

**Placer County Water Agency  
Middle Fork American River Project  
(FERC No. 2079)**

***FINAL***

**TERR 5 – BALD EAGLE  
TECHNICAL STUDY REPORT – 2008**



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## **1.0 INTRODUCTION**

This report describes studies conducted by the Placer County Water Agency (PCWA) in accordance with the TERR 5 – Bald Eagle Technical Study Plan (TERR 5 – TSP) for the Middle Fork American River Project (MFP or Project). The TERR 5 – TSP was included in Supporting Document (SD) H of the Pre-Application Document (PAD) (PCWA 2007). Specifically, this report provides a detailed description of the methods and results of bald eagle studies completed in 2007 and 2008.

## **2.0 STUDY OBJECTIVES**

The objectives of the bald eagle studies described in the TERR 5 – TSP are:

- Document wintering and nesting bald eagles in the vicinity of Project reservoirs and large bypass and peaking reaches.
- Document wintering and nesting bald eagles at potential Project betterments.
- Determine whether Project communication lines and powerlines are consistent with Avian Power Line Interaction Committee (APLIC) Guidelines.

Figure TERR 5-1 shows the TERR 5 – TSP study objectives and the study elements associated with each objective. It also shows where information developed is documented.

## **3.0 STUDY IMPLEMENTATION**

Study elements described in the TERR 5 – TSP were initiated in 2006 and were completed in 2008. A summary of the study elements that have been completed, outstanding study elements, and any deviations or proposed modifications to the TERR 5 – TSP are discussed in the following subsections.

### **3.1 STUDY ELEMENTS COMPLETED**

#### **3.1.1 Document Wintering and Nesting Bald Eagles in the Study Area**

- Developed preliminary maps of bald eagle occurrences, winter roosts, and nests in the study area based on agency consultation and a review of existing information.
- Conducted protocol-level bald eagle wintering and nesting surveys.
- Developed final maps of bald eagle occurrences, winter roosts, and nests in the study area, incorporating information obtained during protocol-level surveys.

### **3.1.2 Evaluate the Consistency of Project Communication Lines and Powerlines with APLIC Guidelines**

This element was completed as part of the TERR 4 – Special-Status Wildlife Technical Study Report (TSR) (PCWA 2008). Refer to the TERR 4 – TSR for a complete description of survey methods and results.

### **Deviations from the TERR 5 – TSP**

There were no deviations from the TERR 5 – TSP.

## **3.2 OUTSTANDING STUDY ELEMENTS**

There are no outstanding study elements.

### **3.2.1 Proposed Modifications to the TERR 5 – TSP**

There are no proposed modifications to the TERR 5 – TSP.

## **4.0 EXTENT OF STUDY AREA**

The study area for bald eagle and its habitat includes ½ mile around Project reservoirs, potential Project betterments, and on either side of the river reaches listed below:

- French Meadows Reservoir
- Hell Hole Reservoir
- Middle Fork Interbay
- Ralston Afterbay
- Rubicon River from Hell Hole Reservoir to the confluence with the Middle Fork American River (MFAR)
- MFAR from French Meadows Reservoir to the confluence with the North Fork American River (NFAR)
- NFAR from MFAR confluence to the Ordinary High Water Mark (OHWM) of Folsom Reservoir

## **5.0 STUDY APPROACH**

This section describes the study approach used to document bald eagle and its habitat in the study area.

### **5.1 DOCUMENT WINTERING AND NESTING BALD EAGLES IN THE STUDY AREA**

This section describes the methods and information used for developing preliminary maps of known occurrences of bald eagles, winter roosts, and nests in the study area; conducting protocol-level bald eagle wintering and nesting surveys; and developing final

maps of known occurrences of bald eagles, winter roosts, and nests in the study area that incorporate information obtained during protocol-level surveys.

### **5.1.1 Develop Preliminary Maps of Bald Eagle Occurrences, Winter Roosts, and Nests in the Study Area**

Preliminary maps of known occurrences of bald eagles were developed in 2006 and 2007 based on data obtained from the U.S. Department of Agriculture - Forest Service (USDA-FS) and the California Natural Diversity Database (CNDDDB) (CDFG 2007). These preliminary maps are available in the SD F of the PAD (PCWA 2007).

### **5.1.2 Conduct Bald Eagle Wintering Surveys**

Protocol-level bald eagle wintering and nesting surveys were conducted according to the *Protocol for Evaluating Bald Eagle Habitat and Populations in California* (Jackman and Jenkins 2004) to document wintering and nesting bald eagles in the vicinity of Project reservoirs, large bypass and peaking reaches, and potential Project betterments. Surveys were conducted by low-altitude helicopter, foot, and by boat. Surveys were conducted by Ron Jackman, a recognized raptor expert.

#### **Wintering Bird Surveys**

Three bald eagle surveys were conducted, one each month from December 2007 through February 2008, to document bald eagles in the study area during the non-breeding season. As required, the January survey was conducted during the United States Geological Survey (USGS) two-week nationwide bald eagle winter survey, January 2–16, 2008 to allow comparisons with statewide population trends.

For each monthly survey, the study area was flown in the morning by helicopter. The flight route began in Foresthill, and followed the MFAR east along the major rivers and water bodies of the MFP, ending at the Rubicon River, just north of Hell Hole Reservoir. Two qualified biologists searched the shorelines within approximately ½ mile of Project reservoirs and bypass and peaking reaches to document wintering bald eagles. Areas within ½ mile of potential Project betterments were also searched to document wintering bald eagles. Bald eagle occurrences (including the Global Positioning System (GPS) coordinates of each bald eagle) were recorded on data sheets developed by Zack et al., 1997, as modified by Jackman, et al., 2001.

#### **Winter Night Roost Surveys**

In areas where bald eagles were observed during the wintering bird surveys, follow-up surveys were conducted by helicopter, boat, or on foot in the afternoon and early evening to locate potential night roosts. To find night roost areas, bald eagles were visually observed in the late afternoon and early evening as they moved from foraging habitat to potential night roosts. Once an eagle was detected, the helicopter landed a safe distance from the bird and the biologist observed the bird until it flew to a night roost. The number of eagles entering each night roost was recorded. Winter night

roosts were recorded on data sheets developed by Zack et al., 1997, as modified by Jackman, et al., 2001. Data collected included the GPS coordinates of each wintering roost, roost-tree species and other characteristics, and the number of eagles entering the night roost.

Each night roost area was revisited the following morning beginning ½ hour before sunrise to observe eagles leaving the night roost areas and returning to foraging habitat. Additional on-the-ground surveys were conducted as necessary in the forest stands surrounding the night roost trees to confirm use by bald eagles (feathers, castings) and to GPS the tree used for roosting.

During the winter, Hell Hole Reservoir is inaccessible by vehicle due to road closures caused by heavy snow. For this reason, a morning survey was not conducted on the ground at Hell Hole Reservoir during January and February. During these months, an additional helicopter survey was conducted in the late afternoon/early evening to locate potential winter night roosts.

### **5.1.3 Conduct Bald Eagle Nesting Surveys**

Bald eagle nesting surveys were conducted in late February through July to locate any new nests and to monitor the breeding status of existing nests in the study area. The following describes each survey approach and objective.

#### **Determine New Nests and Occupancy of Existing Nests**

Three single-day surveys were completed in late February to March 2008, to determine whether the study area was occupied by bald eagles and, if so, to determine their breeding status. Surveys were completed by helicopter, by boat and/or on foot, depending on location, weather conditions, and accessibility. Refer to Section 5.1.2 for a detailed description of helicopter survey methods. Observations of bald eagles, courtship behavior, and nest construction activities were recorded on data sheets. The GPS coordinates of all bald eagles and nests observed was recorded on a CDFG Bald Eagle Nesting Territory Survey Form. California Native Species Field Survey Forms were also prepared and submitted to CNDDDB for all bald eagle nests observed.

#### **Determine Presence of Eggs/Nestlings**

For each bald eagle nest (active and inactive) observed in the study area, follow-up surveys were conducted by helicopter during the mid-nesting season (late April through May) to document the presence of adults and number of eggs and/or nestlings, if any, at each nest.

#### **Determine Nest Success**

At each occupied nest, an additional survey was conducted by helicopter and by boat and/or on foot during the late nesting season (early June through early July) to document nest success (i.e., number of nestlings fledged).

The following supplemental survey methods were implemented in June 2008 to determine the location of a bald eagle nest at Hell Hole Reservoir. A floating fish lure was dropped from a boat as bait to potentially attract a bald eagle and to follow the eagle to nest location, if present. If the bird went to a perch to feed on the fish, then it would be assumed that presence of a nest was unlikely. However, if the bird were nesting, the fish would likely be taken back to a nest to feed young, allowing identification of the nest location.

#### **5.1.4 Develop Final Maps of Bald Eagle Occurrences, Winter Roosts, and Nests in the Study Area**

Final maps showing bald eagle occurrences, winter roosts, and nests were developed based on the results of wintering and nesting surveys. This included overlaying bald eagle GIS information on Project facilities and features, recreation facilities, other dispersed concentrated use areas, bypass and peaking reaches, and potential Project betterments.

### **6.0 RESULTS**

The following presents results of the TERR 5 bald eagle studies completed in 2007 and 2008.

#### **6.1 DOCUMENT WINTERING AND NESTING BALD EAGLES IN THE STUDY AREA**

##### **6.1.1 Develop Preliminary Maps of Bald Eagle Occurrences, Winter Roosts, and Nests in the Study Area**

Preliminary maps of known occurrences of bald eagles, winter roosts, and nests are available in the SD F of the PAD for the study area (PCWA 2007).

##### **6.1.2 Conduct Bald Eagle Wintering Surveys**

A total of 14 bald eagle observations (nine during wintering bird surveys and five during winter roost surveys) and three winter roost sites were documented during wintering bird surveys in 2007-2008. The results of each survey are summarized below, by month. Observation data sheets are provided as Appendix A. Refer to Map TERR 5-1 for the location bald eagle occurrences within the study area. Map TERR 5-2 (confidential) provides the location of night roosts within the study area.

#### December

Four bald eagle observations were recorded during wintering bird surveys conducted by helicopter on December 13, 2007.

- A sub-adult bald eagle was observed along the Rubicon River, downstream of Ellicott Bridge near river mile (RM) 20.4.

- An adult bald eagle was observed at the Rubicon River at RM26.2, downstream of Hell Hole Dam. The eagle was observed flying to a perch in a fir (*Abies* sp.) tree.
- An adult bald eagle was observed perched in a fir (*Abies* sp.) tree along the shore of Hell Hole Reservoir.
- An adult bald eagle was observed flying downstream along the MFAR, near RM12.3 near New Orleans Gulch.

Follow-up winter night roost surveys were conducted at Hell Hole Reservoir by boat on December 13, 2007 and by foot on December 14, 2007. Two bald eagles were observed soaring, foraging, hunting, and feeding at the reservoir. However, no night roost location was identified during these surveys.

### January

The second wintering bird survey was conducted by helicopter on January 15, 2008. Three bald eagle observations were recorded:

- An adult bald was observed perched over a pool along the MFAR at American Bar at RM23.3.
- An adult bald eagle was observed perched on a snag at Hell Hole Reservoir near the Rubicon River inlet.
- An adult bald eagle was observed perched over a pool along the MFAR, upstream of Poverty Bar at RM7.3.

A follow-up winter night roost survey was conducted by helicopter on January 15, 2008. No bald eagles were detected during follow-up flights to find potential night roosts along the MFAR. However, an adult bald eagle was observed perched in a ponderosa pine (*Pinus ponderosa*) near the French Meadows Powerhouse (Hell Hole Reservoir). Two biologists observed the bird until near sunset when it flew to a potential night roost in a ponderosa pine on the south shore of Hell Hole Reservoir. Map TERR 5-2 (confidential) provides the location of the night roost.

### February

The third wintering bird survey was conducted by helicopter on February 12, 2008. Two bald eagle observations were recorded:

- An adult bald eagle was observed perched on a snag at Hell Hole Reservoir near the Rubicon River inlet.
- An adult bald eagle was observed perched in a foothill pine (*Pinus sabiniana*) along the MFAR near New Orleans Gulch at RM12.3.

A follow-up winter night roost survey was conducted by helicopter at Hell Hole Reservoir on February 12, 2008. Two adult bald eagles were observed and two potential night roost locations were identified during these surveys.

The first eagle was observed perched on a snag along the Rubicon River upstream of Hell Hole Reservoir. Two biologists observed the bird until it flushed to a second perch on a snag near the Rubicon River inlet. It was determined that the bird likely used this perch as a night roost location.

The second eagle was initially observed standing on the shoreline of Hell Hole Reservoir. The eagle flew out over a flock of tundra swan (*Cygnus columbianus*) and made an unsuccessful foraging attempt. The eagle then perched on a ponderosa pine near French Meadows Powerhouse (Hell Hole Reservoir). The bird was observed at this location until sunset. It was determined that the bird likely used this site as a night roost location. Map TERR 5-2 (confidential) provides the location of these night roosts.

### **6.1.3 Conduct Bald Eagle Nesting Surveys**

A total of seven adult bald eagle observations, at least one young bald eagle, and one active nest were documented during bald eagle nesting surveys in 2008. The results of each survey are summarized below. Observation data sheets are provided as Appendix A. Refer to Map TERR 5-1 for the location bald eagle occurrences within the study area. Map TERR 5-2 (confidential) provides the location of nests within the study area.

#### **Determine New Nests and Occupancy of Existing Nests**

Based on a review of existing information (Section 6.1.1), there were no previously documented bald eagle nests in the study area. Therefore, the entire study area was flown on March 25, May 6, and June 12, 2008, to determine the location of any new or previously undocumented nests.

- No new nests were identified during the March 25, 2008 survey. A single adult bald eagle was observed perched on a snag on the north shore of Hell Hole Reservoir.
- No new nests were identified during the May 6, 2008 survey. Two adult bald eagles were observed, including one adult eagle perched on a snag near the upper end of Hell Hole Reservoir, and a second eagle perched on a snag on the south shore of Hell Hole Reservoir, approximately one mile from the first bald eagle. No nest was located during this survey.
- A bald eagle nest was identified and a pair of bald eagles were observed during a supplemental survey conducted at Hell Hole Reservoir on June 11, 2008 (confidential Map TERR 5-2). The CDFG Nesting Survey Form is provided as Appendix B. Details on this supplemental survey are provided below.

- The entire study area was flown again on June 12, 2008. The nesting bald eagle pair was observed at Hell Hole. No other bald eagles or nests were observed on June 12.

### **Determine Presence of Eggs/Nestlings**

Because at least two bald eagles were known to be resident at Hell Hole Reservoir, it was strongly suspected that a nest was present. A supplemental survey was therefore conducted by boat on June 11, 2008, to determine the location of this suspected nest. A qualified biologist dropped two floating fish lures into the reservoir. Two adult bald eagles were observed during the survey. The first bird observed did not attempt to take the fish lures and instead attempted to forage on a live fish in the reservoir (unsuccessfully). A second bald eagle was later observed in a previously undetected nest located in a ponderosa pine along the Rubicon River upstream of Hell Hole Reservoir. The first adult was later observed delivering prey to the nest while the second adult was observed feeding young. At least one nestling was observed in the nest during the survey.

A follow-up visit to the nest was conducted on June 12, 2008. The bald eagle pair was again observed at the nest tree at Hell Hole Reservoir. One adult bald eagle was observed standing in the nest with at least one three-week-old nestling. The second adult bald eagle was observed perched in a sugar pine (*Pinus lambertiana*) across the Rubicon River from the nest.

### **Determine Nest Success**

On July 30, 2008, a biologist returned to the nest tree and observed the nest from the ground using binoculars. The nest appeared to be empty. A single adult and juvenile bald eagle were observed the same day flying over Hell Hole Reservoir.

#### **6.1.4 Develop Final Maps of Bald Eagle Occurrences, Winter Roosts, and Nests in the Study Area**

Refer to Maps TERR 5-1 and TERR 5-2 for final maps showing the location of bald eagle observations, roosts, and nests documented in the study area, as well as detections obtained from the literature review and agency consultation.

## **7.0 LITERATURE CITED**

California Department of Fish and Game (CDFG). 2007. California Natural Diversity Data Base (CNDDDB). RareFind 3, Version 3.1.0 (March 3, 2007). Sacramento, CA.

Jackman, R.E., W.G. Hunt, and N. Hutchins. 2001. Foraging Ecology of Bald Eagles on Shasta Lake. Report by U.C. Santa Cruz, Predatory Bird Research Group for USDA Forest Service, Shasta Lake Ranger District.

Jackman, R.E. and J.M. Jenkins. 2004. Protocol for Evaluating Bald Eagle Habitat and Populations in California.

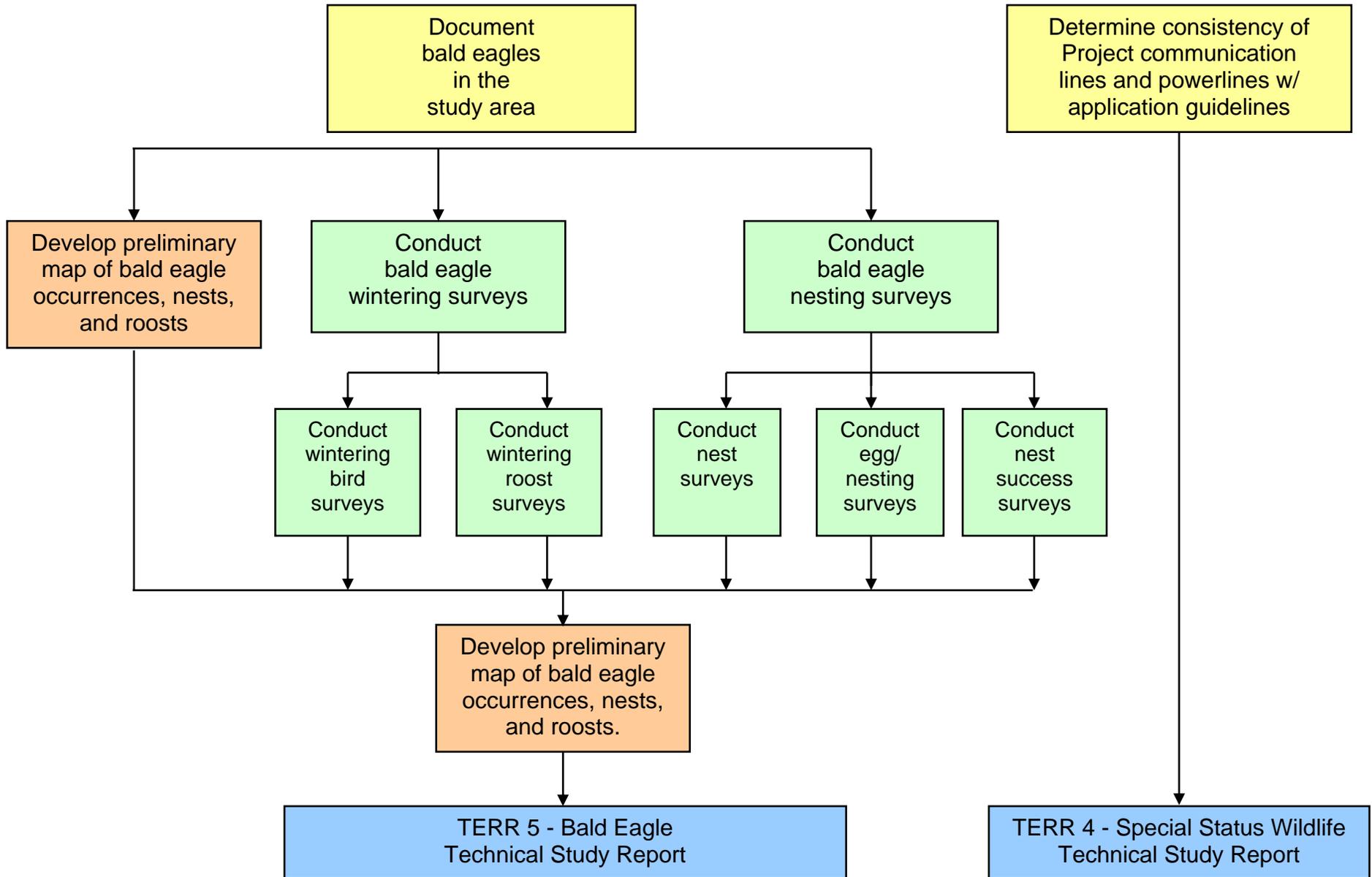
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———. 2008. TERR 4 Special-Status Wildlife Technical Study Report. Auburn, CA.

Zack, S.H., N.N. Cooke, K. Mehl, and J. Wood. 1997. Bald Eagles at Shasta Lake: Ecological and Behavioral Issues Relating to Lake Management and Eagle Productivity. 1997 Summary Report of Field Activities.

**FIGURES**

Figure TERR 5-1. Study Objectives and Related Study Elements and Reports.



**MAPS**

**CONFIDENTIAL**

**MAP TERR 5-2**

**“Bald Eagle Night Roosts and Nests in the  
Middle Fork American River Watershed”**

*(from TERR 5 – Bald Eagle Technical Study Report – 2008)*

Map TERR 5-2 has been removed from this document because it contains the location(s) of sensitive biological resources and is considered “confidential” information. Confidential biological resources information is located in Volume 4 which may not be made available to the public pursuant to the Federal Energy Regulatory Commission’s (FERC’s) regulations contained in 36 CFR 385.1112. This information is not maintained in FERC’s Public Reference Room or on the Commission’s electronic library except as an indexed item.

# **CONFIDENTIAL**

## **APPENDICES**

**“Appendix A: Bald Eagle Observation Data Sheets”**

**“Appendix B: CDFG Bald Eagle Nesting Territory Survey Form”**

*(from TERR 5 – Bald Eagle Technical Study Report – 2008)*

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