardship of water resources. Therefore there would be no significant adverse impacts to water resources associated with the Proposed Action.

4.1.2 **Effects on Climate.** Implementation of the No Action Alternative would not result in changes to the existing climate at Lake Sonoma since the Master Plan would remain unchanged. Implementation of the Agency-Preferred Plan would not have a discernable effect on climate because lands will largely be operated in the same fashion as under the existing Master Plan.

It should be noted that, ongoing research by the USACE Institute for Water Resources on carbon sequestration potential of USACE-owned land and water demonstrates a potential to capture and store greenhouse gases in vegetation and in reservoir sinks. This could be a beneficial climate change mitigation opportunity in the future were it to be pursued.

4.1.3 **Effects on Air Quality.** Implementation of the No Action plan would not change existing air quality since the Master Plan would remain unchanged.

Existing operation and management of Lake Sonoma is compliant with the Clean Air Act and this would not change with the implementation of the proposed Master Plan revision. Therefore there would be no significant adverse impacts to air quality under the Proposed Action (Agency-Preferred Plan).

4.1.4 **Effects on Noise.** Implementation of the No Action Alternative would not result in changes to noise levels since the Master Plan would remain unchanged.

The Agency-Preferred Plan would have no effect on noise levels at Lake Sonoma. Areas within the project have limited noise sources mainly coming from recreational boat traffic with occasional short-term impacts from construction actions. Lands currently classified for intensive use or operations have the greatest potential to create noise within the project boundary, but there will be no expansion of such high density recreation areas with the updated Master Plan.

4.1.5 **Effects on Recreation and Aesthetic Resources.** Implementation of the No Action Alternative would not result in changes to recreation and aesthetic resources since the Master Plan would remain unchanged.

The Agency-Preferred Plan would not change land use classification in the recreation areas. Activities allowed in these areas and how they will be managed would remain the same. However, recommendations presented in the Resource Plan could improve the recreational experience at the lake. Therefore the Agency-Preferred Plan would likely have a beneficial effect on

recreation. Any action taken on these recommendations would be evaluated as appropriate under NEPA prior to implementation.

4.1.6 **Effects on Vegetation.** Implementation of the No Action Alternative would not result in any effects to vegetation since the Master Plan would remain unchanged.

Under the Agency-Preferred Plan the District would update the natural resources conditions and management goals and objectives in the Master Plan, providing the basis for the development of an updated Operational Management Plan. With implementation of the Master Plan, vegetative resources would be better accommodated through analyzing natural resources based on current conditions, resource suitability, and trends occurring on the landscape. Following goals and objectives found in Chapter 3 of the Master Plan would benefit natural resources by improving the health of local habitats which in turn encourages wildlife diversity.

4.1.7 **Effects on Fish and Wildlife**. Implementation of the No Action Alternative would not result in any changes to existing conditions for fish and wildlife resources since the Master Plan would remain unchanged.

The Agency-Preferred Plan does not directly change the way fish and wildlife are managed at the lake. There are no additional management measures for fish and wildlife recommended in the Master Plan. The proposed Master Plan would update the goals and objectives underlying the management of fish and wildlife resources of the lake. Following these goals and objectives found in Chapter 3 of the Master Plan would benefit fish and wildlife by improving the health of local habitats and, in turn, encourages wildlife diversity. Therefore implementation of the Proposed Alternative could beneficially effect fish and wildlife resources.

4.1.8 **Effects on Threatened and Endangered Species.** Implementation of the No Action Alternative would not result in impacts to federally listed species since the Master Plan would remain unchanged.

There is a remote possibility that marbled murrelets or spotted owls might be occasionally present in the remote areas of coniferous forest at Lake Sonoma. The agency preferred plan does not change the way that these areas are managed. There would be no significant adverse impacts to any federally listed species associated with the proposed action.

4.1.9 **Effects on Wetlands.** Implementation of the No Action Alternative would not result in impacts to wetlands since the Master Plan would remain unchanged.

The Agency-Preferred Plan does not change the management of wetland areas at Lake Sonoma. There would be no significant adverse impacts to wetland habitat due to the implementation of the Agency-Preferred Plan.

4.1.10 **Effects of Invasive Species.** Implementation of the No Action Alternative would not result in changes to the existing level of invasive species at Lake Sonoma since the Master Plan would remain unchanged.

The District would continue to implement the existing invasive species control measures under the Proposed Alternative. In addition the updated Resource Plan recommends action to control the feral pigs in the Wildlife Management Area and to coordinate with stakeholder agencies to develop a plan to prevent the introduction of quagga and zebra mussels. These actions would be beneficial in the control of invasive species.

4.1.11 **Effects on Socioeconomics**. Implementation of the No Action Alternative would not result in impacts to low income or minority populations or children since the Master Plan would remain unchanged. Visitors would continue to come to Lake Sonoma from surrounding areas. Many visitors purchase goods such as groceries, fuel, fishing and camping supplies, locally, eat in local restaurants, stay in local hotels, and shop in local retail establishments. These beneficial effects would continue.

The Agency-Preferred Plan would maintain the beneficial effects realized under the No Action alternative. If the Resource Plan measures for improvement of the recreation areas were implemented, increased attendance at the lake could enhance these beneficial effects. There would be no adverse impacts on the economy in the area and no disproportionately high or adverse impacts on minority or low income populations or children as a result of the Agency-Preferred Plan.

4.1.12 **Effects on Transportation.** Implementation of the No Action Alternative would not result in impacts to transportation since the Master Plan would remain unchanged.

The Agency-Preferred Plan recommends upgrades to boat ramps, parking lots and other areas of congestion. Increased traffic from construction of these features, if implemented, could result in minor temporary local impacts on traffic and transportation, but impacts would likely be negligible. Should these recommendations be implemented, appropriate NEPA documentation and environmental compliance would be completed to evaluate and minimize such effects. The updated Resource Plan recommends the expansion and

reconfiguration of entrance station areas, parking areas and boat ramps at various recreation areas and would have long-term beneficial impacts on in-park vehicular traffic flow, likely reducing congestion. The proposed alternative would have no adverse impact on regional transportation.

4.1.13 **Effects on Safety**. Implementation of the No Action Alternative would not result in impacts to safety since the Master Plan would remain unchanged.

The Agency-Preferred Plan would continue the existing safety plan in use at Lake Sonoma. The updated Resource Plan recommends augmenting the existing signage around the lake to increase visitor exposure to safety information with regard to water safety and awareness of wild land dangers such as poison oak, rattlesnakes, and large predators. These measures could have a beneficial effect on visitor safety at the lake.

4.1.14 Effects on Cultural Resources.

Significance Criteria

Any adverse effects on cultural resources that are listed or eligible for listing in the NRHP are considered to be significant. Cultural resources listed or eligible for listing in the NRHP are considered "historic properties" and must undergo particular evaluation of effects in order to determine if an undertaking, pursuant to 36 CFR 800.16 (y), is adverse. An undertaking would be considered to have an adverse effect on historic properties if it diminishes the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. Types of effects include:

- Physical destruction, damage, or alteration of all or part of the historic property;
- Isolation of the historic property from or alteration of the character of the historic property's setting when that character contributes to the historic property's qualifications for the NRHP;
- Introduction of visual, audible, or atmospheric elements that are out of the character with the historic property or alter setting;
- Neglect of a historic property, resulting in its deterioration or destruction; and,
- Transfer, lease, or sale of the historic property.

National Historic Preservation Act of 1966, as amended, 16 U.S.C. § 470, *et seq*. *Partial Compliance.* Section 106 of the National Historic Preservation Act (Section 106) requires Federal agencies to take into account the effects of a

proposed undertaking on properties that have been determined to be eligible for listing in, or are listed in, the National Register of Historic Places (NRHP). The development and possible change of these land use classification changes are an undertaking with the potential to effect historic properties. Several of the cultural resources identified within the project area are recommended as eligible for listing on the NRHP, and several others are in need of evaluation to determine their potential eligibility. Therefore, once land use changes are adopted through the lake management plan, the Corps will be required to carry out consultation with the SHPO and Native American tribes in order to assess the potential effects of each undertaking and to comply with Section 106.

4.2 Probable Adverse Effects Which Cannot be Avoided.

Implementation of the Preferred Alternative is not expected to result in unavoidable adverse impacts to any of the resources analyzed in this EA. The Resource Objectives and direction on agency coordination would help the District avoid, offset, and mitigate for any unforeseen impacts. Any anticipated impacts from the proposed master plan revision would be minor and localized and would not have significant long-term adverse impacts to project resources.

4.3 Relationship Between Short-Term Use and Long-Term Productivity.

The Master Plan is a land use planning document which will benefit productivity of Lake Sonoma lands and waters in the long term. While any future maintenance and construction activities may temporarily disrupt wildlife and human use in project areas, these would be evaluated via action specific NEPA and environmental compliance prior to pimplimentation. Negative long-term impacts are not expected with the proposed Master Plan revision.

4.4 Irreversible or Irretrievable Commitment of Resources.

The commitment of man-hours required to write, coordinate and review the proposed Master Plan are irretrievable. Other than the aforementioned, none of the proposed actions are considered irreversible.

4.5 Relationship of the Project to Land-Use Plans.

Implementation of the Master Plan is a proposed land-use planning change. The Land-Use changes, which the Corps refers to as Land Classifications, are being changed to reflect current conditions and meet current regulations. The Master Plan is consistent with other State and regional goals and programs. If implemented, the District does not expect the Preferred Plan to alter or conflict with other authorized civil works projects.

4.6 Indirect and Cumulative Impacts of the Preferred Alternative.

The CEQ regulations that implement NEPA require assessment of cumulative impacts in the decision-making process for Federal projects. Cumulative impacts are defined as impacts which result when the impact of the Preferred Alternative is added to the impacts of other

past, present and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7). The cumulative impacts associated with the Preferred Alternative and the No Action Alternative are described below.

Past, present, and reasonably foreseeable future actions have and continue to contribute to the cumulative impacts of activities in and around Lake Sonoma. Past actions include the construction and operation of the reservoir, the recreation sites surrounding the reservoir, as well as residential, commercial, and industrial facilities throughout the region. All of these developments have had varying levels of adverse impacts on the physical and natural resources in the region. Many of these developments, however, have had beneficial impacts on the region's socioeconomic resources. In addition, many of the historic impacts have been offset throughout the years by the resource stewardship efforts of the District, California Department of Fish and Wildlife, Sonoma Water and other management partners.

The most significant past action was the construction and development of the Lake Sonoma Reservoir. This change created new natural and physical conditions, which, through careful management by the District, and other management partners, have created new and successful habitats and other natural resource conditions. The construction of the project also had an impact on cultural resources. Impacts to cultural resources were coordinated with the State Historic Preservation Officer. This coordination included appropriate research and documentation of cultural resources. Since that time, the District, and other management partners have worked to preserve, protect, and document cultural resources within the project boundary. The District and the other management partners have also brought a wide variety of high-quality recreational opportunities to the reservoir.

Existing and future actions also contribute to the cumulative impacts in and around the reservoir. Existing and future actions include the operation of project facilities, and upgrades and maintenance of recreation sites. Continued project operations would result in the sustained maintenance and development of recreational facilities. These facilities would enhance the recreational offerings made by the District and other management partners. Such improvements would result in varying levels of impacts to the surrounding resources. Similarly, surrounding residential, commercial, and industrial development could result in varying levels of adverse impacts to many resources. Within the project boundary, adverse impacts would be offset through resource stewardship efforts. The programmatic approach to project management, included in this EA and attached Master Plan, would allow for future development plans and mitigation responses to be adapted to address any adverse actions. This would allow the District and other management partners at Lake Sonoma to continue to reduce the contribution of its activities to regional cumulative impacts through proactive actions and adaptive resource management strategies.

The Preferred Alternative would contribute minor increments to the overall impacts that past, present, and future projects have on the region, mainly through the implementation of the Land Classifications and Resource Objectives outlined in the proposed Master Plan.

4.7 Compliance with Environmental Quality Statutes. See Table EA-8

Table EA-8. Compliance with Environmental Protection Statutes and Other Environmental Requirements

Federal Policies	Compliance[1]
Archaeological and Historic Preservation Act, 16 U.S.C. 469, et seq.	Full compliance
Clean Air Act, as amended, 42 U.S.C. 1857h-7, et seq.	Full compliance
Clean Water Act, 33 U.S.C. 1857h-7, et seq.	Full compliance
Endangered Species Act, 16 U.S.C. 1531, et seq.	Full compliance
Federal Water Project Recreation Act, 16 U.S.C. 460-1(12), et seq.	Full compliance
Land and Water Conservation Fund Act, 16 U.S.C. 460/-460/-11, et seq.	Not applicable
National Environmental Policy Act, 42 U.S.C. 4321, et seq.	Full compliance
National Historic Preservation Act, 16 U.S.C. 470a, et seq.	Partial compliance
River and Harbors Act, 33 U.S.C. 403, et seq.	Full compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Not applicable
Wild and Scenic Rivers Act, 16 U.S.C. 1271, et seq.	Full compliance
Flood Plain Management (EO11988)	Full compliance
Protection of Wetlands (EO11990)	Full compliance
Farmland Protection Act	Full compliance
Corps of Engineers Planning Guidance Handbook (ER 1105-2-100)	Full compliance
EO13112 Invasive Species	Full compliance

[1]Full compliance - Having met all requirements of the statute for the current stage of planning.
Not applicable - No requirements for the statute apply.

5.0 COORDINATION AND PUBLIC INVOLVEMENT

5.1 Scoping and Significant Issues.

In 2017, the USACE began the process of revising the Lake Sonoma Master Plan, which was last approved in 1979. On February 21, 2018, a public meeting was held to kick off the master planning process. The purpose of this meeting was to seek public input regarding (1) the long-range goals for the Lake Sonoma Master Plan Revision and (2) the management and development of project lands and water. Additional coordination with Tribal and other agency representatives was done during the planning process.

Issues/Concerns That Arose During Agency and Public Scoping

- Warm Springs Road, which provides access to the Yorty Creek area may not be able to support significantly increased recreational use at the lake. The road is single lane in sections, has deteriorating road edges in places, is steep in sections and has blind spots. Concern was expressed for the potential for a bottleneck in an emergency situation with emergency vehicles having to maneuver around exiting vehicles.
- Yorty Creek is at maximum capacity on busy weekends.
- Prehistoric and historic archaeological sites at Yorty Creek should be protected.
- Consider using natural long-term phytoremediation to improve water quality.
- Tribal Nations requested to meet separately with USACE to discuss culturally sensitive information.
- Continue to allow dogs and mountain bikes.
- Increase hiking trails in areas that are lacking.
- Request for more recreational opportunities, such as a zip line.
- Allow accommodations and restaurant for visitors who are not inclined to camp. The overlook area was suggested since it is nearing the end of it's lifespan.
- Consider Sonoma Water's proposed Fish Flow Project be considered in future revisions of the Master Plan.
- Partner with Sonoma Water and the other agencies in the North Coast Mussel Prevention Consortium to educate the public about the importance of mussel inspections and protecting our waterways.
- Support the potential future expansion of the Hatchery Component Russian River Coho Broodstock Program.
- Seek opportunities to address erosion issues upstream of the reservoir.
- Provide additional interpretive signage and support for habitat restoration activities along Dry Creek.
- Partner with Sonoma Water and other relevant agencies to reduce fire risk and improve watershed health, water quality, and carbon sequestration through improved forest and vegetation management, installation of fire cameras, prescribed burns and other activities.
- Pursue funding and staffing to enable consistent vegetation management along trails, roads picnic areas, and campsites to reduce likelihood of fire ignition.

- Continue to support education opportunities such as the Lake Sonoma Steelhead Festival and the Headwaters to Ocean Program.

The list is not in order of importance. The list is also not exhaustive, but focuses on the issues that were mentioned the most during scoping and/or were specifically addressed in the Master Plan and this EA.

The master planning team used its experience and expertise to work through the issues that arose during public scoping and discussions with Lake Sonoma staff. Responses from the public were received and taken into consideration when considering management options. The USACE invited comments on this decision-making process from several Federal and State agencies as well. The USACE will endeavor to balance the needs of all user groups to the greatest extent possible within the constraints of the primary missions of flood risk management, recreation, and contractual agreements for water supply. The proposed solutions to issues and concerns are covered more extensively in the Master Plan.

The Draft Master Plan and Environmental Assessment will be provided to the public and resource agencies for review and comment. A 30-day review period is planned for the fall of 2019. Additional public meetings will be held prior to this comment period to explain and present the draft documents. All comments will be considered and the documents will be revised accordingly as appropriate prior to finalization.

6.0 LIST OF PREPARERS

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Margaret Engesser	Project Manager
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APPENDIX EA1

USFWS SPECIES LIST

IPaC U.S. Fish & Wildlife Service

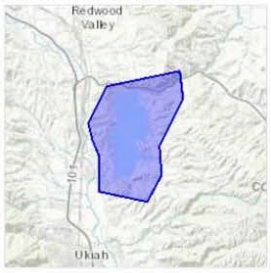
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Mendocino County, California



Local office

Arcata Fish And Wildlife Office

(707) 822-7201
(707) 822-8411

1655 Heindon Road
Arcata, CA 95521-4573

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
Marbled Murrelet Brachyramphus marmoratus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl Strix occidentalis caurina There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/1123	Threatened
Western Snowy Plover Charadrius alexandrinus nivosus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/8035	Threatened
Yellow-billed Cuckoo Coccyzus americanus There is **proposed** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened

Flowering Plants

NAME	STATUS
Burke's Goldfields Lasthenia burkei No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4338	Endangered

Contra Costa Goldfields Lasthenia conjugens — Endangered
There is final critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/7058

Showy Indian Clover Trifolium amoenum — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/6459

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see maps of where birders and the general public have sighted birds in and around your project area, visit E-bird tools such as the E-bird data mapping tool (search for the name of a bird on your list to see specific locations where that bird has been reported to occur within your project area over a certain timeframe) and the E-bird Explore Data Tool (perform a query to see a list of all birds sighted in your county or region and within a certain timeframe). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15
Ashy Storm-petrel Oceanodroma homochroa This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/7237	Breeds May 1 to Jan 15

Bald Eagle Haliaeetus leucocephalus **This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.** **https://ecos.fws.gov/ecp/species/1626**	**Breeds Jan 1 to Aug 31**
Black Oystercatcher Haematopus bachmani **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** **https://ecos.fws.gov/ecp/species/9591**	**Breeds Apr 15 to Oct 31**
Black Skimmer Rynchops niger **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** **https://ecos.fws.gov/ecp/species/5234**	**Breeds May 20 to Sep 15**
Black Swift Cypseloides niger **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** https://ecos.fws.gov/ecp/species/8878	**Breeds Jun 15 to Sep 10**
Black Turnstone Arenaria melanocephala This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Black-chinned Sparrow Spizella atrogularis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9447	Breeds Apr 15 to Jul 31
Burrowing Owl Athene cunicularia This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737	Breeds Mar 15 to Aug 31
California Thrasher Toxostoma redivivum This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Jul 31
Clark's Grebe Aechmophorus clarkii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Dec 31
Costa's Hummingbird Calypte costae This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9470	Breeds Jan 15 to Jun 10
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lawrence's Goldfinch Carduelis lawrencei **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** **https://ecos.fws.gov/ecp/species/9464**	Breeds Mar 20 to Sep 20
Lewis's Woodpecker Melanerpes lewis **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** **https://ecos.fws.gov/ecp/species/9408**	**Breeds Apr 20 to Sep 30**
Long-billed Curlew Numenius americanus **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** **https://ecos.fws.gov/ecp/species/5511**	**Breeds elsewhere**
Marbled Godwit Limosa fedoa **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** **https://ecos.fws.gov/ecp/species/9481**	**Breeds elsewhere**

Nuttall's Woodpecker Picoides nuttallii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9410	Breeds Apr 1 to Jul 20
Oak Titmouse Baeolophus inornatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9656	Breeds Mar 15 to Jul 15
Rufous Hummingbird selasphorus rufus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds elsewhere
Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Tricolored Blackbird Agelaius tricolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3910	Breeds Mar 15 to Aug 10
Whimbrel Numenius phaeopus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9483	Breeds elsewhere
White Headed Woodpecker Picoides albolarvatus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9411	Breeds May 1 to Aug 15
Willet Tringa semipalmata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wrentit Chamaea fasciata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 10
Yellow-billed Magpie Pica nuttalli This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9726	Breeds Apr 1 to Jul 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in your project's counties during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

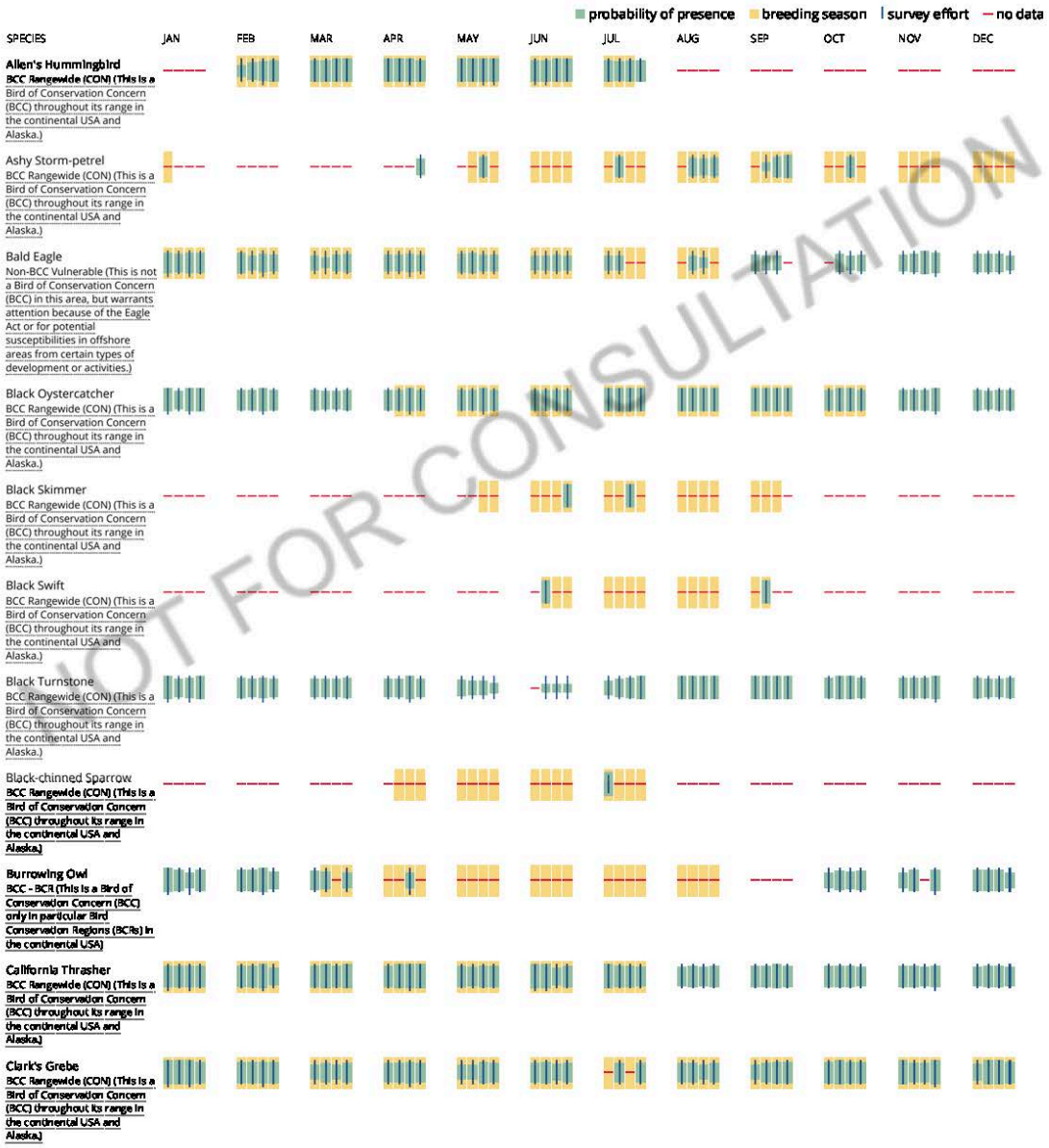
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

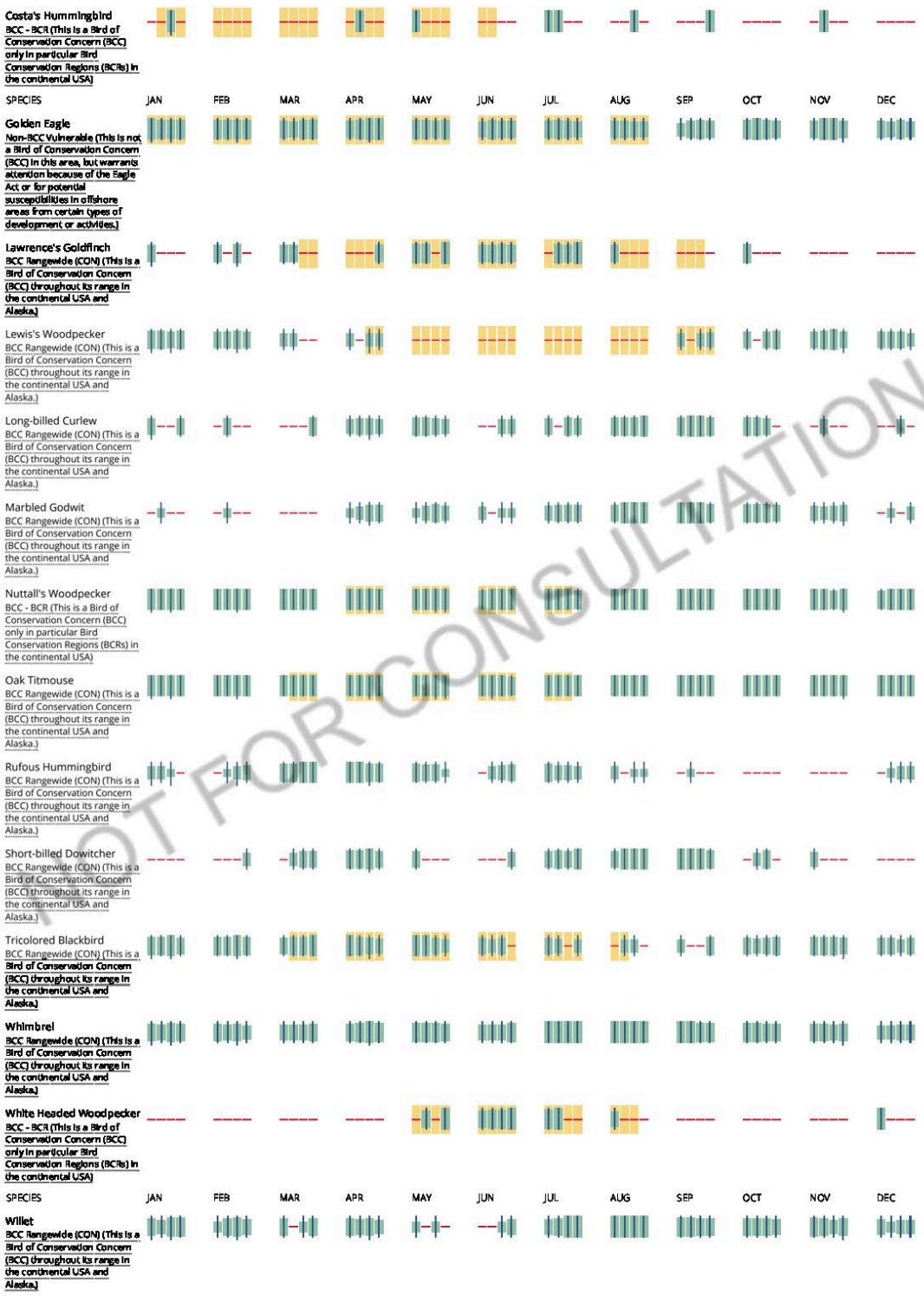
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the counties of your project area. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

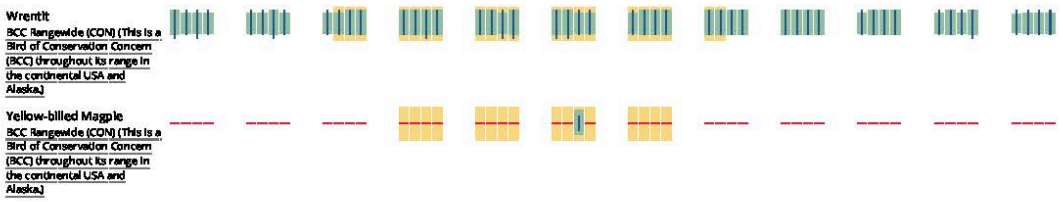
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information.







Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the counties which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird entry on your migratory bird species list indicates a breeding season, it is probable that the bird breeds in your project's counties at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the BGEPA should such impacts occur.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location overlaps the following wetlands:

FRESHWATER POND
- PUSK

LAKE
- L1UBK
- L2USK
- L2USKx

RIVERINE
- R3USC

A full description for each wetland code can be found at the National Wetlands Inventory website: https://ecos.fws.gov/ipac/wetlands/decoder

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC U.S. Fish & Wildlife Service

IPaC resource list

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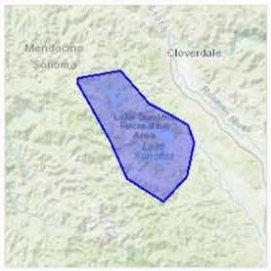
Location

Sonoma County, California



Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

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Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
Marbled Murrelet Brachyramphus marmoratus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl Strix occidentalis caurina There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/1123	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle Chelonia mydas No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6199	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Tidewater Goby Eucyclogobius newberryi There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/57	Endangered

Crustaceans

NAME	STATUS
California Freshwater Shrimp Syncaris pacifica No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7903	Endangered

Flowering Plants

NAME	STATUS
Pennell's Bird's-beak Cordylanthus tenuis ssp. capillaris No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3175	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see maps of where birders and the general public have sighted birds in and around your project area, visit E-bird tools such as the E-bird data mapping tool (search for the name of a bird on your list to see specific locations where that bird has been reported to occur within your project area over a certain timeframe) and the E-bird Explore Data Tool (perform a query to see a list of all birds sighted in your county or region and within a certain timeframe). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Allen's Hummingbird Selasphorus sasin **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** **https://ecos.fws.gov/ecp/species/9637**	**Breeds Feb 1 to Jul 15**
Ashy Storm-petrel Oceanodroma homochroa **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** **https://ecos.fws.gov/ecp/species/7237**	**Breeds May 1 to Jan 15**
Bald Eagle Haliaeetus leucocephalus **This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.** **https://ecos.fws.gov/ecp/species/1626**	**Breeds Jan 1 to Aug 31**
Black Oystercatcher Haematopus bachmani **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** https://ecos.fws.gov/ecp/species/9591	**Breeds Apr 15 to Oct 31**
Black Rail Laterallus jamaicensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/7717	Breeds Mar 1 to Sep 15
Black Swift Cypseloides niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8878	Breeds Jun 15 to Sep 10
Black Turnstone Arenaria melanocephala This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Burrowing Owl Athene cunicularia This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737	Breeds Mar 15 to Aug 31
California Thrasher Toxostoma redivivum This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Jul 31
Clark's Grebe Aechmophorus clarkii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Dec 31
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lawrence's Goldfinch Carduelis lawrencei This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. **https://ecos.fws.gov/ecp/species/9464**	Breeds Mar 20 to Sep 20
Lewis's Woodpecker Melanerpes lewis **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** **https://ecos.fws.gov/ecp/species/9408**	**Breeds Apr 20 to Sep 30**
Long-billed Curlew Numenius americanus **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** **https://ecos.fws.gov/ecp/species/5511**	**Breeds elsewhere**
Marbled Godwit Limosa fedoa **This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.** **https://ecos.fws.gov/ecp/species/9481**	**Breeds elsewhere**

Nuttall's Woodpecker Picoides nuttallii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9410	Breeds Apr 1 to Jul 20
Oak Titmouse Baeolophus inornatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9656	Breeds Mar 15 to Jul 15
Rufous Hummingbird selasphorus rufus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds elsewhere
Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Tricolored Blackbird Agelaius tricolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3910	Breeds Mar 15 to Aug 10
Whimbrel Numenius phaeopus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9483	Breeds elsewhere
Willet Tringa semipalmata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wrentit Chamaea fasciata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 10

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in your project's counties during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

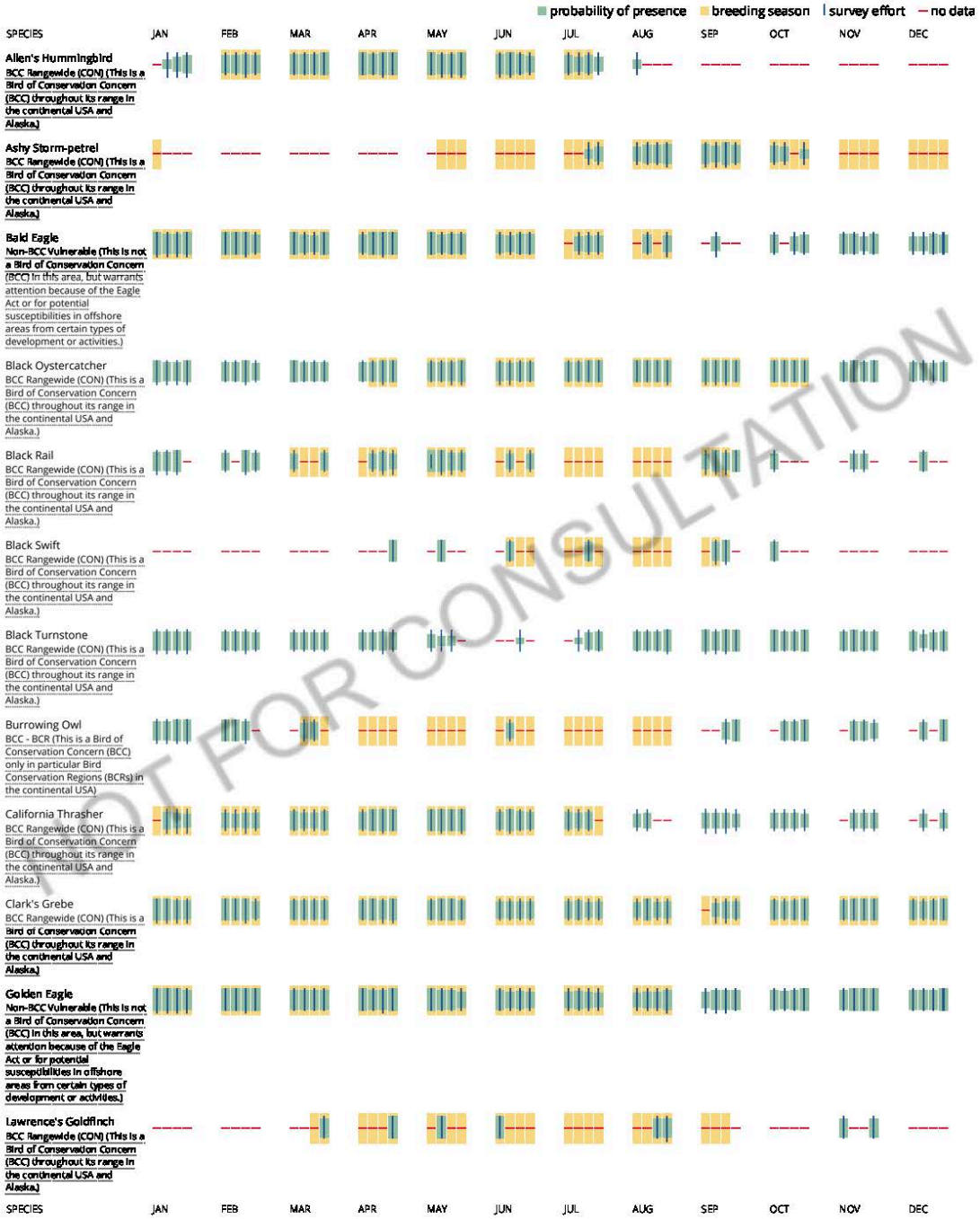
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the counties of your project area. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

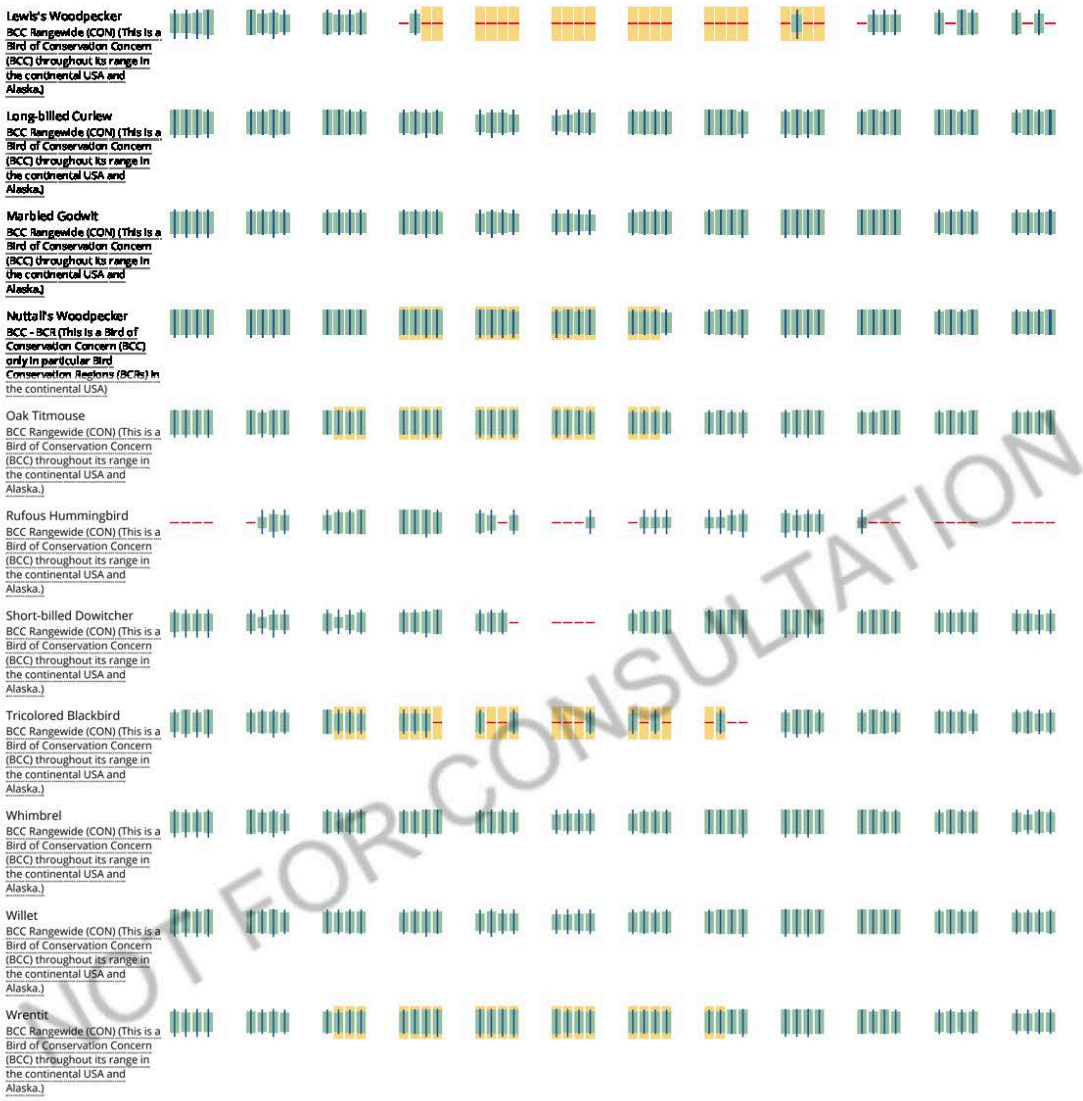
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the counties which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird entry on your migratory bird species list indicates a breeding season, it is probable that the bird breeds in your project's counties at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the BGEPA should such impacts occur.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location overlaps the following wetlands:

FRESHWATER POND

PUS
PUBH
PUBK

LAKE
L

RIVERINE
R3USA
R3USC

A full description for each wetland code can be found at the National Wetlands Inventory website: https://ecos.fws.gov/ipac/wetlands/decoder

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX EA-2

DRAFT FINDING OF NO SIGNIFICANT IMPACT

DRAFT FINDING OF NO SIGNIFICANT IMPACT

LAKE SONOMA MASTER PLAN
SONOMA COUNTY, CALIFORNIA

The U.S. Army Corps of Engineers, San Francisco District (Corps) has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. The final Master Plan and Environmental Assessment (MP/EA) dated **(date to be added when finalized)**, for Lake Sonoma addresses updates to the existing master plan in Sonoma County, California.

The Final MP/EA, incorporated herein by reference, evaluated an action alternative that updates the land use classification system used in the master plan and make recommendations for future improvements to Lake Sonoma's facilities based on the updated land use classifications. The recommended plan is the proposed action, which includes:

- Adoption and implementation of the revised Lake Sonoma Master Plan. The proposed plan revises the 1977 plan currently in use by updating the land use classification system to be compliant with the master planning guidance in ER-1130-2-550.
- Updating existing inventories, management objectives, and development needs in light of the updated land use classification to provide a programmatic approach to the future management of Lake Sonoma.
- Inclusion of 40-acre parcel donated by the Save The Redwoods League to be classified as Environmentally Sensitive Area.
- Conversion of 12 acres of Wildlife Management Area to Operations classification.

In addition to a "no action" plan, one alternative (the proposed action) was evaluated. The alternative development process included the input of resource agencies, the public, local tribes and Lake Staff to update the management objectives and identify development needs for managing Lake Sonoma in the future.

For both alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the recommended plan are listed in Table 1:

Table 1: Summary of Potential Effects of the Recommended Plan

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Recreation and Aesthetics	☒	☐	☐
Air quality	☐	☐	☒
Aquatic resources/wetlands	☐	☐	☒
Invasive species	☒	☐	☐
Fish and wildlife habitat	☒	☐	☐
Threatened/Endangered species/critical habitat	☐	☐	☒
Historic properties	☐	☐	☒
Other cultural resources	☐	☐	☒
Floodplains	☐	☐	☒
Hazardous, toxic & radioactive waste	☐	☐	☒
Hydrology	☐	☐	☒
Land use	☐	☐	☒
Navigation	☐	☐	☒
Noise levels	☐	☐	☒
Public infrastructure	☐	☐	☒
Socio-economics	☐	☐	☒
Environmental justice	☐	☐	☒
Geology, Topography, Soils	☐	☐	☒
Tribal trust resources	☐	☐	☒
Water quality	☐	☐	☒
Climate change	☐	☐	☒
Transportation	☐	☐	☒
Safety	☒	☐	☐

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan.

No compensatory mitigation is required as part of the recommended plan.

Public review of the draft MP/EA and FONSI was completed on ---------. All comments submitted during the public review period were responded to in the Final MP/EA and FONSI. A 30-day state and agency review of the MP/EA was completed on ----------.

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the Corps of Engineers determined that the recommended plan will have no effect on federally listed species or their designated critical habitat.

Pursuant to section 106 of the National Historic Preservation Act of 1966, as amended, the U.S. Army Corps of Engineers determined that historic properties would not be adversely affected by the recommended plan. The SHPO concurred with the determination on **(Date of concurrence letter to be added)**.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed.

All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the recommended plan would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

_____ _____

Date

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