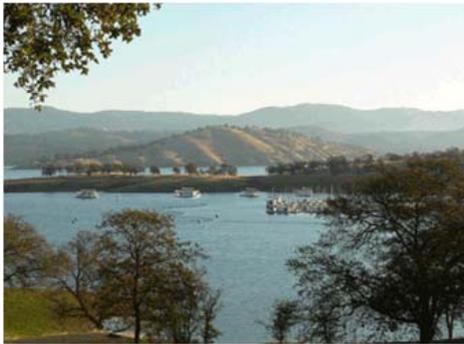


**BALD EAGLE
STUDY REPORT
DON PEDRO PROJECT
FERC NO. 2299**



**Prepared for:
Turlock Irrigation District – Turlock, California
Modesto Irrigation District – Modesto, California**

**Prepared by:
HDR Engineering, Inc.**

January 2013

Bald Eagle Study Report

TABLE OF CONTENTS

Section No.	Description	Page No.
1.0	INTRODUCTION.....	1-1
1.1	General Description of the Don Pedro Project	1-1
1.2	Relicensing Process	1-3
1.3	Study Plan	1-3
2.0	STUDY GOALS AND OBJECTIVES.....	2-1
3.0	STUDY AREA.....	3-1
4.0	METHODOLOGY	4-1
4.1	Field Surveys	4-1
5.0	RESULTS	5-1
5.1	Historical Occurrences.....	5-1
5.2	Nesting Bald Eagles.....	5-3
5.2.1	Initial Nesting Survey	5-3
5.2.2	Second Nesting Survey.....	5-3
5.3	Incidental Bald Eagle and Osprey Sightings	5-6
6.0	DISCUSSION AND FINDINGS	6-1
6.1	Summary.....	6-1
6.2	Bald Eagle Population Status.....	6-1
6.3	Bald Eagle Foraging and Nesting.....	6-3
6.4	Disturbance and Project Effects.....	6-4
7.0	STUDY VARIANCES AND MODIFICATIONS.....	7-1
8.0	REFERENCES.....	8-1

List of Figures

Figure No.	Description	Page No.
Figure 1.1-1.	Don Pedro Project location.	1-2
Figure 5.1-1.	Historical Bald Eagle Nests on Don Pedro Reservoir.	5-2
Figure 5.2-1.	Results and incidental sightings of the 2012 bald eagle nesting surveys.	5-5
Figure 5.3-1.	Incidental osprey observed on Don Pedro Reservoir in 2012.....	5-8

List of Tables

Table No.	Description	Page No.
Table 5.1-1.	Historical Bald Eagle Nests on Don Pedro Reservoir.	5-1
Table 5.2-1.	Results of the 2012 bald eagle nesting surveys.	5-3
Table 5.3-1.	Results of incidental bald eagle sightings on Don Pedro Reservoir in 2012.	5-6
Table 5.3-2.	Incidental osprey observed on Don Pedro Reservoir in 2012.	5-7

List of Acronyms

ac	acres
ACEC	Area of Critical Environmental Concern
AF	acre-feet
ACOE	U.S. Army Corps of Engineers
ADA	Americans with Disabilities Act
ALJ	Administrative Law Judge
APE	Area of Potential Effect
ARMR	Archaeological Resource Management Report
BA	Biological Assessment
BDCP	Bay-Delta Conservation Plan
BLM	U.S. Department of the Interior, Bureau of Land Management
BLM-S	Bureau of Land Management – Sensitive Species
BMI	Benthic macroinvertebrates
BMP	Best Management Practices
BO	Biological Opinion
CalEPPC	California Exotic Pest Plant Council
CalSPA	California Sports Fisherman Association
CAS	California Academy of Sciences
CCC	Criterion Continuous Concentrations
CCIC	Central California Information Center
CCSF	City and County of San Francisco
CCVHJV	California Central Valley Habitat Joint Venture
CD	Compact Disc
CDBW	California Department of Boating and Waterways
CDEC	California Data Exchange Center
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game (as of January 2013, Department of Fish and Wildlife)
CDMG	California Division of Mines and Geology
CDOF	California Department of Finance
CDPH	California Department of Public Health

CDPR	California Department of Parks and Recreation
CDSOD	California Division of Safety of Dams
CDWR	California Department of Water Resources
CE	California Endangered Species
CEII	Critical Energy Infrastructure Information
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGS	California Geological Survey
CMAP	California Monitoring and Assessment Program
CMC	Criterion Maximum Concentrations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CORP	California Outdoor Recreation Plan
CPUE	Catch Per Unit Effort
CRAM	California Rapid Assessment Method
CRLF	California Red-Legged Frog
CRRF	California Rivers Restoration Fund
CSAS	Central Sierra Audubon Society
CSBP	California Stream Bioassessment Procedure
CT	California Threatened Species
CTR	California Toxics Rule
CTS	California Tiger Salamander
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationship
Districts	Turlock Irrigation District and Modesto Irrigation District
DLA	Draft License Application
DPRA	Don Pedro Recreation Agency
DPS	Distinct Population Segment
EA	Environmental Assessment
EC	Electrical Conductivity

EFH.....	Essential Fish Habitat
EIR.....	Environmental Impact Report
EIS.....	Environmental Impact Statement
EPA.....	U.S. Environmental Protection Agency
ESA.....	Federal Endangered Species Act
ESRCD.....	East Stanislaus Resource Conservation District
ESU.....	Evolutionary Significant Unit
EWUA.....	Effective Weighted Useable Area
FERC.....	Federal Energy Regulatory Commission
FFS.....	Foothills Fault System
FL.....	Fork length
FMU.....	Fire Management Unit
FOT.....	Friends of the Tuolumne
FPC.....	Federal Power Commission
ft/mi.....	feet per mile
FWCA.....	Fish and Wildlife Coordination Act
FYLF.....	Foothill Yellow-Legged Frog
g.....	grams
GIS.....	Geographic Information System
GLO.....	General Land Office
GPS.....	Global Positioning System
HCP.....	Habitat Conservation Plan
HHWP.....	Hetch Hetchy Water and Power
HORB.....	Head of Old River Barrier
HPMP.....	Historic Properties Management Plan
ILP.....	Integrated Licensing Process
ISR.....	Initial Study Report
ITA.....	Indian Trust Assets
kV.....	kilovolt
m.....	meters
M&I.....	Municipal and Industrial
MCL.....	Maximum Contaminant Level
mg/kg.....	milligrams/kilogram

mg/L	milligrams per liter
mgd	million gallons per day
mi	miles
mi ²	square miles
MID	Modesto Irrigation District
MOU	Memorandum of Understanding
MSCS	Multi-Species Conservation Strategy
msl	mean sea level
MVA	Megavolt Ampere
MW	megawatt
MWh	megawatt hour
mya	million years ago
NAE	National Academy of Engineering
NAHC	Native American Heritage Commission
NAS	National Academy of Sciences
NAVD 88	North American Vertical Datum of 1988
NAWQA	National Water Quality Assessment
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
ng/g	nanograms per gram
NGOs	Non-Governmental Organizations
NHI	Natural Heritage Institute
NHPA	National Historic Preservation Act
NISC	National Invasive Species Council
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPS	U.S. Department of the Interior, National Park Service
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NTU	Nephelometric Turbidity Unit
NWI	National Wetland Inventory

NWIS	National Water Information System
NWR	National Wildlife Refuge
NGVD 29	National Geodetic Vertical Datum of 1929
O&M.....	operation and maintenance
OEHHA.....	Office of Environmental Health Hazard Assessment
ORV	Outstanding Remarkable Value
PAD.....	Pre-Application Document
PDO.....	Pacific Decadal Oscillation
PEIR.....	Program Environmental Impact Report
PGA.....	Peak Ground Acceleration
PHG.....	Public Health Goal
PM&E	Protection, Mitigation and Enhancement
PMF.....	Probable Maximum Flood
POAOR.....	Public Opinions and Attitudes in Outdoor Recreation
ppb.....	parts per billion
ppm	parts per million
PSP	Proposed Study Plan
QA.....	Quality Assurance
QC	Quality Control
RA.....	Recreation Area
RBP	Rapid Bioassessment Protocol
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RM	River Mile
RMP	Resource Management Plan
RP.....	Relicensing Participant
RSP	Revised Study Plan
RST	Rotary Screw Trap
RWF	Resource-Specific Work Groups
RWG	Resource Work Group
RWQCB.....	Regional Water Quality Control Board
SC.....	State candidate for listing under CESA
SCD.....	State candidate for delisting under CESA
SCE	State candidate for listing as endangered under CESA

SCT	State candidate for listing as threatened under CESA
SD1	Scoping Document 1
SD2	Scoping Document 2
SE	State Endangered Species under the CESA
SFP	State Fully Protected Species under CESA
SFPUC	San Francisco Public Utilities Commission
SHPO	State Historic Preservation Office
SJRA	San Joaquin River Agreement
SJRG	San Joaquin River Group Authority
SJTA	San Joaquin River Tributaries Authority
SPD	Study Plan Determination
SRA	State Recreation Area
SRMA	Special Recreation Management Area or Sierra Resource Management Area (as per use)
SRMP	Sierra Resource Management Plan
SRP	Special Run Pools
SSC	State species of special concern
ST	California Threatened Species under the CESA
STORET	Storage and Retrieval
SWAMP	Surface Water Ambient Monitoring Program
SWE	Snow-Water Equivalent
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TAF	thousand acre-feet
TCP	Traditional Cultural Properties
TDS	Total Dissolved Solids
TID	Turlock Irrigation District
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TRT	Tuolumne River Trust
TRTAC	Tuolumne River Technical Advisory Committee
UC	University of California
USDA	U.S. Department of Agriculture

USDOC	U.S. Department of Commerce
USDOI	U.S. Department of the Interior
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Department of the Interior, Fish and Wildlife Service
USGS	U.S. Department of the Interior, Geological Survey
USR	Updated Study Report
UTM	Universal Transverse Mercator
VAMP	Vernalis Adaptive Management Plan
VELB	Valley Elderberry Longhorn Beetle
VRM	Visual Resource Management
WPT	Western Pond Turtle
WSA	Wilderness Study Area
WSIP	Water System Improvement Program
WWTP	Wastewater Treatment Plant
WY	water year
μS/cm	microSeimens per centimeter

1.0 INTRODUCTION

1.1 General Description of the Don Pedro Project

Turlock Irrigation District (TID) and Modesto Irrigation District (MID) (collectively, the Districts) are the co-licensees of the 168-megawatt (MW) Don Pedro Project (Project) located on the Tuolumne River in western Tuolumne County in the Central Valley region of California. The Don Pedro Dam is located at river mile (RM) 54.8 and the Don Pedro Reservoir formed by the dam extends 24-miles upstream at the normal maximum water surface elevation of 830 ft above mean sea level (msl; NGVD 29). At elevation 830 ft, the reservoir stores over 2,000,000 acre-feet (AF) of water and has a surface area slightly less than 13,000 acres (ac). The watershed above Don Pedro Dam is approximately 1,533 square miles (mi²).

Both TID and MID are local public agencies authorized under the laws of the State of California to provide water supply for irrigation and municipal and industrial (M&I) uses and to provide retail electric service. The Project serves many purposes including providing water storage for the beneficial use of irrigation of over 200,000 ac of prime Central Valley farmland and for the use of M&I customers in the City of Modesto (population 210,000). Consistent with the requirements of the Raker Act passed by Congress in 1913 and agreements between the Districts and City and County of San Francisco (CCSF), the Project reservoir also includes a “water bank” of up to 570,000 AF of storage. CCSF may use the water bank to more efficiently manage the water supply from its Hetch Hetchy water system while meeting the senior water rights of the Districts. CCSF’s “water bank” within Don Pedro Reservoir provides significant benefits for its 2.6 million customers in the San Francisco Bay Area.

The Project also provides storage for flood management purposes in the Tuolumne and San Joaquin rivers in coordination with the U.S. Army Corps of Engineers (ACOE). Other important uses supported by the Project are recreation, protection of the anadromous fisheries in the lower Tuolumne River, and hydropower generation.

The Project Boundary extends from approximately one mile downstream of the dam to approximately RM 79 upstream of the dam. Upstream of the dam, the Project Boundary runs generally along the 855 ft contour interval which corresponds to the top of the Don Pedro Dam. The Project Boundary encompasses approximately 18,370 ac with 78 percent of the lands owned jointly by the Districts and the remaining 22 percent (approximately 4,000 ac) is owned by the United States and managed as a part of the U.S. Bureau of Land Management (BLM) Sierra Resource Management Area.

The primary Project facilities include the 580-foot-high Don Pedro Dam and Reservoir completed in 1971; a four-unit powerhouse situated at the base of the dam; related facilities including the Project spillway, outlet works, and switchyard; four dikes (Gasburg Creek Dike and Dikes A, B, and C); and three developed recreational facilities (Fleming Meadows, Blue Oaks, and Moccasin Point Recreation Areas). The location of the Project and its primary facilities is shown in Figure 1.1-1.

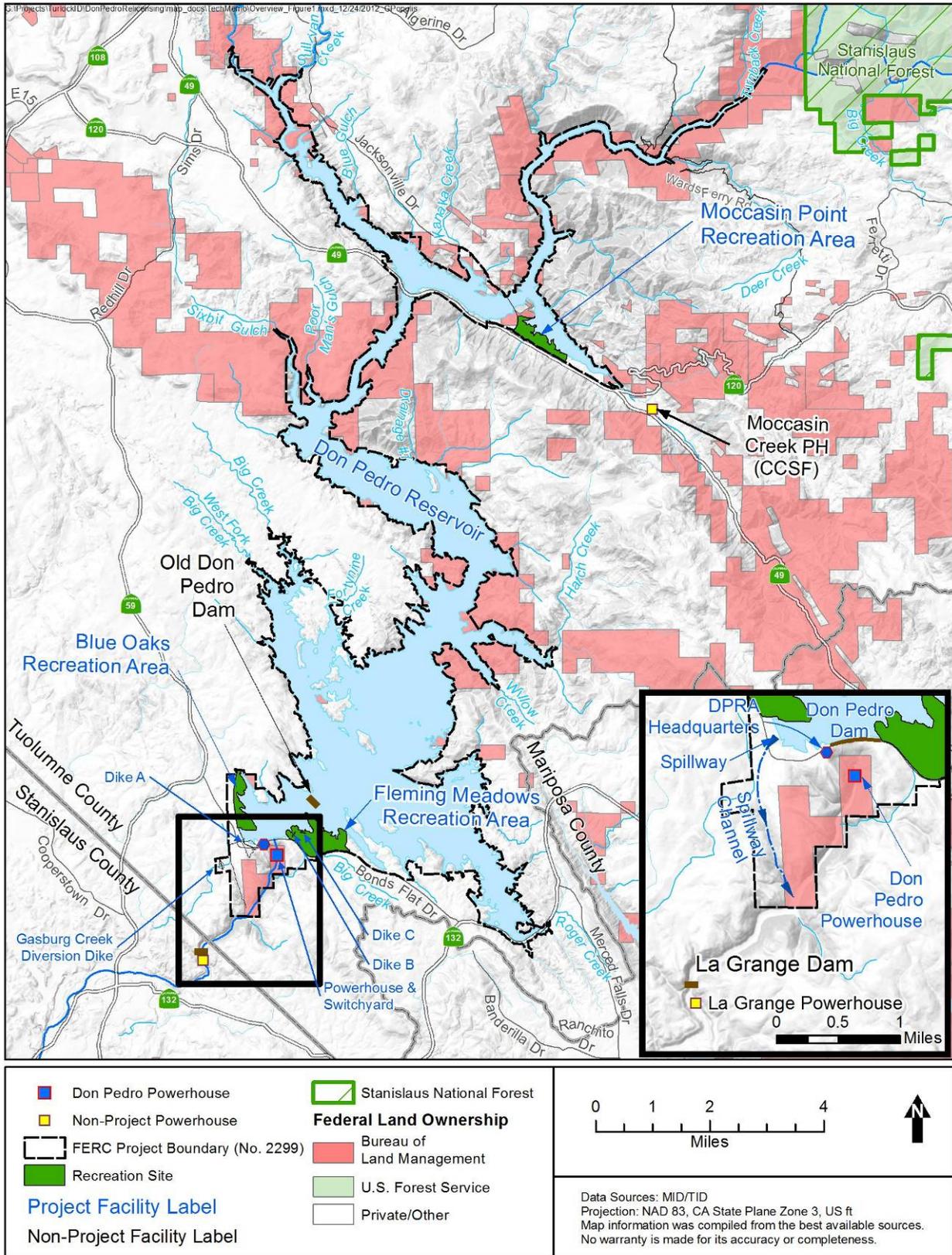


Figure 1.1-1. Don Pedro Project location.

1.2 Relicensing Process

The current FERC license for the Project expires on April 30, 2016, and the Districts will apply for a new license no later than April 30, 2014. The Districts began the relicensing process by filing a Notice of Intent and Pre-Application Document (PAD) with FERC on February 10, 2011, following the regulations governing the Integrated Licensing Process (ILP). The Districts' PAD included descriptions of the Project facilities, operations, license requirements, and Project lands as well as a summary of the extensive existing information available on Project area resources. The PAD also included ten draft study plans describing a subset of the Districts' proposed relicensing studies. The Districts then convened a series of Resource Work Group meetings, engaging agencies and other relicensing participants in a collaborative study plan development process culminating in the Districts' Proposed Study Plan (PSP) and Revised Study Plan (RSP) filings to FERC on July 25, 2011 and November 22, 2011, respectively.

On December 22, 2011, FERC issued its Study Plan Determination (SPD) for the Project, approving, or approving with modifications, 34 studies proposed in the RSP that addressed Cultural and Historical Resources, Recreational Resources, Terrestrial Resources, and Water and Aquatic Resources. In addition, as required by the SPD, the Districts filed three new study plans (W&AR-18, W&AR-19, and W&AR-20) on February 28, 2012 and one modified study plan (W&AR-12) on April 6, 2012. Prior to filing these plans with FERC, the Districts consulted with relicensing participants on drafts of the plans. FERC approved or approved with modifications these four studies on July 25, 2012.

Following the SPD, a total of seven studies (and associated study elements) that were either not adopted in the SPD, or were adopted with modifications, formed the basis of Study Dispute proceedings. In accordance with the ILP, FERC convened a Dispute Resolution Panel on April 17, 2012 and the Panel issued its findings on May 4, 2012. On May 24, 2012, the Director of FERC issued his Formal Study Dispute Determination, with additional clarifications related to the Formal Study Dispute Determination issued on August 17, 2012.

This study report describes the objectives, methods, and results of the Bald Eagle Study (TR-10) as implemented by the Districts in accordance with FERC's SPD and subsequent study modifications and clarifications. Documents relating to the Project relicensing are publicly available on the Districts' relicensing website at www.donpedro-relicensing.com.

1.3 Study Plan

The Districts' continued operation of the Project may affect bald eagles (*Haliaeetus leucocephalus*), which are listed as Endangered under the California Endangered Species Act. Project features may benefit bald eagles by providing suitable nesting, roosting or foraging habitat for bald eagles. In addition, Project operation and maintenance (O&M) activities and Project-related recreation may affect bald eagle through disturbance of bald eagles or bald eagle nest sites.

The District's PSP and RSP filings did not include a Bald Eagle Study. However, FERC's SPD required the Districts to conduct a bald eagle study as outlined in the BLM's comments filed on

December 7, 2011. The bald eagle study was conducted consistent with the BLM's proposed study plan and FERC's directive.

2.0 STUDY GOALS AND OBJECTIVES

As specified in the study plan, the goal of this study is to provide information regarding bald eagles associated with the Don Pedro Reservoir, Project-affected stream reaches, and related Project recreation features or activities.

The objective of this study was to gather information, including: 1) identifying and mapping the location of bald eagle nesting sites; 2) documenting the presence of bald eagles; 3) identifying important bald eagle roosting or hunting perches; and 4) compiling incidental observations of osprey (*Pandion haliaetus*) and osprey nests.

3.0 STUDY AREA

As specified in the study plan, the study area consisted of a 1,000-foot area around Don Pedro Reservoir and Project facilities, including those portions of the Tuolumne River that are within the Project Boundary.

4.0 METHODOLOGY

4.1 Field Surveys

The bald eagle study was performed in four steps, described below.

In Step 1, known bald eagle sightings, nests, and roosts, as well as osprey sightings and nests, within the study area were identified and mapped, using information obtained from Peggy Cranston from the Mother Lode Field Office of the BLM on 7/26/2010 and 3/16/2012 (Cranston 2012). Mapping also incorporated existing California Wildlife Habitat Relationship (CWHR) data and California Natural Diversity Database (CNDDDB) data (CDFG 2012), and incidental sightings reported by field staff during other 2012 relicensing studies. The map was used to provide background information and assist with planning fieldwork.

In Step 2, boat-based surveys for nesting bald eagles were conducted throughout the study area. Surveys were implemented in accordance with the Bald Eagle Breeding Survey Instructions (CDFG 1999), and Protocol for Evaluating Bald Eagle Habitat and Populations in California (Jackman and Jenkins, 2004), excepting that the bald eagle study plan, as proposed by the BLM, requires two rather than three survey visits. These two surveys were conducted in mid March and early May of 2012. These visits followed nesting chronology and included an initial nest search to locate occupied nests and document the presence of eggs or nestlings, and a second survey to determine nesting success. During each survey, two wildlife biologists observed the entire study area from a boat, using binoculars and spotting scopes. All observations were conducted remotely.

Prior to the initial nest survey, review of historical records found five previously documented nests and two anecdotal reports within the study area. On March 19th and 20th, 2012, the study team visited all historical nest sites and searched the study area for additional nests. For each nest, it was documented whether or not adults were present, observed courtship behavior, evidence of nest construction or repair, incubation, and if the nest were historical or new. The initial nest search was conducted by boat. Global positioning system (GPS) coordinates were recorded for all bald eagle nests using a Garmin GPS Map 60 CSx.

The second set of surveys was conducted on May 8th and 9th, 2012. Another comprehensive search of the study area for new nests was performed, and all nests that were occupied during the initial nest search were revisited. At occupied nests, the study team determined whether the breeding pair was still tending to the nest (e.g., incubating eggs or tending to nestlings). The study team also recorded bird behavior, the number of eggs/nestlings, if possible, and other relevant behavior.

Based upon the results of the two nesting surveys, all documented bald eagle nests within the study area were classified and described using the following categories:¹

¹ Categories were obtained from Jackman and Jenkins (2004)

- (1) Occupied: two adults present in a territory containing a nest during the breeding season: or one adult observed incubating, with young, or near a recently used nest.
- (2) Occupied, Not Successful: an occupied territory where no young were produced (failed) because of egg breakage, egg death, nestling death, or no breeding attempt was made.
- (3) Not occupied: no nesting activity and no adults in a nesting territory.
- (4) Failure: nesting attempt failed due to egg breakage, egg death, or nestling death (same as Occupied, Not Successful).
- (5) Successful: one or more young fledged from the nest.
- (6) Status Unknown: territory not checked or incompletely checked to determine occupancy.
- (7) Occupied, Success Unknown: occupied territory not adequately monitored to determine success.

While conducting bald eagle surveys, any osprey sightings were documented and nest locations were recorded using GPS. Where possible, it was determined whether an osprey nest was active or inactive.

In Step 3, the study team conducted Quality Assurance/Quality Control checks on survey data and GIS map products. Reported results and draft maps were checked against field notes, and GIS data were checked for accuracy. In Step 4, this document was prepared in compliance with study plan requirements.

5.0 RESULTS

5.1 Historical Occurrences

A review of historical records from the BLM and CNDDDB for bald eagles in the study area located seven previously documented nests. Table 5.1-1 provides the location, nest status as of the 2012 surveys, historical nesting success, and nest tree type. Figure 5.1-1 shows the locations of historical Bald Eagle nest sites on Don Pedro Reservoir.

Table 5.1-1. Historical Bald Eagle Nests on Don Pedro Reservoir.

Location	UTM-N	UTM-E	Status of Nest in 2012 ¹	Historical Nesting Successes	Nest Tree
Rogers Creek Arm (Penole Peak)	4174998	733076	Nest No Longer Exists	--	--
South Bay (Blank Peak)	4175463	731891	Occupied, Not Successful	2002, 2007, 2009	Gray pine (<i>Pinus sabiniana</i>)
Woods Creek Arm	4196433	726850	Not Occupied, unrepaired	2006, 2007	Undetermined snag
Mine Island	4179132	729011	Nest No Longer Exists	--	--
Big Creek Arm	4181780	728062	Not Occupied, unrepaired	--	Gray pine
Jenkins Hill	4177769	730742	Not Occupied, unrepaired	--	Gray pine
Tuolumne River Arm	4195642	734932	Not Occupied, unrepaired	--	Gray pine

¹ Not Occupied - no nesting activity and no adults in a nesting territory.

Unrepaired – remnant of nest still visible, but no repairs have been made and the nest appears dilapidated.

Nest No Longer Exists – No nest visible at indicated site.

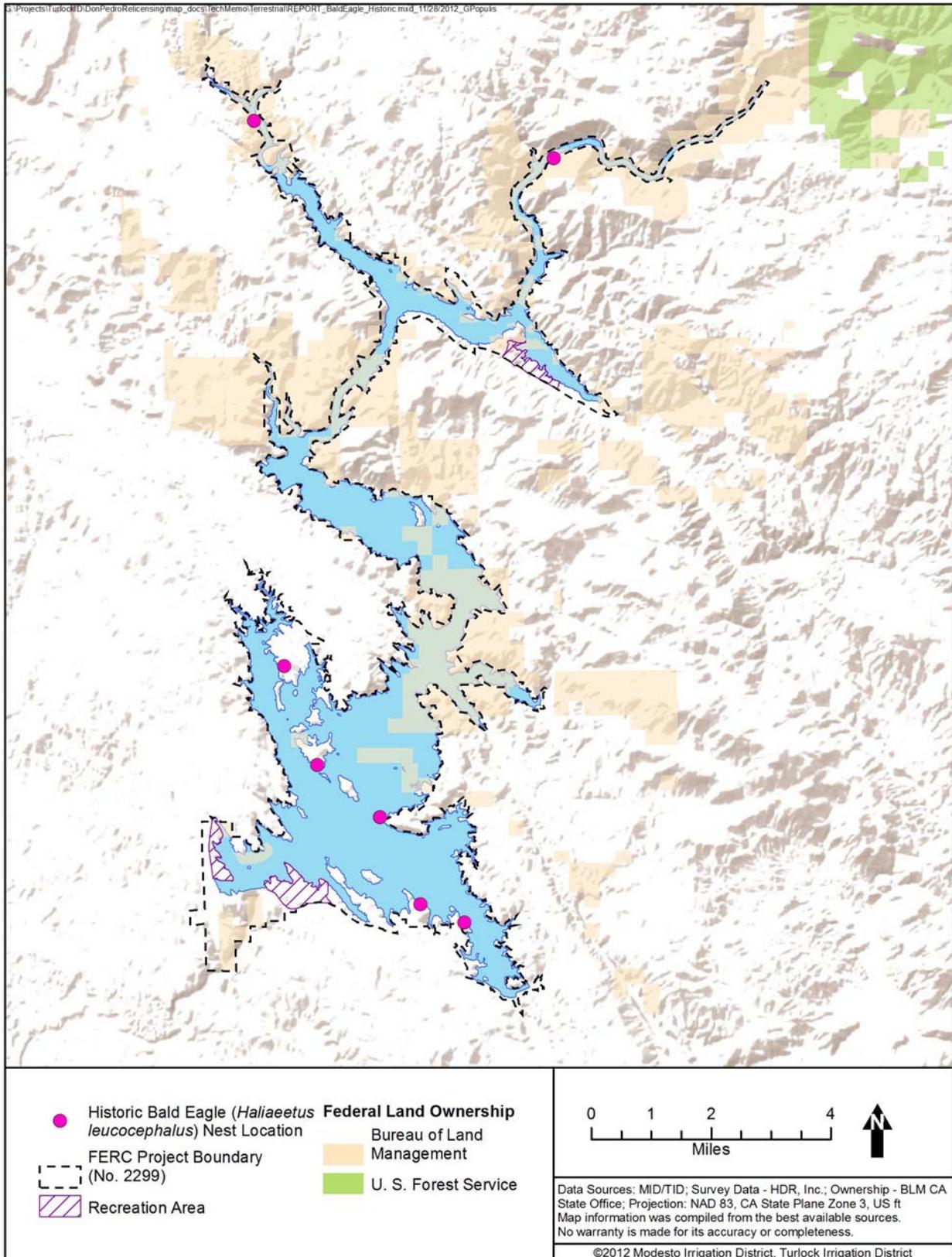


Figure 5.1-1. Historical Bald Eagle Nests on Don Pedro Reservoir.

5.2 Nesting Bald Eagles

5.2.1 Initial Nesting Survey

During the initial nesting survey (March 19 and 20, 2012) the survey team located nine bald eagle nests. Of those, five had been previously documented by the BLM, and four are considered to be new or previously undocumented by the BLM. The five previously documented nests were located: 1) on the northern flank of Blank Peak near the entrance to the Rodgers Creek Arm; 2) on the western flank of Jenkins Hill at the southern entrance to Middle Bay; 3) on the eastern shoreline of the Big Creek Arm; 4) near the confluence of Slate Creek and Woods Creek in the Woods Creek Arm; and 5) near the inflow of Rough and Ready Creek to the Tuolumne River Arm. The four new or previously undocumented nests were located: 1) near the northeast corner of Mine Island; 2) on the northern flank of an unnamed peak in the southwestern corner of the Upper Bay; 3) in the upper reach of the Woods Creek Arm; and 4) near the middle reach of the Woods Creek arm. Furthermore, the survey team was unable to locate two of the seven historic nests reported by the BLM. It is suspected that the two “missing” nests were destroyed prior to this 2012 nesting surveys and not reconstructed. These two nests were located: 1) approximately 1 mi southeast of Blank Peak in the Rodgers Creek Arm; and 2) along the southern shoreline of Mine Island.

Of the nine nests documented during the initial nesting survey, three were found to be occupied by a single adult tending to eggs. These three nests were located: 1) on the northern flank of Blank Peak; 2) near the northeast corner of Mine Island; and 3) near the upper reach of the Woods Creek Arm. The remaining six nests were unoccupied.

5.2.2 Second Nesting Survey

During the second nesting survey on May 8 and 9, 2012 the survey team found that the Mine Island nest and the Woods Creek Arm nest continued to be occupied by at least one adult and contained nestlings. It is unknown if the observed nestlings later fledged from either nest so these two nests were considered to be Occupied, Success Unknown.

With respect to the Blank Peak nest, the survey team found it to be absent of adults and without nestlings. This nest was classified as Occupied, Not Successful. The remaining six nests continued to be unoccupied.

Table 5.2-1 summarizes 2012 observations of bald eagle nests, including location, success and nest tree. Figure 5.2-1 depicts all locations of nests found during the 2012 surveys.

Table 5.2-1. Results of the 2012 bald eagle nesting surveys.

Location	UTM-N	UTM-E	Activity/Observation ¹	Nest Tree
Woods Creek Arm	4195157	727484	Occupied, Success Unknown	Ponderosa pine (<i>Pinus ponderosa</i>)
Woods Creek Arm	4196433	726850	Not Occupied	Undetermined Snag
Woods Creek Arm	4193446	729257	Not Occupied	Undetermined Snag
Upper Bay	4184371	731272	Not Occupied	Ponderosa pine
Big Creek Arm	4181780	728062	Not Occupied	Gray pine

Location	UTM-N	UTM-E	Activity/Observation ¹	Nest Tree
				<i>(Pinus sabiniana)</i>
Mine Island	4179687	729276	Occupied, Success Unknown	Ponderosa pine
Jenkins Hill	4177769	730742	Not Occupied	Gray pine
South Bay	4175463	731891	Occupied, Not Successful	Gray pine
Tuolumne River Arm	4195642	731894	Not Occupied	Gray pine

¹ Not Occupied - no nesting activity and no adults in a nesting territory.

Occupied, Success Unknown- occupied territory not adequately monitored to determine success.

Occupied, Not Successful - An occupied territory where no young were produced (failed) because of egg breakage, egg death, nestling death, or no breeding attempt was made.

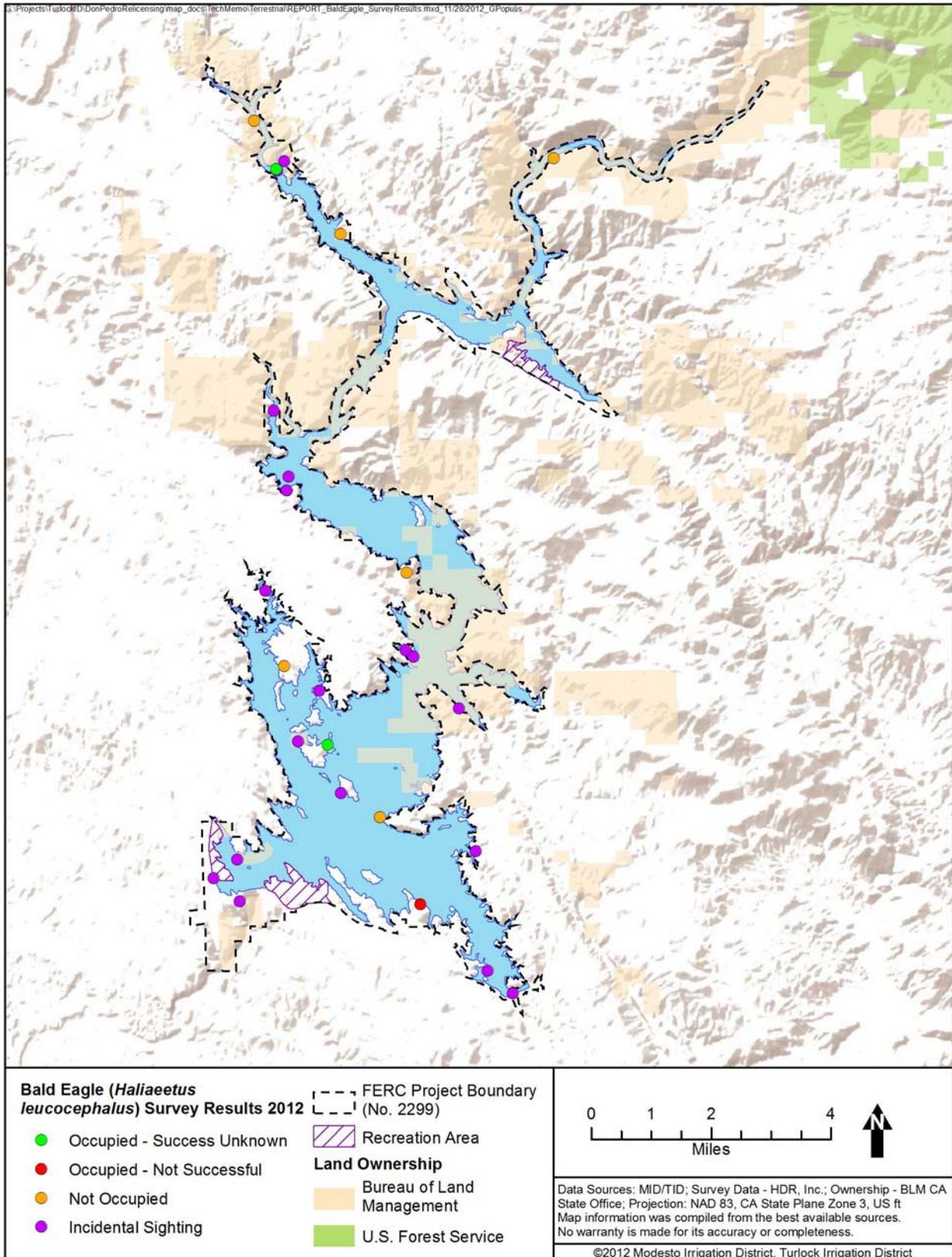


Figure 5.2-1. Results and incidental sightings of the 2012 bald eagle nesting surveys.

5.3 Incidental Bald Eagle and Osprey Sightings

Incidental sightings of bald eagles and osprey were also recorded as part of other 2012 relicensing studies. Information collected during incidental sightings included the number of individuals, location, activity and any other notes of interest.

Twenty-one incidental sightings of bald eagles were recorded during relicensing studies in 2012. Sightings included both adult and juvenile bald eagles either perched, feeding near the reservoir bank, or in flight. Table 5.3-1 summarizes incidental sightings of bald eagles on Don Pedro Reservoir. Incidental sightings of bald eagle have are also shown on Figure 5.2-1.

Table 5.3-1. Results of incidental bald eagle sightings on Don Pedro Reservoir in 2012.

Date	No. of Bald Eagles	Location	UTM-N	UTM-E	Activity/Observation ¹	Perch Type
1/26/2012	1	Blue Oaks Recreation Area	--	--	Perched	--
2/10/2012	2	Wood Creek Arm	4195114	727510	Adults – nesting	--
2/10/2012	1	Hatch Creek Arm	4180762	732779	Juvenile – perched	--
3/7/2012	1	Blue Oaks Boat Launch	--	--	Perched	--
3/7/2012	1	Mine Island	4178397	729669	Adult – perched	--
3/19/2012	2	DPRAs Headquarters	4175411	727029	Flying	--
3/20/2012	1	North end of Mine Island	4179762	728485	Flying in area near nest, on nest	Gray pine (<i>Pinus sabiniana</i>)
4/3/2012	1	West Bay of Don Pedro Reservoir	4176529	726937	Perched on boulder near waters edge	boulder
4/3/2012	1	Blue Oaks Boat Launch Fish Cleaning Station	4176010	726313	Flying around fish cleaning station	--
4/17/2012	2	Big Creek upstream of Don Pedro Reservoir	4183779	727495	1 adult feeding, juvenile and adult seen flying together shortly after initial observation	Creek bank
4/18/2012	1	49er Bay	4181134	729015	Juvenile – perched	ground
4/19/2012	1	Rogers Creek	4173124	734437	Adult – soaring	--
5/9/2012	1	Near siphon	--	--	Feeding	On land at water's edge
5/9/2012	1	Middle Bay	4182123	731523	Flying	--
5/9/2012	1	Upper Bay	4186873	728035	Perched	On land at water's edge
5/22/2012	1	Six Bit Gulch near outlet	4188644	727592	Juvenile – soaring, perched	pine
6/25/2012	1	Rogers Creek Arm	4173712	733736	Juvenile, perched	snag
6/27/2012	2	End of Woods Creek Arm	4195370	727690	Adult - soaring, w/ prey; perched	--
--	1	South Bay	4176928	733342	Juvenile – 1 year old	--
--	1	Middle Bay	4182123	731523	Juvenile – 1 year old flying	--
--	1	Upper Bay	4186497	727999	Juvenile	On land at water's edge

¹ Activity/Observation = the observation made of the individual(s) or nest during helicopter surveys.
 Perched – the individual was found perched on an object; on nest – indicates the individual was found on a nest;
 Feeding – individual was observed in the act of feeding
 Flying – individual was observed in flight;
 Nest – indicates the presence of a nest.
 Perch Type = Type of structure or tree used as a perch or in which nest was built.
 -- indicates information was not included in the incidental observation report.

Osprey were frequently observed on Don Pedro Reservoir, either in flight, or perched on or close to nests. Osprey foraging behavior was observed on multiple occasions, although a predator-prey interaction was not directly observed. Surveyors counted eight osprey nests on Don Pedro Reservoir, with concentrations in the areas of the Upper and Middle Bays (three nests and two nests, respectively). Additionally, one nest was recorded in the vicinity of the Highway 49 Bridge, one nest in the West Bay area, and one adjacent to Jacksonville Road close to Jacksonville Road Bridge. Table 5.3-2 summarizes sightings of osprey and osprey nests documented during bald eagle surveys, as well as incidental sightings reported during other relicensing studies. Figure 5.3-1 shows the locations of osprey sightings and osprey nests.

Table 5.3-2. Incidental osprey observed on Don Pedro Reservoir in 2012.

Date	No.	Location	UTM-N	UTM-E	Activity/Observation ¹	Perch Type
3/7/2012	1	West Bay	4177624	728581	Adult – Nesting	--
3/20/2012	1	Mine Island	4179763	728490	Adult – Nesting	--
3/20/2012	2	Below Don Pedro Dam	4174987	726816	Soaring	--
3/26/2012	2	Riley Ridge/Big Creek	4175092	727993	Soaring	--
4/9/2012	1	Middle Bay	4179061	731281	Adult – soaring	--
4/9/2012	1	Rogers Creek	4173368	733675	Adult – soaring	--
4/9/2012	1	Rogers Creek	4173237	733975	Adult – foraging	--
4/17/2012	2	Middle Bay	4182896	731263	Adult - soaring/perched	--
4/17/2012	2	Middle Bay	4179000	732207	Adult – soaring/perched	--
4/18/2012	2	Jacksonville Rd/Kanaka Point	4191537	733124	Nest – Occupied	Power pole
4/18/2012	1	49er Bay	4181492	728977	Adult – foraging	--
5/8/2012	--	Riley Ridge/Big Creek	4175290	727876	Nest – occupancy unknown	--
5/9/2012	--	Highway 49 bridge area	4190906	730818	Nest – Occupied	--
5/9/2012	--	Upper Bay	4186601	728220	Nest – Occupied	--
5/9/2012	--	Upper Bay	4186748	729201	Nest – Occupied	--
5/9/2012	--	Upper Bay	4186546	730333	Nest – Occupied	--
5/9/2012	--	Middle Bay	4181418	730771	Nest – Occupied	--
5/9/2012	--	Mine Island	4179797	728452	Nest – Occupied	--
5/9/2012	--	West Bay	4178038	728199	Nest – Occupied	--

¹ Activity/Observation = the observation made of the individual(s) or nest during helicopter surveys.
 Perched – the individual was found perched on an object; on nest – indicates the individual was found on a nest;
 Flying – individual was observed in flight;
 Nest – indicates the presence of a nest.
 Perch Type = Type of structure or tree used as a perch or in which nest was built.
 -- indicates information was not included in the incidental observation report.

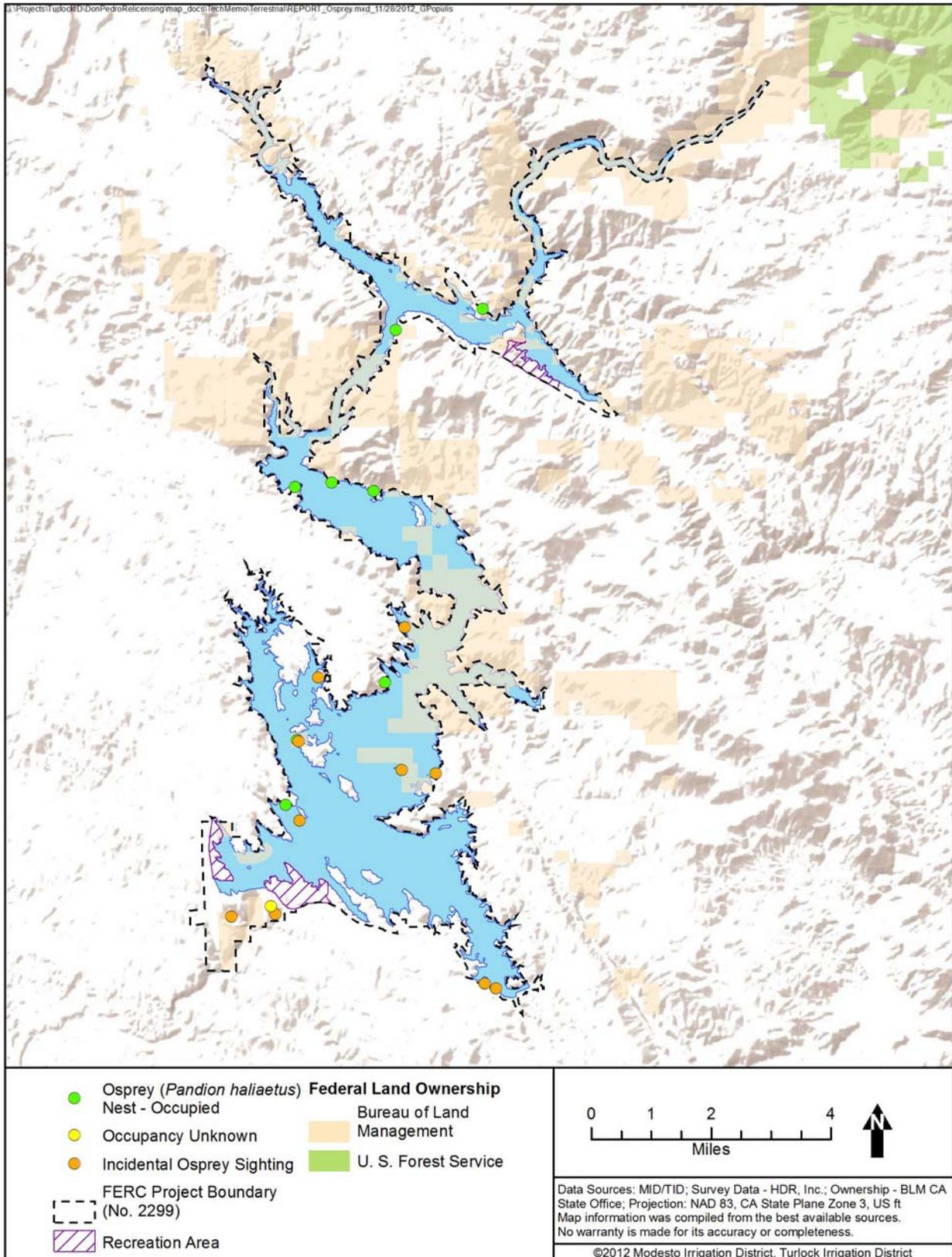


Figure 5.3-1. Incidental osprey observed on Don Pedro Reservoir in 2012.

6.0 DISCUSSION AND FINDINGS

6.1 Summary

Nine bald eagle nests were located during surveys of the Don Pedro Project in 2012, three of which were occupied by nesting bald eagle pairs. Of these, two nests (at Mine Island and Woods Creek Arm) successfully produced bald eagle nestlings that were observed during the second 2012 survey. Because these nestlings were not observed through fledging, both of these nests were categorized as Occupied, Success Unknown. A third nest (at South Bay) was occupied by a bald eagle pair during the first survey, but no adult bald eagles or nestlings were located during the second survey. This nest was categorized as Occupied, Not Successful. The remaining six nests were categorized as Not Occupied; these nests likely serve as alternate nests to the three occupied nests located in 2012.

FERC's Scoping Document 2 identified the following resource issues potentially relevant to bald eagles:

- Effects of project operation, including water level fluctuations, ground-disturbing activities, and maintenance on special-status wildlife species and habitat.
- Effects of maintenance and use of Project recreation facilities by recreationists on special-status wildlife species, special-status plant species and botanical resources, and shoreline vegetation.
- Effects of vegetation clearing for Project maintenance on wildlife and botanical resources.

Don Pedro Project O&M includes normal operations within the currently licensed elevation range (up to 830 feet), as well as operation of three formal recreation areas (Moccasin Point, Blue Oaks, and Fleming Meadows), vegetation management within these recreation areas and surrounding Project facilities, and ongoing reservoir debris removal. Recreation activities occur along portions of the shoreline and include dispersed camping, fishing and hiking. Additionally, the Districts have granted four grazing permits on a limited area within the Project Boundary, on a total of 559 acres.

6.2 Bald Eagle Population Status

Bald eagle populations are increasing in California and the study area. The bald eagle was listed by the United States Department of Interior, Fish and Wildlife Service (USFWS) as an endangered species in 1978, primarily due to population declines related to habitat loss and contamination of prey species by past use of organochlorine pesticides, such as dichlorodiphenyltrichloroethane (DDT) and dieldrin (USFS 2007). On August 11, 1995, the bald eagle's federal status was changed to "threatened" in all lower 48 states. On August 8, 2007, the USFWS ruled to delist the bald eagle (72 FR 37346). In the ruling, USFWS indicated that a reduction or elimination of threats such as DDT, as well as habitat protection led to an increase in breeding pairs from an estimated 487 in 1963 to approximately 9,789 in 2007 in the

48 contiguous States (72 FR 37346). In California, from 1990 and 2006 the number of bald eagle breeding pairs more than doubled from 93 to 200 (USFWS 2010).

The bald eagle breeds and winters throughout California, except for the desert areas, and the statewide population is increasing (CDFG 2000). The number of breeding pairs in California increased from 93 pairs in 1990 to 200 pairs in 2006 (USFWS 2010). Most breeding in the state occurs in the northern Sierra Nevada, Cascades, and north Coast Ranges, and is expanding into the central and southern Sierra Nevada and Sierra Nevada foothills. California's breeding population is resident year-round in most areas where the climate is relatively mild (Jurek 1988). Between mid-October and December, migratory birds from areas north and northeast of California arrive in the state. Wintering populations remain through March or early April. Based on annual wintering and breeding bird surveys, it is estimated that between 100 and 300 eagles winter on the Sierra Nevada National Forests, and at least 151 to 180 pairs remain year-round to breed (USFS 2007). Data from statewide breeding surveys conducted since 1973 indicate that the number of breeding pairs in the State continues to increase on an annual basis (CDFG 2000). The breeding range in California expanded from portions of eight counties in 1981 to 27 of the State's 58 counties in 2000.

The development of regional recovery plans by the USFWS aided in the delisting of bald eagle throughout its range. The state of California was included in the seven-state Pacific recovery area, for which the 1986 Pacific States Bald Eagle Recovery Plan (Recovery Plan) was developed. In order for the plans objective (delisting) to be reached, the USFWS (1986) identified four criteria that needed to be met:

- (1) a minimum of 800 nesting pairs in the Pacific recovery area;
- (2) average reproductive rate of 1.0 fledged young per pair, with an average success rate per occupied site of not less than 65 percent;
- (3) attainment of breeding population goals in at least 80 percent of the management zones with nesting potential; and
- (4) stable or increasing wintering populations. In order to meet these objectives, steps taken included habitat protection, augmentation of populations, increased law enforcement and public awareness, and continued research. To ensure that the species stays recovered the USFWS (1986) states... "Habitat occupied by bald eagles must continue to be protected and managed...Forest stands used by eagles must be managed to maintain the long-term availability of nest sites, roosts and foraging habitat...continued frequent monitoring of populations and productivity."

Appendix A of the Pacific States Bald Eagle Recovery Plan lists 47 Zones within the seven-state Pacific recovery area, one of the zones (Zone 28. Sierra-Nevada Mountains) has identified Don Pedro Reservoir and the Tuolumne River as a key area for bald eagles. At the time of its development, the Recovery Plan indentified no territories in the Don Pedro Reservoir and Tuolumne River area, but indicated that five territories would be a goal (USFWS 1986). The 2007 delisting of bald eagle indicates that the USFWS Pacific States Bald Eagle Recovery Plan has been successful overall. At the local level, the presence of three occupied nesting territories on Don Pedro Reservoir and one nesting territory outside of Don Pedro Reservoir, but within the

Tuolumne River watershed (Cherry Lake South nesting territory) (CDFG 2012) indicates that expansion of nesting territories is occurring in the study area.

6.3 Bald Eagle Foraging and Nesting

The results of this study suggest that Project O&M is compatible with successful bald eagle foraging and nesting. In general, bald eagle foraging habitat consists of large bodies of water or free-flowing rivers with abundant fish and adjacent snags and other perches (USFS 2007). Don Pedro Reservoir is one of the largest reservoirs in California, and is larger than many other reservoirs in the northern Sierra Nevada, Cascades, and north Coast Ranges where breeding bald eagles are typically found. When full, Don Pedro Reservoir contains 2.03 million AF of water, has a surface area of approximately 12,960 acres, with a shoreline – including the numerous islands within the lake – that is approximately 160 miles long, with numerous perch opportunities. Results of reservoir fish studies conducted in 2012 document that Don Pedro Reservoir provides strong foraging opportunities for bald eagle, with 15 warmwater and coldwater species in multiple size classes, and extensive bass nesting habitat (TID/MID 2013).

Bald eagles typically nest in large trees with open branching, and within two miles of a lake, reservoir, or river containing fish. Most nesting territories in California are located in elevations ranging from 1,000 to 6,000 feet; however, nesting can occur from near sea level to over 7,000 feet (Jurek 1988). Nest trees typically provide an unobstructed view of the associated water body and are often prominently located on the topography. Bald eagles often construct up to five nests within a territory and alternate between them from year to year.

Don Pedro Reservoir and adjacent habitats include many of the attributes of optimal bald eagle nesting habitat as described by Peterson (1986): a large waterbody, foraging opportunities, the presence of mature trees for use as nesting sites and limited human disturbances. While Don Pedro Reservoir is located in the central Sierra Nevada foothills, outside of what is thought to be the historic breeding range for bald eagles in California (i.e., northern Sierra Nevada, Cascades and north Coast Ranges), occupied nests are a strong indicator that the Reservoir possess suitable nesting sites. According to Lehman (1979, as cited by Jackman and Jenkins 2004), who evaluated 95 nests from 54 nesting territories in California, the following attributes were generally associated with bald eagle nests:

- Most nests were in Pine (*Pinus* spp.) trees (91 percent).
- Most nests (95 percent) were in the upper forest canopy in live, dominant or co-dominant trees.
- Most nest trees (81 percent) were over 100 ft tall.
- Nest trees surveyed had a mean diameter at breast height of 43 in.
- Eighty-nine percent of the nests surveyed were located in the top 30 ft of the tree.
- Total canopy closure (percent cover) of the adjacent forest stand, as estimated from aerial photography, was below 40 percent for most (75 percent) sites, indicating that “dense forest is not a prime requirement for nesting bald eagles in California” (Lehman 1979, p. 22).
- Over 80 percent of nests had at least light overhead cover providing some shade.

- Most nests (87 percent) were located within 1 mi of a waterfront. One third was within 0.1 mi of water, and none was greater than 2 mi from water.
- Most nests (85 percent) had an unobstructed view of a water body.
- There was no discernible trend related to slope or nest position on slopes (i.e., low to high).
- Elevation of most nest trees above water (78 percent) was < 300 ft, but ranged up to 1,000 ft.
- Elevation above sea level ranged from 1,100 to 7,400 ft.
- Almost one half of the territories contained alternate nests.

Trees meeting most or all of these criteria were commonly observed in the study area during survey efforts. Nest trees and the surrounding stands documented within the study area appeared to have nearly all of the attributes described by Lehman (1990, as cited by Jackman and Jenkins 2004).

6.4 Disturbance and Project Effects

Results of this study suggest that disturbances associated with Project O&M and recreational use of Don Pedro Reservoir do not preclude bald eagle nesting and breeding. No Project O&M activities or grazing permits are located in proximity to bald eagle nests located during this study; as a result, these activities are not likely to affect bald eagles. However, the majority of Don Pedro Reservoir is subject to recreational uses such as camping, hiking, motorized and non-motorized boating, and off highway vehicle use, providing the potential for disturbance to bald eagles. Jackman and Jenkins (2004) describe numerous studies that have documented bald eagle avoidance of areas with anthropogenic disturbance or development, including nest abandonment in some cases. However, USFWS guidelines note that bald eagles are “unlikely to be disturbed by routine use of roads, homes, and other facilities where such use pre-dates the eagles’ successful nesting activity...in most cases, ongoing existing uses may proceed...with little risk of disturbing bald eagles” (USFWS 2007). Recreational use of Don Pedro Reservoir has been ongoing since Project construction, and two of the three occupied bald eagle nests observed during this study were in areas of high recreational use. In particular, the Mine Island nest is located in an area that experiences frequent and heavy recreational boat traffic during the spring and summer seasons. Similarly, the nest in the Woods Creek Arm is located in an area that not only receives regular use by boaters, but was constructed in a narrow portion of the canyon that exposes the nest to all passing boats.

7.0 STUDY VARIANCES AND MODIFICATIONS

This study was conducted consistent with the Bald Eagle study as proposed by the BLM and required by FERC; no variances occurred.

8.0 REFERENCES

- California Department of Fish and Game (CDFG). 1999. Bald eagle breeding survey instructions. November 1999. Sacramento, CA.
- _____. 2000. The status of rare, threatened, and endangered animals and plants of California. Habitat Conservation Planning Branch, Sacramento, CA.
- _____. 2012. Biogeographic Data Branch. California Natural Diversity Database (CNDDDB). Rarefind 4. Available online: < <https://nrmsecure.dfg.ca.gov/cnddb/view/query.aspx> >. Accessed August 1, 2012.
- Cranston, Peggy (2012). Bureau of Land Management. Personal communication with Justin Tortosa, Senior Wildlife Biologist with HDR. 2012.
- Jackman, R.E., and J.M. Jenkins. 2004. Protocol for evaluating bald eagle habitat and populations in California. Prepared for U.S. Fish and Wildlife Service. Sacramento, CA.
- Jurek, R.M. 1988. Five-year status report, bald eagle. California Department of Fish and Game Nongame Bird and Mammal Section. Sacramento, CA.
- Peterson, A. 1986. Habitat Suitability Index Models: Bald Eagle Breeding Season. Biological Report 82 (10.126). Available online: <http://www.nwrc.usgs.gov/wdb/pub/hsi/hsi-126.pdf>.
- Turlock Irrigation District and Modesto Irrigation District (TID/MID). 2013. Don Pedro Reservoir Fish Population Study Report (W&AR-17). Attachment to Don Pedro Hydroelectric Project Initial Study Report. January 2013.
- _____. 2011. Don Pedro Project (FERC No. 2299). Preliminary Application Document. Exhibit E, Description of Environmental Conditions. February 10, 2011.
- United States Fish and Wildlife Service (USFWS). 1986. Recovery plan for the pacific bald eagle. Portland, OR.
- _____. 2007. National bald eagle management guidelines. Available online: <http://www.fws.gov/midwest/Eagle/guidelines/NationalBaldEagleManagementGuidelines.pdf>.
- _____. 2010. Bald Eagle Population Size. Available online: <<http://www.fws.gov/midwest/eagle/population/index.html>>.