Amended Application for a New License Major Project – Existing Dam

Bald Eagle and American Peregrine Falcon Management Plan

Security Level: Public

Yuba River Development Project

FERC Project No. 2246

September 2019

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GLOSSARY – DEFINITIONS OF TERMS, ACRONYMS AND ABBREVIATIONS

BGEPA	Bald and Golden Eagle Protection Act
Cal Fish and Wildlife	California Department of Fish and Wildlife, formally California Department of Fish and Game or CDFG
CESA	California Endangered Species Act
CFP	California Department of Fish and Wildlife Fully Protected Species
DDT	Dichloro-Diphenyl-Trichloroethane
Distress	When a bald or golden eagle vocalizes while leaving the nest or roost, or crowns up the head feathers, raises their wings and vocalizes while remaining on the nest or roost.
Disturb	To agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury, 2) a decrease in productivity, by substantially interfering with normal breeding, feeding or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.
ESA	Federal Endangered Species Act
F.G.C.	Fish and Game Code
FERC	Federal Energy Regulatory Commission
Forest Service	United States Department of Agriculture, Forest Service
ft	feet
LOP	Limited Operating Period
mi	mile
MBTA	Migratory Bird Treaty Act of 1918
NFS	National Forest System
O&M	operation and maintenance
Plan	Bald Eagle and American Peregrine Falcon Management Plan
PNF	Plumas National Forest
Project	Yuba River Development Project, FERC Project No. 2246
TNF	Tahoe National Forest
USFWS	United States Department of the Interior, Fish and Wildlife Service
YCWA or Licensee	Yuba County Water Agency

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SECTION 1.0

INTRODUCTION

In April 2014, the Yuba County Water Agency (YCWA), pursuant to Section (§) 5.18 of Title 18 of the Code of Federal Regulations (C.F.R.), filed with the Federal Energy Regulatory Commission (FERC) an Application for a New License for Major Project – Existing Dam - for YCWA's 361.9 megawatt Yuba River Development Project, FERC No. 2246 (Project). In December 2016, YCWA amended its April 2014 Application for a New License. The initial license for the Project was issued by the Federal Power Commission (FERC's predecessor) to YCWA on May 16, 1963, effective on May 1, 1963. The Federal Power Commission's May 6, 1966, Order Amending License changed the license's effective date to May 1, 1966, for a term ending on April 30, 2016.

YCWA included this Bald Eagle and American Peregrine Falcon Management Plan (Plan) in its December 2016 Amended Application for a New License.

The United States Department of Agriculture, Forest Service's (Forest Service) Federal Power Act (FPA) Section 4(e) authority only applies in this Plan to Project facilities on National Forest System (NFS) land, and the United States Army Corps of Engineers' (USACE) FPA Section 4(e) authority only applies in this Plan to Project facilities on federal land administered by the USACE. The Forest Service administers the Plumas National Forest (PNF) in conformance with the PNF Land and Resource Management Plan (USDA Forest Service 1988), as subsequently amended, and administers the Tahoe National Forest (TNF) in conformance with TNF Land and Resource Management Plan (USDA Forest Service 1990), as subsequently amended. When the TNF or PNF Forest Plan revisions occur, those revised plans will supersede the 1990 TNF and 1988 PNF plans.

1.1 <u>Background</u>

1.1.1 Yuba River Development Project

The Project is located in Yuba, Sierra and Nevada counties, California, on the main stems of the Yuba River, the North Yuba River and the Middle Yuba River, and on Oregon Creek, a tributary to the Middle Yuba River. Major Project facilities, which range in elevation from 280 feet (ft) to 2,049 ft, include: 1) New Bullards Bar Dam and Reservoir; 2) Our House and Log Cabin diversion dams; 3) Lohman Ridge and Camptonville diversion tunnels; 4) New Colgate and Narrows 2 power tunnels and penstocks; 5) New Colgate, New Bullards Minimum Flow and Narrows 2 powerhouses; and 6) appurtenant facilities and features (e.g., administrative buildings, switchyards, roads, trails and gages). The existing Project does not include any aboveground open water conduits (e.g., canals or flumes) or any transmission lines.

In addition, the Project includes 16 developed recreation facilities. These include: 1) Hornswoggle Group Campground; 2) Schoolhouse Campground; 3) Dark Day Campground; 4) Cottage Creek

Campground;[1] 5) Garden Point Boat-in Campground; 6) Madrone Cove Boat-in Campground; 7) Frenchy Point Boat-in Campground; 8) Dark Day Picnic Area; 9) Sunset Vista Point; 10) Dam Overlook; 11) Moran Road Day Use Area; 12) Cottage Creek Boat Launch;[2] 13) Dark Day Boat Launch, including the Overflow Parking Area; 14) Schoolhouse Trail; 15) Bullards Bar Trail; and 16) floating comfort stations.[3] All of the recreation facilities are located on NFS lands, with the exception of the Dam Overlook, Cottage Creek Boat Launch and small portions of the Bullards Bar Trail, which are located on land owned by YCWA. All of the developed recreation facilities are located within the existing FERC Project Boundary, except for a few short segments of the Bullards Bar Trail to the east of the Dark Day Boat Launch. In addition, the Project includes two undeveloped recreation sites at Our House and Log Cabin diversion dams, both located on NFS lands and within the existing FERC Project Boundary.

Figure 1.1-1 shows the Project Vicinity,[4] proposed Project, and proposed FERC Project Boundary.[5]

[1] Cottage Creek Campground was burned in 2011 and has not been rebuilt. YCWA is in discussions with the Forest Service regarding rebuilding the burned campground.
[2] Emerald Cove Marina provides visitor services at Cottage Creek Boat Launch, including houseboat and boat rentals, boat slips and moorings, fuel and a general store. The marina is operated under a lease from YCWA by a private company.
[3] The Project recreation facilities included one campground that is no longer part of the Project. Burnt Bridge Campground was closed initially by the Forest Service in 1979 due to low use levels. FERC, in an August 19, 1993 Order, which approved YCWA's Revised Recreation Plan, directed YCWA to remove all improvements and restore the Burnt Bridge Campground to the condition it was in prior to development of the facility. YCWA consulted with the Forest Service and all that remains of Burnt Bridge Campground today is the circulation road and vehicle spurs; all other facilities were removed.
[4] For the purpose of this Exhibit E, "Project Vicinity" refers to the area surrounding the proposed Project on the order of United States Geological Survey (USGS) 1:24,000 quadrangles.
[5] The FERC Project Boundary is the area that YCWA uses for normal Project operations and maintenance. The Boundary is shown in Exhibit G of YCWA's Application for New License, and may be changed by FERC with cause from time to time during the term of the new license.

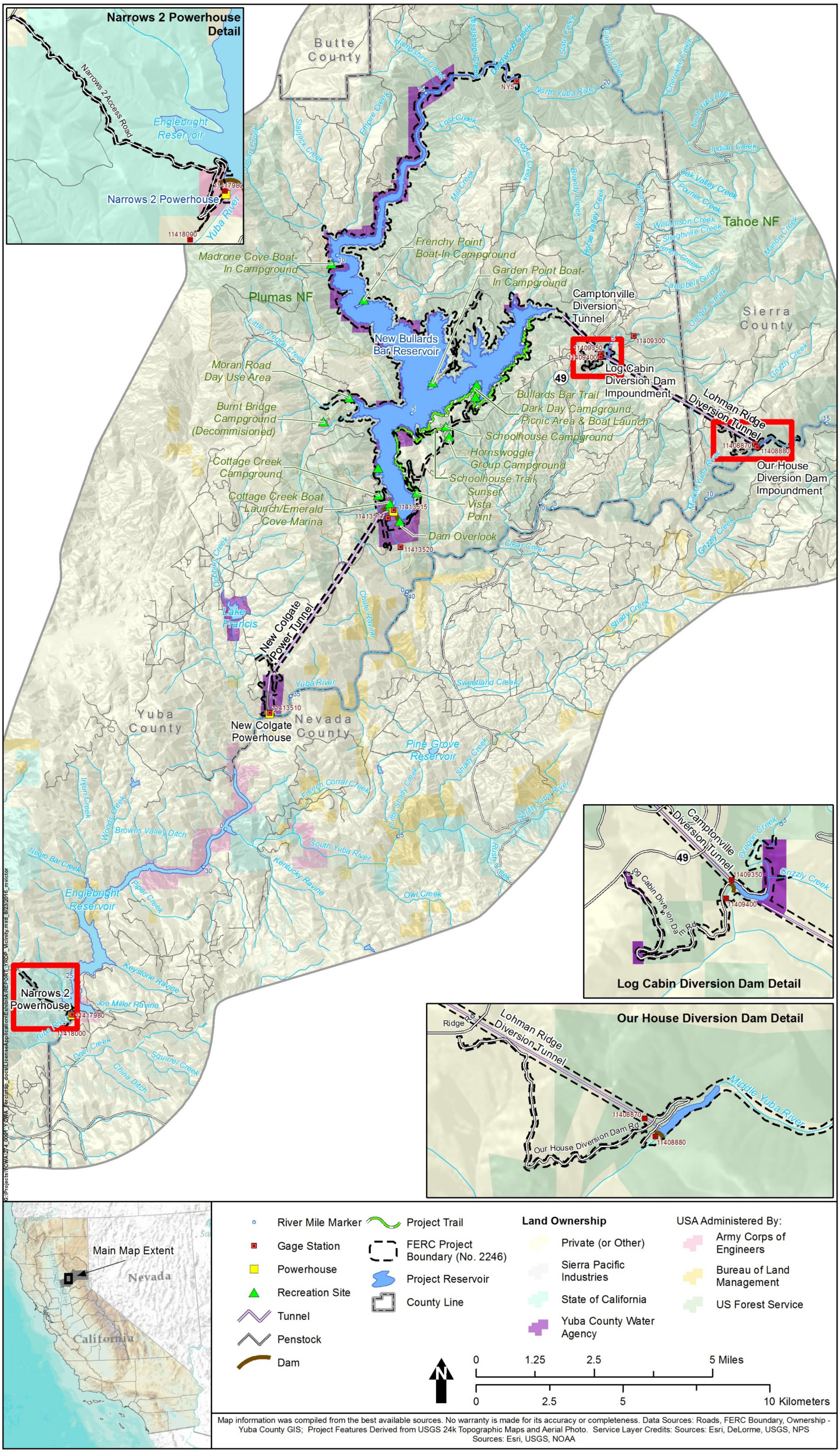

Figure 1.1-1. Yuba County Water Agency's Yuba River Development Project and Project Vicinity.

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1.2 Purpose of the Bald Eagle and American Peregrine Falcon Management Plan

This Plan is intended to provide guidance for the protection of bald eagles (*Haliaeetus leucocephalus*) and American peregrine falcon (*Falco peregrinus anatum*) in all areas within and outside of the FERC Project Boundary where bald eagles and American peregrine falcon are affected or have the potential to be affected by the Project.

YCWA will coordinate, to the extent appropriate, the efforts required under this Plan with other Project resource efforts, including implementation of other resource management plans and measures included in the new license.

1.3 Goals and Objectives of the Bald Eagle and American Peregrine Falcon Management Plan

The goal of the Plan is to ensure that Project operations and maintenance (O&M), as well as Project related recreation activities do not result in “take” of bald eagles, American peregrine falcon and their eggs or nests by implementing measures that are consistent with federal and State of California laws and regulations (see Section 2.1.1 for the definition of take under various applicable laws and regulations).

The objective of the Plan is to provide necessary guidelines to meet Plan goals.

1.4 Contents of the Bald Eagle and American Peregrine Falcon Management Plan

This Plan includes the following:

- Section 1. Introduction. This section includes introductory information, including the purpose and goals of the Plan.
- Section 2. Life History and Distribution. This section provides a physical description of bald eagle and American peregrine falcon, summary of federal and State protection, their life history, as well as distribution throughout California and the Project area.
- Section 3. History of Consultation in the Project Area. This section provides a history of consultation and protection of bald eagle in the Project Area.
- Section 4. Protection. This section describes bald eagle and American peregrine falcon protection measures for the Project.
- Section 5. Reporting, Consultation and Plan Review. This section describes reporting, consultation and other requirements regarding bald eagle and American peregrine falcon between YCWA, and the California Department of Fish and Wildlife (Cal Fish and Wildlife).
- Section 6. References Cited. This section provides a list of the references cited in the Plan.

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SECTION 2.0

LIFE HISTORY AND DISTRIBUTION

2.1 Bald Eagle (*Haliaeetus leucocephalus leucocephalus*)

2.1.1 Bald Eagle Status

On March 11, 1967 the southern bald eagle was listed as endangered under the Endangered Species Act (ESA) of 1966[6] (32 FR 4001). This endangered status resulted from a population decline caused primarily by high levels of dichloro-diphenyl-trichloroethane (DDT) in the food chain that increased egg shell thinning and drastically impaired productivity. On February 14, 1978, the United States Department of the Interior (USDOI), Fish and Wildlife Service (USFWS) ruled to delete the subspecific names for the southern and northern subspecies (*Haliaeetus leucocephalus alascanus*), which resulted in the designation of a single species *Haliaeetus leucocephalus* (43 FR 6230). The February 14, 1978 ruling also listed bald eagle as endangered in 43 of the 48 contiguous States. Bald eagle in the remaining five States (i.e., Washington, Oregon, Minnesota, Wisconsin, and Michigan) was listed as threatened (43 FR 6230). On July 12, 1995, all bald eagles listed as endangered in the 43 States were reclassified as threatened, while the status of threatened remained in effect for the five other States (60 FR 36000). 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).

Within California, the bald eagle was listed under the California Endangered Species Act (CESA) as endangered on June 27, 1971.

In addition, Section 86 of the Fish and Game Code (F.G.C.) defines "take" to mean "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

In 1971 the State of California also assigned the status of Fully Protected Birds to bald eagle (F.G.C. § 3511). Section 3511 of the F.G.C. states:

> Except as provided in Section 2081.7 or 2835, fully protected birds or parts thereof may not be taken or possessed at any time. No provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected bird, and no permits or licenses heretofore issued shall have any force or effect for that purpose. However, the department may authorize the taking of those species for necessary

[6] Endangered Species Preservation Act of 1966 was amended in 1969 by the Endangered Species Conservation Act of December 5, 1969 (P.L. 91-135, 83 Stat. 275), which was repealed by the Endangered Species Act of 1973 (16 U.S.C. 1531-1544).

> scientific research, including efforts to recover fully protected, threatened, or endangered species, and may authorize the live capture and relocation of those species pursuant to a permit for the protection of livestock.

Additional protections for bald eagle in California exist under F.G.C. Sections 3503, 3503.5, and 3513, which make it unlawful to take, possess, or needlessly destroy birds' nests or eggs; take possess, or destroy raptors and their eggs and nests; and take or possess any migratory nongame bird or part thereof, designated in the Migratory Bird Treaty Act of 1918 (MBTA) (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat 755) as amended).[7]

Since delisting, federal protection of the bald eagle has continued under the MBTA, and the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d), as amended.

The MBTA provides protection to migratory birds and includes agreements between the United States, Great Britain on behalf of Canada, Mexico, Japan and Russia for the protection of such birds. The MBTA protects most native species of birds in the United States, including those likely to occur in the Project area (50 CFR 10.13). In short, the MBTA, unless permitted by regulation, prohibits:

> ...pursuit, hunt, capture, take, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation of carriage, or export at any time, or in any manner, any migratory bird, included in the terms of the convention…for the protection of migratory birds…or any part, nest, or egg of such bird." (16 U.S.C. 703).

The MBTA language is clear that actions resulting in a "taking" of a protected species are violations of the MBTA. The MBTA does not specifically authorize the incidental take of migratory birds, and the USFWS does not issue permits authorizing the incidental take of migratory birds. In the absence of a permit from USFWS, the temporary or permanent possession of protected migratory birds and their carcasses is also a violation of the MBTA.

The BGEPA protects bald and golden eagles (*Aquila chrysaetos*),[8] except under specific conditions, from take and includes their parts (feathers), nests or eggs. Under BGEPA, "take" is defined as "*pursue, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb*." Furthermore, disturb is defined as:

> …to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment,

[7] Take under F.G.C. Section 3513 defers to the "rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Bird Treaty Act."
[8] Bald Eagle Protection Act of 1940 was amended in 1978 (P.L. 95-616 (92 Stat. 3114)) to include golden eagles.

by substantially interfering with normal breeding, feeding or sheltering behavior.

The BGEPA authorizes the USFWS to permit the take of eagles for certain purposes and under certain circumstances, including scientific or exhibition purposes, religious purposes of Indian tribes, and the protection of wildlife, agricultural, or other interests, so long as that take is compatible with the preservation of eagles (16 U.S.C. 668a). In 2009, the USFWS promulgated a final rule on two new permit regulations that, for the first time, specifically authorize the incidental take of eagles and eagle nests in certain situations under BGEPA (50 C.F.R. 22.26 & 22.27).

The USFWS carries out its mission to protect wildlife and plant resources by fostering relationships with entities that have taken effective steps to avoid take, by encouraging others to implement measures to avoid take, and through investigations and enforcement when appropriate. The USFWS encourages companies to work closely with the USFWS to identify available protective measures when developing project plans to safeguard wildlife and to implement those measures where applicable. In addition, USFWS strongly encourages companies to apply for permits authorizing otherwise prohibited activity, including and eagle programmatic take permits where eagle take is possible.

The development and implementation of an avian plan to avoid take of migratory birds, including bald and golden eagles, does not limit or preclude the USFWS from exercising its authority under any law, statute, or regulation. However, the USFWS Office of Law Enforcement focuses its resources on investigating and prosecuting those individuals and companies that do not identify and implement all reasonable, prudent and effective measures to avoid the take of migratory birds (including eagles) and then subsequently take individuals of such species.

Ideally, a high quality, scientifically valid, and robust avian protection plan that is implemented in a timely and effective manner, and regularly reviewed and revised as needed, will maximize avoidance of species protected under various federal laws while allowing for project development in the most environmentally conscientious ways practicable.

Ultimately it is the responsibility of those involved with the planning, design, construction, operation, maintenance, and decommissioning of projects to conduct relevant wildlife and habitat evaluation and determine, which, if any, species may be affected, and to seek and obtain necessary permits to avoid liability.

Violation of the BGEPA can result in criminal penalties that can result in a fine of $100,000 for an individual ($200,000 for organizations), imprisonment for 1 year, or both, for a first offense. Penalties increase for additional offenses, and a second offense is a felony.

Bald eagle is also designated by the Forest Service as a Forest Service Sensitive Species when occurring in NFS lands, and by the USFWS as a Bird of Conservation Concern.

2.1.2 Physical Characteristics

The bald eagle is a large raptor with a wingspan between 6 and 8 ft, and can weigh up to 14 pounds. According to McCollough (1989), bald eagles molt through five plumage phases. These five phases are important for establishing the age of an individual as well as distinguishing them from golden eagles.[9] The five plumage phases are:

- Juvenile (first year) – mostly dark including head and beak.
- Basic I (second year) – mottled with white belly and inverted triangle on back and head crown is tan.
- Basic II (third year) – body is mottled and variable with the head having a light crown and throat and dark eye stripe similar to an osprey's (*Pandion haliaetus*) head.
- Basic III (fourth year) – plumage is mostly adult like with brown flecking on head and fading eye stripe, mostly yellow beak, some white flecking on belly and chest, and a brown terminal band on an otherwise white tail.
- Basic IV (fifth year) – often indistinguishable from adult plumage, but does contain some brown flecking on the head and tail.

In addition to the plumage phases listed above, bald eagles may be further distinguished from golden eagles by their proportionately larger head and bill.

2.1.3 Life History

2.1.3.1 Nesting and Breeding

Bald eagles typically nest within 1 mi of water bodies. Their nests are large structures (i.e., approximately 6 ft in diameter), and are constructed with sticks. Nests are often found in the upper third of live, dominant or co-dominant trees, with some canopy above the nest that provides shade.[10] Most nest trees exceed 100 ft in height. A single pair will use the same nest each year, and will often have alternate nests within their breeding territory. Bald eagle nests can be confused with osprey (*Pandion haliaetus*) nests.[11] However, osprey nests are smaller, more rounded resembling a tea cup without its handle, and are placed on top of dead trees (i.e., snags) or man-made structures such as utility poles.

Bald eagles can breed as early as 4 to 5 years of age, but in healthy populations may not breed until much older (USFWS 2007). The breeding period for bald eagles varies throughout their range and can often be influenced by weather but typically begins between January and mid-March with courtship and nest initiation, and ends when young fledge sometime in June or July (Jackman and Jenkins 2004). Table 2.2-1 outlines breeding chronology in northern California.

[9] Golden eagle is designated as a Fully Protected Bird Species pursuant to California Fish and Game Code Section 3511.
[10] Dominant or co-dominant trees are the most significant trees, in terms of size, within a stand of timber.
[11] Osprey is designated as a Taxa to Watch by Cal Fish and Wildlife.

Table 2.2-1. Bald eagle breeding chronology in Northern California.

Breeding Activity	Dec/Jan	Feb	Mar	Apr	May	June	July	Aug
Courtship, Nest Initiation	X[1]	X	X	--	--	--	--	--
Egg Laying	--	X	X	--	--	--	--	--
Incubation	--	X	X	X	--	--	--	--
Hatching	--	--	X	X	X	--	--	--
Nestlings	--	--	X	X	X	X	X	--
Fledging	--	--	--	--	--	X	X	--
Post Fledging	--	--	--	--	--	X	X	X
Migration	--	--	--	--	--	--	X	X

Source: Jackman and Jenkins 2004
[1] X indicates the month in which breeding, nesting or rearing activities generally occur.

According to Stalmaster (1987), bald eagles lay one to three eggs asynchronously, 2 to 4 days apart. Eggs typically require 35 days of incubation and nestlings remain in the nest for about 12 weeks until they are fledged. After they are fully fledged juvenile birds remain in the vicinity of the nest for about 1 month.

2.1.3.2 Foraging

Bald eagles are opportunistic feeders and will forage on fish, waterfowl, small mammals, and carrion. Generally, foraging occurs in the morning and evening hours. Hunting perches are used and have the following attributes: close proximity to potential prey; isolation from disturbance; good visibility of surrounding terrain; and accessibility for landing and departing (Stalmaster 1987). Caton et al. (1992) believed that the location of a hunting perch relative to shallow water was very important at deep water lakes because shallow water tends to concentrate fish and makes them more visible and accessible to bald eagles.

2.1.3.3 Wintering

Prior to the onset of winter, many bald eagles will migrate from colder northern climates to warmer southern climates or from higher elevations that experience complete ice coverage of water bodies to lower elevations where water bodies remain ice free. During the winter bald eagles spend the night in a roost. Paired adults will night roost within their nesting territory, and have been observed roosting in the tree containing their nest (Jackman and Jenkins 2004, Merced ID 2010).[12] According to the USFWS (2007) and Keister et al. (1987), communal roosts: 1) are areas where bald eagles gather and perch overnight, and sometimes during the day during inclement weather; 2) are in stands of trees that contain the largest, oldest, and most open-structured trees available; 3) are as close as possible to food; 4) may be used year after year; and 5) may be occupied by non-breeding migrant birds, both adult and subadult.

[12] A nest stand is a patch of timber that includes the tree on which a bald eagle nest was constructed.

2.1.4 Distribution

2.1.4.1 California

Bald eagles range throughout California and can be found at most lakes, reservoirs, rivers, and some rangelands and coastal wetlands. The largest concentration of wintering bald eagles has historically been in the Klamath Basin, located on the border of California and Oregon. A majority of breeding pairs are found in northern California, while a smaller number of pairs can be found in the central and southern Sierra Nevada mountains and foothills, the Central Coast Range and inland southern California. Breeding pairs are also found on Santa Catalina Island. (CDFG 2010.)

2.1.4.2 Yuba River Development Project

In 2011 and 2012, YCWA conducted wintering and nesting surveys for bald eagles within a 1-mi distance from the shorelines of New Bullards Bar Reservoir, Log Cabin Diversion Dam Impoundment, Our House Diversion Dam Impoundment, and Project-affected stream reaches. The study also included a review and summary of historical surveys by the Forest Service for bald eagles on New Bullards Bar Reservoir. YCWA's 2011 and 2012 survey efforts, and Forest Service surveys, as reported in YCWA (2012a), are summarized below.

Wintering Surveys

YCWA recorded 28 bald eagle occurrences[13] during three wintering surveys at 20 locations. Twenty-two observations of adult bald eagles and four observations of sub-adult bald eagles were made at New Bullards Bar Reservoir, and two adult bald eagles were observed approximately 1,000 ft downstream of New Colgate Powerhouse.

As part of the wintering surveys, YCWA also located three night roosts and 11 hunting perches, one of which was occupied during all three bald eagle wintering surveys. All night roost trees and hunting perches were within 300 ft of the normal maximum water surface elevation (NMWSE) of New Bullards Bar Reservoir. The three night roosts were located on YCWA-owned land. One of the hunting perches was occupied during all three wintering surveys and was located on NFS lands. Of the remaining 10 hunting perches, nine were located around New Bullards Bar Reservoir and were scattered between YCWA-owned land and NFS lands; and one was located on private land, approximately 1,000 ft southwest of New Colgate Powerhouse on the Yuba River.

Nesting Surveys

Two bald eagle nests were known to exist on New Bullards Bar Reservoir prior to YCWA's 2012 nesting surveys. One was located on NFS lands within the TNF at Garden Point Peninsula, while the second was located on NFS lands within the PNF on the western shore of New Bullards Bar Reservoir in the NW ¼ of Section 12, T18N/R7E.

During each of the three nesting survey visits, YCWA observed one adult bald eagle perched in the Garden Point Peninsula nest. On April 30, 2012, YCWA observed one nestling in the Garden

[13] An occurrence is the documentation of an individual bald eagle on a specific day.

Point Peninsula nest. The nestling was again present during the final nesting survey on June 14, 2012, and was estimated to be eight to nine weeks old.

No adult bald eagles were observed at the second nest during surveys. The absence of adult bald eagles during all three nesting surveys indicates that the nest was not active in 2012.

Forest Service Surveys

Prior to its 2011 and 2012 surveys, YCWA reviewed historic records from the TNF and found records for more than 640 bald eagle occurrences around New Bullards Bar Reservoir (TNF 2009a). YCWA also received nesting survey data from the TNF that covered the period from 1989 through 2011. The survey data revealed two nests within the study area, both located on New Bullards Bar Reservoir (TNF 2002, 2005, 2006, 2007, 2009b, 2010, 2011, and 2012).

The Forest Service reports that, since 1989, one pair of bald eagles has occupied a breeding territory on the Garden Point Peninsula. From 1989 through 1999, they nested in a tree on the west side of the Garden Point Peninsula within Section 8, T18N/R8E. In October 1999, the Pendola Fire burned through the nest stand, killing the nest tree, and burned the bald eagle nest. In spring 2000, the bald eagle pair built a new nest, which has been active through the drafting of this Plan, on the east side of the Garden Point Peninsula. From 1989 through the drafting of this Plan, the pair has fledged more than 20 bald eagles within this territory.

The second nest, first reported in 2011, was located on the western shore of New Bullards Bar Reservoir in the NW ¼ of Section 12, T18N/R7E. Nesting was not confirmed in 2011 and 2012. In 2013, the nest was just a remnant. In 2014, the PNF documented active nesting.

In May 2016, the Forest Service discovered an active bald eagle nest near the mouth of Mill Creek at “Houseboat Cove” at New Bullards Bar. YCWA agreed to assist the Forest Service in the administrative closure to protect the nest from potential disturbance from boaters/recreationists in the area until August 31. On May 6, 2016, YCWA monitored the nest during the set-up of the four buoys and post signage on the shores to assist in the administrative closure. YCWA monitored the closed-off area by boat and provided hand-outs created by the Forest Service to inform interested parties of the reason for this closure. It is unknown if this nest was successful in 2016.

2.2 American Peregrine Falcon (*Falco peregrinus anatum*)

2.2.1 American Peregrine Falcon Status

On June 2, 1970 the American peregrine falcon was added to the USDOI's list of foreign endangered species, and to the native list on October 13, 1970. The listing was the result of a population decline linked to DDT (35 FR 8495, and 35 FR 16047). The use of DDT was banned in Canada in 1970 and in the United States in 1972 (37 FR 13369), and was followed by restrictions on the use of aldrin and dieldrin in the United States in 1974 (39 FR 37246). As a result, reproductive rates improved, and numbers began to increase (Kiff 1988). In the Pacific states of Washington, Oregon and California, the number of nesting pairs had increased from an estimated 12 in 1976, all known to be in California, to an estimated 263 in 1998. This increase in nesting pairs, along with increases in the Rocky Mountains, southwestern United States, and eastern United States, brought about the delisting of American peregrine falcon on August 25, 1999 (64 FR 46544).

Within California, the American peregrine falcon was listed under the CESA as endangered on June 27, 1971. In 1971, the State of California also assigned the status of Fully Protected Bird Species (F.G.C. § 3511) to the American peregrine falcon. On November 4, 2009, the American peregrine falcon was considered "Recovered" and subsequently removed from the CESA list. However, the status of Fully Protected Bird Species remains as this designation is separate from the CESA statute.

Additional protections for American peregrine falcon in California exist under F.G.C. sections 3503, 3503.5, and 3513, which make it unlawful to take, possess, or needlessly destroy birds' nests or eggs; take possess, or destroy raptors and their eggs and nests; and take or possess any migratory nongame bird or part thereof, designated in the MBTA.

The American peregrine falcon, like the bald eagle, is also protected under the MBTA (described in Section 2.1.1, above) and designated by the USFWS as a Bird of Conservation Concern.

2.2.2 Physical Characteristics

The American peregrine falcon is a medium-sized raptor with long pointed wings (i.e., wingspan exceeds 3 ft), and a long tail. Adults are slate gray with wings, tail feathers and flanks barred with black. A dark cap on the head extends to the cheeks and its throat is white. The lower body is nearly white, and is extensively spotted and barred with black. The legs and feet are yellow. Subadult birds are brown above, and streaked below (CDFG 2005).

2.2.3 Life History

2.2.3.1 Nesting and Breeding

The American peregrine falcon breeds in many terrestrial biomes in the Americas, with no preference to one specific biome, although the species occurs in greater densities in tundra and coastal areas (White et al. 2002). Nesting habitats contain cliffs, and in some locations large trees (Buchanan et al. 2014) and ground nests (Pagel et al. 2010), with open airspace rather than confined areas such as forested habitats, and generally open landscapes for foraging. In addition to natural habitats, the American peregrine falcon now uses many artificial habitats (e.g., urban, human-built environments, such as towers, bridges and buildings). American peregrine falcon uses a broad array of habitats during fall and spring migration (when migration occurs), including urban, suburban, and rural habitats. In winter, there is extreme habitat variability because of the species' enormous geographical range. Resident populations occupy breeding habitat that contains nesting cliffs and human population centers. Non-breeding birds may be found in open habitat which may include cliffs, mangrove, coastal, or wetland areas, major river valleys, smaller riparian habitat, and lake shores, pasture lands, and featureless terrain without cover, containing waterbirds or pigeons and doves; and urban areas (White et al. 2002).

American peregrine falcon typically breeds at 2 to 3 years of age; however, first year birds have been known to occupy territories and breed with adults. Some, but not all pairs breed for life. Courtship may begin soon after the winter solstice, incubation may begin in early to mid-March, and clutch size ranges from three to seven eggs with an average of two to four eggs. A second clutch (i.e., recycle) may be laid naturally if the first clutch breaks from contaminant-induced thinning, or are otherwise destroyed or removed early in the breeding season. Courtship last approximately 6 weeks, and incubation takes about 29 to 32 days, followed by a nestling period of 35 to 42 or more days. Post-fledge, American peregrine falcons are sensitive to disturbance for about 2 weeks as they learn to fly and perform complex aerial maneuvers.

2.2.3.2 Foraging

American peregrine falcon hunt anytime during the day, and in some urban areas have been found hunting at night (DeCandido and Allen 2006). Primary prey is birds, ranging in size from hummingbirds up to Aleutian Canada geese (*Branta canadensis leucopareia*). However, they may also prey upon bats (Ellis et al. 2007), ground squirrels (Pagel and Sipple 2011), American marten (*Martes americana*) (Pagel and Schmitt 2013), lizards, and insects (Ellis et al. 2007). American peregrine falcon employs various hunting methods, including stooping, level pursuit, and hunting on the ground.

2.2.4 Distribution

2.2.4.1 California

According to Grinnell and Miller (1944), the historic range included the "*entire length of the state, chiefly along seacoast and around the islands, but especially in winter, inland, normally west of southern desert divides*." Estimates of active eyries prior to the 1940s range from 100 to 300. By the 1970s, the statewide population was estimated to have declined by 90 percent from pre-1947 levels (Kiff 1988, Jurek 1989). Population estimates at this time were estimated to be between 22 and 40 active pairs (Thelander 1977). The range of American peregrine falcon in California during the 1970s was thought to include only a few active nests from Humboldt County east to Shasta County, south to Sonoma County, and along the central California coast from Monterey County south to Santa Barbara County. According to the Santa Cruz Predatory Bird Research Group, 271 sites in California have been identified as having an active breeding pair at least once since the recovery began in the 1970s. In 2006, 236 known or suspected sites were surveyed, and of those, 167 had at least one adult present, while 154 had confirmed active pairs (SCPBRG 2006).

2.2.4.2 Yuba River Development Project

In 2012, YCWA queried the California Wildlife Habitat Relationships system and determined that suitable nesting habitat exists within the steep and narrow North Yuba River, Middle Yuba River, and mainstem Yuba River canyons. Despite the presence of nesting habitat, neither the California Natural Diversity Database (CNDDB) nor Forest Service has reports of American peregrine falcon within 0.25-mi of the FERC Project Boundary (YCWA 2012b).

However, in its January 25, 2013 Initial Study Report comment letter the Forest Service reported two sightings of American peregrine falcon in the vicinity of New Bullards Bar Dam. The first sighting was from July 2010, and the second from January 2013. Both sightings, considering the date of the observations, suggest that these could be territorial birds with an occupied eyrie present in the vicinity. The Forest Service noted that the timing of the sightings and the proximity of nesting habitat was suggestive of nearby nesting activity (Forest Service 2013). Early in May 2016, YCWA observed an adult American peregrine falcon flying over the Cottage Creek Boat Launch/Emerald Cove Marina upper parking lot (HDR 2016). In October 2016, Cal Fish and Wildlife reported there is possibly a nest near or just downstream of New Bullards Bar Dam and possibly others in the watershed.

On April 10, 2013, YCWA observed a vocal adult American peregrine falcon in flight above the Narrows 2 Powerhouse. Shortly after the initial sighting, the individual was seen perched high on a cliff, located across the canyon from the powerhouse. The perch appeared to be a rock ledge with a few small shrubs. Whitewash was visible on the rock face immediately below the perch. Project operations staff indicated that they had seen two birds, and the birds have become increasingly vocal over the previous 2 weeks (T. Herman, pers. comm., 2013). Based on the April 10 observation and comments from Project operations staff, YCWA believes that the perch site was in the vicinity of an occupied nest ledge. In October 2016, Cal Fish and Wildlife reported the American peregrine falcon pair had successfully fledged two (both males) in 2015 and three (two males and one female) in 2016. Cal Fish and Wildlife reported it would finalize a report in 2017 (A. Milloy, pers. comm., 2016).

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SECTION 3.0

HISTORY OF CONSULTATION AND PROTECTION IN PROJECT AREA

Of the two species considered under this Plan, only bald eagle has had a history of consultation and protection within the Project area via USFWS issuance of a Biological Opinion with an Incidental Take Statement. With one exception – woody debris disposal at New Bullards Bar Reservoir – bald eagle protection has historically been associated with Forest Service timber management on NFS lands adjacent to New Bullards Bar Reservoir.

On April 4, 2000, in response to the Pendola Fire, the Forest Service sent a letter to YCWA and Yuba County requesting assistance on the implementation of a seasonal closure from January 1 through August 31 for Garden Valley Road and Tractor Cove (*Limited Operating Period Barrier Letter* - Attachment A), with the goal of minimizing disturbances from people and boats during the bald eagle nesting season. As part of its request, the Forest Service stated that the Forest Service would monitor the presence/absence and fledgling dispersal from the bald eagle Garden Point Peninsula nest annually in order to determine if the seasonal closure could be lifted prior to August 31.[14]

YCWA agreed to assist the Forest Service, and a closure of Garden Valley Road and Tractor Cove from January 1 through August 31 has been in-place each year since 2001 through the drafting of this Plan.

On April 11, 2002, the TNF released a *Draft New Bullards Bar Reservoir Fish and Wildlife Management Plan* (Attachment B). The plan resulted from consultations between the TNF and USFWS in 1989 regarding effects of the Skyline Timber Sale, in 1997 regarding actions at New Bullards Bar Dam, and in 2000 regarding the Pendola Fire Restoration Project. The plan focused on bald eagles and California red-legged frog (*Rana aurora draytonii*).

With respect to bald eagles, the plan identified specific guidelines for recreation, vegetation management, residential development, hydroelectric power production and reservoir maintenance, mining, site-specific recommended mitigation and action items, and annual monitoring. Each of these guidelines considers closures (i.e., generally from January 1 through August 31), as well as buffers to which the closures may be applied.

On February 4, 2004, USFWS released its *Biological Opinion for the New Bullards Bar Reservoir Safety and Annual Maintenance Project* (BiOp) (Attachment C). The BiOp was in response to a TNF October 21, 2002, request for informal consultation under Section 7 of the ESA regarding the following safety and maintenance action items: 1) disposal of woody debris accumulated in the reservoir by piling and burning; 2) removal of hazard trees along the shoreline of the reservoir; and 3) reducing ladder fuels within administrative sites around the reservoir (i.e., the Proposed Action). The species of concern in the BiOp were bald eagle, California-red-legged frog, Lahonton

[14] The Forest Service's commitment to monitor the Garden Point nest does not have an end date specified in the Forest Service's April 4, 2000 letter.

cutthroat trout (*Oncorhynchus clarki*), and valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), all of which were listed as threatened in 2002.

A detailed description of the three action items was presented in the BiOp, each of which is summarized below.

Under Item 1, the removal and disposal of woody debris from New Bullards Bar Reservoir, YCWA would gather woody debris from the water surface by boat when the water level is high (generally begin in May of each year), and boom it in coves for storage. YCWA worked with the TNF to select new woody debris gathering and disposal sites. Three sites were identified; all were located on the west shore of the Garden Point Peninsula. Cove 1 offered the best access and wood storage/disposal area and would be the first one used in any given year. If the volume of woody debris exceeded the capacity of Cove 1, then Cove 2 would be used. Cove 3 was the least favorable, and was only selected for temporary storage of until the debris could be moved to Cove 1 or 2 for disposal. After August when the reservoir level has dropped, YCWA would use heavy equipment (e.g., excavator and bulldozer) to pile the accumulated debris in coves 1 and 2. Disposal of the accumulated woody debris would be by burning. Burning of debris would occur after the Forest Service burn ban has been lifted, usually in mid- to late October.

Under Item 2, the removal of hazard trees may occur in developed and undeveloped recreation sites, campgrounds, public access roads, special use areas, Forest Service administrative sites, day use areas, lakeshore areas, trailheads, and other areas of high recreation and visitor use. A tree would be considered to be a hazard if it, or any part thereof, has a high potential to fall or roll onto a facility, visitor use area or roadway and cause property damage or injury. Potentially hazardous trees are evaluated in accordance with the Hazard Tree Criteria, which is based on physical location and characteristics that present an imminent hazard or have high potential for tree failure and the potential to reach an area of concern.

Under Item 3, ladder fuels would be reduced at administrative sites such as campgrounds, day-use areas and Forest Service facilities by removal and disposal of brush and smaller trees. Vegetation selected for treatment would be cut by hand with chainsaws and pruners, piled and burned. Some wood may be cut into firewood for campers, or may be chipped and used as ground cover.

USFWS determined the action was not likely to adversely affect California-red-legged frog, Lahonton cutthroat trout and valley elderberry longhorn beetle. However, the USFWS concluded that removal of hazard trees on the shoreline of New Bullards Bar Reservoir would likely affect bald eagle, because this would involve the removal of actual or potential perching, roosting and nesting habitat for bald eagles.

To mitigate for adverse affects on bald eagles, the USFWS provided measures to the TNF for the three actions considered under the BiOp. For the first two actions – removal and disposal of woody debris from New Bullards Bar Reservoir; and removal of hazard trees – the USFWS provided the following conservation measures: 1) defines a Limited Operating Period (LOP) of January 1 through August 31, or 1 month past fledging for all activities within 0.25 mi of the Garden Point Peninsula bald eagle breeding territory; 2) no proposed activities (e.g., burning debris, stockpiling wood, hazard tree removal and brush removal) will occur from January 1 through August 30 within all expansion territories identified in the Bullards Bar Reservoir Fish and Wildlife Management Plan, but wood gathering from the water surface may still occur within 0.25 mi of the expansion territories; 3) protect wintering bald eagles by restricting activities from November 15 through March 15 within 0.25-mi of the NMWSE, and from November 1 through March 15 for areas within 0.25 mi of the dam and winter night roosts; 4) requires that prior to removal of hazard trees 15 inches in diameter at breast height (dbh) or greater, the following steps be taken: a) a Field Data Form be completed; b) update the public use map; c) snag retention standards as identified in the Sierra Nevada Forest Plan Amendment be met; d) within high use foraging sites and winter night roosts multiple perching structures should be maintained; and e) retain a stump height of 3 to 4 ft for felled hazard trees that are immediately adjacent to the shoreline. For the third action – maintain administrative sites – the USFWS provided the methods for reduction of mid- and lower-story hazard fuel at administrative sites (e.g., campgrounds and day use areas).

After reviewing the Action, current status of the bald eagle, the environmental baseline for the action area, the effects of the Action, the conservation measures incorporated into the project description (outlined above), and cumulative effects, the USFWS's final opinion was that the Action is not likely to jeopardize the continued existence of the bald eagle.

Furthermore, the BiOp included an Incidental Take Statement, which specified that under the terms of section 7(b)(4) and section 7(o)(2) of the ESA, take that is incidental to and not intended as part of the agency action is not considered to be prohibited take under the Act provided that such take is in compliance with this Incidental Take Statement. This statement identifies the TNF's responsibility for regulating the action covered by the Incidental Take Statement. The details regarding amount or extent of take, effect of take, reasonable and prudent measures, terms and conditions, and reporting requirements may be found on pages 23 -27 of the BiOp.

The 2004 BiOp afforded incidental take exemption under the ESA for the Forest Service and YCWA. The take exemption was for bald eagles at a time when the species was listed under the ESA, and when ESA Section 7 consultation could be used to address take under the BGEPA. The take exemption provided by the incidental take statement of the 2004 BiOp sunsets with the expiration of the current FERC license.

The USFWS is currently not issuing incidental take for bald eagles under the BGEPA for periods of greater than 5 years. The proposed monitoring in this Plan is intended to demonstrate that the Project does not cause take, as defined under the BGEPA, of bald eagles or impact the local population of bald eagles.

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SECTION 4.0

PROTECTION

4.1 Bald Eagle Protection Guidelines

YCWA will conduct surveys and implement protection guidelines described in this Plan to ensure that Project-related activities do not result in the take of bald eagles. YCWA will, beginning the first full calendar year after license issuance, conduct bald eagle nesting, wintering, and night roost surveys within suitable habitat around New Bullards Bar Reservoir, as described below. Surveys will be conducted in accordance with the *Bald Eagle Breeding Survey Instructions* (CDFG 2010) and the *Protocol for Evaluating Bald Eagle Habitat and Populations in California* (Jackman and Jenkins 2004). Once any new nest or communal night roosts have been located, YCWA will coordinate with the Forest Service, USFWS, and Cal Fish and Wildlife to establish a buffer zone around each nest to prevent disturbances to nesting birds that may result from O&M activities.

4.1.1 Surveys

4.1.1.1 Wintering Population Surveys

Beginning the first full calendar year after license issuance, and annually thereafter, YCWA will monitor the size and distribution of wintering bald eagle populations along established survey census routes to encompass peak wintering activity around New Bullards Bar Reservoir. YCWA will establish the winter monitoring route in the first year of monitoring in consultation with the Forest Service and use that route each year thereafter during winter monitoring. Surveys will be conducted using the *Protocol for Evaluating Bald Eagle Habitat and Populations in California* (Jackman and Jenkins 2004) with the following addition. Within known breeding territories, surveyors will note courtship, other evidence of early nesting behavior, and describe the condition of known nests. YCWA will conduct single-day surveys in January of every year of the new license. Wintering surveys will occur during the 2-week, nationwide mid-winter bald eagle survey, typically scheduled during the first part of January every year, unless inclement weather prohibits safe surveys. The survey forms derived by Jackman and Jenkins (2004) will be used to record survey data. Any observations of courtship or other evidence of early nesting behaviors and the condition of known nests should also be reported with nesting survey data results.

4.1.1.2 Wintering Night Roost Surveys

During the first full calendar year after license issuance, YCWA will conduct night winter roost surveys for bald eagles in December, January, and February to establish a current baseline regarding the presence of communal night roosts at New Bullards Bar Reservoir. Surveys will be conducted using the *Protocol for Evaluating Bald Eagle Habitat and Populations in California* (Jackman and Jenkins 2004). Surveys will be conducted in the afternoon/early evening in areas where eagles were observed wintering in an effort to identify any night roosts. If roosts are located, the number of eagles will be recorded as they move from foraging to roosting habitat. These locations will be revisited the following morning, 0.5 hour before sunrise for at least 2 hours to count the number of eagles leaving the roost. If a stand is identified as a probable night roost, the area will be revisited during the day to search for any evidence of bald eagle use (e.g., feathers and/or castings) and the exact location will be recorded onto a Global Positioning System (GPS). The survey forms derived by Jackman and Jenkins (2004) will be used to record survey data.

Winter night roost surveys will be repeated as follows:

- If no communal night roosts are identified during initial surveys described above, YCWA will only conduct additional night roost surveys during the term of the new license if new Project developments are proposed within 1 mi of the shoreline of New Bullards Bar Reservoir.
- If one or more communal night roosts are identified during initial surveys, YCWA will consult with the Forest Service, USFWS, and Cal Fish and Wildlife to discuss the need for additional surveys and appropriate protection measures.

YCWA will note evidence of new bald eagle nests concurrently with wintering surveys around the entire perimeter of New Bullards Bar Reservoir. Any new or suspected nests identified will be mapped and surveyed during the annual nesting surveys described below.

4.1.1.3 Nesting Surveys

YCWA will conduct annual nesting surveys at all existing and potential nest sites up to 1 mi around New Bullards Bar Reservoir. Nesting surveys will be conducted in accordance with the *Bald Eagle Breeding Survey Instructions* (CDFG 2010) and the *Protocol for Evaluating Bald Eagle Habitat and Populations in California* (Jackman and Jenkins 2004). All data collected during nesting surveys will be recorded on the California Bald Eagle Nesting Territory Survey Form (CDFG 2010, Attachment D). Each bald eagle nesting survey will consist of three visits to New Bullards Bar Reservoir during March, April or early May, and mid-June of each year. Each visit is described below:

- <u>Visit 1: Determine Occupancy of Territories, Identify New Nests, and Early Incubation.</u> Occupancy of known territories (e.g., Garden Point Peninsula) and a search for new nests will be performed by boat around the entire perimeter of New Bullards Bar Reservoir in March, as weather conditions allow.[15] Data collected at each site will consist of: 1) presence of adults; 2) courtship behavior; 3) evidence of nest repair or construction; 4) incubation; and 5) observation of old nests. GPS coordinates will be recorded, and photographs will be taken for all nests observed in a manner that does not disturb the breeding pair.
- <u>Visit 2: Confirm Occupancy of Territories and Nests, and Presence of Eggs/Nestlings.</u> Visit 2 will be conducted in April or early May to determine whether the breeding pair(s) observed in March is still tending the nest (e.g., incubating eggs or tending nestlings). The number of eggs/nestlings, bird behavior, and any other relevant observations will be

[15] For the purposes of this Plan, one territory, (the Garden Point Territory) is considered to be the Project baseline.

recorded. These visits will be conducted in the same manner as Visit 1, except that ground based observations points or boats may be used to check nesting status.

- Visit 3: Determine Nest Success and Productivity. Visit 3 will be conducted in mid-June to determine how many nestlings are approaching fledgling age. These surveys will be conducted in the same manner as Visit 1 except that ground based observation points or boats may be used to check nesting. The Cal Fish and Wildlife California Bald Eagle Nesting Territory Survey Form (CDFG 2010, Attachment D) will be completed for all nesting surveys.

4.1.2 Establish Buffers and other Protective Measures

Upon completion of the first nest survey (i.e., first visit will occur in March of the first complete year following license issuance), and for all active nests identified after the initial nest survey, YCWA will establish a buffer around all documented active bald eagle nests. The buffer will encompass all federal and YCWA-owned land and water that falls within an approximate 0.25-mi radius of a documented nest or logical topographical boundary.

Beginning January 1 through August 31 of each year, YCWA will institute a LOP around all known active bald eagle nests for all YCWA Project-related activities within the buffer areas. It is recognized that YCWA cannot control the activities of others (i.e., YCWA does not have enforcement authority) within the buffer areas during the LOP period. As needed, YCWA will work with the Forest Service to implement appropriate administrative closures on NFS lands to protect nests, and with Yuba County to implement closures on water.

Nest buffers may be removed, adjusted or new buffers may be established if subsequent nesting surveys demonstrate that a nesting territory is no longer occupied or new nests are identified. Additionally, any information provided to YCWA by Forest Service, USFWS, or Cal Fish and Wildlife regarding previously unidentified or existing nests will be used to inform the establishment of nest buffers. Removal of nest buffers will be done in consultation with the appropriate agency depending on jurisdiction, and may include the Forest Service, USFWS and/or Cal Fish and Wildlife.

In addition, YCWA will abide by the following conditions to address Project activities:

- Maintain seasonal closure to public access during the breeding season (i.e., January 1 through August 31, or 3 weeks after chicks have fledged) of Garden Valley Road and Tractor Cove.
- Locate all portable restrooms at least 0.5 mi from documented nests. Placement of portable restrooms should also consider the resulting traffic patterns that may occur from boats accessing these facilities.
- Protect wintering eagles at foraging sites by limiting disturbances from November 15 through March 15 within 0.25 mi of roosts.

- Nest buffers during the breeding season are expanded to 1 mi for activities requiring the use of helicopters or blasting. The 1 mi buffer may be adjusted (i.e., reduced) in consideration of logical topographical boundaries.

YCWA O&M staff will be trained to recognize nesting or roosting bald eagles exhibiting signs of disturbance or distress, as defined in the Plan Glossary, and will be trained to be knowledgeable of bald eagle and American peregrine falcon LOPs and associated buffers. If YCWA O&M staff incidentally observe signs of disturbance or distress to bald eagles in response to conducting routine Project O&M activities, staff will immediately cease the activities that are causing the disturbance/distress and contact YCWA Management that will contact the USFWS Hydro Coordinator or BGEPA Coordinator within 1 business day. The activities that disturbed/distressed the bald eagles may resume with USFWS approval or in 1 week, whichever occurs first. If USFWS does not respond and YCWA commences in a week the activities that were observed to disturb/distress bald eagles and the activities are observed to again disturb/distress bald eagles, YCWA will cease the activities and again contact USFWS within 1 business day. If USFWS does not respond within 1 week of this second contact, YCWA will send a qualified biologist to the area where the disturbed/distressed eagles were observed to determine if there is a nest or communal winter roost in the area. If a nest, nesting behavior, or communal winter roost is detected, YCWA will establish a buffer and LOP around the nest.

4.2 American Peregrine Falcon Protection Guidelines

YCWA will conduct surveys and implement protection guidelines described in this plan to ensure that Project-related activities do not result in the take of American peregrine falcons. YCWA will perform surveys during the first full calendar year after license issuance to document American peregrine falcons in the Project area exhibiting nesting behavior (i.e., courtship, egg laying, incubation, hatching, and fledging), identify the location of the nest site(s), determine the specific nesting chronology (i.e., clutch complete, hatch, and fledge dates) and success of the nest site(s), and determine the sensitivity of nesting pairs (when possible). YCWA will develop and implement spatial and temporal buffer zones and LOPs for each nest site based on the nest site's specific nesting chronology and the sensitivity of the nesting pair.

4.2.1 Nest Surveys

4.2.1.1 Initial Surveys

During the first full calendar year after license issuance, YCWA will conduct nesting surveys for American peregrine falcon to: 1) to determine occupancy and nesting success including the number of young fledged of the documented eyrie located on the cliff complex on the south side of the Yuba River near Englebright Dam across from Narrows 2 Powerhouse: and 2) search for additional ("new") eyries within suitable habitat within the Project area. Surveys for new eyries will be conducted within suitable habitat in the following three areas: 1) North Yuba River canyon from New Bullards Bar Dam downstream 1 mi; 2) Yuba River canyon within 1 mi upstream and downstream of the New Colgate Powerhouse facilities; and 3) the Middle Yuba River canyon within 1 mi upstream and downstream of Our House Diversion Dam. The size of survey areas may be reduced if the topography of these areas does not provide safe access and/or effective observations by foot.

4.2.1.2 Additional Surveys

Searches for new eyries will be repeated in the three locations identified above every year for the term of the license, or until a new eyrie is documented.

Additionally, surveys at documented eyries and searches for new eyries will be conducted when new Project developments and other ground disturbing activities and helicopter use are proposed within 1 mi of documented eyries and suitable nesting habitat in the Project area.

4.2.1.3 Survey Methodology

Surveys will be conducted as described in *Protocols for Observing Known and Potential Peregrine Falcon Eyries in the Pacific Northwest* (Pagel 1992) and/or other methods as determined in consultation with Cal Fish and Wildlife, USFWS, and the Forest Service. Searches for new nest sites and monitoring of existing nests sites will be performed via ground observations (i.e., no helicopters) by observers familiar with American peregrine falcon nesting behavior and proven experience in conducting American peregrine falcon nest surveys in comparable habitat. YCWA will perform an initial visit of at least 4 continuous hours to the suspected or existing nest site during late courtship, egg laying, or early incubation period (mid-March through April) to determine occupancy. Even if no evidence of occupancy is found during the first visit, a determination that a potential nest site is not occupied can only be made after at least two visits are completed consisting of observation periods of four hours or more during each visit. YCWA will conduct a second visit (i.e., 25 to 30 days after the first visit) to confirm whether or not the potential nest site is occupied. If the nest is occupied, YCWA will conduct additional visits to determine the nesting chronology of the nest site, specifically: 1) the date the clutch is complete, 2) the date the eggs hatch, and 3) the date young fledge. All nest site visits will consist of a minimum of 4 hours of observation and begin at dawn or shortly thereafter, or at other periods of the day if proposed by YCWA and approved by Cal Fish and Wildlife, USFWS and the Forest Service.

All nest surveys will be performed from established viewing stations that: 1) afford observers an unobstructed view of the nest or suspected nesting area (i.e., cliff system); and 2) are of sufficient distance from the nest so that stress to nesting birds is minimized (i.e., 200 to 1,000 meters). If nesting birds exhibit territorial defense towards the observer (i.e., loud kaacking vocalizations and one or both adults circling over the area of disturbance), the observer will immediately retreat from the observance point. Surveyors will record all observations of American peregrine falcon activity and other raptor activity, including interactions between American peregrine falcons and other raptors, and document any human-related activities occurring within 0.5 mi of the nest site. Nest surveys will be performed during favorable weather conditions. Surveys will be avoided during periods of heavy rain, snow, high winds, or severe cold as disturbance to incubating birds in poor weather conditions may result in clutch failure, nest abandonment, or secretive bird behavior. Additionally, adverse weather conditions may reduce the efficacy of surveys.

4.2.2 Establish Buffers and other Protective Measures

Beginning January after the first full calendar year following license issuance, YCWA will implement a LOP for Project O&M, construction, and other ground disturbing activities that are within a 0.5 mi radius of documented American peregrine falcon eyries and all other suitable American peregrine falcon nesting habitat within the Project area (i.e., North Yuba River canyon below New Bullards Bar Dam, Yuba River canyon at New Colgate Powerhouse, the Middle Yuba River canyon below Our House Dam, and the Yuba River canyon below Englebright Dam). In these areas and during the LOP, a 1 mi buffer will be implemented for Project activities that require use of a helicopter or other aircraft, blasting, chainsaws, and other similar loud noises. The LOP will remain in effect until August 15 unless: 1) nest surveys determine that an active nest is outside of the work buffer specified for the activity; 2) an occupied nest is found within the work buffer and either additional nest surveys demonstrate that the young have fledged and the 14-day post fledge period has concluded or approval is received from Cal Fish and Wildlife, USFWS and Forest Service (if on NFS lands).[16]

It is recognized that YCWA cannot control the activities of others (i.e., does not have enforcement authority) within the buffer areas during the LOP period.

YCWA may adjust annual LOPs and buffers in consultation with Cal Fish and Wildlife, USFWS, and Forest Service (if on NFS lands) if specific nesting chronologies for occupied eyries are obtained during nest surveys. Additionally, nest buffers may be removed or new buffers may be established if nesting surveys demonstrate that a nesting territory is no longer occupied, or new or alternate nest ledges are identified, respectively. Additionally, any information provided to YCWA by Cal Fish and Wildlife, Forest Service or USFWS regarding previously unidentified or existing nests will be used to inform the establishment of nest buffers and LOPs. Removal of nest buffers will only be done in consultation with Cal Fish and Wildlife and other appropriate agencies, including the Forest Service on NFS lands, and USFWS.

During the first morning of anticipated disturbance for all Project activities occurring outside the 0.5 mi buffer but within a 1-mi radius of active nest sites during the LOP, a qualified biologist with experience monitoring American peregrine falcon eyries will observe and record the behavior of nesting birds. If observed behavior suggests that Project activities are altering the bird's normal behavior, activities will cease immediately and be postponed until buffers can be expanded or until 14 days after birds fledge or nest failure is confirmed.

4.3 Mitigation Against Disturbances

Work performed by YCWA and its contractors will not occur within the bald eagle and American peregrine falcon nest buffers while the LOP around known active bald eagle and American peregrine falcon nests is in effect unless Cal Fish and Wildlife, Forest Service, and USFWS determine that the work can occur.

[16] Performance of additional nest surveys by YCWA to determine whether nor not young have fledged will be at the discretion of YCWA. If YCWA elects to forego subsequent nest surveys, the LOP will remain in effect until August 15.

Vehicular access to Project facilitates and activities within powerhouse perimeters, or associated with life-threatening or imminent loss of Project facilities emergencies are exempt from the restrictions imposed by the LOP.

Under no circumstances shall YCWA remove or physically disturb a known bald eagle or American peregrine falcon nest without consultation and approval of Cal Fish and Wildlife, Forest Service and USFWS. Any tree removal that holds a bald eagle or American peregrine falcon nest will be performed in compliance with F.G.C. Sections 3503 and 3503.5, MBTA and BGEPA.

Water barriers (e.g., buoys and signage) and land barriers (e.g., fencing and signage) around known occupied bald eagle and American peregrine falcon nests will be installed on NFS lands and YCWA-owned land (i.e., not on private land without the approval of the landowner) if determined appropriate by the Cal Fish and Wildlife and Forest Service, and to delineate the buffers in order to restrict Project O&M and recreation activities in the vicinity of nests. Any signs shall be approved by Cal Fish and Wildlife and Forest Service. If these barriers are not effective, additional barriers will be installed on NFS lands and YCWA-owned land if determined appropriate by Cal Fish and Wildlife and Forest Service. Barriers and signs will be in place from January 1 through August 31 for bald eagle nest buffers, and from January 1 through August 15 for American peregrine falcon nest buffers. The signs, if approved, will provide general information about sensitive wildlife, and the specific notice will be approved by Cal Fish and Wildlife, Forest Service, and USFWS.

4.4 Incidental Sightings of Special-Status Raptors

YCWA shall record all incidental observations of bald eagle, American peregrine falcon, golden eagle, osprey, and other special-status raptor species within the Project area while conducting bald eagle and American peregrine falcon surveys and performing O&M activities. The purpose of this effort is to opportunistically gather data for other special-status raptor species through incidental observations, not to expand the specific bald eagle and American peregrine falcon monitoring described in this Plan, or for YCWA staff to perform additional surveys. YCWA shall maintain a map of all special-status raptors and their nests surveyed or incidentally observed within the Project vicinity. Special-status raptors include species of raptors listed as: threatened or endangered or candidate for listing under CESA and/or ESA; State Fully Protected, Species of Special Concern, and Forest Service Sensitive Species.

4.5 Annual Employee Awareness Training

Each year during the term of the license, YCWA shall, as part of YCWA's Proposed Condition GEN3, *Provide Environmental Training to Employee*, review mitigation measures (e.g., nest buffers and LOP) as they apply to planned O&M activities for the calendar year. Employee training will include documenting signs of disturbance or distress to nesting and roosting bald eagles (see Section 4.1.2), maintaining LOPs and buffers, and identification of bald eagle, American peregrine falcon, golden eagle, osprey, and other special-status raptor species that are known to occur or have the potential to occur in the Project vicinity. It is not the intent of the training that employees become experts in the identification of the birds or perform studies.

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SECTION 5.0

REPORTING, CONSULTATION AND PLAN REVIEW

5.1 Annual Agency and Tribes Meeting

Each year during the term of the license, YCWA shall arrange to meet with the Forest Service, USFWS and Cal Fish and Wildlife to discuss implementation of this Plan in the previous calendar year and YCWA's plans for implementation in the current calendar year. The meeting will occur as part of YCWA's Proposed Condition GEN1, *Meet with Agencies and Indian Tribes Annually*. At the meeting, YCWA will address questions regarding activities in the previous calendar year, and any activities planned for the calendar year that may disturb nesting bald eagles or American peregrine falcon.

5.2 Reporting

By December 31 of each year in which monitoring is conducted under this Plan, YCWA will provide to the Forest Service, USFWS and Cal Fish and Wildlife an annual report for that calendar year. The report will include five components. The first component will include the results of all monitoring that occurred in that calendar year, including: 1) a description of the surveys and methods; 2) the results of those surveys, including maps with occurrence information for each species and their nests surveyed or incidentally observed; and 3) if nesting is documented, a description of the proposed buffers and LOPs. The second component will be a summary of observed disturbance or distress to bald eagles recorded during that calendar year. The third component will be a brief summary of results from all previous surveys conducted for each species. The fourth component will be any additional, relevant information regarding bald eagle and American peregrine falcon nesting within the FERC Project Boundary and adjacent areas that was provided to YCWA by the Forest Service, USFWS, and Cal Fish and Wildlife at least 45 days in advance of the report preparation. This information is intended to inform potential changes to existing buffers and LOPs, if appropriate. The last component of the report will be a summary of specific protection measures that were applied to Project O&M and construction activities, as appropriate, during that calendar year and include a discussion of the effectiveness of those protection measures during the bald eagle and American peregrine falcon nesting seasons. This will also contain a description of emergency activities undertaken, if any, within a nest buffer area during the LOP. The report will also include an appendix containing information regarding incidental sightings of special-status raptors.

Forty-five days will be allowed for the Forest Service, USFWS and Cal Fish and Wildlife to comment before YCWA files the report with FERC. YCWA will include all relevant documentation of coordination/consultation with the report filed with FERC. If YCWA does not adopt a particular recommendation made by Cal Fish and Wildlife, Forest Service or USFWS, the filing would include the reasons for not doing so, based on Project-specific information. The final report will be filed with FERC at least 30 days prior to the meeting described in YCWA's Proposed Condition GEN1.

All bald eagle, American peregrine falcon, golden eagle, osprey, and other special-status raptor sightings will be reported to Cal Fish and Wildlife for inclusion into the CNDDB. In addition, YCWA will submit to Cal Fish and Wildlife completed copies of the Cal Fish and Wildlife California Bald Eagle Nesting Territory Survey Form by September 1 of the survey year.

5.3 Plan Revisions

YCWA, in consultation with Cal Fish and Wildlife, Forest Service, and USFWS, will review, update, and/or revise the Plan, as needed, when significant changes in the existing conditions occur, which may include, but not be limited to: changes in the State or Federal listing status of bald eagle, American peregrine falcon, and other raptors; changes in the occurrence of special-status raptors within the Project vicinity; changes in accepted survey protocols for bald eagle and American peregrine falcon; changes in State and/or Federal laws or management plans; changes in Project operations and maintenance activities; and repairs to existing or new construction of Project facilities. Changes may also be implemented if monitoring feedback indicates that resource objectives are not being met. Any updates to the Plan will be prepared in coordination and consultation with Cal Fish and Wildlife, Forest Service and USFWS. Sixty days will be allowed for Cal Fish and Wildlife, Forest Service and USFWS to comment and make recommendations before YCWA files the updated plan with FERC for FERC's approval. YCWA would include all relevant documentation of coordination/consultation with the updated Plan filed with FERC. If YCWA does not adopt a particular recommendation by Cal Fish and Wildlife, Forest Service and USFWS, the filing would include the reasons for not doing so, based on Project-specific information. YCWA will implement the Plan as approved by FERC.[17]

[17] The Plan will not be considered revised until FERC issues its approval.

SECTION 6.0

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Bald Eagle and American Peregrine Falcon Management Plan

Attachment A

Limited Operating Period Barrier

Yuba River Development Project

FERC Project No. 2246

September 2019

TAHOE NATIONAL FOREST
DOWNIEVILLE RANGER DISTRICT
NORTH YUBA RANGER STATION
15924 HIGWAY 49
CAMPTONVILLE, CA 95922
(530) 478-6253
TTD/TTY (530) 288-3656

FAX NUMBER (530) 288-0727

FAX TRANSMITTAL

TO: ~~Donn Wilson~~ Ivan French

FROM: Jeannie Masquelier

NUMBER OF PAGES: 4 (Including Cover)

RE: Bald Eagle Closure

~~Hard copy is in the mail~~

Letter to Donn Wilson

United States Department of Agriculture

Forest Service

Downieville Ranger District

15924 Highway 49
Camptonville, CA
95922-9707
530 288-3231
530 288-3656 TDD
530 288-0727 FAX

File Code: 2770
Date: April 4, 2000

Attn: Donn Wilson
Yuba County Water Agency
1402 D Street
Marysville, CA 95901

Dear Mr. Wilson:

The Forest Service is requesting Yuba County Water Agency and Yuba County's assistance to implement a seasonal, April 1 to August 31, area closure of Tractor Cove in accordance with U.S. Fish and Wildlife Service's direction. As you are aware, last fall the Pendola Fire burned the New Bullards Bar Reservoir resident eagle pair's previous nest tree and adjacent stand of trees, which was located further from the reservoir. As a result of losing this habitat, the eagle pair has chosen to nest in the Tractor Cove vicinity this year. The area closure action is being requested to minimize disturbance to the nesting eagles. This request comes after extensive discussions between the Forest Service and U.S. Fish and Wildlife Service concerning the protection of the eagles and the resulting impacts to the recreational opportunities at the reservoir.

Minimizing disturbances from people and boats during the nesting and fledgling development stages during the closure period are critical to the reproductive success of the bald eagle. Studies show that these disturbances need to be removed for ½ mile line-of-sight from the nesting eagles. This requires the closing off of a majority of Tractor Cove.

At Ivan French's request in lieu of phone conference I met with him and Bill Zoland on April 3, 2000 to discuss water surface closure alternatives. During that meeting we all agreed that the most practical method to achieve the needed protection for the eagles is to close off the entire cove, see attached map. For the following reasons we selected this option over placing the closure across the middle of Tractor Cove: 1) closing off the entire cove would fully meet the ½ mile line-of-site criteria; 2) closing the entire cove would be easier for the public to understand, resulting in less confusion and compliance problems, and 3) closing half of the cove would leave a narrow strip of water with no speed regulation, which is a safety concern.

During our meeting we also discussed alternative systems to physically implement the closure. The discussion revolved around using the old steel booms to create a fully closed system versus a buoy and marker system. We agreed that the buoy and marker system (Area Closed buoys every 400 feet with floating globe markers ever 20 feet attached by nylon rope to a cable three feet under the water's surface) would be the safest and most economical, in the long run. The buoy system will lesson liability, as the steel cable is three feet under the water, so skiers and props should not get entangled. The steel booms also present a much higher safety and liability concern, as compared to the buoy system, due to being located within a non-speed regulated area and having the characteristics of being rigid, having a low profile, and are muted in color. The buoy system will, however, require more law enforcement action by the Forest Service and Yuba County Sheriff's Department than the boom system. The buoys would portray the message *"No Entry Wildlife Area"*. Signs located on National Forest land on either side of the closure area would read *"Seasonal area closure for the protection of sensitive wildlife habitat. Public entry prohibited January 1 to August 31. Authorized use only. Violation punishable by law. Tahoe National Forest Order No.___. 36CFR261.53a and 261.54c"*.

According to Mr. French, YCWA does not have sufficient number of functioning steel booms to span the area of concern. Mr. French and Mr. Zoland believe the cost of the buoy system to be comparable to using the old steel booms due to the fact that the steel boom system would require more set up and maintenance time, plus the life expectancy is shorter because of the current condition of the booms.

The Forest Service has discussed the specifics of the buoy and marker system, including signage, with the US Fish and Wildlife Service. They are in concurrence with the plan that our work group developed.

The Forest Service will be implementing a Forest Order to close Garden Valley Road, which lies near the nest location, and to seasonally close the lands within ½ mile of the nest location to the public, from January 1 to August 31. As Yuba County has jurisdiction of the reservoir's water surface, Yuba County would need to issue an ordinance to close the aforementioned portion of the reservoir. We would appreciate your assistance to forward this request to Yuba County. The Forest Service will monitor presence/absence and fledgling dispersal of the eagles each year to determine if the closure will be needed or if the closure could be lifted at an earlier date.

The Forest Service will develop a flier to be posted at the recreational sites and distributed to the recreating public that describes the Pendola Fire and the resulting impacts along the reservoir, including the need for the closure.

If this approach is satisfactory to you, would you please let Ivan know so that he can proceed with ordering the buoys. We would like to expedite the order because of the nesting eagles.

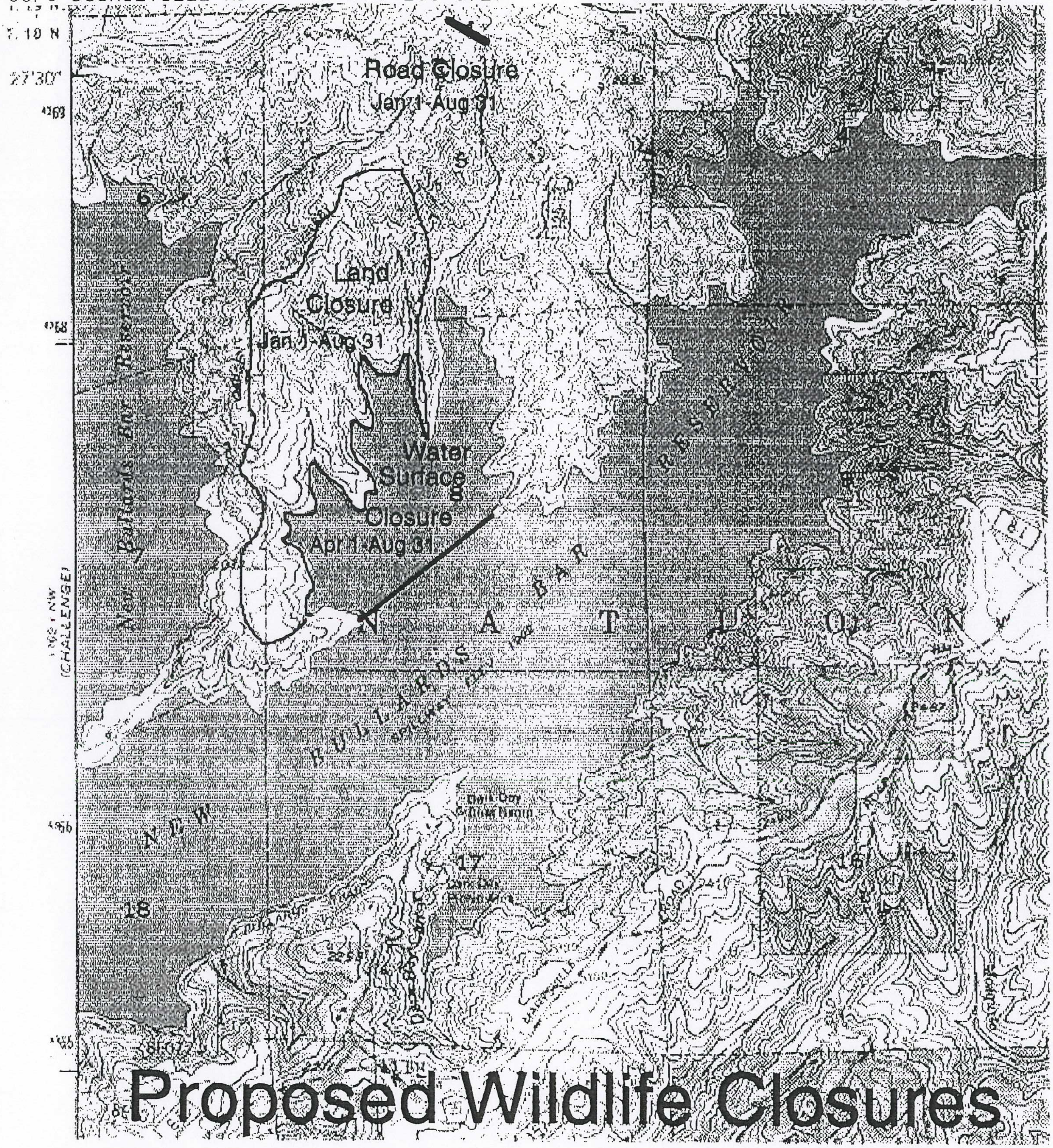
The Forest Service appreciates that you have always cooperated with us in meeting the needs of recreationists and wildlife at New Bullards Bar Reservoir. We look forward to working with you to protect this endangered species.

Sincerely,

Jean M. Masquelier

JEAN M. MASQUELIER
District Ranger

Enclosure


Road Closure
Jan 1-Aug 31
Land
Closure
Jan 1-Aug 31
Water
Surface
Closure
Apr 1-Aug 31
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NEW BULLARDS BAR
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Proposed Wildlife Closures

Bald Eagle and American Peregrine Falcon Management Plan

Attachment B

Draft New Bullards Bar Reservoir Fish and Wildlife Management Plan

Yuba River Development Project

FERC Project No. 2246

September 2019

DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT DRAFT

NEW BULLARDS BAR RESERVOIR

Fish and Wildlife Management Plan

April 11, 2002
(updated with Appendix C)

FORWARD

This draft report has been compiled by the Downieville Ranger District, Tahoe National Forest. Most information was obtained from District records. This is intended to be a living document, and updated as needs arise. Initial formatting is designed so that tables and figures may be easily revised and inserted. Revision dates should be incoporated into sections as appropriate. Individuals participating in the development of the plan, listed alphabetically, are:

U. S. Forest Service:

Ann Carlson, Forest Fisheries Biologist, Tahoe National Forest
Joe Chavez, District Public Services Officer, Downieville District, Tahoe National Forest
David Frazer, Bullards Bar Manager, Downieville District, Tahoe National Forest
Todd Kalish, Assistant Fisheries Biologist, Tahoe National Forest
Jean Masquelier, Downieville District Ranger, Tahoe National Forest
Stephanie Sager, Wildlife Biologist, Tahoe National Forest
Marilyn Tierney, Downieville District Biologist

Yuba County Water Agency:

Steven Onken, Power System Manager, Colgate Power Plant
Gordon Dinwiddy,

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I. Introduction

The Endangered Species Act (ESA) of 1973 (P.L. 93-205), as amended in 1978, 1979, and 1982, directs Federal departments and agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species. The ESA also prohibits "take" of listed species by a federal action without a permit, and it requires all federal agencies to protect and restore threatened or endangered species. Take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such event."

The bald eagle was listed as an endangered species in 1973. In 1988, a large stick nest was found on the Garden Valley Peninsula (New Bullards Bar Reservoir). In 1989, the Tahoe National Forest consulted with the U. S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act for actions associated with the Skyline Timber Sale. In a letter of concurrence, the USFWS directed the Tahoe National Forest to prepare a management plan for bald eagles at the reservoir. Two subsequent consultations resulted in similar direction from the USFWS: (1) In 1997 for actions at the dam by the Yuba County Water Agency, and (2) In 2000, for actions by the Tahoe National Forest associated with the Pendola Fire Restoration Project.

The need to develop a management plan for bald eagles was the driving force for this plan. However, in 1999 a population of California red-legged frogs, a federally threatened species (USDI Fish and Wildlife Service 1996), was discovered in Little Oregon Creek (New Bullards Bar tributary). Activities that mitigate for potential effects to frogs had the potential to conflict with mitigating effects to bald eagles, and vice versa. Therefore, the scope of this plan was expanded to address the California red-legged frog.

Management actions and activities have the potential to affect many species of fish and wildlife. Most actions to protect wildlife focus around maintaining and enhancing habitat, protecting individuals within key areas (i.e. nests, roosts, feeding and spawning areas) or during critical times (breeding). Sharing information regarding where important habitats occur, understanding historic and present wildlife use areas, existing threats to populations, and selecting places to emphasize wildlife management and human use, can reduce conflicts between people and wildlife.

Standard mitigations commonly employed to reduce adverse effects to one species may be in conflict with mitigations for another, or become so restrictive as to become impractical to apply. For example, prohibiting an activity in the fall and winter to protect one animal, and during the spring and summer to protect another, can leave managers with few choices. Integrating information for all fish and wildlife needing protection allows conflicts to be identified early in the process so that solutions can be sought. This plan is intended to facilitate the ability of decisionmakers to make informed choices that better ensure their management actions comply with existing laws and management direction and work towards achieving goals for recovering federally-protected species at New Bullards Bar Reservoir.

Management Plan Objectives

1. Fulfill the USDA Forest Service (USFS) and Yuba Cunty Water Agency's (YCWA) obligations to the USFWS (as mandated by FERC), which is to protect and manage habitat important to the species survival.

2. Help manage to meet the population goals identified in the Recovery Plans for federally-listed species.

3. Manage for a safe visitor experience while mitigating adverse effects to threatened, endangered, and sensitive species.

4. Restrict human disturbances (walking, driving, mountain biking, boating, camping, operating machinery) within the Management Plans area of interest to protect and sustain existing and potential listed species populations and habitat.

5. Provide land managers with guidance regarding the kinds of actions that may require consultation with the U. S. Fish and Wildlife Service.

National Forest Management Direction

The Tahoe National Forest Land and Resource Management Plan (LRMP) states that habitat management for federally threatened and endangered (T&E) species will focus on increasing populations as identified in species recovery plans. It also says that the Forest will coordinate habitat management with the California Department of Fish and Game (CDFG) and the USFWS are responsible for managing animal populations. The three agencies have cooperatively developed priorities for developing management programs for individual species, with the first priority given to federally threatened and endangered species.

FSM 2670.31 THREATENED AND ENDANGERED SPECIES

1. Place top priority on conservation and recovery of endangered, threatened, and proposed species and their habitats through relevant National Forest System, State and Private Forestry, and Research activities and programs.

2. Establish through the Forest planning process objectives for habitat management and/or recovery of populations, in cooperation with States, the USFWS, and other Federal agencies.

3. Through the biological evaluation process, review actions and programs authorized, funded, or carried out by the USFS to determine their potential for effect on threatened and endangered species and species proposed for listing.

4. Avoid all adverse impacts on threatened and endangered species and their habitat except when it is possible to compensate adverse effect totally through alternatives identified in a biological opinion rendered by the USFWS, or when the USFWS biological opinion recognizes an incidental taking. Avoid

adverse impacts on species proposed for listing during the conference period and while their Federal status is being determined.

5. Initiate consultation or conference with the USFWS when the USFS determines that proposed activities may have an adverse effect on threatened, endangered, or proposed species or when USFS projects are for the specific benefit of a threatened or endangered species.

6. Identify and prescribe measures to prevent adverse modification or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species. Protect individual organisms or populations from harm or harassment as appropriate.

The Biological Opinion issued by the U. S. Fish and Wildlife Service for the Sierra Nevada Forest Plan Amendment Final Envirnmental Impact Statement includes conservation recommendations for listed and unlisted species that have been petitioned for listing pursuant to the Act. Unlisted species that may occur in and around Bullards Bar Reservoir are the California spotted owl and Pacific fisher. These are "discretionary agency activities to implement recovery actions, to help implement recovery plans, to develop information, or other further the purposes of the Act.

FSM 2670.32 SENSITIVE SPECIES

1. Assist States in achieving their goals for conservation of endemic species.

2. As part of the National Environmental Policy Act process, review programs and activities, through a biological evaluation, to determine their potential effect on sensitive species.

3. Avoid or minimize impacts to species whose viability has been identified as a concern.

4. If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole.

5. Establish management objectives in cooperation with the States when a project on National Forest System lands may have a significant effect on sensitive species population numbers or distribution. Establish objectives for Federal candidate species, in cooperation with the USFWS and the States.

Region 5 of the USDA Forest Service maintains a sensitive species list for species found within the national forests whose populations may be at risk. The goal of land managers is to mitigate adverse effects and to manage for sufficient populations of these species, thus avoiding the need to protect them under the Endangered Species Act. Therefore, although bald eagles and Califronia red-legged frogs will be the primary focus of this Management Plan (Figure 1), we will also discuss existing and potential populations and habitat of USFS Sensitive Species in the area of interest (ie., foothill yellow-legged frog and Northwestern pond turtle). This plan is designed so that information regarding additional species of concern and sensitive species may be added at a later date as funding and time allow.

Managing for a full array of wildlife at the reservoir requires baseline information that identifies the type of habitat and species that may be present, as well as surveys to determine species occurrence. Table 1 lists the species that may occur in and near New Bullards Bar Reservoir that have special State or Federal status.

Table 1. Fish and Wildlife species of interest that may be present at New Bullards Bar Reservoir and their State or Federal Status.

Common Name	Scientific Name	Status
Birds		
Bald eagle	*Haliaeetus leucocephalus*	FT, SE
American peregrine falcon	*Falco peregrinus anatum*	FSS, SE
California spotted owl	*Strix occidentalis occidentalis*	FSS, CSC
Northern goshawk	*Accipiter gentilis*	FSS, CSC
Greater sandhill crane	*Grus canadensis tabida*	FSS, ST
Osprey	*Pandion haliaetus*	FSI, CSC
Great Blue Heron	*Ardea herodias*	FSI, CSC
Mammals		
Fisher	*Martes pennanti*	FSS, CSC
Wolverine	*Gulo gulo*	FSS, ST
Pallid bat	*Antrozous pallidus*	FSS, CSC
Townsend's big-eared bat	*Corynorhinus townsendii*	FSS, CSC
Western red bat	*Lasiurus blossevillii*	FSS
Reptiles		
Northwestern pond turtle	*Clemmys marmorata marmorata*	FSS, CSC
Amphibians		
California red-legged frog	*Rana aurora aurora*	FT, CSC
Foothill yellow-legged frog	*Rana boyleii*	FSS, CSC
Fish		
Hardhead	*Mylopharodon conocephalus*	FSS, CSC

CSC = California Species of Special Concern
FSI = Forest Service Special Interest
FSS = Forest Service Sensitive, Region 5
FT = Federally listed, Threatened
SE = State-listed Endangered
ST = State-listed Threatened

(Table updated 4/11/02)

Some of these species are known to occupy key areas of New Bullards Bar Reservoir, while others are less known or assumed to be present because their habitat is present. Thorough systematic surveys for many sensitive species have not been conducted. This makes it difficult to mitigate effects at site-specific locations; and, instead, may result in recommended mitigations that cover broad habitats.

In addition to the species listed in Table 1, a historic migratory route for the Downieville Deer Herd traverses the reservoir, and deer continue to swim this route (California Department of Fish and Game). The increase in shrub forage as a consequence of the 1999 Pendola Fire is expected to attract higher concentrations of deer within the northern portions of the reservoir.

The primary game fish present at New Bullards Bar Reservoir are: Kokanee salmon (*Oncorhynchus nerka*), rainbow trout (*Oncorhynchus mykis*), largemouth bass (*Micropterus salmoides*), small mouth bass (*Micropterus dolomieui*), spotted bass (*Micropterus punctulatus*), and green sunfish (*Lepomis cyanellus*). These species are stocked by the California Department of Fish and Game and private interst groups. Sacramento pike minnow (*Ptychocheilus grandis*) and Sacramento sucker (*Catostomus occidentalis*) are the primary native non-game fish.

The need to manage a variety of resources and activities while protecting threatened, endangered, and sensitive species and other fish and wildlife presents a difficult challenge. Activities such as urban development, timber harvesting, recreation activities, recreational developments, woodcutting, water drafting, road maintenance and development, and reservoir maintenance can adversely affect wildlife. The following briefly summarizes the kinds of effects that humans can have on wildlife.

Direct Effects include activities that disturb, increase stress, reduce fitness, lower reproduction, increase predation, displace, or kill individuals. For example, continuously disturbing individuals from foraging sites increases their energy requirements and reduces feeding opportunities. If this happens at critical times, it and can prevent them from reaching breeding condition, successfully reproducing, or dying from starvation.

Indirect effects include activities that lead to the degradation or removal of breeding, foraging, sheltering, or movement habitat, or activities that reduce food resources. Habitat may be degraded by physically changes to its structure or function, and also by increasing human disturbances so it regularly displaces animals out of it.

Cumulative effects combine the effects from past, present and reasonable foreseeable future activities. When taken individually, no single activity may cause much of an effect, but when combined with other activities over time and place, the increased effects to individuals or populations may be significant.

Yuba County Water Agency's Missions and Goals

A mission and goal stated in the Yuba River Development Project Plan (Yuba County Water Agency 1993) is to maintain habitat for healthy fish and wildlife species. The Federal Energy Regulatory Commission does not stipulate specific plans for protection of threatened and endangered species, but expects the property owner (USFS and YCWA) to fulfill their protection obligations according to the rules of the U. S. Fish and Wildlife Service.

In a letter dated January 21, 1999, the Yuba County Water Agency proposed a Draft Operation and Maintenance Guidelines for the Yuba River Development Project for ESA listed and USFS Species of Concern. This letter addresses their agency goals and proposed implementation of goals. A summary of this letter states:

> Conduct YCWA Yuba River Development Project operation and maintenance activities in a manner that minimizes impacts to species of concern. Implementation would occur through an annual meeting each January with USFS and YCWA staff to review planned projects and activities. Activities of possible concern would be identified, and plans would be developed to avoid or minimize impacts. This meeting would attempt to develop work schedules and approaches that minimize potential impacts that are identified.
>
> Identify known species listed under the state and federal ESA and USFS species of concern. Develop and education program for YCWA and YCWA concessionaire employees to recognize species of concern, their habitat, and critical life stages. When requested by USFS, YCWA will assist USFS by reporting sightings of species of interest.

II. Land Ownership and Management

A variety of public and private interests, within the Management Plan area of interest, own and manage land around New Bullards Bar Reservoir (Figure 1). The majority of the land is National Forest Sytem Lands, managed by two national forests, the Tahoe National Forest on the east, and the Plumas National Forest on the west. The Yuba County Water Agency owns the majority of the private land around the perimeter of the reservoir, with individual private property owners and residential housing occupying the remainder.

The U. S. Forest Service and Yuba County Water Agency manages the majority of the land within the first mile of the water's edge around the Reservoir. Residential development that has occurred in the past 10 years is mostly concentrated outside the first mile, northwest near Moran Cove, south near Moonshine Road, and east around the town of Camptonville. This residential development has resulted in an effort by the U. S. Forest Service to emphasize fuels reduction projects around these communities. Under the Sierra Nevada Forest Plan Amendment (USDA Forest Service 2001), two kinds of fuels reduction zones are delineated around communities: (1) Defense Zones, where the most intensive fuel-reduction efforts occur, and (2) Threat Zones, with less intensive treatments. Figure 1 delineates these land allocations as they occur around New Bullards Bar Reservoir.

III. Vegetative Communities

Figure 2 shows vegetative communities crosswalking Tahoe National Forest vegetation into the State of California WHR vegetation.

IV. Recreation

The Yuba County Water Agency is licensed to manage New Bullards Bar Reservoir and provide hydroelectric power, flood control, domestic and agricultural water, and recreation. The reservoir is a 966,103 acre-foot water storage facility, covering 4,809 water surface acres at a maximum water surface elevation of 1,956 feet above sea level (Yuba County Water Agency 1993). The reservoir is mostly undeveloped, but offers easy road access and is particularly attractive to those seeking motorized boat recreation in a scenic setting of forests and remote canyons.

A permit system is used to manage the number of houseboats and boat access campsite users. A maximum of 74 boat access campsite permits (on the shoreline or on developed sites accessible only by boat) will be issued on any one day. When the reservoir is above 1941 feet, permits will be limited to the 38 developed camp sites only. The number of houseboats occupied at any one time is limited to 60.

Recreational camping use includes boat and car camping (Table 2), and day-use boating and picnicking (Table 3).

Table 2. Total Recreational Visitor Days (RVDs) for camping use (boat and car camping)

Year	RVDs
1988	27,575
1989	40,287
1990	49,797
1991	67,919
1992	61,990
1993	59,369
1994	51,699
1995	54,707
1996	41,537
1997	45,079
1998	54,000
1999	69,077
2000	64,616
2001	62,913

(Table 2 updated 4/11/02)

Table 3. Total Recreational Visitor Days (RVDs) for day use (including boating and picnicking)

Year	RVDs
1985	7,765
1986	14,041
1987	13,299
1988	16,775
1989	19,338
1990	24,711
1991	29,118
1992	32,682
1993	25,110
1994	26,583
1995	27,592
1996	26,171
1997	information not available
1998	30,424
1999	26,208
2000	27,752
2001	33,074

(Table 3 updated 4/11/02)

Figure 3 shows the levels of recreational use that occurs around the reservoir, showing the general areas of low, moderate, and high use areas and administrative sites.

IV. Species Addressed

A. BALD EAGLE

Applicable Laws and Management Direction

The bald eagle was listed as a federally endangered species in 1978. On July 12, 1995, this species was reclassified to Threatened status in the lower 48 states. It was proposed for de-listing on July 6, 1999, but remains protected unless delisting is finalized. Following delisting, the species would be placed on the Region 5 Regional Forester's Sensitive Species List (USDA Forest Service 1999). Monitoring is required as a part of the delisting process.

If delisted, bald eagles will continue to be protected under the Migratory Bird Treaty Act of 1918 and the Bald and Golden Eagle Protection Act. Measures currently being taken to minimize disturbance at nesting sites should be maintained in future management for this species. The bald eagle is also currently protected under the State of California Endangered Species Act, listed as state endangered.

National Forest Management Direction

Once delisted, Region 5 of the USDA Forest Service would place it on the Regional Forester's Sensitive Species List and it would be managed according to Forest Service Manual 2670 direction. The species status as "Sensitive" in Region 5 would be re-evaluated at the end of the five-year monitoring period that is identified in the U. S. Fish and Wildlife Service's Final Rule for delisting the species, as published in the Federal Register; or if there is a change in the species' status under the ESA during this period (for example, if the Fish and Wildlife Service initiated relisting due to information gathered from monitoring).

As stated in the Tahoe National Forest Land and Management Plan (p V-27), the forest will "adopt the Recovery Plan for the Northern Bald Eagle as the guide for management on the Forest," and "manage nesting and wintering habitats for target populations as specified in the species recovery plan." Conservation Recommendations for the bald eagle taken from the Biological Opinion for the Sierra Nevada Forest Plan Amendment (USDA Forest Service 2001) represent the most recent management recommendations. They are as follows:

1. Assist the Service in further implementing recovery actions identified within the Recovery Plan for the bald eagle.

2. Conduct systematic surveys across the landscape to detect additional bald eagle nests and communal night roosts.

3. Monitor bald eagle responses to human generated disturbances, including threats and changes to bald eagle habitat. If the data results indicate bald eagles are exposed and negatively impacted by disturbances, consult with the Service on ways to minimize the impacts.

4. Promote public education regarding the importance and successes of conservation and protection of the bald eagle and other listed species. This can be done using signs in occupied habitat, brochures at ranger stations, and other mediums.

5. Within two years of the signing of the Record of Decision, prepare a bald eagle management plan for every basin or site in the analysis area with occupied bald eagle territories. Each bald eagle management plan should be prepared in consultation with the Service. The objective of a bald eagle management plan should be to perpetuate existing habitat conditions in the nesting, foraging, and wintering areas to maintain nesting pairs of bald eagles and to provide for additional nesting territories, based on the habitat suitability and carrying capacity of the area (as measured using Peterson's (1986) bald eagle habitat suitability index model). Each bald eagle management plan should address the effects of recreation, mining, timber management, residential development, hydroelectric power production, fisheries management, and other effects to bald eagles while offering measures to minimize these effects, including:

   A. Seasonal (January 1 to August 31 or 3 weeks after chicks have fledged) road closures within a quarter mile of bald eagle use areas should be implemented on roads, off-highway vehicle routes, or over snow vehicle routes within a quarter mile of bald eagle nesting, roosting, or wintering areas.

B. Seasonal (January 1 to August 31 or 3 weeks after chicks have fledged) boating restrictions should be implemented within a quarter mile of bald eagle use areas where recreational boating and other water activities pose potential negative impacts to breeding, roosting, or wintering bald eagles.

C. Seasonal (January 1 to August 31 or 3 weeks after chicks have fledged) trail restrictions should be implemented within 500 feet of a bald eagle nesting, roosting, or wintering area where hiking and bicycling trails pose potential negative impacts to the bald eagle use area.

D. Non-system and other roads that lead to sensitive bald eagle habitat such as nesting, foraging, or roosting sites should be gated and bermed.

E. Protection and enhancement of fish habitat in occupied bald eagle use areas through the maintenance of streambank stability by restricting activities such as, but not limited to livestock trampling, OHV use, stream crossings, and recreational use.

F. Protection and enhancement of waterfowl habitat in occupied bald eagle use areas through the maintenance of riparian and lake shore vegetation (waterfowl nesting habitat) by restricting activities such as, but not limited to livestock trampling and grazing, OHV use, and recreational use.

G. Seasonal restrictions on logging activities to avoid the bald eagle breeding period (January 1 to August 31 or 3 weeks after chicks have fledged) within one half mile of a nest. This should be increased to one mile for helicopter logging activities. In areas with wintering bald eagles, implement seasonal restrictions on logging activities to avoid the bald eagle wintering period (approximately November 15 to March 15) within one quarter mile of roosts, increase to one half mile for helicopter logging activities.

H. Seasonal restrictions on prescribed burns. Do not implement prescribed burns within one quarter mile of a nest during the breeding season (January 1 to August 31 or 3 weeks after chicks have fledged). If the nest is unoccupied or prescribed burns are to take place outside of the breeding season, maintain the fire at a distance of 500 feet from the nest. Fuels within a 500 foot radius of the nest should be hand thinned. In areas within 500 feet of bald eagle roosts and perches, implement seasonal restrictions on prescribed burns to avoid the bald eagle wintering period (approximately November 15 to March 15).

Yuba County Water Agency's Missions and Goals

The Yuba River Development Project Plan identifies one bald eagle nest near the Garden Point Boat Access Campground. It also identifies the northwest shoreline of the reservoir near the Burnt Bridge Campground as a potential future nesting area, and it states that if any new recreation facilities are planned in known or potential bald eagle nesting or roosting areas, a site specific analysis of the impacts of such development should be performed. The Burnt Bridge Campground was closed in September 1996, with no plans to reopen.

In their development plan (Yuba County Water Agency 1993) the water agency identifies a number of habitat management objectives and policies as stated in the Tahoe National Forest's Draft Habitat Management Plan for the Bald Eagle (USDA Forest Service 1991) as follows:

> Prepare and implement site specific management plans for all known nest sites. Coordinate with Forest Service and other agency recreation plans, since most key eagle habitat areas coincide with high recreation use areas.
>
> Restrict human disturbances (vehicle, foot, and boat traffic) within 0.25 miles around nest(s) from January 1 to July 15. This buffer should be increased up to 0.50 miles if there is line-of-site vision. Time and distance buffers should be modified according to site-specific conditions.
>
> Coordinate with USFS recreation plans for potential nest areas and winter roost sites.
>
> Avoid clear-cut logging, road building, hiking trails, or boat launch facilities within 0.25 mile of potential nest sites. Other possible sources of disturbance, such as mining operations, campgrounds, boat traffic, etc. should be evaluated on a site-by-site basis.
>
> Restrict buildings closer than 0.25 mile from the shorelines of winter feeding waters.

The Pacific Bald Eagle Recovery Plan (USDI Fish and Wildlife Service 1986)

The Tahoe National Forest lies within Zone 28 (Sierra-Nevada Mountains) of the Pacific Bald Eagle Recovery Area (USDI Fish and Wildlife Service 1986). The Recovery Plan established a population goal for New Bullards Bar Reservoir of three breeding territories.

It calls for the design and implementation of site-specific plans throughout the recovery area that "secure individual nest sites, roosts, and foraging areas" (USDI Fish and Wildlife Service 1986), and that provide wintering habitat for an unspecified number of bald eagles. Local management plans should ensure that long term management: (1) provides suitable nesting and foraging habitat, (2) protects present and future habitat necessary for the well-being and continued existence of this species, and (3) restricts and minimizes human disturbances around critical habitat components.

It also calls for plans to describe the human activities that can be permitted as well as those that must be prohibited; and to describe the steps needed to protect and secure key habitat such as nests, roosting trees, and food resources. Each plan should include a map outlining the important eagle use areas and a list of appropriate methods for protecting suitable nesting, foraging, and roosting habitat over time.

A second component of the Recovery Plan is to "Manage breeding and nonbreeding habitat," which is described at the site-specific level as: "managers should identify and manage for the specific needs of individual territorial pairs and groups of roosting eagles." (USDI Fish and Wildlife Service 1986).

The bald eagle section of this document is intended to meet the task of developing a site-specific plan at New Bullards Bar Reservoir in accordance with the direction, missions and goals identified by the agencies involved.

The following lists the Pacific Bald Eagle Recovery Plan work items that are applicable to this Management Plan:

1.11 Locate and describe all existing nest sites, communal roosts, foraging areas, and areas used during migration;
1.12 Assess the suitability of habitat not presently used by bald eagles;
1.23 Incorporate eagle habitat guidelines in agency land use plans;
1.31 Manage and improve quantity, quality, and availability of food supplies by:
1.3115 Review programs to control non-sport fish in known eagle foraging areas;
1.3116 Discourage chemical control of aquatic insects in eagle use areas;
1.3118 Maintain and improve habitat for fish by reducing siltation from logging, roads, and overgrazing;
1.3123 Leave avian and mammalian carcasses on site for future use by eagles;
1.3215 Preserve snags in eagle use areas;
1.33 Restrict human disturbance at eagle use areas;
1.331 Establish buffer zones around nest sites;
1.332 Exclude logging, construction, habitat improvement, and other activities during critical periods of eagle use;
1.333 Prohibit building construction near key bald eagle nesting and wintering habitats;
1.334 Prohibit vehicle traffic at sensitive key areas during periods of eagle use;
2.11 Monitor threats and changes to habitat (nesting territories, foraging areas, communal roosts, and associated winter habitat, and habitat for breeding and non-breeding eagles;
2.211 Inventory the breeding population and determine annual productivity;
2.212 Identify and monitor the size and distribution of wintering populations;
4.131 Replace or modify problem power line structures, using accepted designs;
4.132 Restrict power line construction within identified flight lanes near winter roosts;

History of Bald Eagles at New Bullards Bar Reservoir

Little documented historic information of bald eagle nesting is recorded for New Bullards Bar Reservoir. When the bald eagle was listed in 1978, no nesting eagles were known for the Sierra Nevada south of Lake Shasta. The Pacific Bald Eagle Recovery Plan identifies a goal of establishing three breeding territories at New Bullards Bar Reservoir. With only one known territory, this goal has not been achieved.

Bald eagle activity has been documented on New Bullards Bar Reservoir since the early 1970's. Reports that bald eagles were more abundant in the 1970's and 1980's are difficult to validate. The U. S. Forest Service conducted a nest search in 1978, and several possible eagle nests were observed. All the nests were inactive. Nesting had not been documented at New Bullards Bar Reservoir until 1989, when a nestling was observed in a nest on the Garden Point peninsula. Since 1989 the Forest Service has monitored the Garden Point breeding territory for breeding success (Table 4). The District routinely maintains records of bald eagle sightings that are reported.

Road closures on the Garden Valley Road were implemented shortly after the discovery of the nest in 1989, with a gate preventing year-round vehicular access for 0.5 miles above the nest tree, and a seasonal closure (November 1 through May 31) north of this gate to its intercept with the Baker Ranch Road.

In October 1999, the Pendola Fire burned through the nest territory killing the nest tree on the west side of the peninsula (used 1989 through 1999). The eagles rebuilt their nest in a live tree on the east side of the peninsula near Tractor Cove. The nest failed during the 2000 breeding season, but fledged one young in 2001.

Since 1979, the Forest has conducted annual surveys of winter use around the perimeter of New Bullards Bar Reservoir the second week of January. As needed, monitoring has occurred at specific locations to better determine bald eagle use. Concentrations of sightings occur around the Garden Point area. Smaller clusters of sightings are also recorded at the dam site, Frenchy Point, and over New Bullards Bar Reservoir near Willow and Bridger Creeks.

Table 4. Reproductive success of Garden Point Breeding Territory

Year	No. fledged young	No. fledged/5 years	% success over 5 yrs.
1989	1	--	--
1990	2	--	--
1991	2	--	--
1992	2	--	--
1993	1	1.6	100
1994	2	1.8	100
1995	0	1.4	80
1996	0	1.0	60
1997	0	0.6	40
1998	1	0.6	40
1999	2	0.6	40
2000	0	0.6	40
2001	1	0.8	60

(Table 4 updated 1/15/02)

A second nest, further south and closer to the Garden Point Campground, has been identified on Garden Point Peninsula. Eagles have been observed occasionally in the vicinity, however no nesting activities or nestlings have been documented at this nest site. In October 1999, the Pendola Fire burned through the nesting territory, killing the nest tree and most conifers within a 1000-foot radius. The eagles rebuilt their nest in a live tree on the opposite side of the peninsula near Tractor Cove. The nest failed in 1999.

The Pacific Bald Eagle Recovery Plan goal is to achieve an average reproductive rate of 1.0 fledged young per pair, with an average success rate per occupied site of not less than 65% per 5-year period. New Bullards Bar has not met these criteria since 1995.

Numerous sightings of bald eagles are recorded throughout New Bullards Bar Reservoir during the winter months. The largest concentration of bald eagle use is within 0.5 miles of the dam in the winter. As many as 10 bald eagles, both adult and immature, have been observed perching together. Bald eagles are often observed foraging at this location in the fall, especially when the kokanee congregate at the dam.

Since 1979, annual surveys have been conducted during the National Wildlife Federation Midwinter Bald Eagle Survey (Table 5).

Table 5. New Bullards Bar Reservoir mid-winter bald eagle survey results

Year	Adults	Immature	Unknown
1979	1	9	
1980	1		
1981	no record		
1982	2		
1983	no record		
1984	6		
1985	no record		
1986	4	2	
1987	6	3	
1988	1	1	
1989	2	1	
1990	--	--	
1991	7	3	
1992	4	4	
1993	--	--	
1994	--	--	
1995	2	1	
1996	10	7	
1997	6	2	1
1998	4	1	
1999	4	3	
2000	7	3	
2001	1	1	
2002	3		

(Table 5 updated 1/15/02)

Habitat

New Bullards Bar Reservoir supports a diversity of vegetation typical of montane hardwood-conifer habitats. The most common tree species are Ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), Douglas-fir (*Pseudotsuga menziesii*), incense cedar (*Calocedrus decurrens*), California black oak (*Quercus kelloggii*), tan oak (*Lithocarpus densiflorus*), and Pacific madrone (*Arbutus menziesii*).

Bald eagle habitat is discussed similar to that described in the Pit River Interagency Bald Eagle Management Plan (1986), as follows:

1. Nesting Habitat. This habitat is designated immediately around all nest sites existing in the plan area. The size and shape of the designated area varies at each nest territory depending on topography, number of nest sites in the territory, and the known habits of each eagle pair. This designation is the most restrictive with regard to timber management and human activity.

2. Essential Habitat. This designation includes all areas used by bald eagles for nesting, foraging, perching or roosting; it includes the areas designated as nesting habitat. The essential habitat designations are based upon limited field knowledge of eagle use, and the designated areas should be refined in the future. This designation, although not as restrictive as nesting habitat, also imposes limitations on human activity, timber, fisheries management and other activities. In areas where essential habitat is surrounded by expansion habitat, it is hoped that future nesting activity may occur in addition to present foraging use.

3. Expansion Habitat. These are areas presently receiving a low level of bald eagle use, but appear suitable to accommodate an expansion of the bald eagle nesting population. Using Peterson (1986), the Habitat Suitability Index at Bullards is calculated around 0.8. Using the model presented by Peterson (1986), human disturbances are most likely the primary limiting factor to bald eagle nesting at the Reservoir is human activities. The Recovery Plan for the Pacific Bald Eagle requires that the population be managed for expansion, recovery, and eventual delisting of the species. Under the objectives of this plan, expansion habitat also serves as a buffer against a loss of an existing nesting territory in the plan area. At Bullards Bar Reservoir, the Recovery Plan identifies a recovery goal of three breeding eagles. Therefore, for this plan, expanded breeding territories that could potentially serve as this expansion habitat are the following: (1) The area southwest of Moran Cove/Burnt Bridge, and (2) Willow Creek and south, and (3) Long Point. These are displayed in Figure 4. Following recommendations similar to those made in the Pit River Interagency Bald Eagle Management Plan (Lassen National Forest, 1986), the recommendations for expansion habitat should be regarded as equivalent to essential habitat. The two designations vary in the present level of bald eagle use within them. Human activities which occur in expansion habitat should be planned so as not to preclude future eagle use. Should nesting occur in these or any other areas around the Reservoir, the habitat designations will be upgraded as necessary.

Recreation

Disturbance by recreationists can adversely affect bald eagles. The effect of disturbance on eagles varies with the intensity of recreational use, distance to eagle use areas, time of year, and other factors. Nest territories, foraging areas, and roost sites are particularly sensitive to disturbance and require special management. Nearly all common recreational activities, including fishing, boating, hiking, hunting, camping, or birdwatching, can potentially conflict with bald eagle management when they occur in essential habitats. Managing bald eagles seeks to minimize interactions with recreationists in essential habitat whenever possible. The objective of this element is to avoid increased recreation in essential eagle habitats while solving existing recreation conflicts with bald eagles.

Illegal killing of eagles is a problem in northern California, including the shooting of a bald eagle at New Bullards Bar Reservoir in the late 1990s. Land management agencies should educate their personnel and contractors regarding laws that protect eagles, and the appropriateness of publically disclosing specific locations of sensitive areas around New Bullards Bar Reservoir, such as nest and roost (especially winter night roost) locations. Signing administrative closures or interpretive developments should also consider the effects of particular wording of signs.

In 2000, National Forest System Lands within 0.25 to 0.5 miles of the nest were seasonally closed to public access (April 1 through August 31) within 0.25 to 0.5 miles of the nest. The lower mile of the Garden Valley Road is closed to the general public year-round; it is used for administrative purposes which generally includes a few visits to the campground during breeding season for maintenance. Once a new nest was discovered in Tractor Cove (March 2000) a buoy system was installed to close a portion of Tractor Cove (May 2000). Closures to protect breeding sites should cover Janauary 1 to August 31 or three weeks after chicks have fledged (USDI Fish and Wildlife Service, Biological Opinion, 2001).

With the exception of the seasonal closure at Tractor Cove, all shorelines are open to public camping by permit. Trees that die along the shoreline that have a potential to fall within public use areas, and eventually float into the water, both of which create public safety hazards. The USFS and the YCWA have a commitment to provide a safe recreating experience for the public. Felling and removing dead trees that could provide foraging perches for eagles, may remove habitat elements important to eagles. Standards need to be developed to reduce effects to bald eagles while still providing a safe visitor experience, and that assist land managers in understanding what actions necessitate consultation with the U. S. Fish and Wildlife Service.

Floating toilets have variably been placed around New Bullards Bar Reservoir, and they increase human presence around them. In the past, toilets were sometimes placed in the vicinity of the bald eagle nest. Selection of sites to place these facilities should consider the effects this has in increasing boat traffic.

General maintenance at campgrounds and day use facilities includes routine cleaning, trash collection, and pumping of outhouses. In the past, the Garden Point Road was used for truck access to pump the outhouse. Because of the close proximity of the bald eagle nest to the Garden Point Road, pumping should occur in the Fall of each year, to avoid the necessity of spring pumping. Vehicle access to the campground is again needed by July, but this would occur after egg incubation and hatching.

Planned developments to enhance recreational opportunities and experiences need to consider their effect of increasing or changing human activities within essential bald eagle habitats.

There is a need to routinely remove hazard trees around the reservoir and its related facilities. Trees with a high probability of having limbs or entire trees fall on people, vehicles, or structures, present a public safety hazard, especially within frequently used areas of the Reservoir. In the past, trees identified as hazards (generally ones showing signs of decay, or dead and dying trees) are reviewed on an individual basis and subsequently felled. This commonly occurred within and around administrative sites (campgrounds, day use areas). Consultation on this routine activity needs to occur, to incorporate recommendation from the U. S. Fish and Wildlife Service for federally-listed species. Because of the high numbers of hazard trees potentially created by the Pendola Fire, informal consultation for the Pendola Restoration Project (March 1999) allowed for the removal of dead and dying hazard trees along the water's edge. Additional mortality is occurring within these stands, and this may necessitates reviewing appropriate standards for the felling and removing of hazard trees covered under that consultation and the need to pursue additional consultation. Developing guidelines for routinely addressing hazard tree removal and disposal by burning at the Reservoir can clarify the need for additional measures to be incorporated within the burn area.

Trail maintenance activities that incorporate the use of mechanized equipment should apply appropriate limited operating seasons to protect bald eagles. If there are questions regarding the kinds of activities, locations and times of limited operating seasons, a qualified biologist should be consulted. A biologist should be consulted regarding any use of herbicides along trails or within administrative sites.

With the exception of the administrative closure within Tractor Cove, the remainder of the shoreline is open to camping. Steep terrain naturally eliminates portions of the shoreline to high public use, with picknicking and overnight camping being patchily distributed on the shore. Considerations should be made regarding the need to close additional areas to promote bald eagle nesting.

Vegetation Management

In 1989, the Skyline timber sale included several mitigations and management requirements to eliminate disturbances to bald eagles and promote suitable bald eagle habitat. Although different from current mitigations recommended through consultation with USFWS, consultation at the time required the following:

> Establish a ¾ mile zone around the bald eagle nest (Garden Valley Peninsula area) and implement silvicultural prescriptions that promote suitable bald eagle habitat.
>
> Maintain a seasonal logging and road closure in the Garden Valley Road area (November 1 through May 31) to protect bald eagle nests.

In 2000, the Pendola Fire Restoration project salvage logged within the breeding territory. Among others, all trees previously used for nest building were retained, whether dead or alive, and all trees greater than 18 inches were retained. Fire-killed hazard trees along the shoreline were removed (trees within 165 feet of the shoreline within high public use areas). To provide for shoreline perching structures, trees that are immediately adjacent to the shoreline should be felled waist high.

The Sierra Nevada Forest Plan Amendment significantly changed timber management within the Sierra Nevada. Land allocations determine the timber management activities that can occur within them, with the attainment of fuels reduction a primary driving factor for management actions. Site-specifically, land allocations for fuels treatments and wildlife protection are the two greatest variables determining the management standard that is applied in any given place. Figure 1 identifies the fuels allocations (Defense and Threat Zones) for National Forest System lands around the reservoir; and Figure 5 identifies wildlife land allocations that emphasize the maintenance of old forest characteristics (California spotted owl and goshawk Protected Activity Centers, and spotted owl Home Range Core Areas).

Two activities commonly used in association with fuels reduction treatments are: (1) mechanical vegetation removal by masticating smaller diameter vegetation and (2) prescribed fire. Under the Sierra Nevada Forest Plan Amendment, most areas around the Reservoir lie within the "Threat Zone." The most excessive treatments allow for the removal of trees up to 20 inches in diameter, focusing on removing suppressed and intermediate trees to enhance stand heterogeneity. The treatments vary within zones by the level of canopy cover that may be removed, and the fuels reduction objectives that are met. Application of these standards should promote bald eagle nesting and foraging habitat within National Forest Lands around the Reservoir while decreasing the risk of fire.

Around administrative sites (campgrounds, day-use areas, boat launches), understory vegetation may be removed by hand or chainsaws. This material is often stacked and burned. It is most practical to conduct these activities by administrative personnel outside of the recreation season and fire season. Consultation needs to occur with the U. S. Fish and Wildlife Service to determine whether limited operating seasons need to be implemented for all of these activities; or whether a certain level of burning may be permitted at scattered locations around the Reservoir during the winter.

Residential Development

The majority of land within 0.5 miles of the Reservoir is managed by the Tahoe and Plumas National Forests and the Yuba County Water Agency (Figure 1). The Chy Company, a private timber company, owns several hundred acres of private land just north of Moran Cove. The Pendola Fire intensely burned through this area in 1999, and it was subsequently logged. Although bald eagles may forage along the shoreline, the general lack of suitable nest trees makes it less likely that a breeding territory would become established there. These lands are, however, within 0.75 mile of a winter night roost. Residential development could occur on this land in the future. Within one mile of the Reservoir, most residential development is east of the dam in the vicinity of Moonshine Road. Within two miles of the Reservoir, additional development is occurring east around the town of Camptonville and west around the town of Greenville. Residential development has the potential to affect winter night roosts and reduce nesting opportunities for eagles, but these effects become less likely as distance from the water increases.

Hydroelectric Power Production and Reservoir Maintenance

A list of routine maintenance activities was prepared for the Yuba County Water Agency, and it appears as Appendix A. Most appear have been occurring throughout the years at locations where disturbances have been ongoing. Some have been selected as having a higher potential to affect bald eagles, and should be discussed further in this plan. They are: gathering, stockpiling, and disposing of hazardous wood debris; identifying potential activities that may require consultation; and addressing activities at satellite locations that should be considered in context with this plan.

Dead trees that wash into New Bullards Bar Reservoir when water levels and flows are high, create floating hazards to boaters. Historically, the Yuba County Water Agency has gathered wood debris, contained it in various coves, waited for lowering water levels to land-lock this debris, and subsequently burn it. Optimal sites along the water's edge are places with gradual slope that also provide access by heavy equipment used to pile large pieces of wood for burning. Two places provide the best opportunities: Moran Cove and Tractor Cove. Following the 1999 Pendola Fire, the bald eagles relocated their nest just above Tractor Cove. Because of the bald eagle nest, no additional wood has been stockpiled there. The stockpiling of wood can create a physical barrier that reduces foraging opportunities for eagles. Disturbances from stockpiling wood, operating heavy equipment, and burning piles need to be avoided within essential habitats for bald eagles. Appropriate disposal methods, the timing of activities, and locations of disposal sites need to be selected in consultation with the U. S. Fish and Wildlife Service.

Three alternative coves have been tentatively selected for routinely stockpiling floating wood, based on road access, topography, and balancing threatened species concerns (Figure ___). Although the selected sites are within the bald eagle breeding territory, it appears that practical mitigations can be implemented to alleviate concerns to breeding eagles. Appropriate consultation on this activity needs to be pursued in the very near future with the U. S. Fish and Wildlife Service, and added as an appendix to this plan. Because floods will occur in the future, it would be prudent to establish perameters for identifying overflow sites during "emergencies," and the appropriate consultation procedures for use of these overflow sites.

Cottage Creek Boat Ramp

The dam, adjacent to Cottage Creek Boat Ramp, appears to have the highest concentrated bald eagle use during the winter. Typical mitigations to protect wintering eagles at foraging sites is to limit disturbances approximately between November 15 to March 15 within one quarter mile of roosts (USDI Fish and Wildlife Service 2001). Some years the kokanee begin congregating at the dam earlier, and foraging eagles are present (M. Tierney, personal observation). It is recommended that the limited operating period at the dam begin November 1. Activities that increase noise or disturbances above normal daily background levels such as painting the gates and construction work involving heavy equipment should follow the limited operating periods. Consultation with the U. S. Fish and Wildlife Service should occur if there are questions regarding the kinds and timing of activities. These dates should be better refined with additional monitoring information.

Fisheries Management

The California Department of Fish and Game releases Kokanee fingerlings and Rainbow trout in New Bullard Reservoir yearly (Table 6)

Mining

A search of the Bureau of Land Management data base in February 2002 shows 34 active claims encompassing 680 acres within a two-mile radius of the Reservoir—33 are placer claims, 1 is a lode claim. Active claims are limited to minor exploratory work, with, little to no surface disturbances, storage of equipment, structure building, or extended camping (longer than two weeks), without prior authorization from the U. S. Forest Service. The miner requests authorization by filing a Plan of Operations with the appropriate National Forest. At the present time, no active claims are operating under an approved Plan of Operations. As such, all are limited in scope. Should any expand, the miner would have to submit a Plan of Operation for review and approval by the U. S. Forest Service. At that time, the operation would be evaluated for its compliance with the Endangered Species Act and the National Environmental Policy Act. Any needed consultation with the U. S. Fish and Wildlife Service would occur at that time.

Because the California Department of Fish and Game issues dredging permits, an unidentified number of dredging operations may be present.

Current Site-specific Recommended Mitigations and Action Items

1. In 2000, National Forest System Lands within 0.25 to 0.5 miles of the nest were seasonally closed to public access (April 1 through August 31). The buoy closure remained in place in 2001, with closures officially in effect beginning January 1. Closures should continue to cover the bald eagle breeding season January 1 through August 31 (or three weeks after chicks have fledged), as recommended by the U.S. Fish and Wildlife Service.

2. The use of buoys and signs implementing a seasonal public access closure should continue to be implemented within Tractor Cove. Because this buoy does not prevent access for a full 0.5 miles line-of-sight distance from the Garden point nest tree, a 5m.p.h. speed zone was also signed within the remainder of the cove. Monitoring of the effectiveness of buoys and signs needs to occur in conjunction with monitoring reproductive success at the new nest. Should reproductive success remain below recovery goals, alternative solutions for reducing disturbances need to be considered (i.e. extending buoys to cover 0.5 mile line-of-sight distance, enforcement of 5mph zone).

3. Administrative closures prohibit general public access on land within 0.25 miles of the bald eagle nest during January 1 through August 31, including the Garden Point Road. The upper Garden Point Road gate has been repeatedly vandalized (lock removed) or left open, and the lower gate has been circumvented by motorcycles in previous years. In 1998, installation of new structures effectively closed this area to vehicle access, and monitoring confirmed its effectiveness through 1999 until the Pendola Fire and subsequent timber sale re-opened the landscapes vegetation that once served as barriers to limit vehicle access. The effectiveness of present barriers and gates needs to be diligently monitored in the future.

4. Work in consultation with the U. S. Fish and Wildlife Service to develop guidelines for the removal of hazardous trees along the shoreline and floating wood debris removal.

5. Locate all portable bathrooms > 0.5 miles from nests. These locations should also consider the resulting traffic patterns that may occur from boats accessing these facilities.

6. Identify routine maintenance activities that may/may not need consultation, and prioritize those that do.

Monitoring

Annual bald eagle monitoring (listed in order of priority) should include the following:

Bald eagle nest(s) to determine nesting status and success
Mid-winter survey (should include noting any nests observed and locations of eagles)
Winter night roost use
A spring search (April) for additional nest sites and/or territories (recommended during April)

If sufficient funding is available, monitoring should include:

Search for additional communal winter night roosts; monitor sites located.
Identify additional summer and winter foraging sites.
Search for nests on the North Yuba River between Indian Valley to its mouth

Past funding has been insufficient to support adequate monitoring, including the minimums described above. Funding opportunities should be sought from a variety of sources which may include:

FERC
USFS
YCWA
volunteers

B. CALIFORNIA RED-LEGGED FROG

Applicable laws and management direction

The California red-legged frog, *Rana aurora draytonii*, is listed as federally threatened (USDI Fish and Wildlife Service 1996). Therefore, the California red-legged frog and its associated habitat is protected under the Endangered Species Act of 1973 (ESA). Additionally, the USDI Fish and Wildlife Service (USFWS) identifies other activities that could result in take to include (but not limited to): 1) introduction of exotic species directly into or within dispersal distance of known listed species habitat, 2) unauthorized destruction/alteration of the listed species habitat such as discharge of fill material, draining, ditching, tiling, pond construction, diversion or alteration of stream channels or surface or ground water flow into or out of a wetland, 3) operation of any vehicles within the stream channel, 4) violation of discharge permits, 5) burning, cutting or mowing of wetland or riparian vegetation, 6) pesticide application, discharge, or dumping of toxic chemicals, silt, or other pollutants into waters or riparian and upland habitats supporting listed species (USDI Fish and Wildlife Service 1996).

A Draft Recovery Plan for the California red-legged frog was released for review on May 12, 2000 (USDI Fish and Wildlife Service 2000). The recovery objective is to de-list the California red-legged frog. The recovery strategy includes protecting existing populations by reducing threats, restoring and creating habitat that will be protected and managed in perpetuity, surveying and monitoring populations, conducting research on the biology of the species and threats to the species, re-establishing populations of the species within the historic range, and development of recovery units and core areas that will be the primary focus of recovery actions. The area of interest for this Management Plan falls within the Sierra Nevada Foothills Recovery Unit (Unit 1). The strategy for recovery of the California red-legged frog within Recovery Unit 1 will involve: protecting existing populations by reducing threats, restoring and creating habitat that will be protected and managed in perpetuity, surveying and monitoring populations and conducting research on the biology and threats of the subspecies, and reestablishing populations of the subspecies within its historic range (USDI Fish and Wildlife Service 2000). The Draft Recovery Plan also identified Indian Creek (New Bullards Bar tributary on the Plumas National Forest) as a core area. Recovery action within core areas should include habitat suitability assessments and long-term protection and management to perpetuate existing, or reestablished populations (USDI Fish and Wildlife Service 2000). No critical habitat is designated in the Management Plan area of interest (USDI Fish and Wildlife Service 2001).

History of California red-legged frogs at New Bullards Bar Reservoir and its associated tributaries

Prior to the flooding of New Bullards Bar Reservoir several wetlands existed that could have supported California red-legged frogs. The recent finding (Sept. 15, 2000) of frogs in Little Oregon Creek (tributary to New Bullards Bar Reservoir on the Plumas National Forest) could represent a remnant population from these wetlands. California red-legged frogs have also been observed in Indian Creek (tributary to New Bullards Bar Reservoir on the Plumas National Forest) near the town of Woodleaf from 1973-1983 (Jennings et al. 1992).

Life history patterns and habitat

The California red-legged frog is a highly aquatic species typically found in cold-water ponds and stream pools $\geq$ 2 feet deep with overhanging, emergent, and/or submergent vegetation (Hayes & Jennings 1988). They are generally found at elevations below 4000 feet, but have been found above this (Martin 1992). They are also generally found in or near water, but do disperse away from water after rain storms (Martin 1992). Optimal breeding habitat of California red-legged frogs is characterized by dense riparian vegetation associated with deep ($\geq$ 2 feet), still or slow-moving water and emergent aquatic vegetation (Jennings 1988, Hayes and Jennings 1988). The California red-legged frog breeds during the months of November through March in most of their current range (USDI Fish and Wildlife Service 1996). Eggs are generally attached to emergent vegetation and hatch within 6 to 14 days of fertilization. The following larval stage usually spans 3.5 to 7 months. Larval development occurs in permanent or nearly permanent pools, and is a critical life stage since less than one percent of larvae reach metamorphosis (Jennings et al. 1992).

Management Plan area of interest

The Tahoe National Forest considers all aquatic habitats that contain water through July 31 (such as lakes, ponds, and water holes, and low gradient (<4%) stream habitats lacking spring flushing flows) located below 5000 feet as suitable breeding habitat for California red-legged frogs. Several studies of California red-legged frogs suggest that dispersal movement can occur over 1.25 miles and up to 2 miles without apparent regard to topography, vegetation type, or riparian corridors (USDI Fish and Wildlife Service 2001). California red-legged frogs may also may make overland excursions through upland habitats during wet weather and travel 300 feet from permanent water during winter to estivate (USDI Fish and Wildlife Service 2000). Based on the frog's mobility throughout the riparian corridor and uplands, we suggest adherence to the Sierra Nevada Forest Plan Amendment (USDA Forest Service 2001) guidelines in developing Riparian Conservation Areas (RCAs) for lentic and lotic waterways within the management area of interest (Figure 3). Management activities within RCA's should not adversely affect California red-legged frog populations or habitat through; fragmentation of breeding and dispersal habitat, degradation of water quality, degradation of habitat, alteration of flow regimes, sedimentation, and proliferation of non-native predators.

The proposed actions in this document apply to Federal land within the area of interest only. Private landowners are encouraged, but not required, to comply with the proposed actions of the Management Plan. The area of interest for this Management Plan is New Bullards Bar Reservoir, and its associated sub-watersheds, and riparian habitat (Figure 3). The steams, lakes, ponds, and riparian areas that make up the area of interest may contain suitable breeding and dispersal habitat and corridors essential for connectivity, expansion, and recovery of California red-legged frog populations. Therefore, this Management Plan will review and suggest management standards and guidelines with regards to current and perceived activities occurring within RCAs of the area of interest (Figure 1). All RCAs within the area of interest are subject to the management standards and guidelines proposed in this document. The primary impetuses for including all RCAs, within the area of interest, in the scope of management standards and guidelines are to perpetuate expansion of existing California red-legged frog populations by sustaining and promoting connectivity among current and historical ranges and quality habitat, and to improve and sustain habitat of foothill yellow-legged frogs (*Rana boylii*) and Northwestern pond turtles

(*Clemmys marmorata marmorata*) which are listed as sensitive on the Region 5 Forester's Sensitive Species List (USDA Forest Service 1998).

Forest Service personnel have observed foothill yellow-legged frogs and Northwestern pond turtles during various aquatic and wildlife surveys (frogs: 2001, 2000, 1999, 1998, turtles: 2001 and 2000) in the area of interest. Foothill yellow-legged frogs have been observed in Brandy Creek, Bridger Creek, and Willow Creek (tributaries to New Bullards Bar Reservoir). Northwestern pond turtles have been observed in Tractor cove and Moran Cove in New Bullard Bar Reservoir. The emphasis on multiple species protection and management at the sub-watershed level reflects recognition of species diversity and habitats associated with New Bullards Bar Reservoir. By developing and implementing management standards and guidelines aimed at restoring and protecting California red-legged frogs, and their associated habitat, we improve the chance of recovery for this species, and promote the sustainability of other species of concern (foothill yellow-legged frog and Northwestern pond turtle) since their range and optimal habitat conditions often overlap with the California red-legged frog.

Objectives

Our main objective is to sustain and perpetuate the California red-legged frog, northwestern pond turtle, and foothill yellow-legged frog populations and their habitats. This objective will be met through suggested management standards and guidelines within RCAs of the area of interest. The type and level of allowable management and maintenance activities will be determined by assessing how current and proposed activities measure against the Riparian Conservation Objectives (RCOs) and their associated standards and guidelines. The RCOs are described in the Sierra Nevada Forest Plan Amendment, which amended the Tahoe and Plumas National Forests Land and Resource Management Plans in January, 2001 (USDA Forest Service 2001).

Sierra Nevada Forest Amendment direction as it applies to this management plan

The following Sierra Nevada Forest Plan Amendment direction specific to the California red-legged frog, and its associated habitat, is taken directly from the Record of Decision, Appendix A (USDA Forest Service 2001).

- The Forest Service will implement recovery plans for listed species; maintain and restore habitat to support viable populations of native riparian dependent species; prevent new introductions of invasive species; work cooperatively with appropriate State and Federal wildlife agencies to reduce impacts of invasive species to native populations; manage Riparian Conservation Areas to maintain or restore the structure and function of aquatic ecosystems.
- Riparian conservation areas overlap all land allocations. The standards and guidelines for riparian conservation areas apply in these areas except in cases where the standards and guidelines of the overlapping land allocation place greater restrictions on management activities. The Riparian Conservation Area (RCA) standards and guidelines include:
- Designate RCA widths:

Perennial Streams	300 feet on each side of the stream, measured from the bank full edge of the stream
Seasonally flowing streams (includes ephemerals with defined stream channel or evidence of scour)	150 feet on each side of the stream, measured from the bank full edge of the stream
Streams in inner gorge (slopes greater than 70% gradient)	Top of inner gorge
Special aquatic features (lakes, meadows, bogs, fens, wetlands, vernal pools, springs) or perennial streams with riparian conditions extending more than 150 feet from edge of streambank or seasonally flowing streams with riparian conditions extending more than 50 feet from edge of streambank	300 feet from edge of feature or riparian vegetation, whichever width is greater
Other hydrological or topographic depressions without a defined channel	RCA width and protection measures determined through project level analysis

- Use a peer review process for vegetation treatments or other activities proposed within RCAs that are likely to significantly affect aquatic resources.
- Where a proposed project encompasses a riparian conservation area, conduct a site-specific project area analysis to determine the appropriate level of management within the RCA.
- Determine the type and level of allowable management activities by assessing how proposed activities measure against the riparian conservation objectives and their associated standards and guidelines.
- Implement other related standards and guidelines (S&Gs) appropriate to the project and include them in documentation of meeting riparian conservation objectives (grazing, road management, mining, vegetation management or other forest plan S&Gs).

The Riparian Conservation Objectives that apply to the New Bullards Bar Management Plan include:

RIPARIAN CONSERVATION OBJECTIVE #1: Ensure that identified beneficial uses for the water body are adequately protected. Identify the specific beneficial uses for the project area, water quality goals from the Regional Basin Plan, and the manner in which the standards and guidelines will protect the beneficial uses.

Standards and Guidelines Associated with RCO #1:

Implement project appropriate Best Management Practices and monitor their effectiveness following protocols outlined in "Investigating Water Quality in the Pacific Southwest Region: Best Management Practices Evaluation Program" (USDA-FS, PSW Region 1992).

For waters designated as "Water Quality Limited" (Clean Water Act Section 303(d)), implement appropriate State mandates for the water body, such as Total Maximum Daily Load (TMDL) protocols.

Conduct project-specific cumulative watershed effects analysis following Regional procedures or other appropriate scientific methodology to meet NEPA requirements.

Implement soil quality standards for soil loss, detrimental soil compaction, and organic matter retention to minimize the risk of sediment delivery to aquatic systems from management activities. Ensure that management-related activities, including roads, skid trails, landings, trails, or other activities, do not result in detrimental soil compaction on more than 5 percent of the RCA or 10 percent of the area in CARs. Measure compaction using the procedures outlined in Appendix F of the FEIS.

Identify existing and potential sources of sediment delivery to aquatic systems. Implement preventive and restoration measures, such as modifying management activities, increasing ground cover, reducing the extent of compacted surfaces, or revegetating disturbed sites to reduce or eliminate sediment delivery from these sources to aquatic systems.

Evaluate new proposed management activities within CARs and RCAs during environmental analysis to determine consistency with the riparian conservation objectives at the project level and the AMS goals for the landscape. Ensure that appropriate mitigation measures are implemented to (1) minimize the risk of activity-related sediment entering aquatic systems, and (2) minimize impacts to habitat for aquatic- or riparian-dependent plant and animal species.

Identify existing uses and activities in CARs and RCAs during landscape analysis. Evaluate existing management activities to determine consistency with RCAs during project-level analysis. Develop and implement actions needed for consistency with RCOs.

Ensure that management activities do not adversely affect water temperatures necessary for local aquatic- and riparian-dependent species assemblages.

Limit pesticide applications to cases where project level analysis indicates that pesticide applications are consistent with riparian conservation objectives. Prohibit application of pesticides to livestock in RCAs and CARs.

Avoid pesticide applications within 500 feet of known occupied sites for the California red-legged frog, Cascade frog, Yosemite toad, foothill yellow-legged frog, mountain yellow-legged frog, and northern leopard frog unless environmental analysis documents that pesticides are needed to restore or enhance habitat for these amphibian species.

Prohibit storage of fuels and other toxic materials within RCAs and CARs except at designated administrative sites. Prohibit refueling within RCAs and CARs unless there are no other alternatives. Ensure that spill plans are reviewed and up-to-date.

RIPARIAN CONSERVATION OBJECTIVE #2: Maintain or restore: (1) the geomorphic and biological characteristics of special aquatic features, including lakes, meadows, bogs, fens, wetlands, vernal pools, springs; (2) streams, including in stream flows; and (3) hydrologic connectivity both within and between watersheds to provide for the habitat needs of aquatic-dependent species.

Standards and Guidelines Associated with RCO #2:

Maintain and restore the hydrologic connectivity of streams, meadows, wetlands, and other special aquatic features by identifying roads and trails that intercept, divert, or disrupt natural surface and subsurface water flow paths. Implement corrective actions where necessary to restore connectivity.

Ensure that culverts or other stream crossings do not create barriers to upstream or downstream passage for aquatic-dependent species. Locate water drafting sites to avoid adverse effects to in stream flows and depletion of pool habitat. Where possible, maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows, wetlands, and other special aquatic features.

Prior to activities that could affect streams, determine if relevant geomorphic characteristics, including bank angle, channel bank stability, bank full width-to-depth ratio, embeddedness, channel-floodplain connectivity, residual pool depth, or channel substrate, are within the range of natural variability for the reference stream type as described in the Pacific Southwest Region Stream Condition Inventory protocol. If properties are outside the range of natural variability, implement restoration actions that will result in an upward trend.

Prevent disturbance to meadow-associated streambanks and natural lake and pond shorelines caused by resource activities (for example, livestock, off-highway vehicles, and dispersed recreation) from exceeding 20 percent of stream reach or 20 percent of natural lake and pond shorelines. Disturbance includes bank sloughing, chiseling, trampling, and other means of exposing bare soil or cutting plant roots. This standard does not apply to developed recreation sites and designated off-highway vehicle routes.

In stream reaches occupied by, or identified as "essential habitat" in the conservation assessment for, the Lahonton and Paiute cutthroat trout and the Little Kern golden trout, limit streambank disturbance from livestock to 10 percent of the occupied or "essential habitat" stream reach. (Conservation assessments are described in the record of decision.) Cooperate with State and Federal agencies to develop streambank disturbance standards for threatened, endangered, and sensitive species. Use the regional streambank assessment protocol. Implement corrective action where disturbance limits have been exceeded.

Determine if the age class, structural diversity, composition, and cover of riparian vegetation are within the range of natural variability for the vegetative community. If outside the range of natural variability, implement restoration actions that will result in an upward trend. Actions could include restoration of aspen or other riparian vegetation where conifer encroachment is identified as a problem.

Cooperate with Federal, Tribal, State and local governments to secure in stream flows needed to maintain, recover, and restore riparian resources, channel conditions, and aquatic habitat. Maintain in stream flows to protect aquatic systems to which species are uniquely adapted. Minimize the effects of stream diversions or other flow modifications from hydroelectric projects on threatened, endangered, and sensitive species and essential habitat as identified in conservation assessments. (Conservation assessments are described in the record of decision.)

During relicensing of Federal Energy Regulatory Commission (FERC) hydroelectric projects, evaluate modifications by the project to the natural hydrograph. Determine and recommend in stream flow requirements and habitat conditions that maintain, enhance, or restore all life stages of native aquatic species, and that maintain or restore riparian resources, channel integrity, and fish passage. Provide written and timely license conditions to FERC. Coordinate relicensing projects with the appropriate State and Federal agencies.

For exempt hydroelectric facilities on national forest lands, ensure that special use permit language provides adequate in stream flow requirements to maintain, restore, or recover favorable ecological conditions for local riparian- and aquatic-dependent species.

RIPARIAN CONSERVATION OBJECTIVE #3: Ensure a renewable supply of large down logs that: (1) can reach the stream channel and (2) provide suitable habitat within and adjacent to the RCA.

Standards and Guidelines Associated with RCO #3:

Determine if the level of coarse large woody debris (CWD) is within the range of natural conditions in terms of frequency and distribution and is sufficient to sustain stream channel physical complexity and stability. If CWD levels are deficient, ensure proposed management activities, when appropriate, contribute to the recruitment of CWD. Burning prescriptions should be designed to retain CWD; however short-term reductions below either the soil quality standards or standards in species management plans may result from prescribed burning within strategically placed treatment areas or the urban wildland intermix zone.

In plantations within RCAs or CARs, determine if the plantation will be able to provide a sufficient supply of standing trees suitable for large wood recruitment. If there is not sufficient wood for recruitment, develop a restoration program that will provide standing trees of the appropriate size in the RCA or CAR. In developing the restoration program, ensure that proposed activities are consistent with the riparian conservation objectives.

RIPARIAN CONSERVATION OBJECTIVE #4: Ensure that management activities, including fuels reduction actions, within RCAs and CARs enhance or maintain physical and biological characteristics associated with aquatic- and riparian-dependent species.

Standards and Guidelines Associated with RCO #4:

Within CARs, in occupied habitat or "essential habitat" as identified in conservation assessments for threatened, endangered, or sensitive species, evaluate the appropriate role, timing, and extent of prescribed fire. Avoid direct lighting within riparian vegetation; prescribed fires may back into riparian vegetation areas. Develop mitigation measures to avoid impacts to these species whenever ground-disturbing equipment is used.

Use screening devices for water drafting pumps. (Fire suppression activities are exempt). Use pumps with low entry velocity to minimize removal of aquatic species, including juvenile fish, amphibian egg masses and tadpoles, from aquatic habitats.

Design prescribed fire treatments to minimize disturbance of ground cover and riparian vegetation in RCAs. In burn plans for project areas that include, or are adjacent to RCAs, identify mitigation measures to minimize the spread of fire into riparian vegetation. In determining which mitigation measures to adopt, weigh the potential harm of mitigation measures, for example fire lines, against the risks and benefits of prescribed fire entering riparian vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions could be damaging to habitat or long-term function of the riparian community.

Where catastrophic events, such as drought, fire, flooding, wind, or insect damage, result in degraded stand conditions, allow salvage harvesting and fuelwood cutting in RCAs and CARs consistent with the assessment of the RCOs for the area. Ensure that present and future woody debris needs are met.

Post-wildfire management activities in RCAs and CARs should emphasize enhancing native vegetation cover, stabilizing channels by non-structural means, minimizing adverse effects from the existing road network, and carrying out activities identified in landscape analyses. Post-wildfire operations shall minimize the exposure of bare soil.

Allow mechanical ground disturbing fuels treatments, hazard tree removal, salvage harvest, or commercial fuelwood cutting within RCAs or CARs when the activity is consistent with RCOs. Projects providing for public health and safety, such as the felling of hazard trees or fuel reduction activities within the defense zone of the urban wildland intermix zones, are permitted. Utilize low ground pressure equipment, helicopters, over the snow logging, or other non-ground disturbing actions to operate off of existing roads when needed to achieve RCOs. Prior to removing trees within RCAs or CARs, determine if existing down wood is sufficient to sustain the stream channel physical complexity and stability required to maintain or enhance the aquatic- and riparian-dependent community. Ensure that existing roads, landings, and skid trails meet Best Management Practices. Minimize the construction of new skid trails or roads for access into RCAs for fuel treatments, salvage harvest, commercial fuelwood cutting, or hazard tree removal.

Prior to implementing ground disturbing activities within suitable habitat for the California red-legged frog, foothill yellow-legged frog, mountain yellow-legged frog, and northern leopard frog:

- Assess and document aquatic conditions using the Pacific Southwest Region Stream Condition Inventory protocol, and

- Develop mitigation measures (such as timing of activities, limited operating seasons, avoidance) to avoid impacting these species.

During fire suppression activities, consider impacts to aquatic- and riparian-dependent resources. Where possible, locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of RCAs or CARs. During presuppression planning, determine guidelines for suppression activities, including avoidance of potential adverse effects to aquatic- and riparian-dependent species as a goal.

Assess roads, trails, OHV trails and staging areas, developed recreation sites, dispersed campgrounds, special use permits, grazing permits, and day use sites during landscape analysis. Identify conditions that degrade water quality or habitat for aquatic- and riparian-dependent species. At the project level, determine if use is consistent with other standards and guidelines or desired conditions. If inconsistent, modify the use through redesign, rehabilitation, relocation, closure, or re-directing the use to a more suitable location.

Require solid waste facilities (such as waste rock and tailings dumps) to be located outside riparian conservation areas. Where no reasonable alternative to locating these mine waste facilities in riparian conservation areas exists, locate and design them with the goal of ensuring mine waste facility stability and preventing potentially toxic releases. Ensure the following measures are applied: (1) analyze mine waste material using the best conventional sampling methods and analytical techniques to determine its chemical and physical stability characteristics; (2) locate and design mine waste facilities using best conventional techniques to ensure mass stability and prevent acid or toxic material releases; (3) ensure that reclamation and reclamation bonds are sufficient to ensure long-term chemical and physical stability of mine waste facilities; and (4) monitor mine waste facilities after operations have ceased to ensure that chemical and physical conditions are consistent with aquatic management strategy goals.

Allow saleable mineral activities, such as sand and gravel mining and extraction, in riparian conservation areas only if measures that protect the integrity of aquatic, riparian meadow ecosystems are implemented.

RIPARIAN CONSERVATION OBJECTIVE #6: Identify and implement restoration actions to maintain, restore or enhance water quality and maintain, restore, or enhance habitat for riparian and aquatic species.

Recommend and establish priorities for restoration practices in: (1) areas with compaction in excess of soil quality standards, (2) areas with lowered water tables, or (3) areas that are either actively down cutting or that have historic gullies. Identify other management practices, for example, road building, recreational use, grazing, and timber harvests that may be contributing to the observed degradation.

Reclaim abandoned mine sites that are degrading aquatic riparian and meadow ecosystems. First priority is to reclaim sites with hazardous or toxic substances located within CARs and RCAs.

Critical Aquatic Refuges are small subwatersheds that contain known locations of threatened, endangered or sensitive species. The Tahoe currently has two Critical Aquatic Refuges, Upper Independence Creek and Sierra Buttes, neither of which includes known populations of California red-legged frog. As information is gathered through surveys and landscape analysis, additional Critical Aquatic Refuges may be added to this list.

Recreation

Introduction

New Bullards Bar Reservoir is a popular recreation area. Recreational activities include boating, fishing, mountain biking, camping, picnicking, and swimming. The entire riparian corridor surrounding New Bullards Bar is open to public camping and recreation. Disturbance by recreationists can indirectly and directly affect California red-legged frogs. Illegal collecting of frogs is a problem in California, and land management agencies should educate their personnel and contractors regarding laws that protect frogs, and their associated habitat, and the appropriateness of publicly disclosing specific locations of sensitive areas around New Bullards Bar Reservoir.

Existing recreational maintenance activities

1) Trail and road maintenance and use

Suggested activities

a) Vehicular activities and mountain biking should be excluded from riparian and other wetland areas unless adequate stream crossings exist to prevent sedimentation.

b) Maintain and restore the hydrologic connectivity of streams, meadows, wetlands, and other special aquatic features by identifying roads and trails that intercept, divert, or disrupt natural surface and subsurface water flow. Implement corrective actions where necessary to restore connectivity.

c) Forest Service roads within the Little Oregon Creek sub-watershed should be closed, if feasible, during the late winter and spring to prevent the killing of subadult and adult frogs on the roads.

Potential recreational activities that may affect California red-legged frogs

1) Ground disturbing activities such as construction of roads, skid trails, recreational trails, or landings.

Suggested activities

a) Ground disturbing activities within RCAs should only occur after a qualified biologist assesses the site and provides mitigations to minimize effects to threatened or sensitive species.

b) Management related activities should not result in detrimental soil compaction on more than 5 percent of the RCA (USDA Forest Service 2001).

c) Existing and potential sources of sediment delivery should be identified and ameliorated by implementing preventative and restoration measures such as increasing ground cover, reducing the extent of compacted surfaces, or revegetating disturbed sites to reduce or eliminate sediment delivery from these sources to aquatic systems (USDA Forest Service 2001).

2) Introduction of non-native predators to the area of interest

Suggested activities

a) Interpretive signs should be placed at high-use areas to inform the public about laws prohibiting the introduction or use (as bait) of non-native species (such as the bullfrog, warm water fish, or crawfish) in the area of interest.

Vegetation Management

Introduction

Fuels reduction operations and related practices occurring on Forest Service land within watersheds inhabited by California red-legged frogs or that contain suitable habitat may contribute to the degradation of habitat and the decline of the species. The effects that degrade conditions include increased sedimentation of gravels and pools, removal of trees that provide instream and streamside habitat structure and shade, and changed patterns of runoff (USDI Fish and Wildlife Service 1996). Prescribed fire treatments within RCAs of the area of interest should be designed to minimize disturbance of ground cover and riparian vegetation in the RCAs. Retention of large woody debris within RCAs is also critical when designing fire treatments. Large woody debris provides suitable habitat for California red-legged frogs. Ten to twenty tons per acre should be retained (except in defense zones) to provide habitat heterogeneity, decreased soil erosion potential, stream bank stability, shade, and increased pool formation potential (USDA Forest Service 2001).

Existing vegetation management activities

2) Hazard tree removal within RCAs

Suggested activities

a) Projects providing for public safety within the defense zone of the urban wildland intermix zones, (Figure 2) are permitted (USDA Forest Service 2001). However, we suggest that felled hazard trees be left on site within RCAs to provide habitat for the California red-legged frog.

b) Projects providing for public safety outside the defense zone are permitted as long as they are consistent with the RCOs (USDA Forest Service 2001) and the bald eagle management standards and guidelines.

c) Hazard tree removal personnel should consult with qualified Biologists to develop removal procedures that minimize ground disturbance.

Potential vegetation management activities

1) Fuel treatment projects within the area of interest

Suggested activities

a) Fuels planning personnel should consult with qualified Biologists to determine desired conditions for woody debris retention and to establish RCAs in the fuels treatment areas.

b) No ignition, ground disturbing activities, or pile burning should occur in RCAs without approval from a qualified Biologist.

c) RCAs should be established based on average riparian tree height, stream geomorphology, upland slope, and the entire watersheds ability of providing wooding debris to the fuel treatment area.

b) Site assessments should occur prior to fire treatments to determine the presence of California red-legged frogs and their associated habitat, and to develop an optimal fire treatment time. At certain times of the year (winter and spring) fire treatments have the potential to cause more harm to California red-legged frogs than other times (summer and fall) due to increased activity and mobility (breeding) and estivation.

1) Clearing and disposal of vegetation for trail, road, campground, boat landing, and day use area maintenance.

Suggested activities

a) Burning of brush within RCAs should only occur after the burning site is assessed by a qualified Biologist and a determination of no or minimal effect to California red-legged frogs is made.

b) Chipping of brush piles may be done as an alternative to burning, as long as it confers with the bald eagle management standards and guidelines.

c) Routine recreational site maintenance, such as tree trimming, may occur as long is it confers with the RCOs.

Residential Development

Introduction

Residential development has been implicated as a reason for declining California red-legged frog populations (USDI Fish and Wildlife Service 1996). However, the majority of land within the area of interest is owned by the Tahoe National Forest and The Yuba County Water Agency. Therefore, residential development is not likely to affect California red-legged frogs within the area of interest.

Hydroelectric Power Production and Reservoir Maintenance

Introduction

The Yuba County Water Agency (YCWA) is licensed to manage New Bullards Bar Reservoir. The YCWA provides hydroelectric power, flood control, domestic and agricultural water, and recreation at the reservoir. The YCWA also performs a variety of maintenance activities in and around New Bullards Bar Reservoir that, if done in accordance with the RCOs, are not likely to adversely affect California red-legged frogs or their associated habitat (Appendix 1).

Existing YCWA activities that may affect California red-legged frogs or their associated habitat.

1) Accumulation of woody debris off the reservoir and disposed at coves 1, 2, and 3 (Figure 4).

A) Effects

The proposed burning sites do not provide suitable habitat for California red-legged frogs. Therefore, the accumulation and disposal of woody debris at sites 1, 2, or 3 will have minimal or no effect on California red-legged frogs or their habitat. However, a qualified Biologist should be consulted before initiation of the project to insure that the project complies with the RCOs. If the burning locations change, the new site should be surveyed for California red-legged frogs and their habitat. If frogs or suitable habitat are found, a qualified Biologist should be consulted to explore possible consultation with the US Fish and Wildlife Service, prior to initiation of the project.

2) Siphoning of water from a storage pond near Cottage Creek

Suggested management activities

a) A two-foot average water depth in this pond should be maintained year round.

b) If an emergency arises whereas the minimum water level must be breached, the pond should be surveyed by a qualified Biologist prior to the breach, using an accepted protocol, to assess the site for California red-legged frogs. If California red-legged frogs are observed, the pond should not be siphoned.

3) New Bullards Bar Reservoir launch ramp improvement scheduled for 2003

A) Effects

a) The effects of this project are unknown because of limited information about the project. However, any activities planned by the YWCA within the area of interest that may affect California red-legged frogs or their associated habitat should be reviewed by a qualified Biologist to assure consistency with the RCOs and assess possible consultation with the U.S. Fish and Wildlife Service.

Fisheries and Invasive Species Management

Introduction

The introduction of non-native predatory species such as the bullfrogs, warm water fish, and crawfish (USDI Fish and Wildlife Service 2000) has been implicated as a reason for declining California red-legged frog populations. New Bullards Bar Reservoir is not currently stocked with these predator species. Therefore, the effect of anthropogenic introduction of these species within the area of interest is minimal. However, if areas are identified as having large numbers of non-native predatory species efforts should be made to remove these species, and a predator control plan should be developed.

Mining

A search of the Bureau of Land Management data base in February 2002 shows 34 active claims encompassing 680 acres within a two-mile radius of the Reservoir—33 are placer claims, 1 is a lode claim. Active claims are limited to minor exploratory work, with, little to no surface disturbances, storage of equipment, structure building, or extended camping (longer than two weeks), without prior authorization from the U. S. Forest Service. The miner requests authorization by filing a Plan of Operations with the appropriate National Forest. At the present time, no active claims are operating under an approved Plan of Operations. As such, all are limited in scope. Should any expand, the miner would have to submit a Plan of Operation for review and approval by the U. S. Forest Service. At that time, the operation would be evaluated for its compliance with the Endangered Species Act and the National Environmental Policy Act. Any needed consultation with the U. S. Fish and Wildlife Service would occur at that time.

Because the California Department of Fish and Game issues dredging permits, an unidentified number of dredging operations may be present.

Monitoring

Annual California red-legged frog monitoring should occur (within available budgets) throughout the area of interest. Suitable habitat should be identified so that it can be protected to increase connectivity and expansion potential of existing populations. All surveys should be done to an accepted California red-legged frog protocol.

Review of Site-specific Recommended Mitigations and Action Items

1) Collection and burning of woody debris in New Bullards Bar Reservoir will be done in accordance with the RCOs and Best Management Practices. A qulified Biologist and Fire chief will be consulted with prior to initiation of the project, and they will be on-site during burning.

2) Vehicular activities and mountain biking should be excluded from riparian and other wetland areas unless adequate stream crossings exist to prevent sedimentation.

3) Maintain and restore the hydrologic connectivity of streams, meadows, wetlands, and other special aquatic features by identifying roads and trails that intercept, divert, or disrupt natural surface and subsurface water flow. Implement corrective actions where necessary to restore connectivity.

4) Forest Service roads within the Little Oregon Creek sub-watershed area of interest should be closed, if feasible, during the late winter and spring to prevent the killing of subadult and adult frogs on the roads.

5) Ground disturbing activities within RCAs should only occur after a qualified biologist assesses the site and provides mitigations to minimize effects to threatened or sensitive species.

6) Management of recreation related activities (trails, campgrounds, boat launches, etc.) should not result in detrimental soil compaction on more than 5 percent of the RCAs (USDA Forest Service 2001).

7) Existing and potential sources of sediment delivery should be identified and ameliorated by implementing preventative and restoration measures such as increasing ground cover, reducing the extent of compacted surfaces, or revegetating disturbed sites to reduce or eliminate

sediment delivery from these sources to aquatic systems (USDA Forest Service 2001).

8) Interpretive signs should be placed at high-use areas to inform the public about laws prohibiting the introduction or use (as bait) of non-native species (such as the bullfrog, warm water fish, or crawfish) in the area of interest.

9) Hazard tree removal personnel should consult with qualified Biologists to develop removal procedures that minimize ground disturbance.

10) Fuels planning personnel should consult with qualified Biologists to determine desired conditions for woody debris retention and to establish RCAs in the fuels treatment areas.

11) No ignition, ground disturbing activities, or pile burning should occur in RCAs, without consultation with a qualified Biologist.

12) Fuels treatment RCAs should be established based on average riparian tree height, stream geomorphology, upland slope, and the entire watersheds ability of providing wooding debris to the fuel treatment area.

13) Site assessments should occur prior to fire treatments to determine the presence of California red-legged frogs and their associated habitat, and to develop an optimal fire treatment time. At certain times of the year (winter and spring) fire treatments have the potential to cause more harm to California red-legged frogs than other times (summer and fall) due to increased activity and mobility (breeding) and estivation.

14) Burning of brush within RCAs should only occur after the burning site is assessed by a qualified Biologist and a determination of no or minimal effect to California red-legged frogs is made.
A) Chipping of brush piles may be done as an alternative to burning, as long as it confers with the bald eagle management standards and guidelines

15) Projects providing for public safety within the defense zone of the urban wildland intermix zones, are permitted (USDA Forest Service 2001). However, we suggest that felled hazard trees be left on site within RCAs to provide habitat for the California red-legged frog.

16) Projects providing for public safety outside the defense zone are permitted as long as they are consistent with the RCOs (USDA Forest Service 2001) and the bald eagle management standards and guidelines.

17) Routine recreational site maintenance, such as tree trimming, may occur as long is it confers with the RCOs.

18) A two-foot average water depth in the Cottage Creek pond should be

maintained year round.

A) If an emergency arises whereas the minimum water level must be breached, the pond should be surveyed by a qualified Biologist prior to the breach, using an accepted California red-legged frog protocol, to assess the site for California red-legged frogs. If California red-legged frogs are observed, the pond should not be siphoned.

19) Any activities planned by the YWCA or USFS within the area of interest that may adversely affect California red-legged frogs or their associated habitat should be reviewed by qualified Biologists to assure consistency with the RCOs and assess possible consultation with the US Fish and Wildlife Service.

20) Ten to twenty tons per acre of large woody debris should be retained (except in defense zones) within RCAs (USDA Forest Service 2001).

Review of potential and existing activities that may require consultation with the US Fish and Wildlife Service

1) Collection and disposal of woody debris from New Bullards Bar Reservoir.

2) Ground disturbing activities within RCAs such as; construction or reconstruction of recreational areas, trails, campgrounds, skid trails, or boat landings, and tree felling.

3) Prescribed burning treatments within the area of interest.

4) Mechanical vegetation harvest and/or disposal within the RCAs.

5) Instream or riparian restoration work such as repair or installation of bridges or culverts.

6) Any activity within RCAs that may affect California red-legged frogs, or their associated habitat, that is not listed in this document should be reviewed by qualified Biologists to determine the applicability of consultation with the US Fish and Wildlife Service.

V. Recommended TES Monitoring Plan and Management Plan Direction

VI. Educational Opportunities:

1. Identify interpretive opportunities in conjunction with the Recreation Plan. Consider interpretive signing at Cottage Creek and Dark Day boat ramps to increase public awareness of wildlife's use of the reservoir and the need for habitat protection. The focus is to educate the visiting public as to the role of the YCWA, USFS, and the public in protecting wildlife and its habitat (what we do, how they can help). Species to emphasize could include bald eagle, osprey, great blue heron, and kokanee salmon. Winter eagle watching opportunites exist at the dam that include barrier-free access while still protecting eagles.

2. Educate reservoir employees in the identification of mature and immature bald eagles, and species of concern and special interest. Report sightings and locations of bald eagles to the Downieville Ranger District Wildlife Biologist.

3. The Pendola Fire offers an opportunity to interpret the role of fire in natural processes, fire history, the benefits and costs of fire, and prescribed burning. Interpretation that meets agency goals include: (1) the role of the USFS in fire management, (2) YCWA goals for maintaining healthy watersheds and waterflow regimes.

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Appendix A

Yuba County Water Agency Routine Operation and Maintenance Duties

Activity by Location	**Frequency**
Our House Dam	
1. Maintain sluice and fish valves and controls.	Anual
2. Adjust debris boom to divert trash from tunnel trash rack.	Semi-annual
3. Maintain structures and accesses at dam and downstream weir and gaging station.	Semi-annual
4. Remove trash from trash racks	Seasonal
5. Dispose of trash rack debris and grounds accumulations.	Seasonal
6. Maintain road to dam by repairing pot holes, brushing, and removing slides and debris from road.	Seasonal
7. Place and remove tunnel gates. Procure crane and remove or displace gate according to water flow dictates.	Semi-annual
8. Pump and clean portapottie.	Quarterly
Log Cabin Dam	
1. Maintain sluice and fish valves and controls. Grease, replace parts as necessary, block rust and paint.	Semi-annual
2. Maintain structures and accesses at dam and downstream weir. Paint and repair as necessary. Also, maintain access with heavy duty equipment	Semi-annual
3. Remove trash from trash racks.	Seasonal
4. Dispose of trash rack debris and grounds accumulations.	Seasonal
5. Maintain gate and road to dam by repairing pot holes, brushing, and removing slides and debris from road.	Annual
6. Place and remove tunnel gates. Procure crane and remove or displace gate according to water flow dictates.	Semi-annual
7. Pump and clean portapottie	Quarterly
Bullards Bar Dam and Appurtenant Facilities	
1. Maintain lower outlet butterfly and hollow jet valve. Lubricate, charge accumulator with nitrogen and maintain auxiliary equipment	Semi-annual
2. Maintain fish hydro and building. Inspect runner, filter governor oil. Check bearings and clearances, and replace parts as necessary.	Semi-annual
3. Pump and clean portapotties.	Quarterly
4. Maintain 180" butterfly valve and butterfly valve house. Lubricate stuffing box, flush operation valves, and perform annual tests.	Quarterly
5. Maintain access road to bottom of dam.	Seasonal

Clean ditches and maintain asphalt surface.

6. Maintain spillway gates and hoist mechanisms. — Quarterly
   Lubricate and change operating mechanism oil, service Volkswagen engine and functionally test.
7. Maintain Onan emergency generator at Butterfly Valve House. — Semi-annual
   Change oil, check couplings and filters, check battery charging capability, and check all gages and piping (leak check).
8. Maintain fish hydro air compressor. — Annual
   Lubricate, check belts, check pop off valves and other auxiliaries for safe operation.
9. Inspect lower outlet facility once every five years by removing streamline flow section and placing gate. Unwater and physically inspect and then reverse the procedure. — Annual
   Set up crane for gate and streamline section removal and installation. Open man doors, check for oxygen, install rope, inspect, and repair as necessary.
10. Maintain intake crane and intake bulkhead gates and trash rack. — Quarterly
    Replace cable. Lubricate and check crane operation periodically. Change gate positions for temperature mitigation. Keep gates and machinery free of corrosion.
11. Maintain integrity of water line from BFV to water treatment plant. — Semi-annual
    Repair leaks as necessary and coordinate with USFS.
12. Keep top of dam clear of weeds. — Semi-annual
13. Keep groin of dam clear of weeds and vegetation. — Semi-annual
14. Keep inside of dam clear of stalactites, stalagmites, and calcareous accumulations. — Annual
15. Maintain log boom in front of dam. — Quarterly

Cottage Creek Facilities

1. Water Treatment Plant
   a. Maintain integrity of security fence. — Semi-annual
   b. Keep grounds clean and free from accumulated scrap. — Quarterly
   c. Keep portapotties clean and pumped. — Quarterly
   d. Perform preventive maintenance on building, water tanks, and backflow tank and associated facilities. — Semi-annual
      Maintain building integrity including roof and keep tanks maintained with proper painting. Repair any system plumbing defects.
2. Keep garbage cans and parking lot areas clean. — Weekly
3. Maintain parking lot asphalt and drainage. — Annual
4. Maintain traffic lines and parking lanes well defined with paint. — Annual
5. Report need for disposal unit emptying. — Weekly

Bullards Bar Launch Ramp

1. Maintain ramp clear of rocks and other debris. — Monthly
2. Move boarding float to coincide with water levels. — Weekly

3. Patch asphalt as necessary to prevent pot holes.	Semi-annual
4. Maintain boarding float guide cable and anchors.	Semi-annual
5. Maintain signage for handicap, loading zones, and marina parking.	Semi-annual
Move portable signs to coincide with water levels.	Weekly

Bullards Bar YCWA Boat Dock and Access Road

1. Move dock to coincide with water levels	Weekly
2. Maintain access road to dock	Semi-annual
3. Maintain surface and dock bumpers in good repair on main dock and all slips. Cleats should be well anchored at all times.	Quarterly
4. Maintain all boats and motors in serviceable shape at all times.	Weekly
5. Keep boats pumped out especially during inclement weather.	Seasonal

Bullards Bar Warehouse (Hill above the dam)

1. Keep portapottie clean and pumped.	Quarterly
2. Maintain 5000 gallon water tank and enclosure.	
Open and clean annually. Coordinate with USFS.	Annual
3. Keep area clear of Y.C.W.A. trash.	Quarterly
4. Maintain trailers and stored materials in good order inside warehouse.	
5. Maintain air compressor.	Annual
Change oil, lubricate. Check belts and piping, safety guards, pop off valve and auxiliaries.	Annual

Oregon Peak

1. Maintain security fencing and gate.	Annual
2. Maintain yard free of weeds and foreign material.	Annual
3. Maintain interior and exterior of building	Annual
4. Maintain Onan emergency generator.	Semi-annual

Bullards Bar Reservoir

1. Maintain fish spawning buoys at Bridge Creek, Willow Creek, confluence of Little Oregon and Bridger Creek, and Indian Creek.	Annual
2. Maintain buoys at Dark Day and Upper North Fork of Yuba.	Annual
3. Pump floating comfort stations (via boat)	Monthly (6)
4. Pump toilets at Madrone Cove (via boat)	Semi-annual
5. Pump toilets at Garden Point (via truck on Garden Point Road)	Semi-annual
6. Maintaining FCS's.	Semi-annual
7. Dispose of Reservoir debris.	Annual
Boom wood debris to Cove (previously Moran Road Cove).	
Doze into piles for burning.	
Burn debris in coordination with USFS	

Miscellaneous

1.	Maintain all security fencing throughout project	Semi-annual
2.	Maintain all project roads free of pot holes, etc.	Monthly
3.	Maintain weed abatement program at penstock, dams, roads, Oregon Peak and switch yards.	Annual
	Arrange with vendor, after contract prep, for areas to be covered, accompany Vendor on pre-and post emergency and verify applications.	
4.	Service and maintain all project gates in good condition and sag free. Provide bracing and paint or repair as required. Repair vandalism.	Annual
5.	Keep trash cans throughout the project empty on a periodic basis.	Weekly
6.	Maintain all doors (roll up and personnel) in excellent condition at all times.	Weekly
7.	Maintain water piping system from Cottage Creek to USFS interface.	Quarterly
8.	Facility upkeep.	Monthly

APPENDIX B.

USFS Bullards Bar Routine Maintenance Activity List

Shoreline	Frequency
Remove hazard trees	as needed
Remove mid and lower story fire hazard fuel and vegetation pile and Burn brush, split and stack or remove trunk wood	as needed
Remove and haul away ash and disperse rocks from located fire pits	weekly
Boat in campgrounds	
Remove hazard trees	as needed
Remove mid and lower story fire hazard fuel and vegetation pile and Burn brush, split and stack or remove trunk wood	as needed
Remove or replace broken tables and buildings	annually
Clean and maintain pit toilets and campsites	weekly
Paint or stain tables and buildings	annually
Pump pit toilets	as needed
Drive in campgrounds	
Remove hazard trees	as needed
Remove mid and lower story fire hazard fuel and vegetation pile and Burn brush, split and stack or remove trunk wood	as needed
Remove or replace broken tables and buildings	annually
Clean and maintain pit toilets and campsites	weekly
Paint or stain tables and buildings	annually
Repair or replace septic systems and water lines	as needed

Boat launch facilities

Remove hazard trees	as needed
Remove mid and lower story fire hazard fuel and vegetation pile and Burn brush, split and stack or remove trunk wood	as needed
Clean and remove debris from parking lots	weekly
Seal surface cracks in pavement	as needed
Paint lettering and parking stripes on surface	annually
Paint or stain tables and buildings	annually
Repair or replace septic systems and water lines	as needed
Install and repair regulatory signs	as needed

Trails

Remove hazard trees	as needed
Remove mid and lower story fire hazard fuel and vegetation pile and Burn brush, split and stack or remove trunk wood	as needed
Install and repair drainage devices	as needed
Repair and make minor grade changes and relocation to protect public safety	as needed
Install and repair signs	as needed

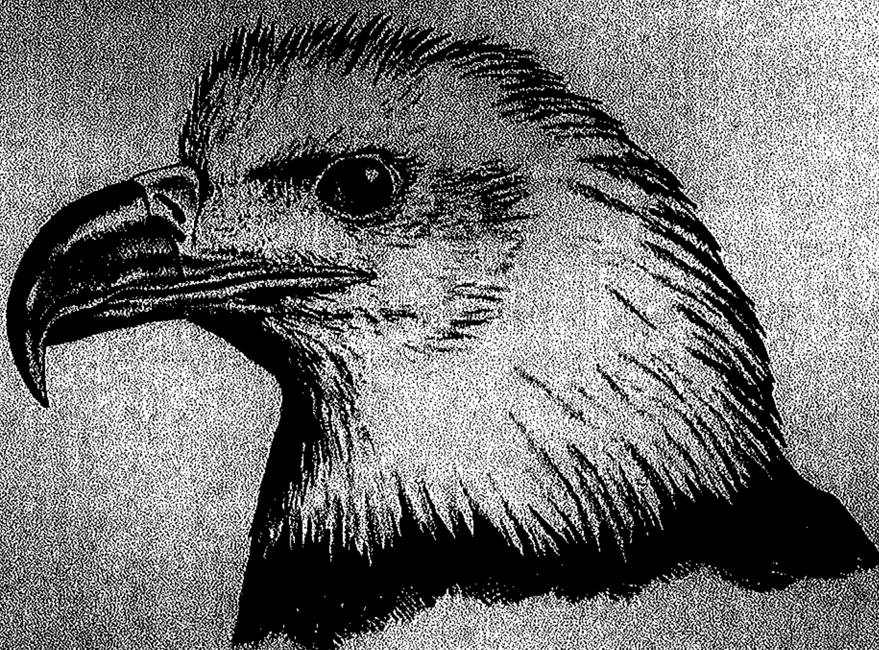
Day use

Remove hazard trees	as needed
Remove mid and lower story fire hazard fuel and vegetation pile and Burn brush, split and stack or remove trunk wood	as needed
Remove or replace broken tables and buildings	annually
Clean and maintain pit toilets and campsites	weekly

Paint or stain tables and buildings	annually
Pump pit toilets	as needed
Repair or replace septic systems and water lines	as needed

BIOLOGICAL REPORT 82(10.126)
OCTOBER 1986

HABITAT SUITABILITY INDEX MODELS: BALD EAGLE (BREEDING SEASON)



h and Wildlife Service

. Department of the Interior

MODEL EVALUATION FORM

Habitat models are designed for a wide variety of planning applications where habitat information is an important consideration in the decision process. However, it is impossible to develop a model that performs equally well in all situations. Assistance from users and researchers is an important part of the model improvement process. Each model is published individually to facilitate updating and reprinting as new information becomes available. User feedback on model performance will assist in improving habitat models for future applications. Please complete this form following application or review of the model. Feel free to include additional information that may be of use to either a model developer or model user. We also would appreciate information on model testing, modification, and application, as well as copies of modified models or test results. Please return this form to:

Habitat Evaluation Procedures Group
U.S. Fish and Wildlife Service
2627 Redwing Road, Creekside One
Fort Collins, CO 80526-2899

Thank you for your assistance.

Species ______________ Geographic Location ______________________________

Habitat or Cover Type(s) ______________________________

Type of Application: Impact Analysis ____ Management Action Analysis ____
Baseline ____ Other ______________________________

Variables Measured or Evaluated ______________________________
____
____
____

Was the species information useful and accurate? Yes ____ No ____

If not, what corrections or improvements are needed? ______________________________
____
____
____

Were the variables and curves clearly defined and useful? Yes ____ No ____

If not, how were or could they be improved? ______________________________

Were the techniques suggested for collection of field data:

Appropriate? Yes ____ No ____

Clearly defined? Yes ____ No ____

Easily applied? Yes ____ No ____

If not, what other data collection techniques are needed? ______________

Were the model equations logical? Yes ____ No ____

Appropriate? Yes ____ No ____

How were or could they be improved? ______________________________

Other suggestions for modification or improvement (attach curves, equations, graphs, or other appropriate information) ______________

Additional references or information that should be included in the model:

Model Evaluator or Reviewer ______________________ Date ____________

Agency ____

Address ____

Telephone Number Comm: ____________________ FTS ____________________

Biological Report 82(10.126)
October 1986

HABITAT SUITABILITY INDEX MODELS: BALD EAGLE (BREEDING SEASON)

by

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National Ecology Center
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PREFACE

This model was developed by the author as a result of his interest in, and experience with, the bald eagle. The U.S. Fish and Wildlife Service provided quality control, content reviews, and publication costs, but the fact that the model was completed is due primarily to the persistence and interest of the author.

This document is part of the Habitat Suitability Index (HSI) Model Series [Biological Report 82(10)], which provides habitat information useful for impact assessment and habitat management. Several types of habitat information are provided. The Habitat Use Information section is largely constrained to those data that can be used to derive quantitative relationships between key environmental variables and habitat suitability. This information provides the foundation for the HSI model and may be useful in the development of other models more appropriate to specific assessment or evaluation needs.

The HSI Model section documents the habitat model and includes information pertinent to its application. The model synthesizes the habitat use information into a framework appropriate for field application and is scaled to produce an index value between 0.0 (unsuitable habitat) and 1.0 (optimum habitat). The HSI Model section includes information about the geographic range and seasonal application of the model, its current verification status, and a list of the model variables with recommended measurement techniques for each variable.

The model is a formalized synthesis of biological and habitat information published in the scientific literature and may include unpublished information reflecting the opinions of identified experts. Habitat information about wildlife species frequently is represented by scattered data sets collected during different seasons and years and from different sites throughout the range of a species. The model presents this broad data base in a formal, logical, and simplified manner. The assumptions necessary for organizing and synthesizing the species-habitat information into the model are discussed. The model should be regarded as a hypothesis of species-habitat relationships and not as a statement of proven cause and effect relationships. The model may have merit in planning wildlife habitat research studies about a species, as well as in providing an estimate of the relative suitability of habitat for that species. User feedback concerning model improvements and other suggestions that may increase the utility and effectiveness of this habitat-based approach to fish and wildlife planning are encouraged. Please send suggestions to:

Habitat Evaluation Procedures Group
National Ecology Center
U.S. Fish and Wildlife Service
2627 Redwing Road
Ft. Collins, CO 80526-2899

CONTENTS

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Earlier drafts of this model were reviewed and commented on by Denis Case (Ohio Department of Natural Resources, Columbus, OH), Stanley Wiemeyer (U.S. Fish and Wildlife Service, Laurel, MD), and Keith Cline and Brian Millsap (Raptor Information Center, Washington, DC). They also provided additional data and literature on the bald eagle. Many people provided literature and unpublished data on different populations of the bald eagle: Jack Hodges (U.S. Fish and Wildlife Service, Juneau, AK), Mark Jenkins (Pacific Gas and Electric Co., San Ramon, CA), Jim Morash and Gary Strawn (West Virginia Department of Natural Resources, Elkins, WV), Peter Nye (New York State Department of Environmental Conservation, Delmar, NY), Dale Sheffer (Pennsylvania Game Commission, Harrisburg, PA), Gary Taylor (Maryland Wildlife Administration, Wye Mills, MD), Sylvia Taylor (Michigan Department of Natural Resources, Lansing, MI), and W. H. Taylor (Virginia Commission of Game and Inland Fisheries, Richmond, VA).

A later draft of this model was reviewed and commented upon by Dr. Robert Anthony (Oregon Cooperative Wildlife Research Unit, Corvallis, OR), Dr. Daniel James (U.S. Fish and Wildlife Service, Arlington, VA), John Mathisen (U.S. Forest Service, Cass Lake, MN), and Karen Steenhof (Bureau of Land Management, Boise, ID). Dr. Anthony, Mr. Mathisen, and Ms. Steenhof also provided additional literature. Much information on the measurement of lake productivity was provided by Richard A. Ryder (Ontario Ministry of Natural Resources, Thunder Bay, Ontario) and Dr. David Green (Cornell University, Biological Field Station, Bridgeport, NY). The generous and valuable assistance of these people is gratefully acknowledged.

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BALD EAGLE (*Haliaeetus leucocephalus*)

HABITAT USE INFORMATION

General

The bald eagle (*Haliaeetus leucocephalus*) is a large predatory raptor that occurs "...primarily near seacoasts, rivers and large lakes, breeding in tall trees or on cliffs" (American Ornithologists' Union 1983:106). It is a common breeder throughout southeastern coastal Alaska (Robards and Hodges 1977) and is found in lesser numbers throughout Canada and the United States (DeGraaf et al. 1980). It winters primarily "...from southern Alaska and southern Canada southward" (American Ornithologists' Union 1983:106) near large, ice-free bodies of water (Steenhof 1978). After suffering precipitous declines over much of its range, the bald eagle population has recently exhibited signs of recovery (Hamerstrom et al. 1975; Grier 1982).

Food

The preferred foraging habitats of the bald eagle are rivers, lakes, and estuaries (DeGraaf et al. 1980). Primary feeding areas are large bodies of open water. It is rarely associated with smaller streams or ponds (Leighton et al. 1979). In the Greater Yellowstone Ecosystem, "[a] stable food source, which was available from early spring, appeared to be the most important factor in breeding area selection" (Swenson et al. 1986:5). Swenson et al. (1986:43) further stated that "[d]ifferences in movements, breeding success, nest site selection, and nesting chronology among [the Yellowstone, Continental, and Snake] units were primarily due to differences in the amount and timing of food availability."

The bald eagle consumes a wide range of food items, from pied-billed grebes (*Podilymbus podiceps*) (Cline and Clark 1981) to bullheads (*Ictalurus* spp.) (Dunstan and Harper 1975) to sea otter (*Enhydra lutris*) pups (Sherrod et al. 1975). Bald eagles at Chesapeake Bay have been found to prey upon or take as carrion 45 species of birds, 11 species of mammals, 12 species of fish, and 5 species of turtles (Cline and Clark 1981). Bald eagles in Maine preyed upon or took as carrion at least 34 species of birds, 18 species of fish, 11 species of mammals, and 2 species of invertebrates (Todd et al. 1982). In Oregon, bald eagles fed on 16 species of fish, 46 species of birds, 20 species of mammals, and 2 invertebrate species (Frenzel 1984).

Although the staple of the bald eagle diet is fish (DeGraaf et al. 1980), their prey may be classified into three main types: live fish, live sea or water birds, and carrion. Fish composed 77% of the food item remains collected at bald eagle nests in interior Maine (Todd et al. 1982). Bald eagles nesting on offshore coastal islands fed primarily on seabirds and waterfowl. In northcentral Minnesota, the diet of breeding eagles was 90% fish (Dunstan and Harper 1975). Studies in Ohio showed that nesting bald eagles fed primarily on fish (Herrick 1924). At San Juan Island, Washington, fish composed 51% of the breeding season diet (Retfalvi 1970). Fish were also the most frequent prey of bald eagles in Chesapeake Bay (LeFranc and Cline 1983) and in Oregon (Frenzel 1984). In southeast New York, wintering bald eagles fed almost entirely on dead and dying alewives (*Alosa pseudoharengus*) that had passed through the turbines of hydroelectric generating stations (Nye and Suring 1978). In contrast, wintering eagles in Missouri fed primarily on dead and crippled Canada geese (*Branta canadensis*) (Griffin et al. 1982).

Bald eagle prey selection is determined largely by availability. Birds accounted for 68% and 47% of the diet of bald eagles in the Yellowstone and Continental Units, respectively, of the Greater Yellowstone Ecosystem, but fish made up 67% of the diet in the Snake Unit, in response to habitat differences and prey availability (Swenson et al. 1986). In Maine, eagles focused on the chain pickerel (*Esox niger*) spawning run in April, then on the sucker (*Catostomus* spp.) spawning run in May (Todd et al. 1982). Bald eagles in Missouri abandoned their primary prey, dead or crippled waterfowl, in favor of fish during years of heavy fish kill (Griffin et al. 1982). In Oregon, bald eagle diets varied both seasonally and geographically (Frenzel 1984). Wintering bald eagles in southeast New York readily fed upon deer (*Odocoileus virginianus*) carcasses on frozen reservoirs (A. Peterson, N.Y. State Department Environmental Conservation, Albany; unpubl.). In Washington, eagles fed heavily on road-killed animals (Retfalvi 1970).

Bald eagle nesting densities depend, in part, on total prey availability. At Besnard Lake, Saskatchewan, nesting densities were higher in areas of higher lake productivity (Gerrard et al. 1983), and eagle nesting densities in central Saskatchewan were significantly correlated with the commercial fish catch per hectare of surface water (Whitfield and Gerrard 1985). In California, there also appears to be a positive relationship between bald eagle nesting densities and lake or reservoir productivity (Detrich 1985).

Total prey availability is a function not only of foraging habitat productivity but also the size of the foraging habitat (i.e., total available prey = prey biomass/ha x size of foraging habitat). This is exemplified by the bald eagle's preference for large areas of open water for foraging. Bald eagles nesting in marine environs in New Brunswick were more successful than those occupying lake or river sites (Stocek and Pearce 1981). Lake habitats were also clearly preferred over river habitats. At the Pit River hydroelectric complex in California, bald eagles nested exclusively along reservoirs, although riverine habitats were available (BSAI 1985). Leighton et al. (1979) concluded that lakes <11 km in circumference did not constitute primary breeding habitat. Whitfield et al. (1974) concluded that lakes with <11.3 km of shoreline did not provide primary breeding habitat. The surface area of lakes with a circumference of 11 km varies with shoreline configuration, but cannot exceed 9.6 km^2 (for a circular lake). The smallest body of water reported to support one nesting pair of bald eagles is 8 ha (J. Mathisen, Chippewa National Forest, Cass Lake, MN; pers. comm.). It should be noted that bald eagles nesting on smaller water bodies may require other nearby lakes for additional foraging areas.

Although larger bodies of water appear to provide superior habitat to smaller ones (Whitfield et al. 1974; Leighton et al. 1979; Stoceck and Pearce 1981), increasing surface area beyond the 9.6 km^2 threshold does not appear to affect habitat suitability. For example, Lake Britton in northern California is a long and narrow reservoir with only 5.2 km^2 of surface area (BSAI 1985); however, it supports the highest density of nesting bald eagles in that state (if it were not so narrow, i.e., had a larger surface area, the same shoreline length could be more effectively used and might support an even greater density) (BSAI 1985; Detrich 1985). Also, in New York State, historical bald eagle nesting densities along Oneida Lake (207 km^2) were at least as great as along the eastern shore of Lake Ontario (>15,000 km^2) (Nye and Peterson 1980). Therefore, lakes with surface areas >10 km^2 (rounded from 9.6) appear to be of optimal size.

Water

No information pertaining to dietary water needs of the bald eagle was found in the literature.

Cover

Wintering bald eagles depend on suitable night and severe weather roosts in sheltered timber stands (Steenhof 1976). Although proximity to food sources is an important attribute (Keister and Anthony 1983), these roosts need not be close to water (Steenhof 1978). Roosts appear to be selected for protection from the wind (Steenhof 1978; Keister et al. 1985). However, the literature does not mention a dependence on cover during the breeding season. Cover requirements during the breeding season are assumed to be identical to reproduction requirements.

Reproduction

Although bald eagles will nest on the ground on isolated, treeless islands (Troyer and Hensel 1965) and occasionally on cliffs (Bull 1974; Brazil 1985), they prefer larger, dominant trees of a variety of species (Murphy 1965; Jaffee 1980; Lehman et al. 1980; Anthony and Isaacs 1981; Mosher and Andrew 1981; Mathisen 1983). The bald eagle prefers to nest in areas that are primarily mature or old-growth timber (Lehman et al. 1980; Anthony and Isaacs 1981; Anthony et al. 1982). Most nests in southeast Alaska were in old-growth forest where the average nest tree height was 29.4 m; no nests were found in second-growth trees (Robards and Hodges 1977). A mature vegetation structure was considered to be an important component of bald eagle breeding habitat in Maryland (Mosher and Andrew 1981). There, the average nest tree height was

29 m. The average nest tree height in Virginia was 30.1 m (Jaffee 1980). Nest trees were of an open, stable form providing easy access; the form was more important than the tree species in nest site selection.

Bald eagles in the Greater Yellowstone Ecosystem were flexible in their selection of nest sites, as long as a dependable food source was available in early spring (Swenson et al. 1986). Once this criterion was met, the eagles "... would nest...near either lakes or rivers, in either large, strong trees ...or small, weak trees..." (Swenson et al. 1986:41), although they tended to select the most desirable trees available. In comparison to surrounding trees, 38%, 44%, and 19% of the nest trees were categorized as larger (in diameter or height) in the Yellowstone, Continental, and Snake Units, respectively (Swenson et al. 1986). Sixty-two percent, 56%, and 71% of the nest trees were categorized as similar to surrounding trees in the three Units, respectively. Only 2 of the 56 nest trees were categorized as smaller than the surrounding trees.

Second-growth forest with a remnant (5% to 10%) old-growth component also may provide breeding areas. In Minnesota, State forestry laws of 1902 and 1908 required that 5% to 10% of the trees in the original forest stands be retained as seed trees (Juenemann and Frenzel 1972). These retained trees currently provide canopy discontinuity from the surrounding second-growth hardwoods and are strongly selected for by breeding bald eagles (Juenemann and Frenzel 1972; Mathisen 1983).

Some deforestation may occur without apparently affecting bald eagle densities. For example, in southern British Columbia, 21% of the study area had no old-growth trees, yet eagle density was not reduced from levels in northern British Columbia where 10% of the study area lacked old-growth (Hodges et al. 1984). Eagle densities in both areas matched those of undisturbed southeast Alaska. Although nesting density was greatly reduced in those plots of the study area without old-growth trees, densities in areas with at least some old-growth trees were higher than expected.

One of the most important characteristics of bald eagle nesting habitat is an open forest structure (Lehman et al. 1980; Anthony and Isaacs 1981; Mosher and Andrew 1981; Anthony et al. 1982). The average percent canopy closure at nests in Maryland was 61% (Mosher and Andrew 1981). In California, the canopy closure of the timber stand associated with the nest was usually <40% (Lehman 1979) and often <20% (Lehman et al. 1980). Bald eagles in the Pacific Northwest also nested in fairly open forests (Anthony et al. 1982) where the mean crown closure was <50% (Anthony and Isaacs 1981).

Bald eagles are primarily shoreline nesters (Hensel and Troyer 1964; Robards and King 1966; King et al. 1972; Gerrard et al. 1975; Grier 1977; Lehman et al. 1980; Hodges 1982; Mathisen 1983; Barber et al. 1985; Brazil 1985; Koonz 1985; Stocek 1985). Murphy (1965) listed proximity to water as the first requirement of an area as nesting habitat. The mean distance from water, however, varies between populations, from 36 m on Admiralty Island, Alaska (Robards and Hodges 1977), to over 707 m in Virginia (Jaffee 1980) to over 1.2 km in Oregon (Anthony and Isaacs 1981). Whitfield et al. (1974)

found that over 90% of all nests in their Manitoba and Saskatchewan study areas were within 182 m of a lake or river. Very few nests were found over 728 m from water. In this study and in Alaska (Robards and Hodges 1977), the number of nests dropped off sharply beyond 46 m from water. Bald eagles nested an average of 97.5 m, 199.8 m, and 552.5 m from water in the Yellowstone, Snake, and Continental Units, respectively, of the Greater Yellowstone Ecosystem (Swenson et al. 1986). In Maryland, Taylor and Therres (1981) did not consider land over 1.6 km from water to be suitable nesting habitat. Over 90% of all Maryland bald eagle nests were within 1.5 km of water. None of these studies, however, established a mean distance of land to water. Therefore, nest site preference may have been confounded with land and water distribution.

Bald eagles may show some reluctance to nest right at the shoreline. Even in relatively undisturbed areas of Alaska, the average distance of nest to water was 36 m (Robards and Hodges 1977). In addition, nests within 10 m of shore had a tendency to be used less than those nests over 10 m from shore. Both Robards and Hodges (1977) and Dixon (1909 cited by Bent 1937) suggested that protection from storms may be a reason for this avoidance of the immediate shoreline.

Special Considerations

Although the level of human disturbance often has no effect on the productivity of bald eagles at existing nest sites (Mathisen 1968; Grier 1969; Jaffee 1980; Stocek and Pearce 1981), eagles clearly prefer to nest in areas with little or no human disturbance (Fraser 1985). For example, bald eagle populations are densest in areas without significant human disturbance, such as southeast Alaska (Robards and Hodges 1977), and there they did not use areas of heavy human use. In Manitoba, there were significant numbers of nesting bald eagles on Lakes Winnipeg and Manitoba, except near extensive cottage development (Hatch 1985). Bald eagle densities on Besnard Lake, Saskatchewan, decreased in areas opened to recreational activity (Gerrard et al. 1985). The distance to a water body from bald eagle nests in the Greater Yellowstone Ecosystem tended to increase as the recreational use of the water body increased (Swenson et al. 1986). In Minnesota, human disturbance was related to lowered nest occupancy and productivity (Juenemann and Frenzel 1972). In coastal British Columbia, bald eagles were abundant except in heavily disturbed areas (Hodges et al. 1984). Bald eagles tended to nest away from human residential areas in Maryland (Taylor and Therres 1981). There, only two of 123 nests had residential development as the primary land use within 0.6 km of the nest. Taylor and Therres (1981) suggested that nesting bald eagles will tolerate low-density residential disturbance at distances greater than 1.2 km and medium- to high-density residential disturbances at greater than 1.8 km. A tendency of bald eagles to nest away from human activity was also noted in another quantitative study of bald eagle nesting habitat in Maryland (Mosher and Andrew 1981). Successful nest sites were located in more dense forest stands set back further from open water and forest openings than unsuccessful nests. All the bald eagle nests on Yellowstone Lake, Wyoming, were on the roadless south shore (Murphy 1965). The north shore is paralleled by a heavily traveled highway that permits access for a wide range of human recreational activities. The majority of bald eagle nests in Virginia were located in areas of light human use (Jaffee 1980). Jaffee (1980) suggested that bald eagles were relocating their nests in Virginia to avoid human disturbance associated with shorelines. Lehman et al. (1980) made a similar suggestion about bald eagles in California. These studies indicated that, although nesting bald eagles were not affected by low degrees of human disturbance, habitat suitability decreased as human disturbance increased. There were few reported instances of bald eagles nesting in medium- to high-density human residential areas, and the greatest densities were always reported in areas of minimal human activity.

Logging operations can be very intensive, and this degree of human activity may lower nesting productivity (Anthony and Isaacs 1981). Carefully controlled selective timber harvest, however, need not lower habitat suitability (Lehman et al. 1980). Selective logging during the fall and winter was considered a necessary and appropriate bald eagle management tool in California because eagles there preferred to nest in ponderosa pine (Pinus ponderosa), a shade intolerant species (Lehman et al. 1980; Burke 1983).

Bald eagles may be more prone to nest desertion early in the nesting cycle than late in the cycle (Mathisen 1968) and will react differently to different types of disturbance. For example, existing cropland was considered an acceptable component of bald eagle nesting habitat in Maryland (Taylor and Therres 1981). However, the authors noted that cropland itself is unsuitable bald eagle nesting habitat. Intensive agriculture in Ohio was not thought to disturb some nesting bald eagles (D. Case, Ohio Department of Natural Resources, Columbus, Ohio; pers. comm.). In addition, disturbances that eagles may not directly recognize as human, such as railroads, planes, and unused buildings, may be tolerated.

HABITAT SUITABILITY INDEX (HSI) MODEL

Model Applicability

Purpose. This model differs from the standard HSI model. Most HSI models are designed to quantify the impacts of development projects for mitigation planning or to predict benefits of various habitat management programs. The bald eagle HSI model may be used for assessment of impacts, but will be of little use in mitigation or management studies due to the model variables. Variables used in this model to assess habitat suitability either are not likely to change due to management (e.g., area of water body, morphoedaphic index), or are likely to change slowly over time as a result of management (e.g., the amount of mature forest available for nest sites). Management of bald eagle nesting habitat currently consists primarily of nest site protection. For example, the management strategy for the bald eagle at Chippewa National Forest in Minnesota is primarily land-use restrictions in the vicinity of nests, along with biological monitoring (Mathisen et al. 1977). Therefore, the primary uses of this model may differ from those of other HSI models. This model may be most useful in comparing the suitability of many different areas at one point in time for site protection, or as a tool in recovery planning to locate optimum areas for bald eagle reintroduction or protection.

Geographic area. This HSI model has been developed for application to habitats in that portion of North America north of the 37th parallel, which runs from Norfolk, Virginia, to San Jose, California (Figure 1). Because the bald eagle nests across the continent in a variety of ecoregions, and is so mobile, no attempt was made to delineate a discrete breeding range within this area.

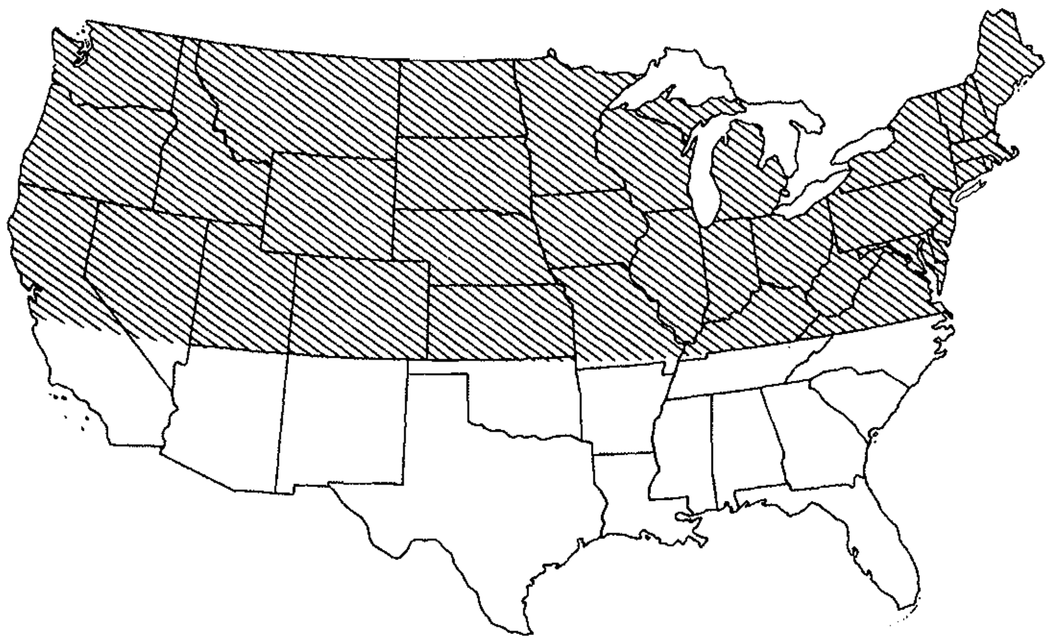


Figure 1. Geographic applicability of the bald eagle HSI model.

Season. This model was developed to evaluate the potential quality of nesting habitat for the bald eagle. It is not intended to assess the quality of fall and winter habitat.

Cover types. This model was developed to evaluate habitat in the Lacustrine (L) and Estuarine (E) cover types (terminology follows that of U.S. Fish and Wildlife Service 1981). These cover types include a 1.5-km strip of land that borders the open water or adjoining emergent or scrub-shrub wetlands. This model does not provide a means of evaluating riverine and marine cover types because data on the morphoedaphic index (a major factor in determining food suitability with this model) was not found for these cover types.

Minimum habitat area. Minimum habitat area is defined as the minimum amount of contiguous habitat that is required before an area will be occupied by a species. The smallest body of water occupied by one pair of nesting bald eagles is 8 ha. Therefore, the minimum size of an evaluation area is assumed to be a body of water with a surface area of 8 ha surrounded by a 1.5-km strip of land.

Verification level. Earlier drafts of this model were reviewed by the following individuals:

Dr. Robert Anthony, Oregon Cooperative Wildlife Research Unit, Corvallis, OR

Mr. Denis Case, Ohio Department of Natural Resources, Columbus, OH

Mr. Keith Cline, Raptor Information Center, Washington, DC

Dr. Daniel James, U.S. Fish and Wildlife Service, Arlington, VA

Mr. John Mathisen, U.S. Forest Service, Cass Lake, MN

Mr. Brian Millsap, Raptor Information Center, Washington, DC

Ms. Karen Steenhof, U.S. Bureau of Land Management, Boise, ID

Mr. Stanley Wiemeyer, U.S. Fish and Wildlife Service, Laurel, MD

Comments by the reviewers were incorporated into the model and resulted in several significant improvements. The current model has not been field tested and empirical relationships between model outputs and measures of bald eagle habitat suitability are unknown.

Model Description

Overview. The breeding season HSI model for the bald eagle considers food, reproduction, and human disturbance as the primary components of breeding habitat. The HSI value considers the quality and availability of nesting sites and the availability of prey. Because eagle prey is primarily derived from aquatic systems, total prey availability is assumed to depend upon the size and productivity of the associated water body. Optimal nesting habitat is assumed to be characterized by: (1) a large foraging area with high fish production, (2) the presence of mature trees for nest sites, and (3) minimal human disturbance. Cover requirements during the breeding season are assumed to be adequately evaluated by the criteria used to evaluate reproductive requirements.

The following sections describe the logic used and the assumptions made to translate the habitat information for the bald eagle to the variables and equations used in the model. The suitability levels of variables and relationships between variables are also described.

Food component. Bald eagle breeding habitat suitability is strongly influenced by the availability of live or carrion prey, primarily fish or aquatic birds. Specifically, the amount of open water in the evaluation area and its productivity are of major importance in determining the total amount of food available to a population of eagles.

Since nesting bald eagles prey largely on aquatic or aquaphilic species, habitat suitability generally increases with the amount of open water. It was noted previously that areas with <8 ha (0.08 km^2) of open water are not known to constitute bald eagle habitat. Habitat suitability increases from zero below this size to optimal for bodies of water with surface areas ≥10 km^2 (Figure 2a). For estuarine cover types, the suitability index (SIV1) is assumed to be optimal (=1.0) for the amount of foraging habitat.

For the purposes of this model, emergent and scrub-shrub wetlands adjacent to open water also should be considered foraging habitat (as opposed to nesting habitat) due to documented eagle use of these habitats. Foraging in emergent or scrub-shrub wetlands, however, is apparently coincidental to the primary feeding strategies of fishing and shoreline scavenging, because bald eagles have not been observed hunting in emergent or scrub-shrub wetlands that are located far from large, open water bodies. Therefore, emergent or scrub-shrub wetlands that are not associated with open water should not be considered foraging habitat.

The productivity of the water body is the second aspect that is of importance in determining food availability. Specifically, food availability and, hence, habitat suitability, increase with productivity. A reasonable measure of the productivity of lentic aquatic systems can be obtained from the morphoedaphic index (Ryder 1965, 1978, 1980; Jenkins 1982) in terms of fish biomass density or potential fish yield (lbs/acre). The morphoedaphic index (MEI), where

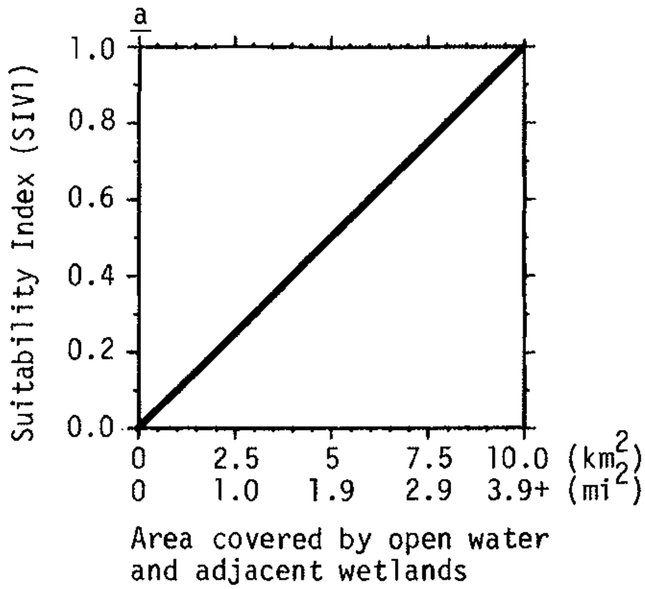
$$MEI = \frac{\text{total dissolved solids (ppm)}}{\text{mean depth (feet)}}$$

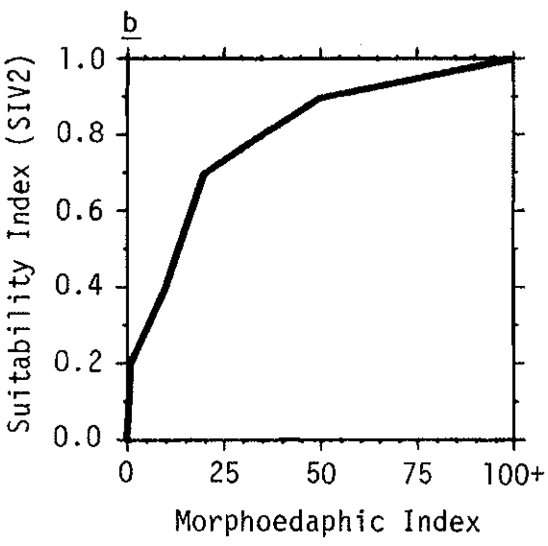
has been used to explain differences in bald eagle nesting densities (Gerrard et al. 1983; Detrich 1985). Detrich (1985) used a modified form where

$$MEI = \frac{\text{conductivity (micromhos)}}{\text{mean depth (cm)}}$$

Fish biomass density and, hence, habitat suitability are assumed to increase with the MEI as a function of the data curves generated by Ryder (1965) and Jenkins (1982) and as described by Ryder (R. A. Ryder, Ontario Ministry of Natural Resources, Thunder Bay, Ontario; pers. comm.) (Figure 2b).

Ryder et al. (1974) note that certain conditions may cause the MEI to yield misleading results. Very shallow lakes, with a mean depth <3 m, may contain lowered fish biomass because of winterkill. Also, lakes with very high TDS levels often have limited fish populations, although the precise reason for this is unclear (Schlesinger and Regier 1982). It is often thought,





Coordinates

X	Y
0.0	0.0
1.0	0.2
10.0	0.4
20.0	0.7
50.0	0.9
100.0	1.0

Figure 2. Relationships between variables used to evaluate suitability of water bodies as bald eagle habitat and suitability indices for the variables.

however, that highly productive systems have marginal habitat for some fish species because of anoxic hypolimnions or reduction of "liebensraum" (Ryder, pers. comm.). Ryder states that fish crops increase rapidly with the MEI to about 40, and show little improvement between MEI's of 40 and 100. Beyond an MEI of 100, Ryder states that the MEI-fish crop relationship often breaks down because of the conditions noted above.

Provided that all criteria for use are heeded, the MEI can be applied to freshwater or brackish ecosystems (Ryder, pers. comm.). However, in this model, comparisons of HSI between the two types may not be made because the salinity of estuaries and, therefore, TDS differs from that of lake water.

The suitability of the food component (SIF) is assumed to be best represented by the geometric mean of the two variables used to evaluate this component, as in Equation 1. This is intended to reflect the compensatory nature between lake size and lake productivity. Specifically, it is assumed that the food resources in lakes from 0.08 - 10 km^2 are not most efficiently used by eagles due to their territorial requirements. It is assumed, following the discussion of Detrich (1985), that smaller lakes often have opposing shorelines <0.5 km apart and that the presence of a pair of eagles on one shore may preclude use of the other shore by other eagles. On larger lakes (>10 km^2), it is assumed that lake geometry does not affect habitat use and that the SI is primarily determined by the MEI. Equation 1 yields a food suitability index of 0.0 for lakes ≤8 ha. For lakes >8 ha, the food suitability index determined by Equation 1 is a function both of area and MEI, but the index will be closer to the lower of the two inputs (i.e., SIV1 and SIV2). Note that the area of foraging habitat in estuarine cover types is assumed to be optimal (i.e., SIV1 = 1.0).

$$SIF = (SIV1 \times SIV2)^{1/2} \tag{1}$$

Reproduction component. Although individual pairs or remnant populations of bald eagles will nest in second-growth timber or largely deforested areas, the species clearly prefers, and reaches its greatest densities in, large areas of undisturbed, mature or old-growth timber, with an open and discontinuous canopy. This habitat type provides an abundance of the eagle's preferred nesting sites, i.e., tall, dominant trees, regardless of species, with an open structure and stable limbs allowing easy approach from the air. Second-growth forests, with a remnant (5% to 10%) old-growth component intermixed, also can provide for nesting requirements. Dense stands of even-aged, small, second-growth timber without a remnant old-growth component do not provide the relatively open canopy structure bald eagles need. The species rarely nests in this seral stage. Productivity of more exposed nests may be affected by increased vulnerability to storm damage. Susceptibility to human disturbance also may increase with visibility or accessibility of the nest.

Suitable bald eagle nesting habitat within lacustrine or estuarine habitats is assumed to be a function of the amount of mature, open canopy forest cover within the evaluation area. Because the majority of bald eagle nests of all populations are within 1.5 km of shore, the evaluation area for this component is the land area within 1.5 km of the edge of the water or associated herbaceous or shrub wetland. Optimum conditions for reproduction are assumed to occur when mature timber exceeds 75% of the land area. Smith (1974) defined undisturbed (i.e., mature) temperate forest generally as uneven aged, having a discontinuous canopy >20 m high. However, the height and structure of mature forests will vary with the forest type. Hence, the user should establish a definition of maturity for the forest cover in the evaluation area. The silvicultural definition of rotation age maturity is not appropriate for the purposes of this model, because it refers to the concepts of financial maturity and return on investment (Smith 1962). Habitats where mature forest cover is <75% of the land area are assumed to be suboptimal (Figure 3). Because bald eagles are territorial, with widely spaced nests even under optimum conditions, it is assumed that some deforestation within an evaluation area may occur without reducing the suitability index for the reproduction component. In this model, the suitability index for bald eagle reproduction (SIR) is estimated by only one variable, the proportion of potential nesting area in mature timber, and is equal, therefore, to SIV3 (from Figure 3).

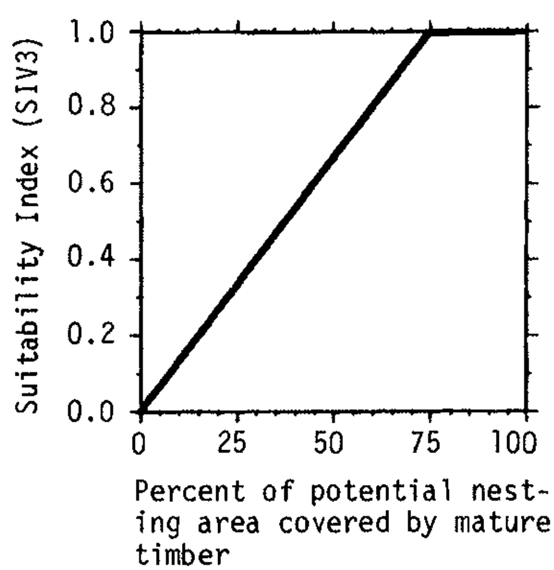


Figure 3. The assumed relationship between the amount of mature timber within 1.5 km of a shoreline and suitability of the habitat for bald eagle nesting.

Human disturbance component. Bald eagle populations reach their greatest densities in areas of minimal human activity. They are found in reduced densities in areas of moderate human use and are not found at all in areas of heavy human use. They prefer to nest at least 1.0 km from human residences and will nest farther from shore to avoid shoreline disturbances. Where human disturbance is severe, nesting success may be affected, and the area may be abandoned entirely. Although remnant populations often are not affected by existing levels of human disturbance, the potential carrying capacity of their habitat has been reduced through human presence and activities. The precise effect of human disturbance on bald eagle carrying capacity is not known and is, therefore, difficult to evaluate.

Human presence in bald eagle nesting habitat falls primarily into four categories: (1) agriculture, (2) urbanization, (3) recreational development, and (4) logging. Most agricultural operations are not human intensive and their effect on carrying capacity most likely is felt via attendant deforestation, not via the human presence *per se*. For this reason, agriculture is considered to be an impact upon the reproduction component. Urbanization and recreational development can both be measured by the density of houses, buildings, or campsites. Medium- and high-density residential areas are defined as areas where lot frontage is ≤33 m (New York State 1974). Medium-density residential areas along a lakeshore would then have buildings at a density of 30 per kilometer of shoreline (Figure 4). This corresponds to 20 buildings per square kilometer of the reproduction area. Habitat suitability is assumed to be optimal where there are no buildings or campsites and unsuitable where there are >20 buildings or campsites per square kilometer of upland (Figure 4).

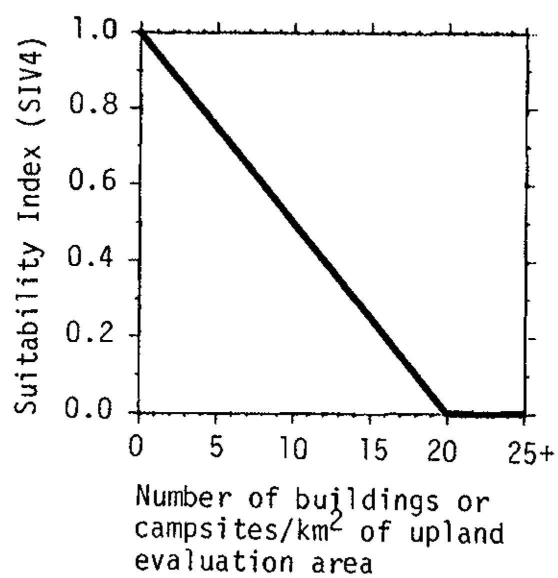


Figure 4. Assumed relationship between housing or campsite density and habitat suitability for the bald eagle.

The distribution and uses of the buildings or campsites, as well as the season of use, will affect the amount of their disturbance. If all the buildings or campsites are distributed evenly along the shoreline, so as to preempt the most desired nesting and perching sites, their impact will be greater than if they are tightly clustered and removed from the shoreline.

The human presence associated with logging may be significant and could cause large reductions in habitat suitability. However, this form of human disturbance has been studied only with respect to impacts upon productivity at individual nest sites. Because productivity varies between and within eagle populations, regardless of nesting density, productivity data alone cannot be used to reliably support habitat suitability models that are based upon nesting density. No information was located in the literature that documented a correlation between logging intensity over a large area (i.e., more than a single nest site) and nesting density in the same area. For this reason, the human disturbance associated with logging operations, although important, cannot be reliably included in this model and must be considered as a separate process.

The overall suitability index for the human disturbance (SIHD) component is estimated by the suitability index determined for building or campsite density (i.e., SIHD = SIV4).

Building density may not be the most precise indicator of human disturbance under certain conditions (e.g., heavy boat traffic only). To be a useful habitat assessment tool, however, the model variables must be easily measurable and applicable to the range of conditions within the model's geographic area of applicability. Building density, therefore, is used as a surrogate measure of human disturbance, because it is an easily measured indicator of long-term human land use.

HSI determination. The overall habitat suitability index is a function of the food, reproductive, and human disturbance components. Any of the components may be the most limiting factor in a given situation. Under pristine conditions, where the reproductive and human disturbance components are optimum, the overall habitat suitability will be determined by the food component which is, in turn, a function of the foraging area and the MEI. Under other conditions, the potential food base may be capable of supporting a higher density of bald eagles than is actually realized, as a result of less than optimum conditions for nesting sites and disturbance potential. It is assumed that the food component is of greater importance alone than either of the other components alone, unless one of the other components is 0.0. The reproductive and human disturbance components are combined via a geometric mean which yields a combined suitability value of 0.0 if either of the inputs is 0.0, and a value closer to the lower of the input values if both are >0.0. The resulting suitability value is multiplied by the food suitability index to yield the overall habitat suitability index (Equation 2). This relationship is based on the assumption that the food suitability value defines the upper level of potential suitability that will be realized only when the reproductive and human disturbance components are optimum. Values less than optimum for the reproductive and human disturbance components will lower the overall value from the maximum set by the food component suitability. In the extreme situation, none of the potential food will be used by eagles when either or both of the reproductive or human disturbance components equals 0.0. It should be noted that the product resulting from Equation 2 will be lower than any individual input if the combined reproductive/disturbance input and the food input are <1.0, because decimals are being multiplied. This is intended and follows the logic that the combined reproductive/disturbance component is a modifier of the maximum suitability determined by the food component.

$$HSI = (SIR \times SIHD)^{1/2} \times (SIF) \qquad (2)$$

Because the HSI equation is geometric, and uses values <1.0, the HSI score will generally be <1.0, and will often be <0.5. This will be particularly true when cold, oligotrophic lakes are evaluated. The assignment of an HSI value <0.5 to a wilderness lake with perhaps a healthy eagle population may seem illogical. However, it should be remembered that the HSI is designed to reflect habitat suitability by the density of eagles along the shoreline. Oligotrophic, wilderness lakes may have quite healthy populations of eagles, but at lower densities than can be expected around more productive lakes.

Application of the Model

Summary of model variables. This model provides criteria to evaluate the suitability of bald eagle nesting habitat in lacustrine or estuarine cover types. The relationships of the habitat variables to an HSI are shown in Figure 5. Definitions of habitat variables and suggested measurement techniques (Hays et al. 1981, unless noted otherwise) are shown in Figure 6.

The presumed relationship between each habitat variable and habitat suitability has been described and documented. This provides some insights that can be used to tailor the model to fit study constraints and local bald eagle breeding characteristics. Due to the large breeding range of the bald eagle, it is expected that model alterations will be necessary.

Because many of the data used in applying this model are derived from remote sensing, it is essential that the user visit the evaluation area to ensure that all remote sensing data are accurate. This is necessary to properly define the occurrence and limits of mature forest and to accurately record the type and intensity of human disturbance. This model should not be applied solely on the basis of remote sensing data, no matter how recently collected.

Model assumptions. A number of significant assumptions were made in the development of this HSI model for the bald eagle. The major assumptions are as follows:

1. Mature forested stands with minimal human disturbance are required for nesting by bald eagles. However, optimal nesting conditions can exist as long as >75% of potential nesting area is in mature timber.

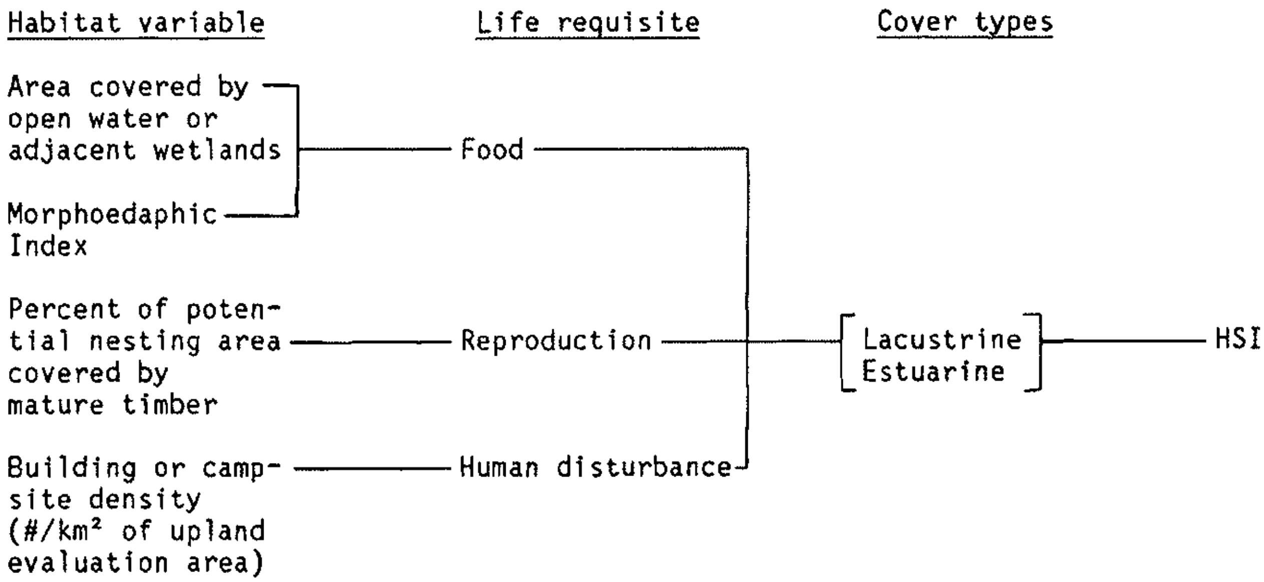


Figure 5. Relationships of habitat variables, life requisites, and cover types in the bald eagle HSI model.

2. Mature forest stands within 1.5 km of a body of water ≥8 ha provide optimal nesting conditions regardless of stand composition.

3. Immature forest stands provide no nesting habitat.

4. The extent and influence of human disturbance can be estimated by an estimate of building or campsite density.

The first assumption will probably be valid in most applications of this model. Under certain conditions, however, bald eagles will nest on the ground or on cliffs. This typically occurs on isolated, uninhabited islands where trees are scarce or absent. Under these circumstances, the model should be modified to include potential cliff or ground nests.

The second and third assumptions also should be valid in most applications of this model. However, certain monotypic stands may not provide optimal nesting conditions at maturity, if the tree species' terminal branching structure is too fine or fragile to support eagle nests. Some immature forest stands that are approaching maturity may contain scattered individual trees that, due to site advantage, possess size and form suitable for nesting. If either circumstance occurs, the model should be modified to reflect the relative presence or absence of nesting sites.

Variable (definition)	Cover types	Suggested technique
Area covered by open water or adjacent wetlands (the absolute area being evaluated that consists of open water plus the herbaceous and shrub wetlands that are immediately adjacent to open water; herbaceous and shrub wetlands that are not adjacent to open water should not be included in determination of area for this variable.)	L	Remote sensing, topographic map, dot grid, published data.
Morphoedaphic Index [A ratio relating the productivity of a water body as measured by total dissolved solids to the mean depth of that water body using the following formula: Morphoedaphic Index (MEI) = $\frac{\text{total dissolved solids}}{\text{mean depth}}$ where total dissolved solids (TDS) is measured in parts per million and mean depth is measured in feet].	L,E	TDS meter, conductivity meter, laboratory analysis, soundings, published data, (Hamilton and Bergersen, n.d.). (NOTE: Conductivity measurements must be converted to TDS before determination of MEI.)
Percent of potential nesting area covered by mature timber (an estimate of the proportion of a 1.5 km wide band of land, surrounding the cover type being evaluated, that is covered by mature forest; characteristics defining mature forest, such as height and density of trees, must be defined by the model user).	L,E	Remote sensing, direct observation, dot grid, topographic map.

Figure 6. Definitions of habitat variables and suggested measurement techniques.

Variable (definition)	Cover types	Suggested technique
Building or campsite density (the number of campsites, houses, or other permanent dwellings per km² of upland evaluation area based on the 1.5 km wide strip of land surrounding the aquatic cover type being evaluated).	L,E	Remote sensing.

Figure 6. (Concluded)

The fourth assumption is perhaps the assumption that will most often be invalid. The impact of humans on nesting bald eagles involves many types and intensities of disturbances. The use of building or campsite density as the single estimator of the impact of human disturbance obviously simplifies a very complex problem. Other means of assessing human disturbance on a local basis may be preferable to building or campsite density.

There are factors other than habitat that affect the carrying capacity of an area for bald eagles, including climate and environmental contaminants. These factors should be considered as possible sources of variation when model outputs are compared to populations in different habitats in widely separated areas.

Climate affects virtually all living organisms. As the mean temperature decreases, breeding seasons become shortened and energetics becomes an increasingly important factor. Wetmore and Gillespie (1976) found a significant correlation between mean April temperature and osprey (Pandion haliaetus) productivity in Labrador and northeastern Quebec. Leighton et al. (1979) found a significant correlation between April temperature and bald eagle nesting density in Saskatchewan. Their data indicated that, whereas local climatic and geographic features may cause variation, in general, bald eagle reproduction becomes difficult, if not impossible, where the mean April temperature is <-7 °C. Where mean April temperature is >10 °C, bald eagles begin nesting earlier to avoid extreme summer temperatures; this behavior is exhibited by bald eagles nesting in the southeastern United States (Bent 1937).

Climate also affects bald eagle prey availability. Total annual fish production is positively correlated with annual temperature on a global basis (Schlesinger and Regier 1982). Although climate was not a significant factor in fish production within the north-temperate climatic region (Matuszek 1978), there can be large differences in annual fish production between north-temperate and south-temperate lakes with similar morphoedaphic indices (Schlesinger and Regier 1982).

Persistent environmental contaminants are another factor, but are not included as a habitat component in this model for two reasons. First, the contaminant burden in eagle populations is a function of wintering habitat as well as breeding habitat and cannot be accurately measured by analysis of breeding habitat alone. Second, the effect of persistent environmental contaminants on eagles has been measured by its effect upon nesting productivity, not directly on nesting density. However, nesting density has been affected where contamination was severe for prolonged periods (S. N. Wiemeyer, Patuxtent Wildlife Research Center, Laurel, MD; pers. comm.). In these cases, reproduction was inadequate to maintain stable populations and contaminants caused direct mortality to eagles. For the same reasons discussed earlier concerning logging impacts, the impact of persistent environmental contaminants upon habitat suitability cannot be reliably included in this model and must be considered as a separate process. Persistent environmental contaminants, however, have had marked effects on many raptor populations (Hickey 1969; Porter and Wiemeyer 1969; Redig 1979), including the bald eagle (Hamerstrom et al. 1975; Wiemeyer et al. 1984). Thus, the level of environmental contaminants in the nesting area should be considered in conjunction with any habitat analysis. Few controlled studies of the relationships between dietary levels of contaminants and reproductive success have been conducted. However, a very general pattern has been observed regarding dietary concentrations of DDE, which is now the most frequent source of chemically-induced reproductive disruptions (Wiemeyer, pers. comm.). This pattern can be used as a preliminary guide to suggest effects on productivity. When the wet weight dietary concentration of DDE in prey tissue is <0.1 ppm, no effect on raptor productivity is expected. Between 0.1 and 0.5 ppm, there may be some residue accumulation and minor effects. Between 0.5 and 3 ppm, there may be some eggshell thinning and reproductive problems. When DDE concentrations in prey tissues are consistently above 3 ppm, there may be occasional adult mortality and a severe reduction or complete failure in productivity. Other persistent contaminants also may cause adverse effects on bald eagle populations (Wiemeyer, pers. comm.). Contaminant ecologists should be consulted when such contaminants are detected in prey items. The potential effects of nonpersistent but moderately to highly toxic contaminants should not be overlooked.

SOURCES OF OTHER MODELS

Two HSI models have been developed for Alaska (Steenhof, in press). Both models rely on subjective characterization of habitat types and appear to measure the suitability of individual nest sites, rather than larger areas of habitat.

Taylor and Therres (1981) used the physical characteristics of known bald eagle nesting habitat in Maryland to construct a computer-generated prediction of suitable habitat in Maryland. They evaluated land use, cover type, disturbance, and distance to feeding areas. Their system measured many different areas at a single point in time. The biological data used in their model supports this HSI model and was used to document some of the assumptions contained herein.

Two additional HSI models are currently being developed for use in Montana (Steenhof, in press).

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A review and synthesis of existing information were used to develop a Habitat Suitability Index (HSI) model for the bald eagle (Haliaeetus leucocephalus). The model consolidates habitat use information into a framework appropriate for field application, and is scaled to produce an index between 0.0 (unsuitable habitat) and 1.0 (optimum habitat). HSI models are designed to be used with Habitat Evaluation Procedures previously developed by the U.S. Fish and Wildlife Service.

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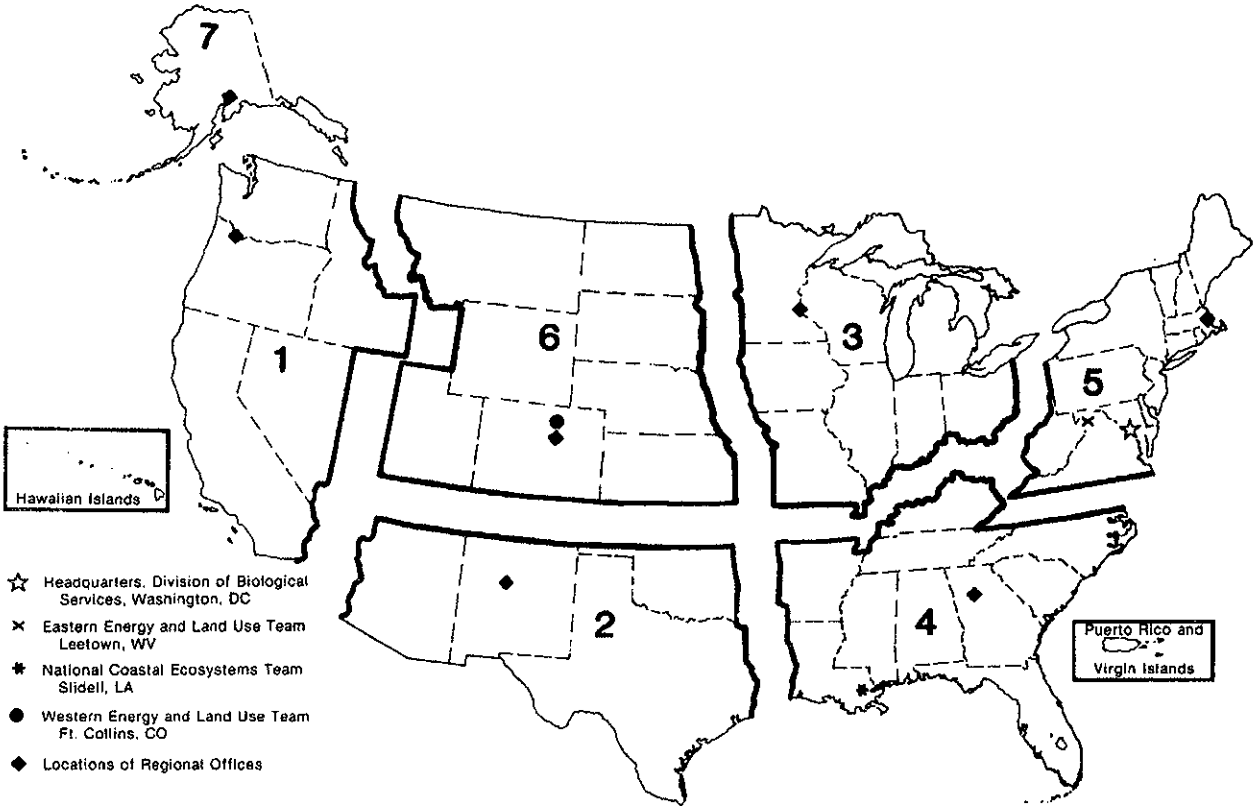

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Bald Eagle and American Peregrine Falcon Management Plan

Attachment C

Biological Opinion for the New Bullards Bar Reservoir Safety and Annual Maintenance, Downieville Ranger District, Tahoe National Forest

Yuba River Development Project

FERC Project No. 2246

September 2019

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

TAKE PRIDE IN AMERICA

In reply refer to:
1-1-03-F-0335

FEB 04 2004

Steven T. Eubanks
Forest Supervisor
Tahoe National Forest
631 Coyote Street
Nevada City, California 95959

Subject: Biological Opinion for the New Bullards Bar Reservoir Safety and Annual Maintenance, Downieville Ranger District, Tahoe National Forest

Dear Mr. Eubanks:

This is in response to your October 21, 2002, request for informal consultation with the U.S. Fish and Wildlife Service (Service) on the New Bullards Bar Reservoir Safety and Annual Maintenance Project in Yuba County, California. Your request was received in our office on October 23, 2002. The proposed action involves disposal of woody debris accumulated in the reservoir by piling and burning, removal of standing trees on the shoreline areas of the reservoir that have been determined to be hazards to human safety, and reducing ladder fuels within administrative sites around the reservoir, including campgrounds, day-use facilities, and U. S. Forest Service (Forest Service) facilities. The species at issue with this proposed action are the Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) (LCT), the bald eagle (*Haliaeetus leucocephalus*), the California red-legged frog (*Rana aurora draytonii*) (frog), and the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (beetle), which are listed as threatened pursuant to the Endangered Species Act of 1973, as amended (Act).

Your October 21, 2002, letter, requested concurrence with the determinations that the proposed action would not affect the LCT and the beetle, and was not likely to adversely affect the bald eagle and the frog. We concur that the proposed action will not affect the LCT and the beetle. We also concur that the proposed action is not likely to adversely affect the frog. We are unable to concur that the proposed action is not likely to adversely affect the bald eagle, because the removal of hazard trees on the shoreline of the reservoir is likely to involve the removal of actual or potential perching, roosting, and nesting habitat for bald eagles.

This document represents the Service's biological opinion on the effects of the action on the bald eagle, in accordance with section 7 of the Act. This biological opinion is based on information provided in the October 15, 2002, *Biological Assessment for the New Bullards Bar Reservoir Safety and Annual Maintenance, Downieville Ranger District, Tahoe National Forest* (Biological Assessment), the August 7, 2003, *New Bullards Bar Hazard Tree Rating Form, New Bullards Bar Reservoir Hazard Tree Rating Form Supplement*, and *Short Term Mortality Indicators* (collectively referred to as the Field Data Form), the April 11, 2002, *Draft New Bullards Bar Management Plan*, field investigations, and other sources of information. A complete administrative record of this consultation is on file in this office.

Consultation History

April 24, 2002 Site visit at New Bullards Bar Reservoir to review areas used by bald eagles, and discuss proposed wood debris disposal sites.

May 16, 2002 Site visit at New Bullards Bar Reservoir to discuss proposed criteria for hazard tree identification and removal and view examples of tree proposed for removal around the reservoir.

October 23, 2002 Request for informal consultation received for the New Bullards Bar Reservoir Safety and Annual Maintenance, Downieville Ranger District, Tahoe National Forest

August 6, 2003 Meeting at Downieville Ranger District to discuss the final draft of the August 7, 2003, *New Bullards Bar Hazard Tree Rating Form, New Bullards Bar Reservoir Hazard Tree Rating Form Supplement*, and *Short Term Mortality Indicators*

BIOLOGICAL OPINION

Description of the Proposed Action

In this proposed action involves three closely related safety and maintenance actions. The proposed actions include: (1) removing and disposing of woody debris from the reservoir; (2) removing hazard trees; and (3) maintaining administrative sites (campgrounds, day-use areas and Forest Service facilities) by removing under-story vegetation. In addition to these proposed activities, management requirements listed in Section VIII of the Biological Assessment are a required part of these proposed actions, and are described in the *Conservation Measures* section.

The Draft New Bullards Bar Fish and Wildlife Management Plan (April 11, 2002) (Management Plan) includes the following objectives: (1) fulfill the USDA Forest Service (USFS) and Yuba County Water Agency's (YCWA) obligations to the USFWS (as mandated by the Federal Energy Regulatory Commission), which is to protect and manage habitat important to the species survival; (2) help manage to meet the population goals identified in the Recovery Plans for federally-listed species; (3) manage for a safe visitor experience while mitigating adverse effects to threatened, endangered, and sensitive species; (4) restrict human disturbances (walking, driving, mountain biking, boating, camping, operating machinery) within the Management Plan areas of interest to protect and sustain existing and potential listed species populations and habitat; (5) provide land managers with guidance regarding the kinds of actions that may require consultation with the Service. The Management Plan identifies certain routine activities that must occur at the reservoir to provide for improved public safety. Agency managers wish to consult with the Service on some of these actions, to ensure that adequate mitigations and protection measures are included for federally protected species.

Several physical requirements for wood debris disposal sites are needed to be able to stockpile and dispose of wood. These include:

1. Have a low-gradient slope at the water's edge so that wood can be floated onto the shoreline.
2. Possess a cove-like shape, to facilitate effective booming of wood while water levels are high.
3. Have nearby road access for heavy equipment, needed to pile wood for burning.
4. Be large enough to accommodate estimated yearly wood volumes, including periodic years with medium to high water flows.

Forest Service and YCWA personnel surveyed the reservoir by boat on several occasions to identify alternative sites. No potential sites were found that met all objectives. Developing a site for stockpiling, including new road construction was considered, and again, no suitable locations were found. Some alternative sites were found, but all were within the bald eagle breeding territory.

Three locations were selected for wood disposal. Mitigations are incorporated with the proposed actions, to meet the following wildlife objectives, and are part of the proposed action.:

1. Minimize the risk of adversely affecting the California red-legged frog.
2. Protect bald eagle breeding at the reservoir.
3. Protect wintering eagles.
4. Reduce adverse effects to fish and wildlife habitat.

The proposed safety and annual maintenance actions will take place at New Bullards Bar Reservoir, in the Downieville Ranger District of the Tahoe National Forest, Yuba County, California, on the USGS Camptonville, CA 7.5' Quadrangle Map, (T18N R8E) (Figure 1 - Appendix B). The proposed actions will be administered by the Downieville Ranger District and/or the YCWA. They include: (1) remove and dispose of woody debris from the water surface; (2) remove hazard trees that present a higher risk to public safety; and (3) reduce ladder fuels within administrative sites (campgrounds, day-use areas and Forest Service facilities) by removing and disposing of brush and smaller trees. Specific activities associated with these actions are detailed below. The conservation measures specified in this project description are provided at the end of this section.

<u>Action Item 1: Remove and Dispose of Woody Debris From the Reservoir</u>

Woody debris in New Bullards Bar Reservoir poses a hazard to the public. To provide for public safety the YCWA will gather wood from the water surface by boat when the water level is high (generally in May of each year), and boom it in the coves for storage until the water level drops, leaving the wood on land. Wood gathering will occur several times per week, limited to a few trips into a cove per day.

Over the past year YCWA has worked with the Tahoe National Forest to select new woody debris gathering and disposal sites. Three proposed woody debris treatment sites are located on the west bank of Garden Point (T18N R8E Sec 7 SW 1/4) (Figure 2 - Appendix B). The total area to be affected is approximately ½ acre. Since the new sites are much smaller than Moran Cove, three potential small cove sites were identified to handle anticipated annual volumes of woody debris. The three coves were prioritized for use based on ease of access, wood storage/disposal space and proximity to the bald eagle nest tree. Cove 1 offers the best access and wood storage/disposal area; this cove would be the first one used in any given year. If woody debris volume required the use of a second site, Cove 2 would be used. Cove 2 is smaller than Cove 1, and the slope is steeper making woody debris storage/disposal more difficult. Cove 3 is the least favorable cove for woody debris storage and is unsuitable for debris disposal due to the topography. If Cove 3 is needed, it would only be used for woody debris storage, necessitating moving the wood later to Cove 1 or 2 for disposal.

The new woody debris gathering and disposal sites do not require any California red-legged frog mitigations, since these sites are not located near (within one mile of) any suitable breeding habitat for this species. Limited operating periods are implemented to protect wintering eagles and breeding eagles.

The Peripheral Facilities Caretaker, of the Yuba County Water Agency, has been disposing of wood debris at Bullards Reservoir since 1986, and he was consulted regarding the adequacy of the disposal sites. The three coves selected should be able to handle wood disposal during most years; it is questionable whether they can handle the volumes of wood washed down during 30- or 100-year flood events. It is possible that air quality restrictions on burning, combined with the uncertainty of when fall rains begin, could delay burning too late to be able to complete these actions prior to the November 15 limited operating period, which protects wintering eagles. Once burning begins, wood consumption should be complete within several days. The expectation is that in most years, wood can be burned prior to November 15, or, wood can be held over to the following year. If the wood is accumulating faster than it can be disposed of, alternatives will be sought to avoid the need to revert to emergency consultation. Should a flood event occur, or other unforeseen circumstance, additional sites may need to be identified, and emergency consultation may need to occur. A management requirement is included limiting emergency consultation to no more than two out of five years, or this plan will be re-evaluated, and regular consultation pursued as needed.

The following outlines the Woody Debris Gathering and Removal proposed actions:
After August, when the reservoir level is low and the wood debris is high and dry, an excavator and bulldozer, backhoe or similar equipment would be used in Coves 1 and/or 2 to pile the accumulated woody debris. Equipment access would be along the existing road that extends through Garden Point. Equipment would not operate within 25 feet of any surface water or cross any areas with surface water unless reviewed and approved by a Forest Service aquatic specialist.

To provide for proper/safe weather conditions for burning, woody debris piles would be burned by the Yuba County Water Agency after the burn ban is lifted and the weather is cool and wet (probably sometime in mid to late October). Fuel treatment for administrative burning will be done with an approved burn plan or a valid burn permit. Burning outside of the USFS Direct Protection Area (DPA) will be coordinated with the California Department of Forestry. The woody debris piles would be directionally ignited to provide escape routes for lizards and other animals that may be hiding under the wood. Burning of the woody debris may be aided by alumagel and portable fans. A Forest Service biologist will conduct site reviews and be available for advice during all phases of project implementation.

Action Item 2: Remove Hazard Trees

Hazard trees near New Bullards Bar Reservoir pose a threat to public safety. It is Forest Service policy to provide for public safety. Areas where hazard tree removal may occur include: developed and undeveloped recreation sites, campgrounds, public access roads, special use areas, Forest Service administrative sites, day use areas, lakeshore areas, trailheads, and other areas of high recreation and visitor use.

A tree (conifer or hardwood) is considered a hazard if all or a portion of the tree has a high potential to fall or roll onto a facility, visitor use area or roadway and cause personal injury or property damage. The distance to trees on the uphill side may exceed one tree height if they are likely to roll or slide onto the roadway, site, or facility (i.e., barriers are insufficient to prevent trees from reaching the roadway, trail or facility).

Hazard Tree Criteria. The Field Data Form provided in Appendix A of this Biological Opinion is for determining definite hazard tree situations. Guidelines applied in the Field Data Form are based on physical location (target potential) and physical characteristics (tree defects) that either present an imminent hazard or have high potential for tree failure and the potential to reach an area of concern (road, campground, administrative site, etc.). There may be other trees and situations that may not specifically fall into these categories but may still be determined to be a hazard based on local conditions, further site evaluation and the judgment of the inspector.

Conservation Measures

The Tahoe National Forest Land and Resource Management Plan Standards and Guidelines which have been incorporated into the project proposal are:

1. Surveys for elderberry plants will continue in any unsurveyed sites to within 200 feet of the proposed management actions, until all sites have been surveyed. If plants are found, necessary consultation will occur with the USDI Fish and Wildlife Service prior to implementing any management action.

2. To protect breeding eagles, no activities will occur between January 1 through August 31 (or one month past fledging) within 0.25 miles of the Garden Point bald eagle breeding territory (Figure 4 - Appendix B). If sufficient monitoring identifies the nest tree being used that year, the area for the limited operating season may be adjusted to within 0.25 miles of the nest tree. (Provided eagles continue to use the 2002 nest tree, because it is outside of the 0.25 mile buffer, stockpiling of wood by boat in the three coves identified in the Biological Assessment may still occur in the spring.) Should eagles use a different nest tree, all activities will be re-evaluated based on their proximity to the new nest, which may necessitate the re-initiation of consultation with the U. S. Fish and Wildlife Service.

3. To assist recovery plan goals for the bald eagle, no proposed activities on the land (burning debris, stockpiling wood, hazard tree removal, brush removal) will occur from January 1 through August 30 within all expansion territories identified in the Bullards Bar Reservoir Fish and Wildlife Management Plan (Figure 4 - Appendix B). This season may be shortened from January 1 to June 30, if sufficient monitoring can determine that eagles are not nesting within 0.25 miles of the proposed activities. Wood gathering from the water surface may still occur within 0.25 miles of the expansion territories. Should new bald eagle nests be discovered in the future, appropriate consultation will be re-initiated as needed, depending on site-specific concerns.

4. To protect wintering bald eagles, limit the operating season, so that no activities occur from November 15 through March 15 within 0.25 miles of the high water mark. Because site-specific monitoring at the dam shows that in some years eagles may congregate earlier, this limited operating period is extended from November 1 through March 15 for areas within 0.25 miles of the dam and 0.25 miles of the winter night roost.
5. Prior to removing any hazard trees 15" dbh or greater, the following reviews will take place in coordination with a USFS biologist:

a. Completion of the Field Data Form (Appendix A) that documents the rationale for hazard rating, and identifies the tree species, dbh, and location, including distance from the water's edge. The form will also document site-specific determinations made of public use within the range of the tree, based on the site-specific evaluation of shoreline topography and local knowledge of public use by reservoir personnel. The form will also note any occurrences of elderberry (Sambucus sp.) plants within 200 feet of any project activities.

b. Because the public use map (Figure 3 - Appendix B) delineates broad areas of the shoreline that receives high, moderate, and low use, and it is of a broader scale than site-specific determinations, further refinement of this public use map should be an ongoing process, and include updates to the map.

c. Snag retention standards as identified in the Sierra Nevada Forest Plan Amendment (Forest Service 2001) should be met within this area (i.e. four snags per acre). Refer to Appendix B of the Biological Assessment for a detailed explanation of the snag retention standards as they apply to Bullards Bar Reservoir (Appendix B in this Biological Opinion). For hazard trees identified for removal within 200 feet of the shoreline, all snags will be sampled for a distance of approximately 0.25 miles in either direction. Additional live tree or other potential perching structures in this area may also be noted. If snag retention standards would not be met as a result of hazard tree removal, administrative closures should be considered as an alternative to protect public safety. The construction or development of alternate bald eagle perching structures may also be considered, should public closures not be feasible.

d. Within high use foraging sites and winter night roosts identified in the *Draft Bullards Bar Reservoir Fish and Wildlife Management Plan* (or as revised in the future), multiple perching structures should be maintained. The above standard of retaining four snags per acre is a minimal goal at these sites. Additionally, the following standard should be applied:

i. Ninety percent of all potential perches that are present should be retained; up to ten percent may be removed as hazards. If hazard tree removal would cause perching structures to be reduced below this level, administrative closures should be considered as an alternative to hazard tree removal to protect public safety. The construction or development of alternate bald eagle perching structures may also be considered, should public closures not be feasible.

e. To mitigate for the loss of bald eagle perching habitat, fell hazard trees that are immediately adjacent to the shoreline so that stumps are higher than usual (e.g. 3- to 4-feet high), so the stumps may still be used for perching. If practical, directional fall trees to avoid the high water line. Where safety and fuels concerns are not present, recruit the bole of the tree for additional wood structure and potential perching structures. These actions are recommended only where they do not compromise faller safety.

6. For all hazard trees identified for removal from Moran Cove, contact a biologist to check the site for California red-legged frogs prior to removal of any hazard tree(s).

7. To protect aquatic and riparian resources all hazard trees identified for removal in riparian conservation areas (RCAs) will be reviewed by a biologist. Review may include species specific surveys and/or additional recommendations such as dropping and leaving trees on-site. Required RCA widths are as follows:
Perennial streams = 300 feet each side
Seasonal streams = 150 feet each side

8. If large frogs (> 2 inches), turtles, large stick nests or eagles are observed, a Forest Service biologist will be contacted and activities will be delayed until the site can be reviewed.

9. It is expected that activities identified in this consultation adequately cover most routine activities needed to address public safety. To better address any uncertainty surrounding this, especially regarding the stockpiling and disposing of woody debris, should it be necessary to pursue emergency consultation in two of five years, alternative solutions will be sought and appropriate consultation reinitiated, to avoid the need for emergency consultation.

Figure 3 (Appendix B) shows public use of the reservoir near the shoreline at a coarse scale. Information used to develop Figure 3 (Appendix B) took into consideration boating use, popular areas for fishing, camping, picnicking, and shoreline access. Not all areas shown as high and moderate use have an accessible shoreline. Steep topography at this reservoir makes most of the shoreline difficult to access and hazard trees are not an issue at these sites. Moderate to high shoreline use tends to occur at places with the lowest gradient. Shoreline use patterns will be identified site-specifically, as areas are assessed in more detail during hazard tree ranking. Each hazard tree ranking will evaluate public use site-specifically, based on local knowledge of the actual use at the site and the probability of use based on topography. The actual public use is discontinuous at a finer scale, rather than the continuous areas reflected in Figure 3 (Appendix B).

A hazard tree evaluation form will be completed for all trees 15 inches or greater. All hazard tree removal will be coordinated through the District Wildlife Biologist. Wildlife mitigation measures need to be met at each hazard tree removal site.

<u>Action Item 3: Maintain Administrative Sites (campgrounds, day-use areas and Forest Service facilities) by: reducing ladder fuels within administrative sites by removing and disposing of brush and smaller trees.</u>

Maintaining administrative sites is needed to provide a safe recreational and working environment at the reservoir. Maintenance includes removing mid- and lower-story fire hazard fuels from campgrounds (Garden Point, Dark Day, Schoolhouse, Hornswoggle, Cottage Creek, Madrone Cove, and Frenchy Point), day use areas (Dark Day and Cottage Creek) and administrative sites (Bullards Work Station) (Figure 1- Appendix B). This includes removing selected trees 12 inches and smaller and brush (deer brush, tan oak, scotch-broom, poison oak, blackberry). Vegetation would be hand cut using chainsaws and pruners, piled and burned. Some woody debris will be cut into firewood-sized pieces and left for campers to use the following season. Woody debris may also be chipped and used for ground cover, where needed.

Action Area

New Bullards Bar Reservoir is located at an elevation of 1900 feet and is constructed on the North Yuba River. Several creeks flow into the reservoir from both the Plumas National Forest and the Tahoe National Forest.

A variety of public and private interests own land around New Bullards Bar Reservoir. The majority of the land is National Forest System Lands, managed by two National Forests, the Tahoe National Forest (TNF) and the Plumas National Forest (PNF). The Yuba County Water Agency (YCWA) owns the majority of the private land around the perimeter of the reservoir, with individual private property owners and residential housing occupying the remainder.

The YCWA is licensed to manage New Bullards Bar Reservoir and provide hydroelectric power, flood control, domestic and agricultural water and recreation. The reservoir is a 966,103 acre-foot water storage facility, covering 4,809 water surface acres at a maximum water surface elevation of 1,956 feet above sea level (YCWA 1993). The reservoir is mostly undeveloped, but offers easy road access and is particularly attractive to those seeking motorized boat oriented recreation in a scenic setting.

Vegetation surrounding the reservoir includes a diversity of vegetation typical of montane hardwood-conifer habitats. The most common tree species are Ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), Douglas-fir (*Pseudotsuga menziesii*), incense cedar (*Calocedrus decurrens*), California black oak (*Quercus kelloggii*), tan oak (*Lithocarpus densiflorus*) and Pacific madrone (*Arbutus menziesii*). Canopy cover generally exceeds 40 percent.

Bald Eagle

Status of the Species

The bald eagle once nested throughout much of North America near coasts, rivers, lakes, and wetlands. The species experienced population declines throughout most of its range, including California, due primarily to environmental contamination from the use of DDT and other persistent organochlorine compounds, habitat loss and degradation, shooting, and other disturbances (Detrich 1986, Stalmaster et al. 1985, USFWS 1986). The drastic decline of the species led to its listing on February 14, 1978, and protection under the Act (USFWS 1978). The *Pacific Bald Eagle Recovery Plan* (Recovery Plan) was released in 1986 for the recovery and maintenance of bald eagle populations in the 7-state Pacific recovery region (Idaho, Nevada, California, Oregon, Washington, Montana, and Wyoming) (USFWS 1986). In recent years, the status of bald eagle populations has improved throughout the United States. It was downlisted from endangered to threatened on July 12, 1995, throughout the lower 48 states (USFWS 1995). A proposed rule to remove the species from the list of endangered and threatened wildlife was made on July 6, 1999 (USFWS 1996) but this rule has not been finalized. Critical habitat has not been designated for this species. In addition to the Act, the bald eagle is protected under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712) and the Bald Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d).

The adult bald eagle is recognized by its white head and tail contrasting against its dark brown body as well as its wingspan which can be greater than 6.5 ft (2 m). The species is long-lived, and individuals do not reach sexual maturity until four or five years of age.

The bald eagle is a generalist and opportunistic predator and scavenger adapted to aquatic ecosystems. It frequents estuaries, large lakes, reservoirs, major rivers, and some coastal habitats. Its primary foods, in descending order of importance are: fish (taken both alive and as carrion), waterfowl, mammalian carrion, and small birds and mammals. Bald eagles are highly maneuverable in flight and frequently perch-hunt. Diurnal perches are used during foraging; these usually have a good view of the surrounding area and are often the highest perch sites available (Stalmaster 1976, USFWS 1986). They are also known to hunt by coursing low over the ground or water. In general, foraging habitat consists of large bodies of water or free-flowing rivers with abundant fish and adjacent snags and other perches (Zeiner et al. 1990).

Breeding generally occurs February to July (Zeiner et al. 1990) but breeding can be initiated as early as January 1st via courtship, pair bonding, and territory establishment. The breeding season normally ends approximately August 31st when the fledglings have begun to disperse from the immediate nest site. One to three eggs are laid in a stick platform nest 50-200 ft (15 .2-61.0 m) above the ground and usually below the tree crown (Zeiner et al. 1990). Incubation may begin in late February to mid-March, with the nestling period extending to as late as the end of June. From June thru August, the chicks will generally remain within the nest tree area. Bald eagles are susceptible to disturbance by human activity during the breeding season, especially during egg laying and incubation, and such disturbances can lead to nest desertion or disruption of breeding attempts (USFWS 1986).

Nesting territories are normally associated with lakes, reservoirs, rivers, or large streams and are usually within 2 miles from water bodies that support an adequate food supply (Lehman 1979, USFWS 1986). Some of California's breeding birds winter near their nesting territories. Most nesting territories in California occur from 1000-6000 ft (304.8-1828.8 m) elevation, but nesting can occur from near sea level to over 7,000 ft (2133.6 m) (Jurek 1988).

In the Pacific Northwest, bald eagle nests are usually located in uneven-aged (multi-storied) stands with large, old trees (Anthony et al. 1982). Most nests in California are located in ponderosa pine and mixed-conifer stands and nest trees are most often ponderosa pine (*Pinus ponderosa*) (Jurek 1988). Other site characteristics, such as relative tree height, tree diameter, species, position on the surrounding topography, distance from water, and distance from disturbance, also appear to influence nest site selection (Lehman et al. 1980, Anthony and Isaacs 1989). Bald eagles often construct up to five nests within a territory and may alternate between them from year to year (USFWS 1986). Nests are often reused and eagles will add new material to a nest each year (DeGraaf et al. 1991).

Trees selected for nesting are characteristically one of the largest in the stand or at least co-dominant with the over story, and usually have stout upper branches and large openings in the canopy that permit nest access (USFWS 1986). Nest trees usually provide an unobstructed view of the associated water body and are often prominently located on the topography. A survey of nest trees used in California found that about 71 percent were ponderosa pine, 16 percent were sugar pine (*Pinus lambertiana*), and five percent were incense-cedar (*Librocedrus decurrens)*, with the remaining eight percent distributed among five other coniferous species (Lehman 1979).

Lehman (1979) found that 70 percent of the nest trees surveyed were classified as highly susceptible to beetle infestation, probably a function of bald eagles using mature and over mature trees. Ninety-three percent of the nest trees were 21-60 inches (in) (53.3-152.4 centimeters (cm)) in diameter, with a mean diameter of 43.1 in (109.5 cm) and 92 percent were greater than 76 ft (23.2 m) tall, with a mean height of 111.9 ft (43.1 m). Seventy-three percent of the nest sites were within 0.5 mile (0.8 km) of a body of water, 87 percent within 1 mile (1.6 km), and none were over 2 miles (3.2 km) from water. Other trees, such as snags, trees with exposed lateral limbs, or trees with dead tops, are often also present in nesting territories and are used for perching or as points of access to and from the nest. Such trees also provide vantage points from which territories can be guarded and defended. Nearby trees may also screen the nest from human disturbances or provide protection from wind damage (Jurek 1988).

Wintering habitat is associated with open bodies of water, with some of the largest wintering bald eagle populations occurring in the Klamath Basin (Detrich 1981, 1982). Smaller concentrations of wintering birds are found at most of the larger lakes and man-made reservoirs in the mountainous interior of the north half of the state and at scattered reservoirs in central and southwestern California.

Two habitat characteristics appear to play a significant role in habitat selection during the winter: diurnal feeding perches, as described above; and communal night roost areas. Communal roosts are usually near a rich food resource (USFWS 1986), although Keister and Anthony (1983) found that bald eagles used forest stands with older trees as far as 9.6 miles (15.4 km) from the food source in the Klamath Basin. The areas used as communal roosts in the Klamath Basin were the forest stands with old (mean age of roost trees was 236 years), open-structured trees that were close to the feeding areas. In stands where ponderosa pine was dominant, the pine was used almost exclusively for roosting. In forest stands that are uneven-aged in the Pacific Northwest, communal roosts have at least a remnant of large, old trees (Anthony et al. 1982).

Most communal winter roosts used by bald eagles throughout the recovery areas offer considerably more protection from the weather than diurnal habitat (USFWS 1986). Isolation from disturbances is an important feature of bald eagle wintering habitat. Excessive human activity may be the reason why some suitable wintering habitat is not used by bald eagles (USFWS 1986). Human activity near wintering bald eagles can adversely affect eagle distribution and behavior (Stalmaster and Newman 1978).

Bald eagles are susceptible to disturbance by human activity during the breeding season, especially during egg laying and incubation. This includes recreational activities, fluctuating fish populations and availability of roost trees as a result of reservoir level fluctuations, risk of wild fire, fire suppression activities, fragmentation of habitat, home sites, campgrounds, mines, timber harvest, and roads. Such disturbances can lead to nest desertion or disruption of breeding attempts. Human activities are more likely to disturb bald eagles when located near roosting, foraging, and nesting areas (Stalmaster and Kaiser 1998, Stalmaster et al. 1985, USFWS 1986).

Studies have documented a threshold at which human activities elicit response for eagles (Stalmaster and Newman 1978, Knight and Knight 1984), though other studies show little direct effect of human activities on bald eagle nesting attempts (Mathisen 1968, Fraser et al.1985). Human induced failures are likely one-time catastrophic events (i.e., firearm target practice) occurring near nests early in the nesting season, which often escape detection (Jackman and Hunt 2000).

Human recreation resulting in disruption of wildlife ecology is an emerging issue in natural resources management (reviews in Knight and Gutzwiller 1995; Knight and Skagen 1988). Boyle and Samson (1983) listed 189 literature references that identified effects of non-consumptive outdoor recreation on terrestrial vertebrates in North America. More than 81 percent (136) of these articles reported negative effects on wildlife while less than 7 percent (11) reported positive effects and 22 percent (41) reported no or undetermined effects. Several authors have demonstrated that nesting and foraging eagles avoid areas of human use or development (Buehler et al. 1991, McGarigal et al. 1991, Brown and Stevens 1997). Individual pairs of nesting bald eagles exhibit varying levels of tolerance to disturbance throughout the breeding season and during periods of foraging.

The effects of recreational activities on bald eagles are variable and depend on the context in which the activity and eagle encounters take place, the eagles behavioral and physical state, and the spatial and temporal variation of the interaction (Grubb and King 1991; Anthony et al. 1995). McGarigal et al. (1991) described two forms of disturbance which result from human-eagle interactions. The first form, active displacement, involves humans actively approaching or passing by eagles. The second form, passive displacement, involves human activities that influence an eagle's environment and cause eagles to change their location and behavior.

McGarigal et al. (1991) described active displacement as humans coming into contact with eagles by boating past eagles on a narrow section of river. This terminology could also apply to open lakes and marshes when humans may have access to areas by foot where eagles congregate. Several researchers have examined active displacement by measuring the distance between a human activity and an eagle at which an eagle flushes. This method enables researchers to establish a flush response (percentage of human-eagle interactions within a specified distance which result in an eagle flushing) or a mean flush distance. McGarigal et al. (1991) found that less than 6 percent of human activities within 1640.4 ft (500 m) of breeding eagles resulted in flushing disturbance on the Columbia River in Washington. Skagen (1980) found that 42.5 percent of wintering eagles on the Skagit River in Washington flushed when boats, pedestrians, or vehicles approached within 1640.4 ft (500 m). Fraser et al. (1985) found that breeding bald eagles in Minnesota flushed at 187-3251.3 ft (57-991 m) at the approach of a pedestrian, with an average flushing distance of 1561.7 ft (476 m). Seventy-five percent of all flight responses occurred when eagles in Michigan were within 656.2 ft (200 m) of vehicles, pedestrians, boats, or aircraft (Grubb et al. 1992). Steidl and Anthony (1996) reported that 52 percent of all non-breeding summer eagles in Alaska that flushed in response to rafts on the Gulkana River did so between 82-328.1 ft (25-100 m). In northwestern Washington, researchers reported that flushing distances of perched and feeding bald eagles averaged 436.4 and 734.9 ft (133 and 224 m) in response to boating and pedestrian activities on the Skagit River Bald Eagle Natural Area (Stalmaster and Kaiser 1998). Finally, Russel (1980) found that 59 percent of all wintering eagles along three rivers in northwestern Washington flushed in response to a census raft and 100 percent of eagles in feeding activities were flushed.

The second form of displacement described by McGarigal et al. (1991) is passive displacement. Human activities affect the eagle's environment and cause changes in the eagle's distribution or behavior (Anthony et al. 1995). McGarigal et al. (1991) reported that breeding eagles avoided an area within 1312.3 ft (400 m), ranging from 656.2-2952.8 ft (200-900 m) of an experimental stationary boat. Eagles also spent less time and made fewer foraging attempts in the experimental area during the experimental period. Knight et al. (1991) found that eagles were more likely to be on the ground than in perches when anglers were absent from riverbanks. Eagles on their study area were constrained to feed on the ground, as the salmon carcasses they fed on were too heavy to take to perch trees. This led Knight et al. (1991) to suggest that human activity disrupted feeding, and reduced energy intake and increased energy expenditure. Skagen et al. (1991) reported that after a disturbance, eagles seldom returned to feed that day. On the Skagit River in Washington, Skagen (1980) found a significant decrease in the proportion of eagles feeding when human activity was present within 200 m of the feeding area in the previous 30 minutes. Stalmaster and Newman (1978) found that disturbance in areas of high human activity at major feeding grounds caused a shift in distribution which resulted in displacement of birds to lower quality habitat and confined the population to a smaller area. Eagles utilizing a portion of the Sauk and Suiattle Rivers in Washington having lower human activity showed significantly higher sensitivity to human disturbance than areas with higher levels of activity (Russel 1980).

There have been several studies that have evaluated the effects of recreational human disturbance on nesting bald eagles. These types of studies are not common and relatively speaking a small number of them have been published (Mathisen 1968; Anthony and Isaacs 1989; Grubb and King 1991; Buehler et al. 1991; Grubb et al. 1992; Steidl and Anthony 1996). Several studies have examined the relationship between recreation and wintering bald eagle activity (Shea 1973; Servheen 1975; Stalmaster and Newman 1978; Russel 1980; Skagen 1980; Steenhof et al. 1980; Walter and Garrett 1981; Knight 1984; Stalmaster and Kaiser 1998). Negative impacts of recreational activities on bald eagles include: reduced fitness, altered behavior, death, changes in demographics, distribution (spatially and temporally), and community composition and interactions.

Environmental Baseline

The purpose of this section is to provide a baseline for comparison in determining whether implementation of the proposed project would jeopardize the continued existence of the species throughout all or part of its range, and whether the proposed project would provide for the species' conservation and long-term survivability.

The bald eagle continues to be found throughout much of North America and breeds or winters throughout California, except in the desert areas (Zeiner et al. 1990; DeGraaf et al. 1991). In California, most breeding occurs in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties (Zeiner et al. 1990; Jurek in litt. 2000). California's breeding population is resident year-long in most areas as the climate is relatively mild (Jurek 1988). Between mid-October and December, migratory bald eagles arrive in California from areas north and northeast of the state. The wintering populations remain in California through March or early April.

The California bald eagle nesting population has increased in recent years from under 30 occupied territories in 1977 to 151 occupied territories in 1999 (Jurek 2000). Based upon annual wintering and breeding bird survey data, it is estimated that between 100-300 bald eagles winter on National Forests in the Sierra Nevada, and at least 151-180 individuals remain year-round to breed (Forest Service 2000). Most of the breeding population is found in the northern third of the state, primarily on public lands. Seventy percent of nests surveyed in 1979 were located near reservoirs (Lehman 1979) and this trend has continued, with population increases occurring at several reservoirs since the time of that study. In the Pacific recovery region, which includes the Mokelumne watershed, population goals as set forth in the Recovery Plan (USFWS 1986) have been met. The Sierra Nevada management zone of the Recovery Plan however, has not reached its goal of 15 occupied territories: in 1999 there was a total of nine occupied territories in this management zone. Though the Sierra Nevada is only at 60 percent of the recovery goal, it has steadily increased since 1986 when there were only two known occupied territories in this management zone.

The observed increase in population is believed to be the result of a number of protective measures enacted throughout the range of the species since the early 1970s including listing of the species. These measures include the banning of the pesticide DDT, protection of nest sites, and protection from shooting.

The CDFG's fish stocking program throughout California's lakes, reservoirs and rivers has provided an abundant prey base of fish for the bald eagle. In the northern California lakes, 4,000 pounds (lbs) (1814.4 kilograms (kg)) of salmonids are stocked in approximately 57 bodies of water each year. That includes approximately 200-350 lb (90.7-158.8 kg) of fish 10-12 in (25.4-30.5 cm) in length. For recreational fishing, 70,000 lbs (31752 kg) of fish averaging approximately 0.5 lbs (0.2 kg) each are annually stocked in approximately 62 different bodies of water in the southern Sierra Nevada. In stocking programs in northern California, up to 20 percent of the released hatchery trout may die soon after release and many initially inhabit the top of the water column because of increased oxygen levels there. In one study, bald eagles were observed taking fish carrion at the stocking location at the Shasta Reservoir (Detrich 1978).

Though the construction of dams has limited the range of anadromous fish, an important historic bald eagle prey base, reservoir construction and the stocking of fish in reservoirs in the west has provided bald eagles with habitat for population expansion following their mid-century decline which resulted from DDT poisoning, degradation of historical nesting habitat, and persecution by humans (Detrich 1986, USFWS 1986). Food habitat studies of reservoir-nesting bald eagles in the west have focused on populations in northern California and Arizona (Hunt et al. 1992, Jackman et al. 1999).

Potential risk factors to the bald eagle from resource management activities include modification or loss of habitat or habitat components (primarily large trees) and behavioral disturbance to nesting eagles from vegetation treatment, facilities maintenance, recreation, or other associated activities within occupied habitat, which could prevent or inhibit nesting or lead to nest failure (Forest Service 2001).

The draft California Bald Eagle Habitat Management Guidelines recommends that management eliminate human disturbances at nesting areas during the breeding period, and it gives examples of closures that include signs, road closures, floating booms, and prohibition of shoreline moorage (Forest Service 1977). Similar closures have been implemented at other locations in California that include: Shasta Lake, Little Grass Valley Reservoir, Stampede Reservoir.

For delisting to occur, the Pacific Bald Eagle Recovery Plan identifies four criteria: (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%; (3) attainment of breeding population goals in at least 80% of the management zones with nesting potential; and (4) stable or increasing wintering populations.

Within the Tahoe National Forest, three breeding territories have been identified in the 1990's--Stampede, Boca, and Bullards Bar reservoirs—with an additional breeding territory on private land at Milton Reservoir. The Bullards territory is the only one located within the Downieville District.

Outside of the Tahoe National Forest, a territory is reported to occur at Collins Reservoir, 10 miles to the southwest, and Little Grass Valley Reservoir in the Plumas National Forest, approximately 7 miles northwest.

The Plumas and Tahoe National Forests lie within Zone 28 (Sierra-Nevada Mountains) of the Pacific Bald Eagle Recovery Area (USFWS 1986). Recovery goals identify a target of three territories at New Bullards Bar Reservoir, and one territory each for Stampede, Boca, and Jackson. Considering the previously-mentioned territories in the Tahoe NF (assuming the Milton Reservoir territory substitutes for Jackson because of its close proximity), recovery goals for the numbers of territories have been met at the other three sites; they have not been met at New Bullards Bar Reservoir.

The Pacific Bald Eagle Recovery Plan (USFWS 1986) task 1.32 recommends maintaining and improving forested habitat in both the breeding and wintering range for the bald eagle, including the preservation of snags in bald eagle use areas (Task 1.3215). Recovery Plan task 1.332 recommends excluding logging within 800 m (0.5 miles) where the activity is within line of sight, otherwise within 400 m (0.25 miles) of bald eagle use areas during critical periods of use, including the wintering and nesting season. The nesting season occurs approximately between January 1st and August 31st, or when fledglings actually leave the nest. The wintering season occurs approximately from November 15 to March 15. Other Recovery Plan tasks include, developing public information programs, improved enforcement of eagle protection laws, restricting human disturbance at eagle use areas, and surveillance in habitats where eagles are vulnerable to human disturbance.

Removing wood debris at New Bullards Bar Reservoir has probably disturbed eagles in the past. During the 1980's and early 1990's, woody debris was piled and burned along the water's edge, in order to remove accumulated fuels and prevent hazardous logs from floating into the water when the water level is high. These burn piles were distributed along the shoreline, and the piles were burned in the winter, when eagles concentrate at the Reservoir to feed and roost. In the mid-1990's, wood was gathered in booms, moved to accessible beaches, piled into large piles and subsequently burned. During 1999, wood was boomed close to an active nest during breeding season; and in 1994, blasting of a debris pile occurred in close proximity to an active nest during the breeding season. Although not necessarily the cause, eagles failed to breed for three seasons following 1994. The lack of breeding roughly corresponds with the same year that the California Department of Fish and Game stopped stocking the reservoir with adult kokanee, but planted finglerlings instead. Lowered foraging opportunities could have delayed eagle breeding for several years, while the fingerlings were growing (Forest Service 2002).

The Yuba County Water Agency, the U. S. Forest Service, and the USDI Fish and Wildlife Service have been working together to develop a New Bullards Bar Reservoir Fish and Wildlife Management

Plan. The plan is presently in draft form (April 11, 2002) and is designed to be a working document. The draft plan identified two to three expansion breeding territories, which were unmapped at that time. Three are submitted with this Biological Assessment (Figure 4 - Appendix B), and they are intended to be incorporated into the plan.

Bald eagle habitat, both nesting and wintering, occurs in many areas around Bullards Bar Reservoir. Forest Service recreation personnel regularly report bald eagle activity and potential nesting activity that they observe in the area. Two routes occur within the District that are part of the nationwide annual mid-winter bald eagle survey--one along the North Yuba River for a 14 mile stretch west of the town of Downieville, and the second conducted by boat around the perimeter of Bullards Bar Reservoir. These surveys, conducted since 1990, have produced an occasional individual eagle wintering along the North Yuba River, and a range of 10 to 20 individuals wintering at Bullards Bar Reservoir. This is the largest wintering concentration of eagles identified within the Tahoe National Forest.

Within the Reservoir, wintering habitat generally consists of a 200-foot perimeter along the high water mark, where eagles perch to forage. Winter surveys have identified scattered individual eagles perching along the water's edge, with certain areas used more regularly than others (Figure 5 - Appendix B). Eagles are often seen foraging at the mouth of Willow Creek. Bullards dam is a frequently used diurnal area where wintering eagles congregate, and they are often seen foraging and perching in a cove just east of the dam, especially when the kokanee salmon congregate to spawn. Observations of eagles at the dam show that eagles begin congregating at the dam when the kokanee salmon are spawning. The actual timing of kokanee spawning is dependent on the timing of temperature changes and rainfall. This typically occurs in November, but it may vary each year, and it occasionally occurs in October (Forest Service 2002).

The west-side of the dam provides fewer perching opportunities because of the Emerald Cove marina and a large boat and motor vehicle parking area 100 feet above it. These developments increase human disturbance and displace vegetative perching structures. The cove on the east-side of the dam is well vegetated with large trees, provides some thermal cover, sturdy perching branches, and visual screening from Marysville Road, which runs above it. Eagles are often seen perching in these trees and on rocks at the water's edge, and flying from perches over the water. Other frequently used places around the reservoir include prominent points and the Garden Point peninsula. A boom located just below this cove effectively limits shoreline access by boat.

A winter communal roost was recently discovered (January 2000) within a sheltered multi-storied stand along the water's edge (Figure 5 - Appendix B). At least eight eagles were counted at this roost. The field observer noted frequent vocalizing and social interactions between individuals at this site. Low light conditions around dusk and dawn, multi-layered closed-canopy stands, and cryptic coloring that camouflages immature eagles—all these, make observations of the night roost difficult.

A pair of breeding eagles have had a nesting territory at the Reservoir on the Garden Point peninsula since 1989 (Figure 4 - Appendix B). Monitoring at the reservoir indicates that the breeding pair are year-round residents. During years that the pair fledge young, adults and young are often seen in the nest territory through the fall. There is no indication that other eagles frequent the territory, as sightings appear to be limited to one to two adults.

The same nest tree was used through 1999, located on the west side approximately 1000 feet above a cove highly frequented by recreationists in boats. Thirteen young were fledged between the years 1989-99. In October of 1999, the Pendola Fire burned intensely through the nest stand, killing the nest tree and surrounding trees. The eagles built a new nest in a stand of green trees above Tractor Cove, approximately 0.25 miles southeast of the original one. Tractor Cove was a very popular boating and camping area. Since the discovery of the new nest, Reservoir management has implemented administrative closures during the breeding season within Tractor Cove and on the land that includes the access road to the Garden Point peninsula. Buoy closures limit boating access to within 0.25 miles of the nest tree on the north side, and approximately 0.5 miles to the south. The nest failed in 2000, but one young has fledged in each of 2001 and 2002. Figure 2 (Appendix B) shows the most recently active nest in proximity to the coves proposed for stockpiling wood.

A necessary criteria for recovery identified in the Pacific Bald Eagle Recovery Plan is an average reproductive rate of 1.0 fledged young per pair, with an average success rate per occupied site of not less than 65 percent per 5-year period. The Garden Point pair have met these goals, with a current average of 1.0 fledged and an average 5-year success rate of 80 percent.

In the spring of 2000, a boat survey of the Reservoir was conducted to look for additional breeding territories; none were found. Summer observations do not indicate that more than one breeding pair is present at the Reservoir. In January, during annual winter bald eagle surveys, large nests are mapped and checked in the summer to see if eagles are using them. To date, all surveys have only identified the presence of one breeding pair at Bullards Reservoir. Additional adults, even single adults, are not known to be present during the summer. Because eagles are frequently seen within and near the breeding territory year round, it is assumed that both members of the breeding pair are year-round residents.

In 2003, a fourth-year adult was frequenting the Frenchy Point and North Yuba River areas of the Reservoir, and it has been near a second adult eagle. It is not known if the adult is from the existing breeding pair, or if there is a second pair of eagles establishing residence. Forest Service Downieville

District personnel, in cooperation with the Yuba County Water Agency, monitor eagle activity at the reservoir, and if eagles establish a new breeding territory, the Service will be notified and any necessary consultation would be re-initiated at that time (Forest Service 2003).

Effects of the Proposed Action

Direct effects are the direct or immediate effects of the project on the species or its habitat (USFWS, NMFS 1998). Bald eagles breed, roost, and forage at New Bullards Bar Reservoir year-round. Wintering bald eagles congregate in the vicinity of New Bullards Bar Dam during the kokanee spawning run that occurs between October and November. Hazard trees may be identified in the vicinity of parking areas immediately to the east and west of the dam (Forest Service 2002). Skagen et al. (1991) observed that following disturbance, bald eagles seldom returned to feed that day. Noise and smoke generated by hazard tree removal, fuel reduction, woody debris collection, and pile burning activities may result in temporary avoidance of nesting, foraging, or roosting habitat by breeding and wintering bald eagles.

Modification of habitat used by bald eagles may result in an immediate decrease in foraging, nesting, and roosting opportunities for eagles currently using the reservoir for breeding and wintering if alternate nesting, roosting, and perching structures are not available. Most hazard trees are either dead (snags) or dying trees. Lehman (1979) found that 70 percent of the nest trees surveyed were classified as highly susceptible to beetle infestation, probably a function of bald eagles using mature and over mature trees. Trees with characteristics described in the Field Data Form may also possess the characteristics, such as exposed lateral limbs or dead tops, that provide suitable habitat for bald eagles. The Biological Assessment (Forest Service 2002) identifies areas, such as along the east and west sides of New Bullards Bar Dam, where eagle perching structures may be identified as hazard trees and removed.

Indirect effects are those effects that are caused by or will result from the proposed action later in time, but are still reasonably certain to occur. The proposed action is expected to modify actual or potential bald eagle nesting, roosting, or foraging habitat. Modification of habitat that may provide future nesting roosting, or foraging habitat may reduce the likelihood that the target number of three nesting pairs of bald eagles at New Bullards Bar Reservoir is achieved. In 2003, two new eagles were observed at Frenchy Point (Forest Service 2003). At this time it is unknown whether these eagles are attempting to establish a new breeding territory at New Bullards Bar Reservoir. Frenchy Point is immediately south of Long Point, one of the potential nesting territories identified in the Biological Assessment (Figure 4 - Appendix B). Noise from the operation of heavy machinery and removal of potential nesting, roosting, and foraging structures may adversely affect selection of the Reservoir as a breeding territory by a new pair of eagles.

Additionally, bald eagles may be harmed later in time if individual health and fitness and/or reproductive success is affected by increased levels of harassment. Noise, operation of large equipment, smoke from pile burning, and additional human presence in nesting and wintering areas may result in flushing of foraging, roosting, or nesting bald eagles. Flushing increases energy expenditures due to flight, decreases energy intake by interfering with feeding, and may force eagles to leave preferred habitat (Stalmaster and Kaiser 1998).

Although noise and operation of large equipment around administrative sites for the purpose of fuels reduction may disturb eagles in nearby areas, the removal of ladder fuels will have the beneficial effect of reducing the likelihood of human-caused fires starting at a campground or day use facility in the project area. This will help prevent a stand-replacing fire that could remove mature trees that presently provide existing and potential nesting and perching structures.

Effects of the Conservation Measures

Conservation measures represent actions pledged in the project description that the agency will implement to further the recovery of the species under review. Such measures may be tasks recommended in the species' recovery plan, should be closely related to the action, and should be achievable within the authority of the action agency or applicant. Conservation measures are part of the proposed action, and their implementation is required under the terms of the consultation (USFWS, NMFS 1998). The Forest Service has incorporated conservation measures into the description of the proposed action to reduce or avoid adverse impacts to bald eagles resulting from project activities, and that address specific tasks in the *Pacific Bald Eagle Recovery Plan* (USFWS 1986).

<u>Limited Operating Periods (Measures 2-4)</u>. The proposed limited operating periods will help to avoid conflicts between project related activites and wintering/nesting bald eagle areas in current use. The Forest Service has also extended limited operating periods to expansion territories identified in the Bullards Bar Fish and Wildlife Management Plan until it is determined that eagles have not established residence within those areas (Figure 4 - Appendix B).

<u>Removal of Hazard Trees (Measure 5)</u>. The Field Data Form requires review by a biologist prior to removing any tree identified as a hazard that is 15 inches dbh or greater. In addition, only trees with a Target Rating and a Defect Rating shall be considered for removal. For example, even if a tree is evaluated as having a high Defect Rating, it would not be removed if it exists in a Low Use Area (Figure 3 - Appendix B) that would receive "no score" as a Potential Target Rating on the Field Data Form. This will allow more trees to be available as perching, nesting, and roosting structures.

Reinitiation of Consultation (Measure 9). Once pile burning for woody debris disposal begins, wood consumption should be complete within several days. However, it is possible that air quality restrictions on burning, combined with the uncertainty of when fall rains begin, could delay burning too late to dispose of woody debris prior to the November 15 limited operating period for wintering eagles. The Forest Service expects that in most years, wood can be burned prior to November 15. With the coves set aside for woody debris storage in the proposed action, wood can be held over to the following year if pile burning is not completed. The project description for the proposed action requires reinitiation of consultation if emergency consultation is sought in two out of five years to dispose of woody debris outside of the proposed LOPs.

Other Listed Species (Measures 1, and 6-8). These measures provide written directives to field personnel via the Field Data Form to cease activities and contact a Forest Service biologist if eagles, large frogs, or elderberry plants are sighted within specified distances of project activities.

These proposed conservation measures will promote objectives identified in the Recovery Plan, including retention of eagle habitat and avoidance of human-bald eagle disturbance interactions.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Cumulative effects to eagles in the vicinity of the action area include: lowered reproduction caused by pesticides; loss of habitat through increased recreation; development of shorelines; private timber harvest; and disturbance from human activities. The number of summer recreationists has steadily increased at New Bullards Bar Reservoir since the late 1980's. These uses include: camping; hiking; fishing; boating; picnicking; motorized vehicular use; mountain biking; and reservoir maintenance. Shoreline camping is permitted along most shorelines. In October of 1999, the Pendola Fire burned 12,000 acres, removing approximately 1600 acres of mixed conifer stands with large trees (greater than 24 inches dbh), that provided potential nest or roosting trees for eagles.

The Service is not aware of specific projects that might affect the bald eagle or its habitat that are currently under review by State, county, or local authorities. Nevertheless, it is foreseeable that further development of residential and recreational uses, industry, transportation, and water resources, as well as continued timber harvest on private lands, will occur in the future. Some of these future activities will not be subject to Federal jurisdiction (and thus are considered to enter into cumulative effects), and may result in loss of bald eagle habitat.

Conclusion

After reviewing the project description, current status of the bald eagle, the environmental baseline for the action area, the effects of the proposed New Bullards Bar Reservoir Safety and Annual Maintenance, the conservation measures incorporated into the project description, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the bald eagle. No critical habitat has been designated for this species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Forest Service has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Forest Service: (1) fails to adhere, or fails to require an applicant or permittee to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to a permit or grant document; and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service does not anticipate that bald eagles will be killed or injured as a result of the proposed action. The Service expects that incidental take of bald eagles will be in the form of harassment and harm. Bald eagles may be harassed due to increased levels of noise and smoke generated by hazard tree removal, fuel reduction, woody debris collection, and pile burning activities. Bald eagles may be harmed if individual health and fitness and/or reproductive success is affected by increased levels of harassment and decreased numbers of perch trees available for nesting, foraging, and roosting. The Service expects that incidental take of the bald eagle will be difficult to detect or quantify for the following reasons: (1) it will not be possible to separate the effects to bald eagle resident and migrant populations of varying disturbance levels resulting from the proposed action from the disturbance levels which are currently ongoing; (2) there is a low likelihood of determining that the reduced fitness of an individual is a result of the action; e.g., positively correlating a failed nest or abandonment of wintering ground with project induced harassment or harm of a bald eagle may only be speculative; (3) non-use of portions of New Bullards Bar Reservoir and the shoreline areas by foraging eagles will be difficult to detect.

The Service believes that the nesting bald eagles of New Bullards Bar Reservoir may be harmed or harassed as a result of the proposed project. Therefore, the Service estimates that two individual adult nesting bald eagles may be harmed or harassed per year as a result of the proposed project. The Service believes that wintering bald eagles may be harmed or harassed as a result of the proposed action. Therefore, the Service estimates that ten to twenty wintering bald eagles may be harmed or harassed per year as a result of the proposed action. Take in the form of harm or harassment is not authorized to an extent that would result in nest failure or mortality.

Upon implementation of the following reasonable and prudent measure, incidental take associated with the New Bullards Bar Reservoir Safety and Annual Maintenance in the form of harassment of nesting and foraging bald eagles due to increased levels of noise and smoke generated by hazard tree removal, fuel reduction, woody debris collection, and pile burning activities will become exempt from the prohibitions described under section 9 of the Act for direct impacts; in addition, incidental take in the form of harassment associated with the New Bullards Bar Reservoir Safety and Annual Maintenance in the form of harassment of nesting and foraging bald eagles due to increased levels of noise and smoke generated by hazard tree removal, fuel reduction, woody debris collection, and pile burning activities will be exempt from the prohibitions described under section 9 of the Act for indirect impacts as a result of the management activities described.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the bald eagle.

Reasonable and Prudent Measure

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of the bald eagle:

1. Minimize the impacts of project effects to the bald eagle throughout the proposed project area.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of ESA, the Forest Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

a. Implement all aspects of the project description and all conservation measures as proposed on pages 2-10 of this Biological Opinion, with modifications noted in the following terms and conditions below.

b. A copy of the August 7, 2003, *New Bullards Bar Hazard Tree Rating Form*, *New Bullards Bar Reservoir Hazard Tree Rating Form Supplement*, and *Short Term Mortality Indicators* shall be given to appropriate personnel (contract administrator) to ensure that all required mitigations are implemented. Should it not be possible to implement the required minimizations in the Description of the Proposed Action, the District Biologist shall be notified to evaluate the need for emergency consultation under the Endangered Species Act. Only trees with an appropriate rating and review shall be removed. Any additional trees shall receive the further evaluation in coordination with the Service prior to felling and removal.

c. Snag retention standards as identified in the Sierra Nevada Forest Plan Amendment (Forest Service 2001) shall be met within this area (i.e. four snags per acre where present). The Biological Assessment contains a detailed explanation of the snag retention standards as they apply to Bullards Bar Reservoir (Appendix B). For hazard trees identified for removal within 200 feet of the shoreline, all snags will be sampled for a distance of approximately 0.25 miles in either direction. Additional live tree or other potential perching structures in this area may also be noted. If snag retention standards would not be met as a result of proposed hazard tree removal, administrative closures shall be considered as an alternative to protect public safety. The construction or development of alternate bald eagle perching structures may also be considered, should public closures not be feasible.

d. Within high use foraging sites and winter night roosts identified in the Draft Bullards Bar Reservoir Fish and Wildlife Management Plan (or as revised in the future), multiple perching structures shall be maintained. The above standard of retaining four snags per acre is a minimal goal at these sites. Additionally, the following standard shall be applied:

i. Ninety percent of all potential perches that are present shall be retained; up to ten percent may be removed as hazards. If hazard tree removal would cause perching structures to be reduced below this level, administrative closures shall be considered as an alternative to hazard tree removal to protect public safety. The construction or development of alternate bald eagle perching structures may also be considered, should public closures not be feasible. Reducing perching structures in high use foraging sites and winter night roosts below ninety percent of what is present at the time of evaluation shall receive further consideration in coordination with the Service prior to felling and removal.

e. The Forest Service shall conform with the reporting requirements below.

Reporting Requirements

The Forest Service must provide the Service with annual reports to describe the progress of implementation of all the commitments in the Conservation Measures and Terms and Conditions sections of this biological opinion. The first report is due January 31, 2004, and annually thereafter. Reports shall include the number of snags removed and the location(s), updated copies of the maps in Appendix B of this opinion, and results of all bald eagle surveys conducted the previous year.

The Sacramento Fish and Wildlife Office is to be notified within three working days of the finding of any dead listed wildlife species or any unanticipated harm to the species addressed in this biological opinion. The Service contact person for this is the Chief, Endangered Species Division at (916) 414-6620.

The Forest Service must require any contractor or permittee to report to the Service immediately any information about take or suspected take of listed wildlife species not authorized in this opinion. The Forest Service must notify the Service within 24 hours of receiving such information. Notification must include the date, time, and location of the incident of the incident or of the finding of a dead or injured animal. The Service contact is the Service's Law Enforcement Division at (916) 414-6660.

Any contractor or employee who during routine operations and maintenance activities inadvertently kills or injures a listed wildlife species must immediately report the incident to their representative. This representative must contact the California Department of Fish and Game immediately in the case of a dead or injured (*species*). The California Department of Fish and Game contact for immediate assistance is State Dispatch at (916) 445-0045.

The U.S. Fish and Wildlife Service Regional Office in Portland, and the Sacramento Fish and Wildlife Office, must be notified immediately if any dead or sick listed wildlife species is found in or adjacent to pesticide-treated areas, with information about the cause of death or illness, if known. The appropriate contact for the U.S. Fish and Wildlife Service Regional Office in Portland, Oregon, is Don Steffeck at (503) 231-6223. The appropriate contact for the Sacramento Fish and Wildlife Office is Ken Sanchez at (916) 414-6600.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of ESA directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

1. Assist the U. S. Fish and Wildlife Service in further implementing recovery actions identified within the Recovery Plan for the bald eagle.

2. Conduct systematic surveys across the landscape to detect additional bald eagle nests and communal night roosts.

3. Monitor bald eagle responses to human generated disturbances, including threats and changes to bald eagle habitat. If the data results indicate bald eagles are exposed and negatively impacted by disturbances, consult with the Service on ways to minimize the impacts.

4. Promote public education regarding the importance and successes of conservation and protection of the bald eagle and other listed species. This can be done using signs in occupied habitat, brochures at ranger stations, and other mediums.

5. Non-system and other roads that lead to sensitive bald eagle habitat such as nesting, foraging, or roosting sites should be gated and bermed.

6. Protection and enhancement of fish habitat in occupied bald eagle use areas through the maintenance of streambank stability by restricting activities such as, but not limited to livestock trampling, OHV use, stream crossings, and recreational use.

7. Protection and enhancement of waterfowl habitat in occupied bald eagle use areas through the maintenance of riparian and lake shore vegetation (waterfowl nesting habitat) by restricting activities such as, but not limited to livestock trampling and grazing, OHV use, and recreational use.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION--CLOSING STATEMENT

This concludes formal consultation on the action(s) outlined in the (request or reinitiation request). As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Please contact Ann Bowers or Roberta Gerson of this office at (916) 414-6600, if you have any questions.

Sincerely,

Cay C. Goude

Wayne White
Field Supervisor

cc: U. S. Forest Service, Downieville Ranger District, Camptonville, CA (Attn: Jean M. Masquelier, Marilyn Tierney)

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Appendix A
Field Data Form

This Field Data Form will be used for judging hazard trees by tree defect and target potential. Rating: Tree Defect Rating + Target Potential Rating = Hazard Score. Tree/snag needs any combination of 4 points or greater to qualify as Hazard Tree (more than one category can be used to get a total of 4 or greater).

New Bullards Bar Reservoir Hazard Tree Rating Form
(Field Data Form)

Complete one form for each hazard tree proposed for felling and/or removal that is: 15 inches or greater diameter breast height* and within one mile of the Reservoir.
(*trees < 15 inches dbh must still comply with the management requirements described in the Supplement to this field form)

Location______________________________GPS___________________________
Attach a map of location; or number trees and attach one map__________________
Tree Species____dbh______________
Estimated distance from the water's edge_________________(< 200 feet requires snag monitoring)
Less than 200 feet_____Within 0.25 miles____ within 1 mile_____

Circle the points on the list below that you are selecting for this tree to rate the hazard:

Tree Defect Rating	Points
Tree is dead (no live crown), is straight or leans towards area of concern, and has the potential to reach site/facility	3
Green tree, ≥15" DBH and 20 feet tall or greater, and with an unnatural lean that exceeds 20 degrees towards the area of concern and is sufficiently tall to reach site/facility	2
Green tree, <15" DBH, and with an unnatural lean that exceeds 20 degrees towards the area of concern and is sufficiently tall to reach site/facility	1
Soil at base of tree shows evidence of recent movement (within the last 5 years) and has the potential to reach the area of concern (i.e. freshly exposed soil, cracks in soil)	2
Spike top tree where the dead portion of the tree has the potential to reach the area of concern	2
Trees showing signs of advanced symptoms of root diseases (trees infected with annosus root disease, black stain, Armillaria root disease, etc.) and have the potential to reach the area of concern (Ref: PSW-P1 1963. Wagener, Willis W. Judging Hazard from Native Trees in California Recreational	3

Areas.)

Trees expected to die within the next 6 months (see Appendix A, "Short-term Mortality Indicators") and have the potential to reach the area of concern. Attach Appendix A and circle rationale.	1
Mechanical and bole defects (including fire damage). Bole damage (cambium) exceeds one-third of the circumference for all species except sugar pine and has the potential to reach the area of concern. Bole damage (cambium) on sugar pines exceeds 50% of the circumference and has the potential to reach the area of concern	3
Exposed root wad of a tree that is sufficiently tall to reach area of concern	3
Trees showing symptoms of advanced branch, bole or basal decay due to root disease or heart rot. Total solid rind thickness is less than one-third of the diameter at the point of decay, and the tree has the potential to reach the area of concern.	3

Target Potential Rating*	**Points**
High Use (designated recreation sites, shoreline area used twice/week or more on average)	4
Moderate Use (specific shoreline area or other area used once/week on average)	2
Low Use (general forest or shoreline area with little to no use)	No score

Circle the Management Action Selected, from the list below

Management Action	**Hazard Score**
Cut down tree or remove dead or injured portion of tree; or close site/facility	7
Remove hazard from highest score to lower score with available funds	6-4
No action required (unless special circumstances dictate)	≤ 3

Tree must have both a Defect and a Target rating to be considered a hazard tree (i.e. if either the defect or target rating is 0, the tree is not considered a hazard).

Enter the numerical values selected from the above tables:

Defect rating______

Target rating ______

TOTAL HAZARD RATING ______

Prepared by: __________________ Title: _______________ Date: _________________

Additional comments or documentation for hazard:

____

____

Are there any elderberry bushes within 200 feet of this tree? _____ (Surveys are required for all unsurveyed sites.) If elderberry bushes are present, no action may occur until a determination is made regarding the need for additional consultation with the U. S. Fish and Wildlife Service.

Supplemental Information is included with this form to identify the actions submitted for consultation regarding hazard tree removal in the vicinity of Bullards Bar Reservoir, including the management requirements that are considered to be a part of the proposed action.

Prior to tree removal, return this form to the District Biologist.

TES habitat information:
Bald eagle:____
    Winter foraging____
    Winter roosting____
    Active Breeding____
    Alternate Breeding Territories_____________________________________
California red-legged frog?____
Valley elderberry longhorn beetle _______________________________________
Forest Service Sensitive____
Snag documentation needed?___ If yes, provide:___________________________
Additional Mitigations necessary? (i.e. snag replacement)__________________
Recreation, note any revisions to public use map that are needed:_____________

APPENDIX A: SHORT TERM MORTALITY INDICATORS

The following conditions indicate that the affected trees have a fatal, non-reversible condition and are very likely to be dead within 6 months. Some trees under severe drought-stress may show no external sign of being attacked by beetles. Any tree, which has life stages or galleries of any species of beetle, except red turpentine beetle, visible when bark is removed with an axe, should be expected to die within 6 months. Trees infested with only red turpentine beetle must be physically girdled around at least 40 % of the tree circumference to be expected to die within 6 months.

A. Pines. (Ponderosa, Jeffrey, sugar and western white pines).

(1) Top one third of crown faded down to a stem diameter of at least 6 inches. (Crown fading will follow a rapid progression of colors from pea-green to straw-yellow to orange to brick-red to brown. The size limitation indicates infestation by a species of Dendroctonus bark beetle).

(2) Fresh, sticky pitch tubes located on the bole between 2 and 20 feet above the ground. Pitch tubes must be reddish in color (pink, rosy, red, purplish-red, reddish-brown). Number of fresh pitch tubes must be at least equal or greater than half of the DBH in inches (i.e. a 12 inch DBH pine must have at least 6 fresh, reddish pitch tubes). Crown may be any color.

(3) Fine, dry red frass (boring dust) accumulated in bark crevices, or cobwebs, or on ground around base of pine tree. (This does not include the coarse, crumbly frass produced by red turpentine beetle, which is often resinous.) Amount of frass per tree must total at least one tablespoon to be considered significant. Crown may be any color.

(4) Conspicuous removal of bark by woodpeckers. Outer bark of ponderosa pines usually removed in patches of several square inches to reveal reddish inner bark. Woodpecker work on Jeffrey, sugar and western white pines usually a vertical series of 3/8 inch diameter holes at about 1 inch spacing on bark plates. Bark flakes usually accumulate on ground or snow under tree. Crown may be any color.

(5) Blowdown.

B. White fir.

(1) Crown currently faded down to a stem diameter of 4 inches or greater. Crown color will rapidly change from pea-green to yellow to orange to brick-red to brown. Size limitation indicates the fir engraver (*Scolytus ventralis*) is infesting the main stem.

(2) White frass (boring dust) accumulated in bark crevices, cobwebs or around base of fir tree. Amount of frass per tree must total one tablespoon to be significant. Crown may be any color. (White frass indicates either no pitch flow in response to fir engraver attack, or successful infestation by ambrosia beetles. Either condition indicates a dying fir tree.)

(3) Ground or snow below white fir tree covered with "green" needles. This does not include normal fall shedding of older yellow needles.

(4) Blowdown.

C. Red fir.

(1) No limbs with normal-color green foliage left in crown.

(2) White frass (boring dust) accumulated in bark crevices, cobwebs or around base of fir tree. Amount of frass per tree must total one tablespoon to be significant. Crown may be any color. (White frass indicates either no pitch flow

in response to fir engraver attack, or successful infestation by ambrosia beetles. Either condition indicates a dying fir tree.)

(3) Blowdown.

D. Douglas-fir.

(1) At least one accumulation of rusty-orange frass (boring dust) per foot of circumference. The piles of frass will be approximately ¾ inch in diameter and will be located in bark crevices in the lower 3 feet of the bole. (This indicates successful attack by the Douglas-fir beetle.)

(2) Trees have not broken bud while all adjacent trees have broken bud. Buds are drying and are not firm.

(3) Woodpeckers have removed at least several square inches of bark from the bole portion which has bark less than 1.5 inches in thickness. Crown may be any color, including green. Ignore single, deep woodpecker holes near the base of old, thick-barked trees (the woodpeckers at the base are usually seeking ants in the bark, which are not a threat to the tree).

(4) No limbs with completely normal-color foliage remaining on tree.

(5) Blowdown.

E. Incense-cedar.

(1) No limbs with completely normal-color foliage remaining on tree.

(2) Blowdown.

NEW BULLARDS BAR RESERVOIR HAZARD TREE RATING FORM SUPPLEMENT

A copy of the conservation measures in the project description and the Field Data Form should be given to appropriate personnel (contract administrator) to ensure that all required minimizations are implemented. Should it not be possible to implement the required minimizations, the District Biologist should be notified to evaluate the need for emergency consultation under the Endangered Species Act. To ensure that Forest Service legal obligations are met, only trees with an appropriate rating and review should be removed; any additional trees should receive the appropriate evaluations prior to felling and removal.

Appendix B

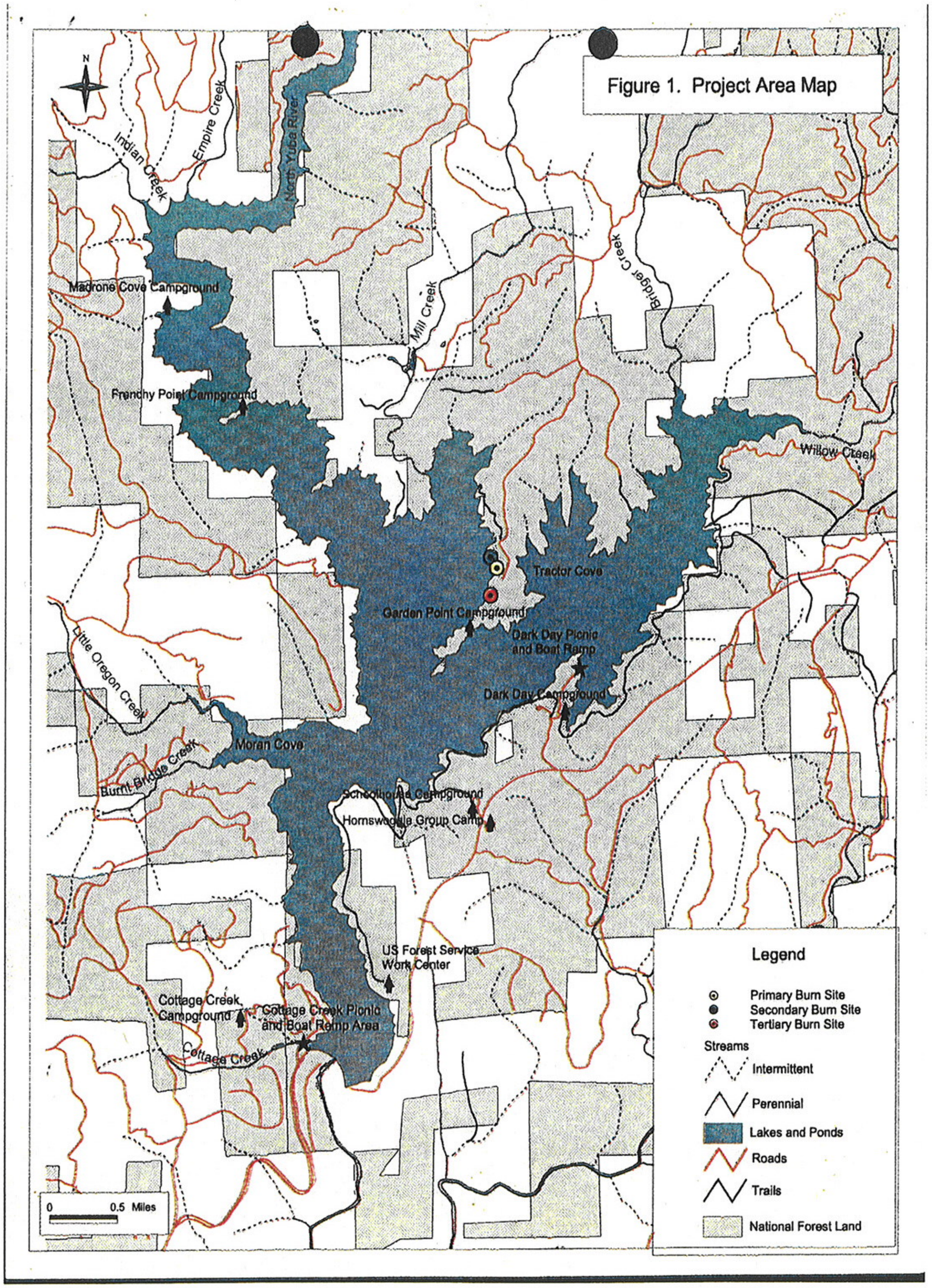


Figure 1. Project Area Map
N
Indian Creek
Empire Creek
North Yuba River
Madrone Cove Campground
Mill Creek
Bridger Creek
Frenchy Point Campground
Willow Creek
Tractor Cove
Garden Point Campground
Dark Day Picnic and Boat Ramp
Dark Day Campground
Little Oregon Creek
Moran Cove
Burnt Bridge Creek
Schoolhouse Campground
Hornswoggle Group Camp
US Forest Service Work Center
Cottage Creek Campground
Cottage Creek Picnic and Boat Ramp Area
Cottage Creek
0 0.5 Miles
Legend
Primary Burn Site
Secondary Burn Site
Tertiary Burn Site
Streams
Intermittent
Perennial
Lakes and Ponds
Roads
Trails
National Forest Land

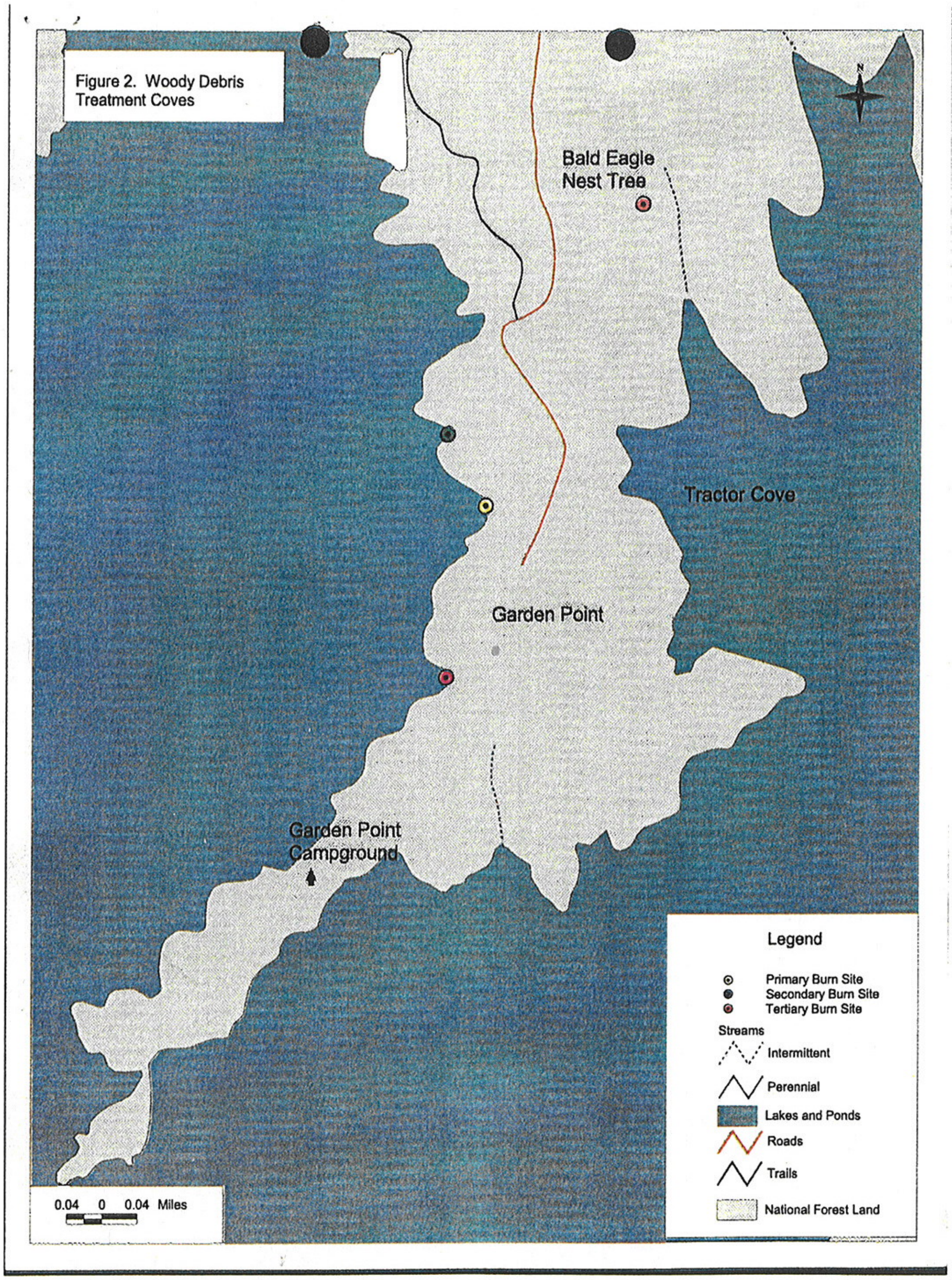


Figure 2. Woody Debris Treatment Coves
Bald Eagle Nest Tree
Tractor Cove
Garden Point
Garden Point Campground
Legend
Primary Burn Site
Secondary Burn Site
Tertiary Burn Site
Streams
Intermittent
Perennial
Lakes and Ponds
Roads
Trails
National Forest Land
0.04 0 0.04 Miles

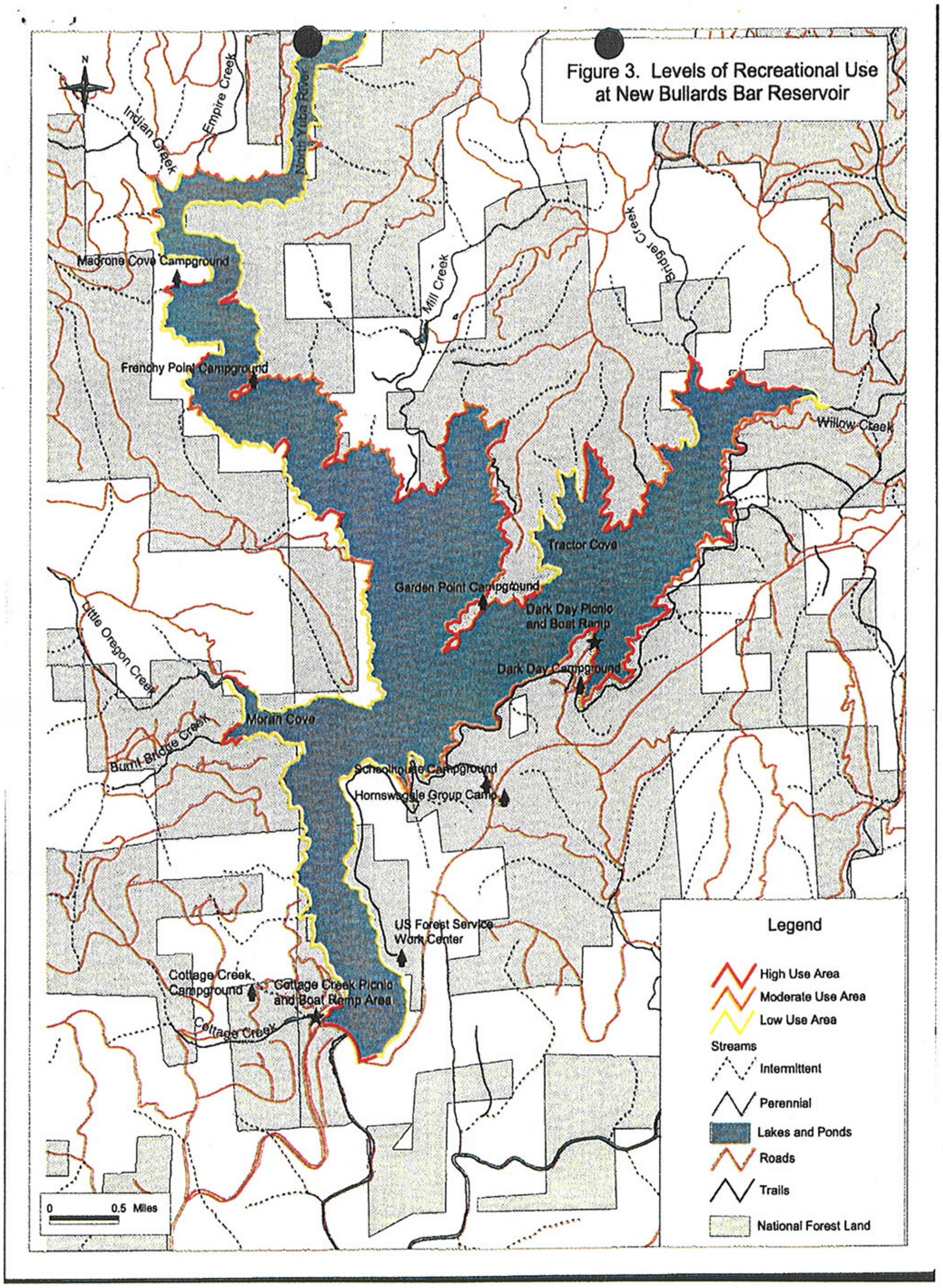


Figure 3. Levels of Recreational Use at New Bullards Bar Reservoir
N
Indian Creek
Empire Creek
North Yuba River
Madrone Cove Campground
Frenchy Point Campground
Mill Creek
Bridger Creek
Willow Creek
Tractor Cove
Garden Point Campground
Dark Day Picnic and Boat Ramp
Dark Day Campground
Little Oregon Creek
Moran Cove
Burnt Bridge Creek
Schoolhouse Campground
Hornswoggle Group Camp
US Forest Service Work Center
Cottage Creek Campground
Cottage Creek Picnic and Boat Ramp Area
Cottage Creek
0 0.5 Miles
Legend
High Use Area
Moderate Use Area
Low Use Area
Streams
Intermittent
Perennial
Lakes and Ponds
Roads
Trails
National Forest Land

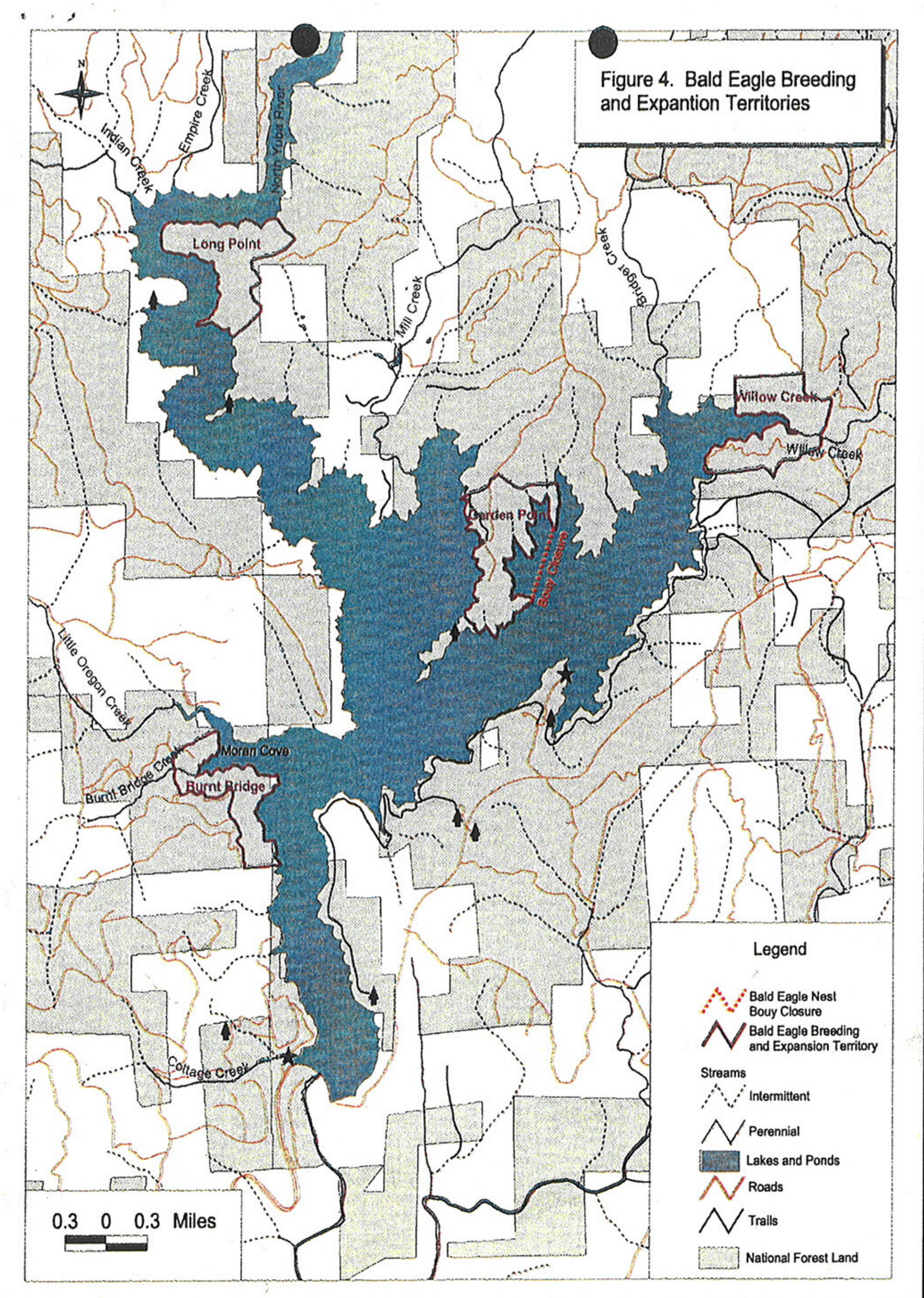
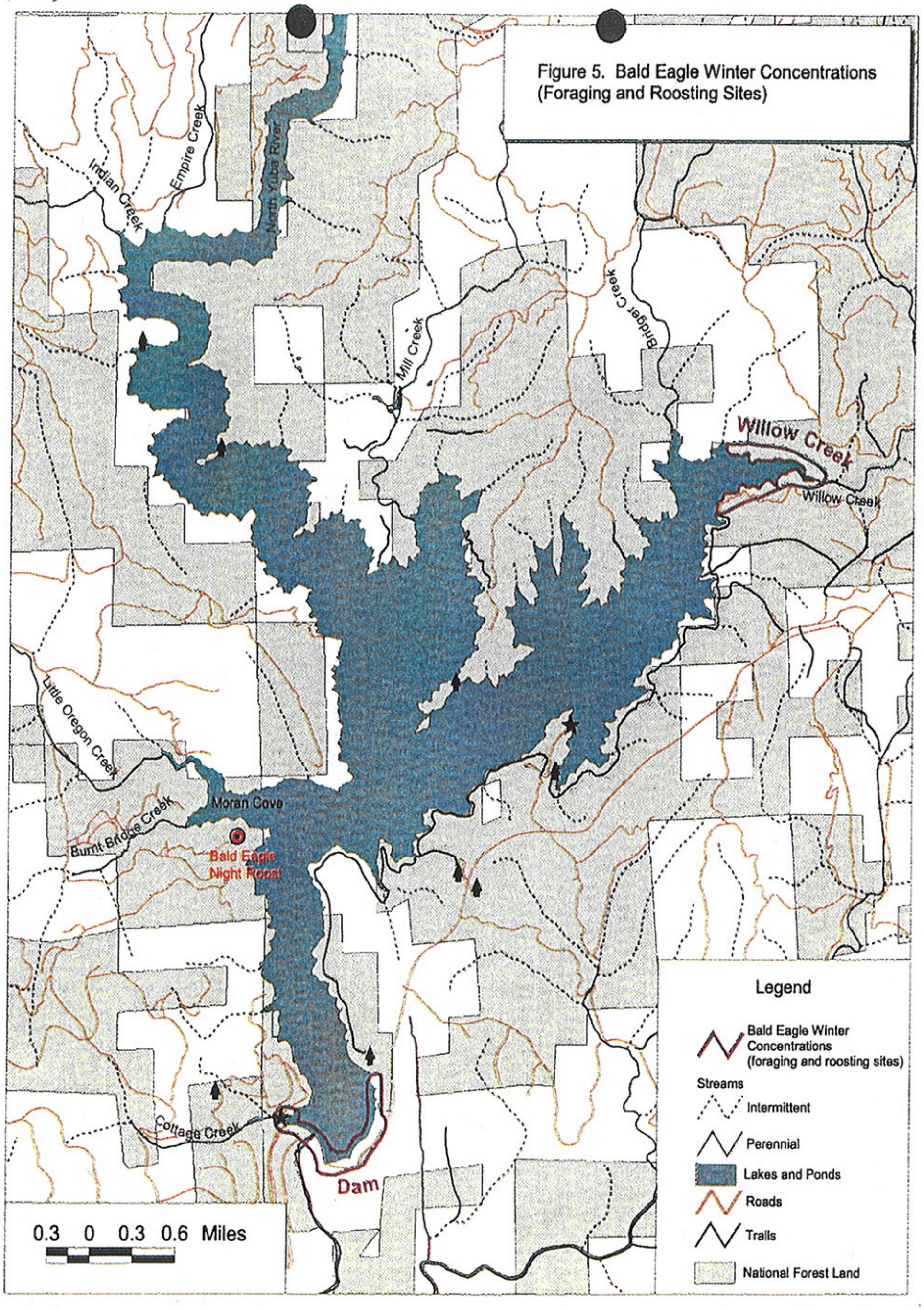


Figure 4. Bald Eagle Breeding and Expantion Territories
N
Indian Creek
Empire Creek
North Yuba River
Long Point
Mill Creek
Bridger Creek
Willow Creek
Willow Creek
Garden Point
Bouy Closure
Little Oregon Creek
Moran Cove
Burnt Bridge Creek
Burnt Bridge
Cottage Creek
0.3 0 0.3 Miles
Legend
Bald Eagle Nest Bouy Closure
Bald Eagle Breeding and Expansion Territory
Streams
Intermittent
Perennial
Lakes and Ponds
Roads
Trails
National Forest Land

Figure 5. Bald Eagle Winter Concentrations (Foraging and Roosting Sites)



Appendix C
Rationale for Snag retention Standards

The Sierra Nevada Forest Plan Amendment (USDA Forest Service 2001) Forestwide Standard and Guidelines for snag retention are to retain four of the largest snags per acre in westside mixed conifer and ponderosa pine forest types. In westside hardwood ecosystems these may be hardwood or conifer (Record of Decision, Appendix A – 28). Snags are to be larger than 15 inches dbh to meet this standard, and snag density is to be evaluated on a 10-acre basis. However, the defense zone of the urban wildland intermix zone and developed recreation sites are exempt from this standard and guideline.

Foraging Habitat:

Developed recreation sites (Figure 1 - Appendix B) are exempt from this standard and guideline. Defense and Threat Zones are unmapped land allocations, which may change with site-specific analysis in the future. At the present time, most of the land surrounding the reservoir lies within a threat zone, rather than a defense zone. Defense zones, do, however, overlap some areas of the shoreline at the present time. These areas may be refined in the future, at the time of project level analysis. Because the shoreline perimeter is foraging habitat for bald eagles, a federally protected species, until this site-specific analysis is conducted, for the 200-foot shoreline area that is outside of developed recreation sites, the snag retention requirement of four snags per acre should extend to this 200-foot zone, irregardless of the fuels zone that is presently mapped. Therefore, for actions associated with the Bullards Bar Reservoir Safety and Annual Maintenance Project, the four-snag per acre standard is applied outside of developed recreation sites, evaluated on a 10-acre basis (200 feet wide by 2178 feet of shoreline, or approximately 0.41 miles of shoreline).

Breeding and Expansion Territories:

A similar rationale is applied for routine hazard tree removal within bald eagle breeding territories (occupied and expansion); the four-snag-per-acre standard applies, evaluated on a ten-acre basis.

Bald Eagle and American Peregrine Falcon Management Plan

Attachment C

Biological Opinion for the New Bullards Bar Reservoir Safety and Annual Maintenance, Downieville Ranger District, Tahoe National Forest

Yuba River Development Project

FERC Project No. 2246

September 2019

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

TAKE PRIDE IN AMERICA

In reply refer to:
1-1-03-F-0335

FEB 04 2004

Steven T. Eubanks
Forest Supervisor
Tahoe National Forest
631 Coyote Street
Nevada City, California 95959

Subject: Biological Opinion for the New Bullards Bar Reservoir Safety and Annual Maintenance, Downieville Ranger District, Tahoe National Forest

Dear Mr. Eubanks:

This is in response to your October 21, 2002, request for informal consultation with the U.S. Fish and Wildlife Service (Service) on the New Bullards Bar Reservoir Safety and Annual Maintenance Project in Yuba County, California. Your request was received in our office on October 23, 2002. The proposed action involves disposal of woody debris accumulated in the reservoir by piling and burning, removal of standing trees on the shoreline areas of the reservoir that have been determined to be hazards to human safety, and reducing ladder fuels within administrative sites around the reservoir, including campgrounds, day-use facilities, and U. S. Forest Service (Forest Service) facilities. The species at issue with this proposed action are the Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) (LCT), the bald eagle (*Haliaeetus leucocephalus*), the California red-legged frog (*Rana aurora draytonii*) (frog), and the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (beetle), which are listed as threatened pursuant to the Endangered Species Act of 1973, as amended (Act).

Your October 21, 2002, letter, requested concurrence with the determinations that the proposed action would not affect the LCT and the beetle, and was not likely to adversely affect the bald eagle and the frog. We concur that the proposed action will not affect the LCT and the beetle. We also concur that the proposed action is not likely to adversely affect the frog. We are unable to concur that the proposed action is not likely to adversely affect the bald eagle, because the removal of hazard trees on the shoreline of the reservoir is likely to involve the removal of actual or potential perching, roosting, and nesting habitat for bald eagles.

This document represents the Service's biological opinion on the effects of the action on the bald eagle, in accordance with section 7 of the Act. This biological opinion is based on information provided in the October 15, 2002, *Biological Assessment for the New Bullards Bar Reservoir Safety and Annual Maintenance, Downieville Ranger District, Tahoe National Forest* (Biological Assessment), the August 7, 2003, *New Bullards Bar Hazard Tree Rating Form, New Bullards Bar Reservoir Hazard Tree Rating Form Supplement*, and *Short Term Mortality Indicators* (collectively referred to as the Field Data Form), the April 11, 2002, *Draft New Bullards Bar Management Plan*, field investigations, and other sources of information. A complete administrative record of this consultation is on file in this office.

Consultation History

April 24, 2002 Site visit at New Bullards Bar Reservoir to review areas used by bald eagles, and discuss proposed wood debris disposal sites.

May 16, 2002 Site visit at New Bullards Bar Reservoir to discuss proposed criteria for hazard tree identification and removal and view examples of tree proposed for removal around the reservoir.

October 23, 2002 Request for informal consultation received for the New Bullards Bar Reservoir Safety and Annual Maintenance, Downieville Ranger District, Tahoe National Forest

August 6, 2003 Meeting at Downieville Ranger District to discuss the final draft of the August 7, 2003, *New Bullards Bar Hazard Tree Rating Form, New Bullards Bar Reservoir Hazard Tree Rating Form Supplement*, and *Short Term Mortality Indicators*

BIOLOGICAL OPINION

Description of the Proposed Action

In this proposed action involves three closely related safety and maintenance actions. The proposed actions include: (1) removing and disposing of woody debris from the reservoir; (2) removing hazard trees; and (3) maintaining administrative sites (campgrounds, day-use areas and Forest Service facilities) by removing under-story vegetation. In addition to these proposed activities, management requirements listed in Section VIII of the Biological Assessment are a required part of these proposed actions, and are described in the *Conservation Measures* section.

The Draft New Bullards Bar Fish and Wildlife Management Plan (April 11, 2002) (Management Plan) includes the following objectives: (1) fulfill the USDA Forest Service (USFS) and Yuba County Water Agency's (YCWA) obligations to the USFWS (as mandated by the Federal Energy Regulatory Commission), which is to protect and manage habitat important to the species survival; (2) help manage to meet the population goals identified in the Recovery Plans for federally-listed species; (3) manage for a safe visitor experience while mitigating adverse effects to threatened, endangered, and sensitive species; (4) restrict human disturbances (walking, driving, mountain biking, boating, camping, operating machinery) within the Management Plan areas of interest to protect and sustain existing and potential listed species populations and habitat; (5) provide land managers with guidance regarding the kinds of actions that may require consultation with the Service. The Management Plan identifies certain routine activities that must occur at the reservoir to provide for improved public safety. Agency managers wish to consult with the Service on some of these actions, to ensure that adequate mitigations and protection measures are included for federally protected species.

Several physical requirements for wood debris disposal sites are needed to be able to stockpile and dispose of wood. These include:

1. Have a low-gradient slope at the water's edge so that wood can be floated onto the shoreline.
2. Possess a cove-like shape, to facilitate effective booming of wood while water levels are high.
3. Have nearby road access for heavy equipment, needed to pile wood for burning.
4. Be large enough to accommodate estimated yearly wood volumes, including periodic years with medium to high water flows.

Forest Service and YCWA personnel surveyed the reservoir by boat on several occasions to identify alternative sites. No potential sites were found that met all objectives. Developing a site for stockpiling, including new road construction was considered, and again, no suitable locations were found. Some alternative sites were found, but all were within the bald eagle breeding territory.

Three locations were selected for wood disposal. Mitigations are incorporated with the proposed actions, to meet the following wildlife objectives, and are part of the proposed action.:

1. Minimize the risk of adversely affecting the California red-legged frog.
2. Protect bald eagle breeding at the reservoir.
3. Protect wintering eagles.
4. Reduce adverse effects to fish and wildlife habitat.

The proposed safety and annual maintenance actions will take place at New Bullards Bar Reservoir, in the Downieville Ranger District of the Tahoe National Forest, Yuba County, California, on the USGS Camptonville, CA 7.5' Quadrangle Map, (T18N R8E) (Figure 1 - Appendix B). The proposed actions will be administered by the Downieville Ranger District and/or the YCWA. They include: (1) remove and dispose of woody debris from the water surface; (2) remove hazard trees that present a higher risk to public safety; and (3) reduce ladder fuels within administrative sites (campgrounds, day-use areas and Forest Service facilities) by removing and disposing of brush and smaller trees. Specific activities associated with these actions are detailed below. The conservation measures specified in this project description are provided at the end of this section.

Action Item 1: Remove and Dispose of Woody Debris From the Reservoir

Woody debris in New Bullards Bar Reservoir poses a hazard to the public. To provide for public safety the YCWA will gather wood from the water surface by boat when the water level is high (generally in May of each year), and boom it in the coves for storage until the water level drops, leaving the wood on land. Wood gathering will occur several times per week, limited to a few trips into a cove per day.

Over the past year YCWA has worked with the Tahoe National Forest to select new woody debris gathering and disposal sites. Three proposed woody debris treatment sites are located on the west bank of Garden Point (T18N R8E Sec 7 SW 1/4) (Figure 2 - Appendix B). The total area to be affected is approximately ½ acre. Since the new sites are much smaller than Moran Cove, three potential small cove sites were identified to handle anticipated annual volumes of woody debris. The three coves were prioritized for use based on ease of access, wood storage/disposal space and proximity to the bald eagle nest tree. Cove 1 offers the best access and wood storage/disposal area; this cove would be the first one used in any given year. If woody debris volume required the use of a second site, Cove 2 would be used. Cove 2 is smaller than Cove 1, and the slope is steeper making woody debris storage/disposal more difficult. Cove 3 is the least favorable cove for woody debris storage and is unsuitable for debris disposal due to the topography. If Cove 3 is needed, it would only be used for woody debris storage, necessitating moving the wood later to Cove 1 or 2 for disposal.

The new woody debris gathering and disposal sites do not require any California red-legged frog mitigations, since these sites are not located near (within one mile of) any suitable breeding habitat for this species. Limited operating periods are implemented to protect wintering eagles and breeding eagles.

The Peripheral Facilities Caretaker, of the Yuba County Water Agency, has been disposing of wood debris at Bullards Reservoir since 1986, and he was consulted regarding the adequacy of the disposal sites. The three coves selected should be able to handle wood disposal during most years; it is questionable whether they can handle the volumes of wood washed down during 30- or 100-year flood events. It is possible that air quality restrictions on burning, combined with the uncertainty of when fall rains begin, could delay burning too late to be able to complete these actions prior to the November 15 limited operating period, which protects wintering eagles. Once burning begins, wood consumption should be complete within several days. The expectation is that in most years, wood can be burned prior to November 15, or, wood can be held over to the following year. If the wood is accumulating faster than it can be disposed of, alternatives will be sought to avoid the need to revert to emergency consultation. Should a flood event occur, or other unforeseen circumstance, additional sites may need to be identified, and emergency consultation may need to occur. A management requirement is included limiting emergency consultation to no more than two out of five years, or this plan will be re-evaluated, and regular consultation pursued as needed.

The following outlines the Woody Debris Gathering and Removal proposed actions:
After August, when the reservoir level is low and the wood debris is high and dry, an excavator and bulldozer, backhoe or similar equipment would be used in Coves 1 and/or 2 to pile the accumulated woody debris. Equipment access would be along the existing road that extends through Garden Point. Equipment would not operate within 25 feet of any surface water or cross any areas with surface water unless reviewed and approved by a Forest Service aquatic specialist.

To provide for proper/safe weather conditions for burning, woody debris piles would be burned by the Yuba County Water Agency after the burn ban is lifted and the weather is cool and wet (probably sometime in mid to late October). Fuel treatment for administrative burning will be done with an approved burn plan or a valid burn permit. Burning outside of the USFS Direct Protection Area (DPA) will be coordinated with the California Department of Forestry. The woody debris piles would be directionally ignited to provide escape routes for lizards and other animals that may be hiding under the wood. Burning of the woody debris may be aided by alumagel and portable fans. A Forest Service biologist will conduct site reviews and be available for advice during all phases of project implementation.

Action Item 2: Remove Hazard Trees

Hazard trees near New Bullards Bar Reservoir pose a threat to public safety. It is Forest Service policy to provide for public safety. Areas where hazard tree removal may occur include: developed and undeveloped recreation sites, campgrounds, public access roads, special use areas, Forest Service administrative sites, day use areas, lakeshore areas, trailheads, and other areas of high recreation and visitor use.

A tree (conifer or hardwood) is considered a hazard if all or a portion of the tree has a high potential to fall or roll onto a facility, visitor use area or roadway and cause personal injury or property damage. The distance to trees on the uphill side may exceed one tree height if they are likely to roll or slide onto the roadway, site, or facility (i.e., barriers are insufficient to prevent trees from reaching the roadway, trail or facility).

Hazard Tree Criteria. The Field Data Form provided in Appendix A of this Biological Opinion is for determining definite hazard tree situations. Guidelines applied in the Field Data Form are based on physical location (target potential) and physical characteristics (tree defects) that either present an imminent hazard or have high potential for tree failure and the potential to reach an area of concern (road, campground, administrative site, etc.). There may be other trees and situations that may not specifically fall into these categories but may still be determined to be a hazard based on local conditions, further site evaluation and the judgment of the inspector.

Conservation Measures

The Tahoe National Forest Land and Resource Management Plan Standards and Guidelines which have been incorporated into the project proposal are:

1. Surveys for elderberry plants will continue in any unsurveyed sites to within 200 feet of the proposed management actions, until all sites have been surveyed. If plants are found, necessary consultation will occur with the USDI Fish and Wildlife Service prior to implementing any management action.

2. To protect breeding eagles, no activities will occur between January 1 through August 31 (or one month past fledging) within 0.25 miles of the Garden Point bald eagle breeding territory (Figure 4 - Appendix B). If sufficient monitoring identifies the nest tree being used that year, the area for the limited operating season may be adjusted to within 0.25 miles of the nest tree. (Provided eagles continue to use the 2002 nest tree, because it is outside of the 0.25 mile buffer, stockpiling of wood by boat in the three coves identified in the Biological Assessment may still occur in the spring.) Should eagles use a different nest tree, all activities will be re-evaluated based on their proximity to the new nest, which may necessitate the re-initiation of consultation with the U. S. Fish and Wildlife Service.

3. To assist recovery plan goals for the bald eagle, no proposed activities on the land (burning debris, stockpiling wood, hazard tree removal, brush removal) will occur from January 1 through August 30 within all expansion territories identified in the Bullards Bar Reservoir Fish and Wildlife Management Plan (Figure 4 - Appendix B). This season may be shortened from January 1 to June 30, if sufficient monitoring can determine that eagles are not nesting within 0.25 miles of the proposed activities. Wood gathering from the water surface may still occur within 0.25 miles of the expansion territories. Should new bald eagle nests be discovered in the future, appropriate consultation will be re-initiated as needed, depending on site-specific concerns.

4. To protect wintering bald eagles, limit the operating season, so that no activities occur from November 15 through March 15 within 0.25 miles of the high water mark. Because site-specific monitoring at the dam shows that in some years eagles may congregate earlier, this limited operating period is extended from November 1 through March 15 for areas within 0.25 miles of the dam and 0.25 miles of the winter night roost.
5. Prior to removing any hazard trees 15" dbh or greater, the following reviews will take place in coordination with a USFS biologist:

a. Completion of the Field Data Form (Appendix A) that documents the rationale for hazard rating, and identifies the tree species, dbh, and location, including distance from the water's edge. The form will also document site-specific determinations made of public use within the range of the tree, based on the site-specific evaluation of shoreline topography and local knowledge of public use by reservoir personnel. The form will also note any occurrences of elderberry (Sambucus sp.) plants within 200 feet of any project activities.

b. Because the public use map (Figure 3 - Appendix B) delineates broad areas of the shoreline that receives high, moderate, and low use, and it is of a broader scale than site-specific determinations, further refinement of this public use map should be an ongoing process, and include updates to the map.

c. Snag retention standards as identified in the Sierra Nevada Forest Plan Amendment (Forest Service 2001) should be met within this area (i.e. four snags per acre). Refer to Appendix B of the Biological Assessment for a detailed explanation of the snag retention standards as they apply to Bullards Bar Reservoir (Appendix B in this Biological Opinion). For hazard trees identified for removal within 200 feet of the shoreline, all snags will be sampled for a distance of approximately 0.25 miles in either direction. Additional live tree or other potential perching structures in this area may also be noted. If snag retention standards would not be met as a result of hazard tree removal, administrative closures should be considered as an alternative to protect public safety. The construction or development of alternate bald eagle perching structures may also be considered, should public closures not be feasible.

d. Within high use foraging sites and winter night roosts identified in the *Draft Bullards Bar Reservoir Fish and Wildlife Management Plan* (or as revised in the future), multiple perching structures should be maintained. The above standard of retaining four snags per acre is a minimal goal at these sites. Additionally, the following standard should be applied:

i. Ninety percent of all potential perches that are present should be retained; up to ten percent may be removed as hazards. If hazard tree removal would cause perching structures to be reduced below this level, administrative closures should be considered as an alternative to hazard tree removal to protect public safety. The construction or development of alternate bald eagle perching structures may also be considered, should public closures not be feasible.

e. To mitigate for the loss of bald eagle perching habitat, fell hazard trees that are immediately adjacent to the shoreline so that stumps are higher than usual (e.g. 3- to 4-feet high), so the stumps may still be used for perching. If practical, directional fall trees to avoid the high water line. Where safety and fuels concerns are not present, recruit the bole of the tree for additional wood structure and potential perching structures. These actions are recommended only where they do not compromise faller safety.

6. For all hazard trees identified for removal from Moran Cove, contact a biologist to check the site for California red-legged frogs prior to removal of any hazard tree(s).

7. To protect aquatic and riparian resources all hazard trees identified for removal in riparian conservation areas (RCAs) will be reviewed by a biologist. Review may include species specific surveys and/or additional recommendations such as dropping and leaving trees on-site. Required RCA widths are as follows:
Perennial streams = 300 feet each side
Seasonal streams = 150 feet each side

8. If large frogs (> 2 inches), turtles, large stick nests or eagles are observed, a Forest Service biologist will be contacted and activities will be delayed until the site can be reviewed.

9. It is expected that activities identified in this consultation adequately cover most routine activities needed to address public safety. To better address any uncertainty surrounding this, especially regarding the stockpiling and disposing of woody debris, should it be necessary to pursue emergency consultation in two of five years, alternative solutions will be sought and appropriate consultation reinitiated, to avoid the need for emergency consultation.

Figure 3 (Appendix B) shows public use of the reservoir near the shoreline at a coarse scale. Information used to develop Figure 3 (Appendix B) took into consideration boating use, popular areas for fishing, camping, picnicking, and shoreline access. Not all areas shown as high and moderate use have an accessible shoreline. Steep topography at this reservoir makes most of the shoreline difficult to access and hazard trees are not an issue at these sites. Moderate to high shoreline use tends to occur at places with the lowest gradient. Shoreline use patterns will be identified site-specifically, as areas are assessed in more detail during hazard tree ranking. Each hazard tree ranking will evaluate public use site-specifically, based on local knowledge of the actual use at the site and the probability of use based on topography. The actual public use is discontinuous at a finer scale, rather than the continuous areas reflected in Figure 3 (Appendix B).

A hazard tree evaluation form will be completed for all trees 15 inches or greater. All hazard tree removal will be coordinated through the District Wildlife Biologist. Wildlife mitigation measures need to be met at each hazard tree removal site.

Action Item 3: Maintain Administrative Sites (campgrounds, day-use areas and Forest Service facilities) by: reducing ladder fuels within administrative sites by removing and disposing of brush and smaller trees.

Maintaining administrative sites is needed to provide a safe recreational and working environment at the reservoir. Maintenance includes removing mid- and lower-story fire hazard fuels from campgrounds (Garden Point, Dark Day, Schoolhouse, Hornswoggle, Cottage Creek, Madrone Cove, and Frenchy Point), day use areas (Dark Day and Cottage Creek) and administrative sites (Bullards Work Station) (Figure 1- Appendix B). This includes removing selected trees 12 inches and smaller and brush (deer brush, tan oak, scotch-broom, poison oak, blackberry). Vegetation would be hand cut using chainsaws and pruners, piled and burned. Some woody debris will be cut into firewood-sized pieces and left for campers to use the following season. Woody debris may also be chipped and used for ground cover, where needed.

Action Area

New Bullards Bar Reservoir is located at an elevation of 1900 feet and is constructed on the North Yuba River. Several creeks flow into the reservoir from both the Plumas National Forest and the Tahoe National Forest.

A variety of public and private interests own land around New Bullards Bar Reservoir. The majority of the land is National Forest System Lands, managed by two National Forests, the Tahoe National Forest (TNF) and the Plumas National Forest (PNF). The Yuba County Water Agency (YCWA) owns the majority of the private land around the perimeter of the reservoir, with individual private property owners and residential housing occupying the remainder.

The YCWA is licensed to manage New Bullards Bar Reservoir and provide hydroelectric power, flood control, domestic and agricultural water and recreation. The reservoir is a 966,103 acre-foot water storage facility, covering 4,809 water surface acres at a maximum water surface elevation of 1,956 feet above sea level (YCWA 1993). The reservoir is mostly undeveloped, but offers easy road access and is particularly attractive to those seeking motorized boat oriented recreation in a scenic setting.

Vegetation surrounding the reservoir includes a diversity of vegetation typical of montane hardwood-conifer habitats. The most common tree species are Ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), Douglas-fir (*Pseudotsuga menziesii*), incense cedar (*Calocedrus decurrens*), California black oak (*Quercus kelloggii*), tan oak (*Lithocarpus densiflorus*) and Pacific madrone (*Arbutus menziesii*). Canopy cover generally exceeds 40 percent.

Bald Eagle

Status of the Species

The bald eagle once nested throughout much of North America near coasts, rivers, lakes, and wetlands. The species experienced population declines throughout most of its range, including California, due primarily to environmental contamination from the use of DDT and other persistent organochlorine compounds, habitat loss and degradation, shooting, and other disturbances (Detrich 1986, Stalmaster et al. 1985, USFWS 1986). The drastic decline of the species led to its listing on February 14, 1978, and protection under the Act (USFWS 1978). The *Pacific Bald Eagle Recovery Plan* (Recovery Plan) was released in 1986 for the recovery and maintenance of bald eagle populations in the 7-state Pacific recovery region (Idaho, Nevada, California, Oregon, Washington, Montana, and Wyoming) (USFWS 1986). In recent years, the status of bald eagle populations has improved throughout the United States. It was downlisted from endangered to threatened on July 12, 1995, throughout the lower 48 states (USFWS 1995). A proposed rule to remove the species from the list of endangered and threatened wildlife was made on July 6, 1999 (USFWS 1996) but this rule has not been finalized. Critical habitat has not been designated for this species. In addition to the Act, the bald eagle is protected under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712) and the Bald Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d).

The adult bald eagle is recognized by its white head and tail contrasting against its dark brown body as well as its wingspan which can be greater than 6.5 ft (2 m). The species is long-lived, and individuals do not reach sexual maturity until four or five years of age.

The bald eagle is a generalist and opportunistic predator and scavenger adapted to aquatic ecosystems. It frequents estuaries, large lakes, reservoirs, major rivers, and some coastal habitats. Its primary foods, in descending order of importance are: fish (taken both alive and as carrion), waterfowl, mammalian carrion, and small birds and mammals. Bald eagles are highly maneuverable in flight and frequently perch-hunt. Diurnal perches are used during foraging; these usually have a good view of the surrounding area and are often the highest perch sites available (Stalmaster 1976, USFWS 1986). They are also known to hunt by coursing low over the ground or water. In general, foraging habitat consists of large bodies of water or free-flowing rivers with abundant fish and adjacent snags and other perches (Zeiner et al. 1990).

Breeding generally occurs February to July (Zeiner et al. 1990) but breeding can be initiated as early as January 1st via courtship, pair bonding, and territory establishment. The breeding season normally ends approximately August 31st when the fledglings have begun to disperse from the immediate nest site. One to three eggs are laid in a stick platform nest 50-200 ft (15 .2-61.0 m) above the ground and usually below the tree crown (Zeiner et al. 1990). Incubation may begin in late February to mid-March, with the nestling period extending to as late as the end of June. From June thru August, the chicks will generally remain within the nest tree area. Bald eagles are susceptible to disturbance by human activity during the breeding season, especially during egg laying and incubation, and such disturbances can lead to nest desertion or disruption of breeding attempts (USFWS 1986).

Nesting territories are normally associated with lakes, reservoirs, rivers, or large streams and are usually within 2 miles from water bodies that support an adequate food supply (Lehman 1979, USFWS 1986). Some of California's breeding birds winter near their nesting territories. Most nesting territories in California occur from 1000-6000 ft (304.8-1828.8 m) elevation, but nesting can occur from near sea level to over 7,000 ft (2133.6 m) (Jurek 1988).

In the Pacific Northwest, bald eagle nests are usually located in uneven-aged (multi-storied) stands with large, old trees (Anthony et al. 1982). Most nests in California are located in ponderosa pine and mixed-conifer stands and nest trees are most often ponderosa pine (*Pinus ponderosa*) (Jurek 1988). Other site characteristics, such as relative tree height, tree diameter, species, position on the surrounding topography, distance from water, and distance from disturbance, also appear to influence nest site selection (Lehman et al. 1980, Anthony and Isaacs 1989). Bald eagles often construct up to five nests within a territory and may alternate between them from year to year (USFWS 1986). Nests are often reused and eagles will add new material to a nest each year (DeGraaf et al. 1991).

Trees selected for nesting are characteristically one of the largest in the stand or at least co-dominant with the over story, and usually have stout upper branches and large openings in the canopy that permit nest access (USFWS 1986). Nest trees usually provide an unobstructed view of the associated water body and are often prominently located on the topography. A survey of nest trees used in California found that about 71 percent were ponderosa pine, 16 percent were sugar pine (*Pinus lambertiana*), and five percent were incense-cedar (*Librocedrus decurrens)*, with the remaining eight percent distributed among five other coniferous species (Lehman 1979).

Lehman (1979) found that 70 percent of the nest trees surveyed were classified as highly susceptible to beetle infestation, probably a function of bald eagles using mature and over mature trees. Ninety-three percent of the nest trees were 21-60 inches (in) (53.3-152.4 centimeters (cm)) in diameter, with a mean diameter of 43.1 in (109.5 cm) and 92 percent were greater than 76 ft (23.2 m) tall, with a mean height of 111.9 ft (43.1 m). Seventy-three percent of the nest sites were within 0.5 mile (0.8 km) of a body of water, 87 percent within 1 mile (1.6 km), and none were over 2 miles (3.2 km) from water. Other trees, such as snags, trees with exposed lateral limbs, or trees with dead tops, are often also present in nesting territories and are used for perching or as points of access to and from the nest. Such trees also provide vantage points from which territories can be guarded and defended. Nearby trees may also screen the nest from human disturbances or provide protection from wind damage (Jurek 1988).

Wintering habitat is associated with open bodies of water, with some of the largest wintering bald eagle populations occurring in the Klamath Basin (Detrich 1981, 1982). Smaller concentrations of wintering birds are found at most of the larger lakes and man-made reservoirs in the mountainous interior of the north half of the state and at scattered reservoirs in central and southwestern California.

Two habitat characteristics appear to play a significant role in habitat selection during the winter: diurnal feeding perches, as described above; and communal night roost areas. Communal roosts are usually near a rich food resource (USFWS 1986), although Keister and Anthony (1983) found that bald eagles used forest stands with older trees as far as 9.6 miles (15.4 km) from the food source in the Klamath Basin. The areas used as communal roosts in the Klamath Basin were the forest stands with old (mean age of roost trees was 236 years), open-structured trees that were close to the feeding areas. In stands where ponderosa pine was dominant, the pine was used almost exclusively for roosting. In forest stands that are uneven-aged in the Pacific Northwest, communal roosts have at least a remnant of large, old trees (Anthony et al. 1982).

Most communal winter roosts used by bald eagles throughout the recovery areas offer considerably more protection from the weather than diurnal habitat (USFWS 1986). Isolation from disturbances is an important feature of bald eagle wintering habitat. Excessive human activity may be the reason why some suitable wintering habitat is not used by bald eagles (USFWS 1986). Human activity near wintering bald eagles can adversely affect eagle distribution and behavior (Stalmaster and Newman 1978).

Bald eagles are susceptible to disturbance by human activity during the breeding season, especially during egg laying and incubation. This includes recreational activities, fluctuating fish populations and availability of roost trees as a result of reservoir level fluctuations, risk of wild fire, fire suppression activities, fragmentation of habitat, home sites, campgrounds, mines, timber harvest, and roads. Such disturbances can lead to nest desertion or disruption of breeding attempts. Human activities are more likely to disturb bald eagles when located near roosting, foraging, and nesting areas (Stalmaster and Kaiser 1998, Stalmaster et al. 1985, USFWS 1986).

Studies have documented a threshold at which human activities elicit response for eagles (Stalmaster and Newman 1978, Knight and Knight 1984), though other studies show little direct effect of human activities on bald eagle nesting attempts (Mathisen 1968, Fraser et al.1985). Human induced failures are likely one-time catastrophic events (i.e., firearm target practice) occurring near nests early in the nesting season, which often escape detection (Jackman and Hunt 2000).

Human recreation resulting in disruption of wildlife ecology is an emerging issue in natural resources management (reviews in Knight and Gutzwiller 1995; Knight and Skagen 1988). Boyle and Samson (1983) listed 189 literature references that identified effects of non-consumptive outdoor recreation on terrestrial vertebrates in North America. More than 81 percent (136) of these articles reported negative effects on wildlife while less than 7 percent (11) reported positive effects and 22 percent (41) reported no or undetermined effects. Several authors have demonstrated that nesting and foraging eagles avoid areas of human use or development (Buehler et al. 1991, McGarigal et al. 1991, Brown and Stevens 1997). Individual pairs of nesting bald eagles exhibit varying levels of tolerance to disturbance throughout the breeding season and during periods of foraging.

The effects of recreational activities on bald eagles are variable and depend on the context in which the activity and eagle encounters take place, the eagles behavioral and physical state, and the spatial and temporal variation of the interaction (Grubb and King 1991; Anthony et al. 1995). McGarigal et al. (1991) described two forms of disturbance which result from human-eagle interactions. The first form, active displacement, involves humans actively approaching or passing by eagles. The second form, passive displacement, involves human activities that influence an eagle's environment and cause eagles to change their location and behavior.

McGarigal et al. (1991) described active displacement as humans coming into contact with eagles by boating past eagles on a narrow section of river. This terminology could also apply to open lakes and marshes when humans may have access to areas by foot where eagles congregate. Several researchers have examined active displacement by measuring the distance between a human activity and an eagle at which an eagle flushes. This method enables researchers to establish a flush response (percentage of human-eagle interactions within a specified distance which result in an eagle flushing) or a mean flush distance. McGarigal et al. (1991) found that less than 6 percent of human activities within 1640.4 ft (500 m) of breeding eagles resulted in flushing disturbance on the Columbia River in Washington. Skagen (1980) found that 42.5 percent of wintering eagles on the Skagit River in Washington flushed when boats, pedestrians, or vehicles approached within 1640.4 ft (500 m). Fraser et al. (1985) found that breeding bald eagles in Minnesota flushed at 187-3251.3 ft (57-991 m) at the approach of a pedestrian, with an average flushing distance of 1561.7 ft (476 m). Seventy-five percent of all flight responses occurred when eagles in Michigan were within 656.2 ft (200 m) of vehicles, pedestrians, boats, or aircraft (Grubb et al. 1992). Steidl and Anthony (1996) reported that 52 percent of all non-breeding summer eagles in Alaska that flushed in response to rafts on the Gulkana River did so between 82-328.1 ft (25-100 m). In northwestern Washington, researchers reported that flushing distances of perched and feeding bald eagles averaged 436.4 and 734.9 ft (133 and 224 m) in response to boating and pedestrian activities on the Skagit River Bald Eagle Natural Area (Stalmaster and Kaiser 1998). Finally, Russel (1980) found that 59 percent of all wintering eagles along three rivers in northwestern Washington flushed in response to a census raft and 100 percent of eagles in feeding activities were flushed.

The second form of displacement described by McGarigal et al. (1991) is passive displacement. Human activities affect the eagle's environment and cause changes in the eagle's distribution or behavior (Anthony et al. 1995). McGarigal et al. (1991) reported that breeding eagles avoided an area within 1312.3 ft (400 m), ranging from 656.2-2952.8 ft (200-900 m) of an experimental stationary boat. Eagles also spent less time and made fewer foraging attempts in the experimental area during the experimental period. Knight et al. (1991) found that eagles were more likely to be on the ground than in perches when anglers were absent from riverbanks. Eagles on their study area were constrained to feed on the ground, as the salmon carcasses they fed on were too heavy to take to perch trees. This led Knight et al. (1991) to suggest that human activity disrupted feeding, and reduced energy intake and increased energy expenditure. Skagen et al. (1991) reported that after a disturbance, eagles seldom returned to feed that day. On the Skagit River in Washington, Skagen (1980) found a significant decrease in the proportion of eagles feeding when human activity was present within 200 m of the feeding area in the previous 30 minutes. Stalmaster and Newman (1978) found that disturbance in areas of high human activity at major feeding grounds caused a shift in distribution which resulted in displacement of birds to lower quality habitat and confined the population to a smaller area. Eagles utilizing a portion of the Sauk and Suiattle Rivers in Washington having lower human activity showed significantly higher sensitivity to human disturbance than areas with higher levels of activity (Russel 1980).

There have been several studies that have evaluated the effects of recreational human disturbance on nesting bald eagles. These types of studies are not common and relatively speaking a small number of them have been published (Mathisen 1968; Anthony and Isaacs 1989; Grubb and King 1991; Buehler et al. 1991; Grubb et al. 1992; Steidl and Anthony 1996). Several studies have examined the relationship between recreation and wintering bald eagle activity (Shea 1973; Servheen 1975; Stalmaster and Newman 1978; Russel 1980; Skagen 1980; Steenhof et al. 1980; Walter and Garrett 1981; Knight 1984; Stalmaster and Kaiser 1998). Negative impacts of recreational activities on bald eagles include: reduced fitness, altered behavior, death, changes in demographics, distribution (spatially and temporally), and community composition and interactions.

Environmental Baseline

The purpose of this section is to provide a baseline for comparison in determining whether implementation of the proposed project would jeopardize the continued existence of the species throughout all or part of its range, and whether the proposed project would provide for the species' conservation and long-term survivability.

The bald eagle continues to be found throughout much of North America and breeds or winters throughout California, except in the desert areas (Zeiner et al. 1990; DeGraaf et al. 1991). In California, most breeding occurs in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties (Zeiner et al. 1990; Jurek in litt. 2000). California's breeding population is resident year-long in most areas as the climate is relatively mild (Jurek 1988). Between mid-October and December, migratory bald eagles arrive in California from areas north and northeast of the state. The wintering populations remain in California through March or early April.

The California bald eagle nesting population has increased in recent years from under 30 occupied territories in 1977 to 151 occupied territories in 1999 (Jurek 2000). Based upon annual wintering and breeding bird survey data, it is estimated that between 100-300 bald eagles winter on National Forests in the Sierra Nevada, and at least 151-180 individuals remain year-round to breed (Forest Service 2000). Most of the breeding population is found in the northern third of the state, primarily on public lands. Seventy percent of nests surveyed in 1979 were located near reservoirs (Lehman 1979) and this trend has continued, with population increases occurring at several reservoirs since the time of that study. In the Pacific recovery region, which includes the Mokelumne watershed, population goals as set forth in the Recovery Plan (USFWS 1986) have been met. The Sierra Nevada management zone of the Recovery Plan however, has not reached its goal of 15 occupied territories: in 1999 there was a total of nine occupied territories in this management zone. Though the Sierra Nevada is only at 60 percent of the recovery goal, it has steadily increased since 1986 when there were only two known occupied territories in this management zone.

The observed increase in population is believed to be the result of a number of protective measures enacted throughout the range of the species since the early 1970s including listing of the species. These measures include the banning of the pesticide DDT, protection of nest sites, and protection from shooting.

The CDFG's fish stocking program throughout California's lakes, reservoirs and rivers has provided an abundant prey base of fish for the bald eagle. In the northern California lakes, 4,000 pounds (lbs) (1814.4 kilograms (kg)) of salmonids are stocked in approximately 57 bodies of water each year. That includes approximately 200-350 lb (90.7-158.8 kg) of fish 10-12 in (25.4-30.5 cm) in length. For recreational fishing, 70,000 lbs (31752 kg) of fish averaging approximately 0.5 lbs (0.2 kg) each are annually stocked in approximately 62 different bodies of water in the southern Sierra Nevada. In stocking programs in northern California, up to 20 percent of the released hatchery trout may die soon after release and many initially inhabit the top of the water column because of increased oxygen levels there. In one study, bald eagles were observed taking fish carrion at the stocking location at the Shasta Reservoir (Detrich 1978).

Though the construction of dams has limited the range of anadromous fish, an important historic bald eagle prey base, reservoir construction and the stocking of fish in reservoirs in the west has provided bald eagles with habitat for population expansion following their mid-century decline which resulted from DDT poisoning, degradation of historical nesting habitat, and persecution by humans (Detrich 1986, USFWS 1986). Food habitat studies of reservoir-nesting bald eagles in the west have focused on populations in northern California and Arizona (Hunt et al. 1992, Jackman et al. 1999).

Potential risk factors to the bald eagle from resource management activities include modification or loss of habitat or habitat components (primarily large trees) and behavioral disturbance to nesting eagles from vegetation treatment, facilities maintenance, recreation, or other associated activities within occupied habitat, which could prevent or inhibit nesting or lead to nest failure (Forest Service 2001).

The draft California Bald Eagle Habitat Management Guidelines recommends that management eliminate human disturbances at nesting areas during the breeding period, and it gives examples of closures that include signs, road closures, floating booms, and prohibition of shoreline moorage (Forest Service 1977). Similar closures have been implemented at other locations in California that include: Shasta Lake, Little Grass Valley Reservoir, Stampede Reservoir.

For delisting to occur, the Pacific Bald Eagle Recovery Plan identifies four criteria: (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%; (3) attainment of breeding population goals in at least 80% of the management zones with nesting potential; and (4) stable or increasing wintering populations.

Within the Tahoe National Forest, three breeding territories have been identified in the 1990's--Stampede, Boca, and Bullards Bar reservoirs—with an additional breeding territory on private land at Milton Reservoir. The Bullards territory is the only one located within the Downieville District.

Outside of the Tahoe National Forest, a territory is reported to occur at Collins Reservoir, 10 miles to the southwest, and Little Grass Valley Reservoir in the Plumas National Forest, approximately 7 miles northwest.

The Plumas and Tahoe National Forests lie within Zone 28 (Sierra-Nevada Mountains) of the Pacific Bald Eagle Recovery Area (USFWS 1986). Recovery goals identify a target of three territories at New Bullards Bar Reservoir, and one territory each for Stampede, Boca, and Jackson. Considering the previously-mentioned territories in the Tahoe NF (assuming the Milton Reservoir territory substitutes for Jackson because of its close proximity), recovery goals for the numbers of territories have been met at the other three sites; they have not been met at New Bullards Bar Reservoir.

The Pacific Bald Eagle Recovery Plan (USFWS 1986) task 1.32 recommends maintaining and improving forested habitat in both the breeding and wintering range for the bald eagle, including the preservation of snags in bald eagle use areas (Task 1.3215). Recovery Plan task 1.332 recommends excluding logging within 800 m (0.5 miles) where the activity is within line of sight, otherwise within 400 m (0.25 miles) of bald eagle use areas during critical periods of use, including the wintering and nesting season. The nesting season occurs approximately between January 1st and August 31st, or when fledglings actually leave the nest. The wintering season occurs approximately from November 15 to March 15. Other Recovery Plan tasks include, developing public information programs, improved enforcement of eagle protection laws, restricting human disturbance at eagle use areas, and surveillance in habitats where eagles are vulnerable to human disturbance.

Removing wood debris at New Bullards Bar Reservoir has probably disturbed eagles in the past. During the 1980's and early 1990's, woody debris was piled and burned along the water's edge, in order to remove accumulated fuels and prevent hazardous logs from floating into the water when the water level is high. These burn piles were distributed along the shoreline, and the piles were burned in the winter, when eagles concentrate at the Reservoir to feed and roost. In the mid-1990's, wood was gathered in booms, moved to accessible beaches, piled into large piles and subsequently burned. During 1999, wood was boomed close to an active nest during breeding season; and in 1994, blasting of a debris pile occurred in close proximity to an active nest during the breeding season. Although not necessarily the cause, eagles failed to breed for three seasons following 1994. The lack of breeding roughly corresponds with the same year that the California Department of Fish and Game stopped stocking the reservoir with adult kokanee, but planted finglerlings instead. Lowered foraging opportunities could have delayed eagle breeding for several years, while the fingerlings were growing (Forest Service 2002).

The Yuba County Water Agency, the U. S. Forest Service, and the USDI Fish and Wildlife Service have been working together to develop a New Bullards Bar Reservoir Fish and Wildlife Management

Plan. The plan is presently in draft form (April 11, 2002) and is designed to be a working document. The draft plan identified two to three expansion breeding territories, which were unmapped at that time. Three are submitted with this Biological Assessment (Figure 4 - Appendix B), and they are intended to be incorporated into the plan.

Bald eagle habitat, both nesting and wintering, occurs in many areas around Bullards Bar Reservoir. Forest Service recreation personnel regularly report bald eagle activity and potential nesting activity that they observe in the area. Two routes occur within the District that are part of the nationwide annual mid-winter bald eagle survey--one along the North Yuba River for a 14 mile stretch west of the town of Downieville, and the second conducted by boat around the perimeter of Bullards Bar Reservoir. These surveys, conducted since 1990, have produced an occasional individual eagle wintering along the North Yuba River, and a range of 10 to 20 individuals wintering at Bullards Bar Reservoir. This is the largest wintering concentration of eagles identified within the Tahoe National Forest.

Within the Reservoir, wintering habitat generally consists of a 200-foot perimeter along the high water mark, where eagles perch to forage. Winter surveys have identified scattered individual eagles perching along the water's edge, with certain areas used more regularly than others (Figure 5 - Appendix B). Eagles are often seen foraging at the mouth of Willow Creek. Bullards dam is a frequently used diurnal area where wintering eagles congregate, and they are often seen foraging and perching in a cove just east of the dam, especially when the kokanee salmon congregate to spawn. Observations of eagles at the dam show that eagles begin congregating at the dam when the kokanee salmon are spawning. The actual timing of kokanee spawning is dependent on the timing of temperature changes and rainfall. This typically occurs in November, but it may vary each year, and it occasionally occurs in October (Forest Service 2002).

The west-side of the dam provides fewer perching opportunities because of the Emerald Cove marina and a large boat and motor vehicle parking area 100 feet above it. These developments increase human disturbance and displace vegetative perching structures. The cove on the east-side of the dam is well vegetated with large trees, provides some thermal cover, sturdy perching branches, and visual screening from Marysville Road, which runs above it. Eagles are often seen perching in these trees and on rocks at the water's edge, and flying from perches over the water. Other frequently used places around the reservoir include prominent points and the Garden Point peninsula. A boom located just below this cove effectively limits shoreline access by boat.

A winter communal roost was recently discovered (January 2000) within a sheltered multi-storied stand along the water's edge (Figure 5 - Appendix B). At least eight eagles were counted at this roost. The field observer noted frequent vocalizing and social interactions between individuals at this site. Low light conditions around dusk and dawn, multi-layered closed-canopy stands, and cryptic coloring that camouflages immature eagles—all these, make observations of the night roost difficult.

A pair of breeding eagles have had a nesting territory at the Reservoir on the Garden Point peninsula since 1989 (Figure 4 - Appendix B). Monitoring at the reservoir indicates that the breeding pair are year-round residents. During years that the pair fledge young, adults and young are often seen in the nest territory through the fall. There is no indication that other eagles frequent the territory, as sightings appear to be limited to one to two adults.

The same nest tree was used through 1999, located on the west side approximately 1000 feet above a cove highly frequented by recreationists in boats. Thirteen young were fledged between the years 1989-99. In October of 1999, the Pendola Fire burned intensely through the nest stand, killing the nest tree and surrounding trees. The eagles built a new nest in a stand of green trees above Tractor Cove, approximately 0.25 miles southeast of the original one. Tractor Cove was a very popular boating and camping area. Since the discovery of the new nest, Reservoir management has implemented administrative closures during the breeding season within Tractor Cove and on the land that includes the access road to the Garden Point peninsula. Buoy closures limit boating access to within 0.25 miles of the nest tree on the north side, and approximately 0.5 miles to the south. The nest failed in 2000, but one young has fledged in each of 2001 and 2002. Figure 2 (Appendix B) shows the most recently active nest in proximity to the coves proposed for stockpiling wood.

A necessary criteria for recovery identified in the Pacific Bald Eagle Recovery Plan is an average reproductive rate of 1.0 fledged young per pair, with an average success rate per occupied site of not less than 65 percent per 5-year period. The Garden Point pair have met these goals, with a current average of 1.0 fledged and an average 5-year success rate of 80 percent.

In the spring of 2000, a boat survey of the Reservoir was conducted to look for additional breeding territories; none were found. Summer observations do not indicate that more than one breeding pair is present at the Reservoir. In January, during annual winter bald eagle surveys, large nests are mapped and checked in the summer to see if eagles are using them. To date, all surveys have only identified the presence of one breeding pair at Bullards Reservoir. Additional adults, even single adults, are not known to be present during the summer. Because eagles are frequently seen within and near the breeding territory year round, it is assumed that both members of the breeding pair are year-round residents.

In 2003, a fourth-year adult was frequenting the Frenchy Point and North Yuba River areas of the Reservoir, and it has been near a second adult eagle. It is not known if the adult is from the existing breeding pair, or if there is a second pair of eagles establishing residence. Forest Service Downieville

District personnel, in cooperation with the Yuba County Water Agency, monitor eagle activity at the reservoir, and if eagles establish a new breeding territory, the Service will be notified and any necessary consultation would be re-initiated at that time (Forest Service 2003).

Effects of the Proposed Action

Direct effects are the direct or immediate effects of the project on the species or its habitat (USFWS, NMFS 1998). Bald eagles breed, roost, and forage at New Bullards Bar Reservoir year-round. Wintering bald eagles congregate in the vicinity of New Bullards Bar Dam during the kokanee spawning run that occurs between October and November. Hazard trees may be identified in the vicinity of parking areas immediately to the east and west of the dam (Forest Service 2002). Skagen et al. (1991) observed that following disturbance, bald eagles seldom returned to feed that day. Noise and smoke generated by hazard tree removal, fuel reduction, woody debris collection, and pile burning activities may result in temporary avoidance of nesting, foraging, or roosting habitat by breeding and wintering bald eagles.

Modification of habitat used by bald eagles may result in an immediate decrease in foraging, nesting, and roosting opportunities for eagles currently using the reservoir for breeding and wintering if alternate nesting, roosting, and perching structures are not available. Most hazard trees are either dead (snags) or dying trees. Lehman (1979) found that 70 percent of the nest trees surveyed were classified as highly susceptible to beetle infestation, probably a function of bald eagles using mature and over mature trees. Trees with characteristics described in the Field Data Form may also possess the characteristics, such as exposed lateral limbs or dead tops, that provide suitable habitat for bald eagles. The Biological Assessment (Forest Service 2002) identifies areas, such as along the east and west sides of New Bullards Bar Dam, where eagle perching structures may be identified as hazard trees and removed.

Indirect effects are those effects that are caused by or will result from the proposed action later in time, but are still reasonably certain to occur. The proposed action is expected to modify actual or potential bald eagle nesting, roosting, or foraging habitat. Modification of habitat that may provide future nesting roosting, or foraging habitat may reduce the likelihood that the target number of three nesting pairs of bald eagles at New Bullards Bar Reservoir is achieved. In 2003, two new eagles were observed at Frenchy Point (Forest Service 2003). At this time it is unknown whether these eagles are attempting to establish a new breeding territory at New Bullards Bar Reservoir. Frenchy Point is immediately south of Long Point, one of the potential nesting territories identified in the Biological Assessment (Figure 4 - Appendix B). Noise from the operation of heavy machinery and removal of potential nesting, roosting, and foraging structures may adversely affect selection of the Reservoir as a breeding territory by a new pair of eagles.

Additionally, bald eagles may be harmed later in time if individual health and fitness and/or reproductive success is affected by increased levels of harassment. Noise, operation of large equipment, smoke from pile burning, and additional human presence in nesting and wintering areas may result in flushing of foraging, roosting, or nesting bald eagles. Flushing increases energy expenditures due to flight, decreases energy intake by interfering with feeding, and may force eagles to leave preferred habitat (Stalmaster and Kaiser 1998).

Although noise and operation of large equipment around administrative sites for the purpose of fuels reduction may disturb eagles in nearby areas, the removal of ladder fuels will have the beneficial effect of reducing the likelihood of human-caused fires starting at a campground or day use facility in the project area. This will help prevent a stand-replacing fire that could remove mature trees that presently provide existing and potential nesting and perching structures.

Effects of the Conservation Measures

Conservation measures represent actions pledged in the project description that the agency will implement to further the recovery of the species under review. Such measures may be tasks recommended in the species' recovery plan, should be closely related to the action, and should be achievable within the authority of the action agency or applicant. Conservation measures are part of the proposed action, and their implementation is required under the terms of the consultation (USFWS, NMFS 1998). The Forest Service has incorporated conservation measures into the description of the proposed action to reduce or avoid adverse impacts to bald eagles resulting from project activities, and that address specific tasks in the *Pacific Bald Eagle Recovery Plan* (USFWS 1986).

<u>Limited Operating Periods (Measures 2-4)</u>. The proposed limited operating periods will help to avoid conflicts between project related activites and wintering/nesting bald eagle areas in current use. The Forest Service has also extended limited operating periods to expansion territories identified in the Bullards Bar Fish and Wildlife Management Plan until it is determined that eagles have not established residence within those areas (Figure 4 - Appendix B).

<u>Removal of Hazard Trees (Measure 5)</u>. The Field Data Form requires review by a biologist prior to removing any tree identified as a hazard that is 15 inches dbh or greater. In addition, only trees with a Target Rating and a Defect Rating shall be considered for removal. For example, even if a tree is evaluated as having a high Defect Rating, it would not be removed if it exists in a Low Use Area (Figure 3 - Appendix B) that would receive "no score" as a Potential Target Rating on the Field Data Form. This will allow more trees to be available as perching, nesting, and roosting structures.

Reinitiation of Consultation (Measure 9). Once pile burning for woody debris disposal begins, wood consumption should be complete within several days. However, it is possible that air quality restrictions on burning, combined with the uncertainty of when fall rains begin, could delay burning too late to dispose of woody debris prior to the November 15 limited operating period for wintering eagles. The Forest Service expects that in most years, wood can be burned prior to November 15. With the coves set aside for woody debris storage in the proposed action, wood can be held over to the following year if pile burning is not completed. The project description for the proposed action requires reinitiation of consultation if emergency consultation is sought in two out of five years to dispose of woody debris outside of the proposed LOPs.

Other Listed Species (Measures 1, and 6-8). These measures provide written directives to field personnel via the Field Data Form to cease activities and contact a Forest Service biologist if eagles, large frogs, or elderberry plants are sighted within specified distances of project activities.

These proposed conservation measures will promote objectives identified in the Recovery Plan, including retention of eagle habitat and avoidance of human-bald eagle disturbance interactions.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Cumulative effects to eagles in the vicinity of the action area include: lowered reproduction caused by pesticides; loss of habitat through increased recreation; development of shorelines; private timber harvest; and disturbance from human activities. The number of summer recreationists has steadily increased at New Bullards Bar Reservoir since the late 1980's. These uses include: camping; hiking; fishing; boating; picnicking; motorized vehicular use; mountain biking; and reservoir maintenance. Shoreline camping is permitted along most shorelines. In October of 1999, the Pendola Fire burned 12,000 acres, removing approximately 1600 acres of mixed conifer stands with large trees (greater than 24 inches dbh), that provided potential nest or roosting trees for eagles.

The Service is not aware of specific projects that might affect the bald eagle or its habitat that are currently under review by State, county, or local authorities. Nevertheless, it is foreseeable that further development of residential and recreational uses, industry, transportation, and water resources, as well as continued timber harvest on private lands, will occur in the future. Some of these future activities will not be subject to Federal jurisdiction (and thus are considered to enter into cumulative effects), and may result in loss of bald eagle habitat.

Conclusion

After reviewing the project description, current status of the bald eagle, the environmental baseline for the action area, the effects of the proposed New Bullards Bar Reservoir Safety and Annual Maintenance, the conservation measures incorporated into the project description, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the bald eagle. No critical habitat has been designated for this species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Forest Service has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Forest Service: (1) fails to adhere, or fails to require an applicant or permittee to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to a permit or grant document; and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service does not anticipate that bald eagles will be killed or injured as a result of the proposed action. The Service expects that incidental take of bald eagles will be in the form of harassment and harm. Bald eagles may be harassed due to increased levels of noise and smoke generated by hazard tree removal, fuel reduction, woody debris collection, and pile burning activities. Bald eagles may be harmed if individual health and fitness and/or reproductive success is affected by increased levels of harassment and decreased numbers of perch trees available for nesting, foraging, and roosting. The Service expects that incidental take of the bald eagle will be difficult to detect or quantify for the following reasons: (1) it will not be possible to separate the effects to bald eagle resident and migrant populations of varying disturbance levels resulting from the proposed action from the disturbance levels which are currently ongoing; (2) there is a low likelihood of determining that the reduced fitness of an individual is a result of the action; e.g., positively correlating a failed nest or abandonment of wintering ground with project induced harassment or harm of a bald eagle may only be speculative; (3) non-use of portions of New Bullards Bar Reservoir and the shoreline areas by foraging eagles will be difficult to detect.

The Service believes that the nesting bald eagles of New Bullards Bar Reservoir may be harmed or harassed as a result of the proposed project. Therefore, the Service estimates that two individual adult nesting bald eagles may be harmed or harassed per year as a result of the proposed project. The Service believes that wintering bald eagles may be harmed or harassed as a result of the proposed action. Therefore, the Service estimates that ten to twenty wintering bald eagles may be harmed or harassed per year as a result of the proposed action. Take in the form of harm or harassment is not authorized to an extent that would result in nest failure or mortality.

Upon implementation of the following reasonable and prudent measure, incidental take associated with the New Bullards Bar Reservoir Safety and Annual Maintenance in the form of harassment of nesting and foraging bald eagles due to increased levels of noise and smoke generated by hazard tree removal, fuel reduction, woody debris collection, and pile burning activities will become exempt from the prohibitions described under section 9 of the Act for direct impacts; in addition, incidental take in the form of harassment associated with the New Bullards Bar Reservoir Safety and Annual Maintenance in the form of harassment of nesting and foraging bald eagles due to increased levels of noise and smoke generated by hazard tree removal, fuel reduction, woody debris collection, and pile burning activities will be exempt from the prohibitions described under section 9 of the Act for indirect impacts as a result of the management activities described.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the bald eagle.

Reasonable and Prudent Measure

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of the bald eagle:

1. Minimize the impacts of project effects to the bald eagle throughout the proposed project area.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of ESA, the Forest Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

a. Implement all aspects of the project description and all conservation measures as proposed on pages 2-10 of this Biological Opinion, with modifications noted in the following terms and conditions below.

b. A copy of the August 7, 2003, *New Bullards Bar Hazard Tree Rating Form, New Bullards Bar Reservoir Hazard Tree Rating Form Supplement*, and *Short Term Mortality Indicators* shall be given to appropriate personnel (contract administrator) to ensure that all required mitigations are implemented. Should it not be possible to implement the required minimizations in the Description of the Proposed Action, the District Biologist shall be notified to evaluate the need for emergency consultation under the Endangered Species Act. Only trees with an appropriate rating and review shall be removed. Any additional trees shall receive the further evaluation in coordination with the Service prior to felling and removal.

c. Snag retention standards as identified in the Sierra Nevada Forest Plan Amendment (Forest Service 2001) shall be met within this area (i.e. four snags per acre where present). The Biological Assessment contains a detailed explanation of the snag retention standards as they apply to Bullards Bar Reservoir (Appendix B). For hazard trees identified for removal within 200 feet of the shoreline, all snags will be sampled for a distance of approximately 0.25 miles in either direction. Additional live tree or other potential perching structures in this area may also be noted. If snag retention standards would not be met as a result of proposed hazard tree removal, administrative closures shall be considered as an alternative to protect public safety. The construction or development of alternate bald eagle perching structures may also be considered, should public closures not be feasible.

d. Within high use foraging sites and winter night roosts identified in the Draft Bullards Bar Reservoir Fish and Wildlife Management Plan (or as revised in the future), multiple perching structures shall be maintained. The above standard of retaining four snags per acre is a minimal goal at these sites. Additionally, the following standard shall be applied:

i. Ninety percent of all potential perches that are present shall be retained; up to ten percent may be removed as hazards. If hazard tree removal would cause perching structures to be reduced below this level, administrative closures shall be considered as an alternative to hazard tree removal to protect public safety. The construction or development of alternate bald eagle perching structures may also be considered, should public closures not be feasible. Reducing perching structures in high use foraging sites and winter night roosts below ninety percent of what is present at the time of evaluation shall receive further consideration in coordination with the Service prior to felling and removal.

e. The Forest Service shall conform with the reporting requirements below.

Reporting Requirements

The Forest Service must provide the Service with annual reports to describe the progress of implementation of all the commitments in the Conservation Measures and Terms and Conditions sections of this biological opinion. The first report is due January 31, 2004, and annually thereafter. Reports shall include the number of snags removed and the location(s), updated copies of the maps in Appendix B of this opinion, and results of all bald eagle surveys conducted the previous year.

The Sacramento Fish and Wildlife Office is to be notified within three working days of the finding of any dead listed wildlife species or any unanticipated harm to the species addressed in this biological opinion. The Service contact person for this is the Chief, Endangered Species Division at (916) 414-6620.

The Forest Service must require any contractor or permittee to report to the Service immediately any information about take or suspected take of listed wildlife species not authorized in this opinion. The Forest Service must notify the Service within 24 hours of receiving such information. Notification must include the date, time, and location of the incident of the incident or of the finding of a dead or injured animal. The Service contact is the Service's Law Enforcement Division at (916) 414-6660.

Any contractor or employee who during routine operations and maintenance activities inadvertently kills or injures a listed wildlife species must immediately report the incident to their representative. This representative must contact the California Department of Fish and Game immediately in the case of a dead or injured (*species*). The California Department of Fish and Game contact for immediate assistance is State Dispatch at (916) 445-0045.

The U.S. Fish and Wildlife Service Regional Office in Portland, and the Sacramento Fish and Wildlife Office, must be notified immediately if any dead or sick listed wildlife species is found in or adjacent to pesticide-treated areas, with information about the cause of death or illness, if known. The appropriate contact for the U.S. Fish and Wildlife Service Regional Office in Portland, Oregon, is Don Steffeck at (503) 231-6223. The appropriate contact for the Sacramento Fish and Wildlife Office is Ken Sanchez at (916) 414-6600.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of ESA directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

1. Assist the U. S. Fish and Wildlife Service in further implementing recovery actions identified within the Recovery Plan for the bald eagle.

2. Conduct systematic surveys across the landscape to detect additional bald eagle nests and communal night roosts.

3. Monitor bald eagle responses to human generated disturbances, including threats and changes to bald eagle habitat. If the data results indicate bald eagles are exposed and negatively impacted by disturbances, consult with the Service on ways to minimize the impacts.

4. Promote public education regarding the importance and successes of conservation and protection of the bald eagle and other listed species. This can be done using signs in occupied habitat, brochures at ranger stations, and other mediums.

5. Non-system and other roads that lead to sensitive bald eagle habitat such as nesting, foraging, or roosting sites should be gated and bermed.

6. Protection and enhancement of fish habitat in occupied bald eagle use areas through the maintenance of streambank stability by restricting activities such as, but not limited to livestock trampling, OHV use, stream crossings, and recreational use.

7. Protection and enhancement of waterfowl habitat in occupied bald eagle use areas through the maintenance of riparian and lake shore vegetation (waterfowl nesting habitat) by restricting activities such as, but not limited to livestock trampling and grazing, OHV use, and recreational use.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION--CLOSING STATEMENT

This concludes formal consultation on the action(s) outlined in the (request or reinitiation request). As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Please contact Ann Bowers or Roberta Gerson of this office at (916) 414-6600, if you have any questions.

Sincerely,

Cay C. Goude

Wayne White
Field Supervisor

cc: U. S. Forest Service, Downieville Ranger District, Camptonville, CA (Attn: Jean M. Masquelier, Marilyn Tierney)

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Appendix A
Field Data Form

This Field Data Form will be used for judging hazard trees by tree defect and target potential. Rating: Tree Defect Rating + Target Potential Rating = Hazard Score. Tree/snag needs any combination of 4 points or greater to qualify as Hazard Tree (more than one category can be used to get a total of 4 or greater).

New Bullards Bar Reservoir Hazard Tree Rating Form
(Field Data Form)

Complete one form for each hazard tree proposed for felling and/or removal that is: 15 inches or greater diameter breast height* and within one mile of the Reservoir.

(*trees < 15 inches dbh must still comply with the management requirements described in the Supplement to this field form)

Location____________________________GPS__________________________
Attach a map of location; or number trees and attach one map_________________
Tree Species______________________________________dbh______________
Estimated distance from the water's edge________________(< 200 feet requires snag monitoring)
Less than 200 feet_____Within 0.25 miles____ within 1 mile_____

Circle the points on the list below that you are selecting for this tree to rate the hazard:

Tree Defect Rating	Points
Tree is dead (no live crown), is straight or leans towards area of concern, and has the potential to reach site/facility	3
Green tree, ≥15” DBH and 20 feet tall or greater, and with an unnatural lean that exceeds 20 degrees towards the area of concern and is sufficiently tall to reach site/facility	2
Green tree, <15” DBH, and with an unnatural lean that exceeds 20 degrees towards the area of concern and is sufficiently tall to reach site/facility	1
Soil at base of tree shows evidence of recent movement (within the last 5 years) and has the potential to reach the area of concern (i.e. freshly exposed soil, cracks in soil)	2
Spike top tree where the dead portion of the tree has the potential to reach the area of concern	2
Trees showing signs of advanced symptoms of root diseases (trees infected with annosus root disease, black stain, Armillaria root disease, etc.) and have the potential to reach the area of concern (Ref: PSW-P1 1963. Wagener, Willis W. Judging Hazard from Native Trees in California Recreational	3

Areas.)

Trees expected to die within the next 6 months (see Appendix A, "Short-term Mortality Indicators") and have the potential to reach the area of concern. Attach Appendix A and circle rationale.	1
Mechanical and bole defects (including fire damage). Bole damage (cambium) exceeds one-third of the circumference for all species except sugar pine and has the potential to reach the area of concern. Bole damage (cambium) on sugar pines exceeds 50% of the circumference and has the potential to reach the area of concern	3
Exposed root wad of a tree that is sufficiently tall to reach area of concern	3
Trees showing symptoms of advanced branch, bole or basal decay due to root disease or heart rot. Total solid rind thickness is less than one-third of the diameter at the point of decay, and the tree has the potential to reach the area of concern.	3

Target Potential Rating*	**Points**
High Use (designated recreation sites, shoreline area used twice/week or more on average)	4
Moderate Use (specific shoreline area or other area used once/week on average)	2
Low Use (general forest or shoreline area with little to no use)	No score

Circle the Management Action Selected, from the list below

Management Action	**Hazard Score**
Cut down tree or remove dead or injured portion of tree; or close site/facility	7
Remove hazard from highest score to lower score with available funds	6-4
No action required (unless special circumstances dictate)	≤3

Tree must have both a Defect and a Target rating to be considered a hazard tree (i.e. if either the defect or target rating is 0, the tree is not considered a hazard).

Enter the numerical values selected from the above tables:

Defect rating______

Target rating ______

TOTAL HAZARD RATING ______

Prepared by: ____________________ Title: ________________ Date: ____________________

Additional comments or documentation for hazard:

____

____

Are there any elderberry bushes within 200 feet of this tree? _____ (Surveys are required for all unsurveyed sites.) If elderberry bushes are present, no action may occur until a determination is made regarding the need for additional consultation with the U. S. Fish and Wildlife Service.

Supplemental Information is included with this form to identify the actions submitted for consultation regarding hazard tree removal in the vicinity of Bullards Bar Reservoir, including the management requirements that are considered to be a part of the proposed action.

Prior to tree removal, return this form to the District Biologist.

TES habitat information:
Bald eagle:____
- Winter foraging____
- Winter roosting____
- Active Breeding____
- Alternate Breeding Territories________________________________

California red-legged frog?____
Valley elderberry longhorn beetle ______________________________________
Forest Service Sensitive____
Snag documentation needed?___ If yes, provide:___________________________
Additional Mitigations necessary? (i.e. snag replacement)__________________
Recreation, note any revisions to public use map that are needed:_______________

APPENDIX A: SHORT TERM MORTALITY INDICATORS

The following conditions indicate that the affected trees have a fatal, non-reversible condition and are very likely to be dead within 6 months. Some trees under severe drought-stress may show no external sign of being attacked by beetles. Any tree, which has life stages or galleries of any species of beetle, except red turpentine beetle, visible when bark is removed with an axe, should be expected to die within 6 months. Trees infested with only red turpentine beetle must be physically girdled around at least 40 % of the tree circumference to be expected to die within 6 months.

A. Pines. (Ponderosa, Jeffrey, sugar and western white pines).

(1) Top one third of crown faded down to a stem diameter of at least 6 inches. (Crown fading will follow a rapid progression of colors from pea-green to straw-yellow to orange to brick-red to brown. The size limitation indicates infestation by a species of Dendroctonus bark beetle).

(2) Fresh, sticky pitch tubes located on the bole between 2 and 20 feet above the ground. Pitch tubes must be reddish in color (pink, rosy, red, purplish-red, reddish-brown). Number of fresh pitch tubes must be at least equal or greater than half of the DBH in inches (i.e. a 12 inch DBH pine must have at least 6 fresh, reddish pitch tubes). Crown may be any color.

(3) Fine, dry red frass (boring dust) accumulated in bark crevices, or cobwebs, or on ground around base of pine tree. (This does not include the coarse, crumbly frass produced by red turpentine beetle, which is often resinous.) Amount of frass per tree must total at least one tablespoon to be considered significant. Crown may be any color.

(4) Conspicuous removal of bark by woodpeckers. Outer bark of ponderosa pines usually removed in patches of several square inches to reveal reddish inner bark. Woodpecker work on Jeffrey, sugar and western white pines usually a vertical series of 3/8 inch diameter holes at about 1 inch spacing on bark plates. Bark flakes usually accumulate on ground or snow under tree. Crown may be any color.

(5) Blowdown.

B. White fir.

(1) Crown currently faded down to a stem diameter of 4 inches or greater. Crown color will rapidly change from pea-green to yellow to orange to brick-red to brown. Size limitation indicates the fir engraver (*Scolytus ventralis*) is infesting the main stem.

(2) White frass (boring dust) accumulated in bark crevices, cobwebs or around base of fir tree. Amount of frass per tree must total one tablespoon to be significant. Crown may be any color. (White frass indicates either no pitch flow in response to fir engraver attack, or successful infestation by ambrosia beetles. Either condition indicates a dying fir tree.)

(3) Ground or snow below white fir tree covered with "green" needles. This does not include normal fall shedding of older yellow needles.

(4) Blowdown.

C. Red fir.

(1) No limbs with normal-color green foliage left in crown.

(2) White frass (boring dust) accumulated in bark crevices, cobwebs or around base of fir tree. Amount of frass per tree must total one tablespoon to be significant. Crown may be any color. (White frass indicates either no pitch flow

in response to fir engraver attack, or successful infestation by ambrosia beetles. Either condition indicates a dying fir tree.)

(3) Blowdown.

D. Douglas-fir.

(1) At least one accumulation of rusty-orange frass (boring dust) per foot of circumference. The piles of frass will be approximately ¾ inch in diameter and will be located in bark crevices in the lower 3 feet of the bole. (This indicates successful attack by the Douglas-fir beetle.)

(2) Trees have not broken bud while all adjacent trees have broken bud. Buds are drying and are not firm.

(3) Woodpeckers have removed at least several square inches of bark from the bole portion which has bark less than 1.5 inches in thickness. Crown may be any color, including green. Ignore single, deep woodpecker holes near the base of old, thick-barked trees (the woodpeckers at the base are usually seeking ants in the bark, which are not a threat to the tree).

(4) No limbs with completely normal-color foliage remaining on tree.

(5) Blowdown.

E. Incense-cedar.

(1) No limbs with completely normal-color foliage remaining on tree.

(2) Blowdown.

NEW BULLARDS BAR RESERVOIR HAZARD TREE RATING FORM SUPPLEMENT

A copy of the conservation measures in the project description and the Field Data Form should be given to appropriate personnel (contract administrator) to ensure that all required minimizations are implemented. Should it not be possible to implement the required minimizations, the District Biologist should be notified to evaluate the need for emergency consultation under the Endangered Species Act. To ensure that Forest Service legal obligations are met, only trees with an appropriate rating and review should be removed; any additional trees should receive the appropriate evaluations prior to felling and removal.

Appendix B

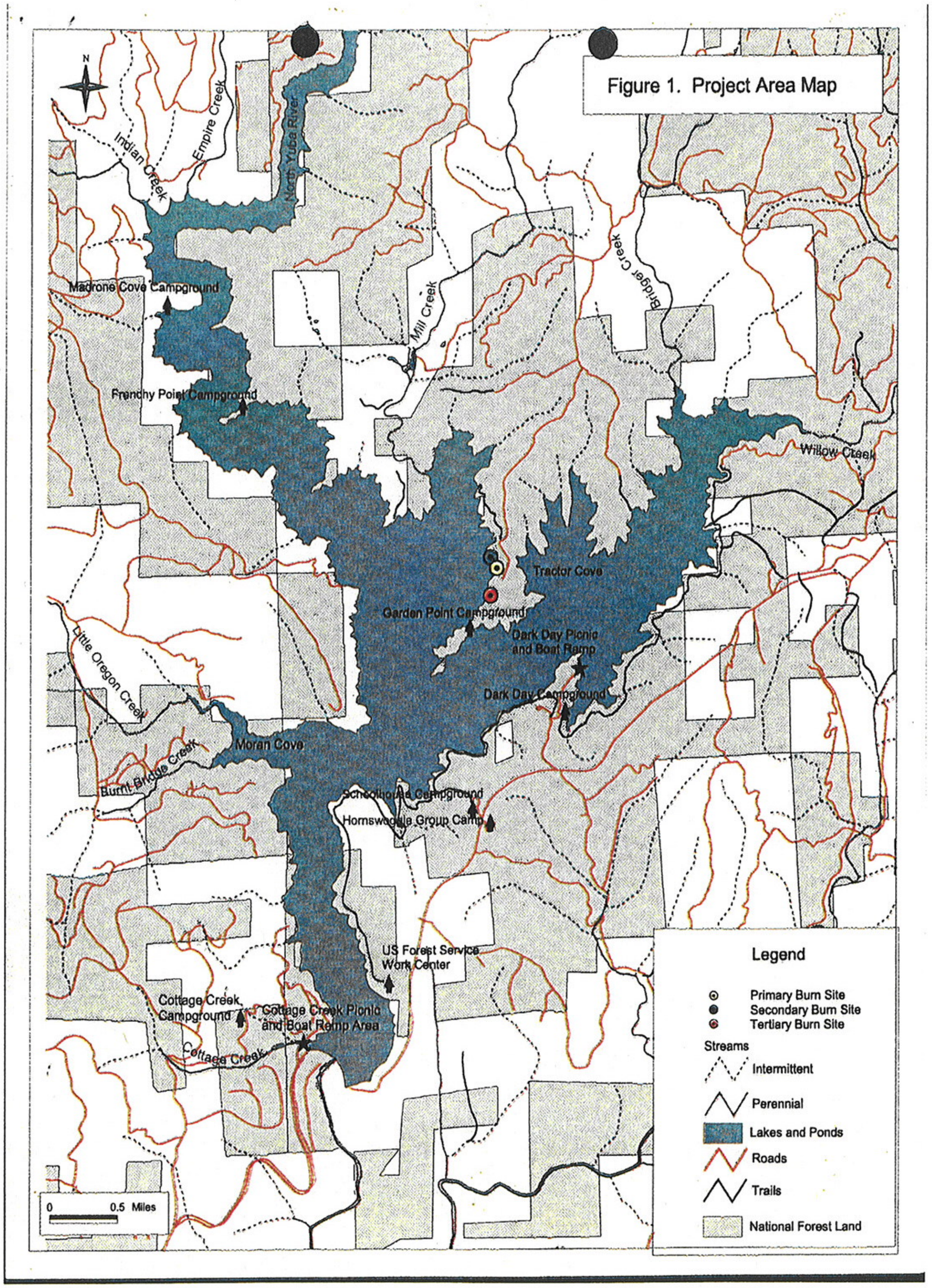
Figure 1. Project Area Map
N
Indian Creek
Empire Creek
North Yuba River
Mill Creek
Bridger Creek
Madrone Cove Campground
Frenchy Point Campground
Willow Creek
Tractor Cove
Garden Point Campground
Dark Day Picnic and Boat Ramp
Dark Day Campground
Little Oregon Creek
Moran Cove
Burnt Bridge Creek
Schoolhouse Campground
Hornswoggle Group Camp
US Forest Service Work Center
Cottage Creek Campground
Cottage Creek Picnic and Boat Ramp Area
Cottage Creek
0
0.5 Miles
Legend
Primary Burn Site
Secondary Burn Site
Tertiary Burn Site
Streams
Intermittent
Perennial
Lakes and Ponds
Roads
Trails
National Forest Land

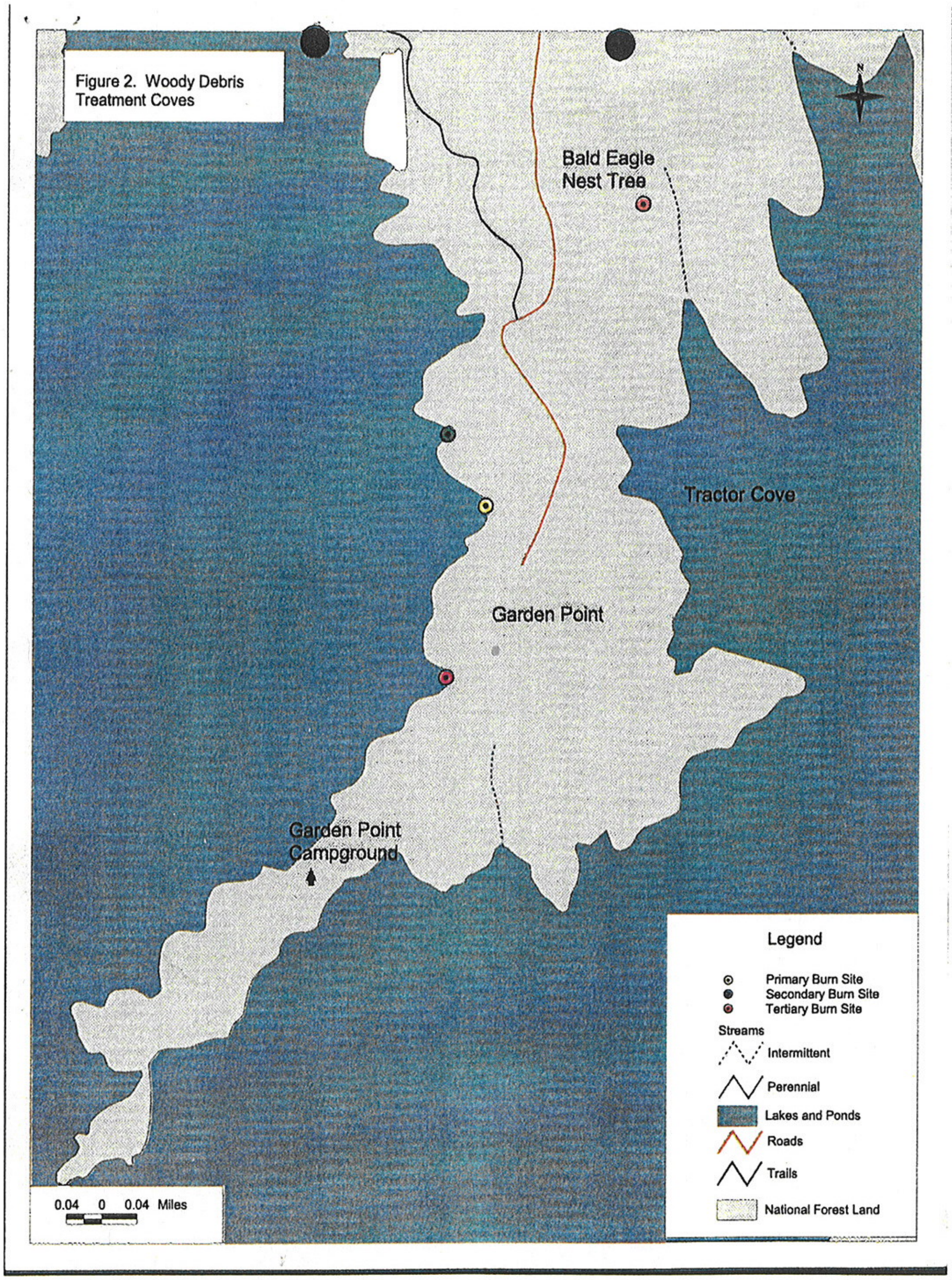

Figure 2. Woody Debris
Treatment Coves
Bald Eagle
Nest Tree
Tractor Cove
Garden Point
Garden Point
Campground
Legend
Primary Burn Site
Secondary Burn Site
Tertiary Burn Site
Streams
Intermittent
Perennial
Lakes and Ponds
Roads
Trails
National Forest Land
0.04 0 0.04 Miles

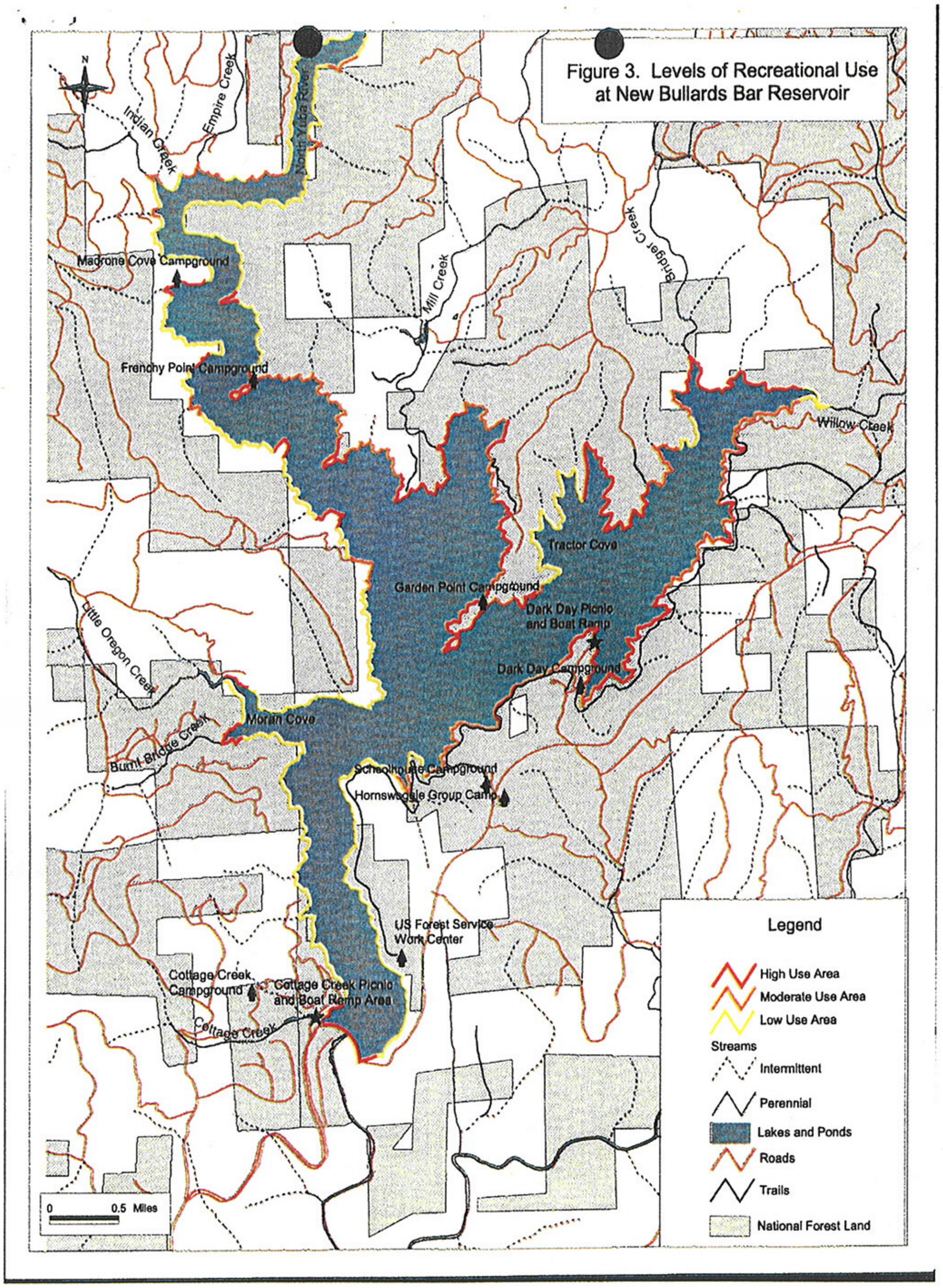
Figure 3. Levels of Recreational Use at New Bullards Bar Reservoir
N
Indian Creek
Empire Creek
Madrone Cove Campground
Frenchy Point Campground
Mill Creek
Bridger Creek
Willow Creek
Tractor Cove
Garden Point Campground
Dark Day Picnic and Boat Ramp
Dark Day Campground
Little Oregon Creek
Moran Cove
Burnt Bridge Creek
Schoolhouse Campground
Hornswoggle Group Camp
US Forest Service Work Center
Cottage Creek Campground
Cottage Creek Picnic and Boat Ramp Area
Cottage Creek
0
0.5 Miles
Legend
High Use Area
Moderate Use Area
Low Use Area
Streams
Intermittent
Perennial
Lakes and Ponds
Roads
Trails
National Forest Land

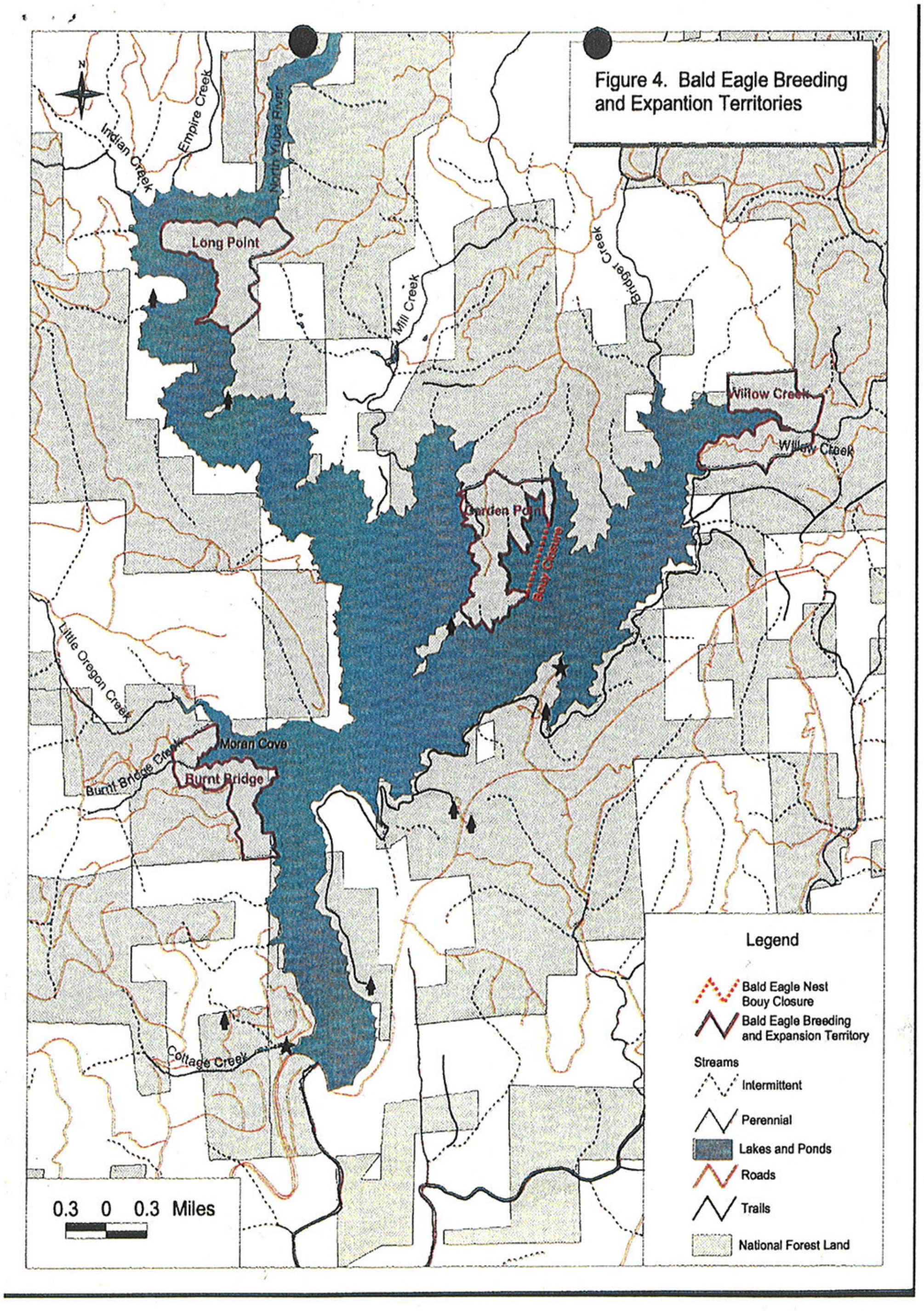
Figure 4. Bald Eagle Breeding and Expantion Territories
Indian Creek
Empire Creek
North Yuba River
Long Point
Mill Creek
Bridger Creek
Willow Creek
Willow Creek
Garden Point
Bouy Closure
Little Oregon Creek
Moran Cove
Burnt Bridge Creek
Burnt Bridge
Cottage Creek
0.3 0 0.3 Miles
Legend
Bald Eagle Nest Bouy Closure
Bald Eagle Breeding and Expansion Territory
Streams
Intermittent
Perennial
Lakes and Ponds
Roads
Trails
National Forest Land

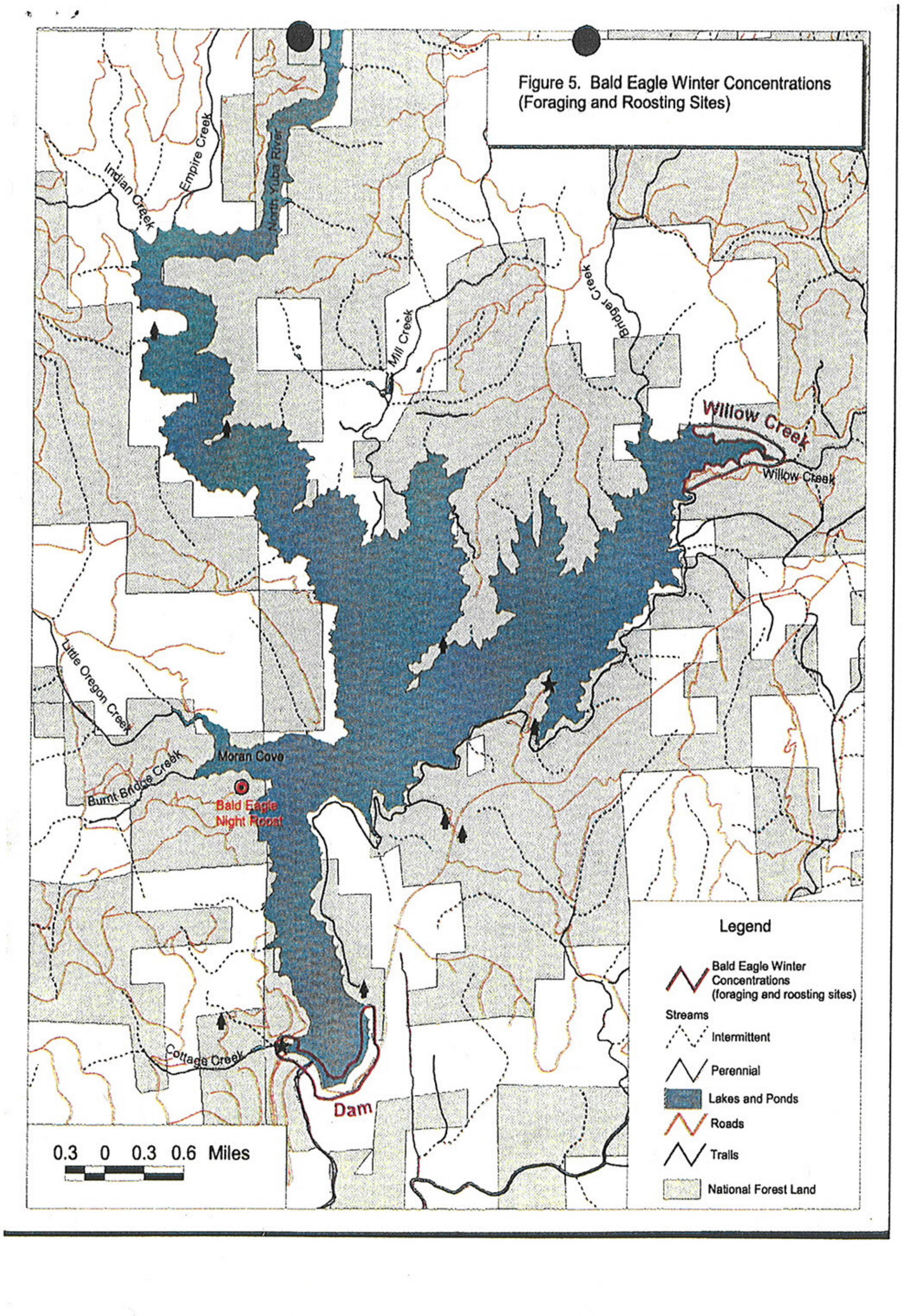

Figure 5. Bald Eagle Winter Concentrations
(Foraging and Roosting Sites)
Indian Creek
Empire Creek
North Yuba River
Mill Creek
Bridger Creek
Willow Creek
Willow Creek
Little Oregon Creek
Moran Cove
Burnt Bridge Creek
Bald Eagle
Night Roost
Cottage Creek
Dam
0.3 0 0.3 0.6 Miles
Legend
Bald Eagle Winter Concentrations (foraging and roosting sites)
Streams
Intermittent
Perennial
Lakes and Ponds
Roads
Trails
National Forest Land

Appendix C
Rationale for Snag retention Standards

The Sierra Nevada Forest Plan Amendment (USDA Forest Service 2001) Forestwide Standard and Guidelines for snag retention are to retain four of the largest snags per acre in westside mixed conifer and ponderosa pine forest types. In westside hardwood ecosystems these may be hardwood or conifer (Record of Decision, Appendix A – 28). Snags are to be larger than 15 inches dbh to meet this standard, and snag density is to be evaluated on a 10-acre basis. However, the defense zone of the urban wildland intermix zone and developed recreation sites are exempt from this standard and guideline.

Foraging Habitat:

Developed recreation sites (Figure 1 - Appendix B) are exempt from this standard and guideline. Defense and Threat Zones are unmapped land allocations, which may change with site-specific analysis in the future. At the present time, most of the land surrounding the reservoir lies within a threat zone, rather than a defense zone. Defense zones, do, however, overlap some areas of the shoreline at the present time. These areas may be refined in the future, at the time of project level analysis. Because the shoreline perimeter is foraging habitat for bald eagles, a federally protected species, until this site-specific analysis is conducted, for the 200-foot shoreline area that is outside of developed recreation sites, the snag retention requirement of four snags per acre should extend to this 200-foot zone, irregardless of the fuels zone that is presently mapped. Therefore, for actions associated with the Bullards Bar Reservoir Safety and Annual Maintenance Project, the four-snag per acre standard is applied outside of developed recreation sites, evaluated on a 10-acre basis (200 feet wide by 2178 feet of shoreline, or approximately 0.41 miles of shoreline).

Breeding and Expansion Territories:

A similar rationale is applied for routine hazard tree removal within bald eagle breeding territories (occupied and expansion); the four-snag-per-acre standard applies, evaluated on a ten-acre basis.

Bald Eagle and American Peregrine Falcon Management Plan

Attachment D

Bald Eagle
Nesting Survey Form

Yuba River Development Project

FERC Project No. 2246

September 2019

YUBA COUNTY WATER AGENCY
YUBA RIVER DEVELOPMENT PROJECT (FERC No. 2246)
BALD EAGLE NESTING SURVEY DATA SHEET

Date: ___________ **Visit ____ of 3** **Pg ___ of ___**

Reservoir: ______________________

Observers: _________ **Map No.**: ________

Time Start: ________ **Time End**: _________

Weather (circle one): Clear / Partly Cloudy / Overcast / Rain / Snow

Wind (circle one): Calm / Slight Breeze / Breezy / Windy

Temperature (ºC):______

QA/QC:

- **Data Entered by: ____________________ on ______________**
- **Checked by: ____________________ on __________________**

Observation	1	2	3	4	5	6	7	8
General Location								
UTM E								
UTM N								
Distance from H_2O(m)								
Habitat								
Nest Tree Species								
Active? (Y/N)								
Adult(s) Present? (Y/N)								
Juvenile(s) Present in nest? (Y/N)								

Observation	9	10	11	12	13	14	15	16
General Location								
UTM E								
UTM N								
Distance from H_2O(m)								
Habitat								
Nest Tree Species								
Active? (Y/N)								
Individual(s) Present? (Y/N)								
Juvenile(s) Present in nest? (Y/N)								

COMMENTS:

Bald Eagle Nesting Data Sheet Page _____of_____ Date: ________ Location: ___________________

Bald Eagle and American Peregrine Falcon Management Plan

Attachment E

American Peregrine Falcon Nesting Survey Form

Yuba River Development Project

FERC Project No. 2246

September 2019

Peregrine Falcon Monitoring Form

OMB Control No. 1018-0101
Expires 04/30/2008

----- Return this form to your State or Regional Coordinator ----

Date, Place, & Observers

Observation Date:(M/D/YR)______________ State Nest Site #___________ Fed. Nest Site #________

Site Name: ____

Substrate: (circle one) MANMADE or NATURAL If Manmade, describe structure:________________

First Name:___________________ Last Name: __________________ Phone: ____________________

Email:___________________________________ Affiliation: __________________________________

Other observers present: ____

Observation Post

Meters to Eyrie: _______________ Total Observation Time (hours): __________ (There should be at least 2 (probably more) properly-timed visits of 4 hrs each if territory occupancy, nest age, or nestling number are in question)

Did weather cause observing problems (circle one): YES NO If yes, explain in WEATHER NOTES

Breeding-age Birds and Their Behavior

Number, Age (ad, subad, or ?), *and Sex* (F.M, of ?) for each bird observed [i.e. (A) 1 ad F (B) 1 ? M]
NONE (A) ___________ (B) ___________ (C) ___________ (D) ___________ (E) ___________

Circle breeding behavior observed. A. None B. Unknown C. Courtship D. Defense E. Copulation F. Prey Exchange G. Incubation H. Incubation Exchange I. Prey Delivery J. Feeding Nestling(s) K. Other __________________________________ (describe more under NOTES if necessary).

Circle Nesting Phase: In BEHAVIOR NOTES indicate how determined, e.g. Cade et al., 1996 pp 22-25). A. None B. Unknown C. Courtship D. Pre-laying E. Egg-laying F. Incubation G. Egg Failure H. Re-Nesting I. Young (Nestlings) J. Young (Fledged)

Nest Site and Nest Contents

Eyrie Location. A. Unknown B. Cliff/Structure suspected but not certain. C. Cliff/Structure known but ledge unknown D. Ledge known but scrape not visible E. Scrape visible F. Eggs visible (how many? __________)

Do you suspect an alternate nest site? YES or NO. If yes, describe where in OTHER NOTES.

Nestling Number, *Age* (in days from hatching or fledged), *and Sex* (F, M, or ?). See Cade et al. 1996, pp. 37-63 for aging guide. Example: (A) 1 28d F (B) 2 28d M (C) 1 fledged M.
NONE (A) ___________ (B) ___________ (C) ___________ (D) ___________ (E) ___________
Could there have been additional nestlings or fledglings that were not observed: YES or NO

Notes WEATHER: ____

____

BEHAVIOR: ____-

____

OTHER: ____

____

Occupied Territory - a territory where either a pair of Peregrines is present (two adults or an adult/subadult mixed pair), or there is evidence of reproduction [e.g., one adult is observed sitting low in the nest, eggs or young are seen, or food is delivered into eyrie (nest site)]. Occupancy for a territory must be established for at least one of two, and possibly more, 4-hour site visits. Occupancy within a region is the number of occupied territories divided by the number of territories that were checked for occupancy.

Nest Success - the proportion of occupied territories in a monitoring region in which one or more young ≥ 28 days old is observed, with age determined following guidelines in Cade et al. (1996).

Productivity - the number of young observed at ≥ 28 days old per occupied territory, averaged across a monitoring region.

Paperwork Reduction Act: The total annual paperwork burden per respondent is estimated to be 10 hours and 15 minutes. This includes time for reviewing instructions, gathering and maintaining data, and preparing and transmitting reports. Send comments regarding the burden estimate or any other aspect of the reporting requirement(s) to the Service Information Collection Clearance Officer, Fish and Wildlife Service, 4401 N. Fairfax Drive, MS 222, Arlington, VA 22203.

An agency may not conduct and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number.

Bald Eagle and American Peregrine Falcon Management Plan

Attachment F

Agency Concurrence

Yuba River Development Project

FERC Project No. 2246

October 2019

Robinson, Shakara

From:	Lynch, Jim
Sent:	Wednesday, October 16, 2019 7:53 AM
To:	Robinson, Shakara; Tansey-Rodarmel, Jenna
Subject:	FW: USFWS Approval of IVM Plan and Eagle/Falcon Plan

James Lynch
D 916.679.8740 **M** 916.802.6247

hdrinc.com/follow-us

From: Welsh, Daniel [mailto:daniel_welsh@fws.gov]
Sent: Wednesday, October 16, 2019 7:30 AM
To: caikens@yubawater.org
Cc: grabone@yubawater.org; Lynch, Jim <Jim.Lynch@hdrinc.com>; Millsap, Stephanie <stephanie_millsap@fws.gov>
Subject: USFWS Approval of IVM Plan and Eagle/Falcon Plan

Curt,

The US Fish and Wildlife Service (USFWS) supports Yuba Water Agency's (YWA) finalization of the Integrated Vegetation Management Plan and the Bald Eagle and the American Peregrine Falcon Management Plan (collectively, Plans) for the Yuba River Development Project (FERC Project # P-2246) dated October 2019.

USFWS, YWA, and other agencies have collaboratively revised these Plans, consistent with the changes identified by FERC in the Final Environmental Impact Statement. The revised plans will be submitted to FERC by YWA.

If you have any questions about our support for the revised plans, please contact me or Stephanie Millsap.

Sincerely,

Dan Welsh, Deputy Field Supervisor
U.S. Fish and Wildlife Service
San Francisco Bay-Delta Fish and Wildlife Office
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814
(916) 930-5639 (office)
(916) 468-8470 (cell)
Daniel_Welsh@fws.gov

Robinson, Shakara

From: Traci Sheehan <traci@foothillswaternetwork.org>
Sent: Wednesday, October 23, 2019 7:48 AM
To: Lynch, Jim
Cc: Lind, Amy -FS; Thomas.holley@noaa.gov; alison_willy@fws.gov; Stephanie Millsap (USFWS; Cornell, MaryLisa@Wildlife; Lawson, Beth@Wildlife; Lose, Sarah@Wildlife; Smith, Jordan@Waterboards; Chris Shutes; Dan.Teater@usda.gov; Purchase, Carol E - FS; rachel@yubariver.org; Ashley Overhouse; traci.sheehan@gmail.com; sean.hoobler@wildlife.ca.gov; Geoff Rabone; Willie Whittlesey; Avinash Sandher; Jacob Vander Meulen; Marie Rainwater; Vertucci, Charles; Tansey-Rodarmel, Jenna; Robinson, Shakara
Subject: Re: Yuba Relicensing: Follow-up from 10/2 Conference Call - NEED EMAIL SIGN-OFFS BY COB 10/31

The Network has no changes to the letter or plans. You can include the Network. Thank you.

Traci Sheehan

> On Oct 9, 2019, at 9:45 AM, Lynch, Jim <Jim.Lynch@hdrinc.com> wrote:
>
> All – As mentioned in the email below, I have attached for your review a draft letter to FERC filing the five plans, with evidence of consultation. If you would, let me know if you have any suggested changes to the letter.
>
> Also, Stephanie pointed out some things we missed correcting on the IVMP, which we have now corrected, and a clean version is posted at the link below. Thanks, Stephanie.
>
> James Lynch
> **D** 916.679.8740 **M** 916.802.6247
>
> hdrinc.com/follow-us
>
> ---
>
> **From:** Lynch, Jim
> **Sent:** Friday, October 4, 2019 7:04 AM
> **To:** 'Lind, Amy -FS' <amy.lind@usda.gov>; 'Thomas.holley@noaa.gov' <Thomas.holley@noaa.gov>; 'alison_willy@fws.gov' <alison_willy@fws.gov>; 'Stephanie Millsap (USFWS' <stephanie_millsap@fws.gov>; 'Cornell, MaryLisa@Wildlife' <MaryLisa.Cornell@wildlife.ca.gov>; 'Lawson, Beth@Wildlife' <Beth.Lawson@wildlife.ca.gov>; 'Lose, Sarah@Wildlife' <Sarah.Lose@wildlife.ca.gov>; 'Smith, Jordan@Waterboards' <Jordan.Smith@Waterboards.ca.gov>; 'Chris Shutes' <blancapaloma@msn.com>; 'traci@foothillswaternetwork.org' <traci@foothillswaternetwork.org>; 'Dan.Teater@usda.gov' <Dan.Teater@usda.gov>; 'Purchase, Carol E -FS' <carol.purchase@usda.gov>; 'rachel@yubariver.org' <rachel@yubariver.org>; 'Ashley Overhouse' <ashley@yubariver.org>; 'traci.sheehan@gmail.com' <traci.sheehan@gmail.com>; 'sean.hoobler@wildlife.ca.gov' <sean.hoobler@wildlife.ca.gov>
> **Cc:** 'Geoff Rabone' <grabone@yubawater.org>; 'Willie Whittlesey' <wwhittlesey@yubawater.org>; 'Avinash Sandher' <asandher@yubawater.org>; 'Jacob Vander Meulen'

Robinson, Shakara

From:	Lose, Sarah@Wildlife <Sarah.Lose@wildlife.ca.gov>
Sent:	Thursday, October 31, 2019 9:47 AM
To:	Lind, Amy -FS; Lynch, Jim; 'Thomas.holley@noaa.gov'; 'alison_willy@fws.gov'; Stephanie Millsap (USFWS; Cornell, MaryLisa@Wildlife; Lawson, Beth@Wildlife; Smith, Jordan@Waterboards; blancapaloma@msn.com; 'traci@foothillswaternetwork.org'; Teater, Dan -FS; Purchase, Carol E -FS; rachel@yubariver.org; Ashley Overhouse; traci.sheehan@gmail.com; Hoobler, Sean@Wildlife
Cc:	Geoff Rabone; Willie Whittlesey; Avinash Sandher; Jacob Vander Meulen; Marie Rainwater; Vertucci, Charles; Tansey-Rodarmel, Jenna; Robinson, Shakara; Alvarez, Dawn -FS
Subject:	RE: Yuba Relicensing: Follow-up from 10/2 Conference Call - NEED EMAIL SIGN-OFFS BY COB 10/31

CDFW is ok with the revisions to these plans. Please file with FERC and thank you for your collaboration.

Sarah C. Lose
Senior Environmental Scientist (Specialist)
CA. Dept of Fish and Wildlife/North Central Region
Water Program-FERC Coordinator
1701 Nimbus Rd.
Rancho Cordova, CA. 95670
(916) 747-5226: cell

From: Lind, Amy -FS <amy.lind@usda.gov>
Sent: Wednesday, October 23, 2019 2:28 PM
To: Lynch, Jim <Jim.Lynch@hdrinc.com>; 'Thomas.holley@noaa.gov' <Thomas.holley@noaa.gov>; 'alison_willy@fws.gov' <alison_willy@fws.gov>; Stephanie Millsap (USFWS <stephanie_millsap@fws.gov>; Cornell, MaryLisa@Wildlife <MaryLisa.Cornell@wildlife.ca.gov>; Lawson, Beth@Wildlife <Beth.Lawson@wildlife.ca.gov>; Lose, Sarah@Wildlife <Sarah.Lose@wildlife.ca.gov>; Smith, Jordan@Waterboards <Jordan.Smith@Waterboards.ca.gov>; blancapaloma@msn.com; 'traci@foothillswaternetwork.org' <traci@foothillswaternetwork.org>; Teater, Dan -FS <dan.teater@usda.gov>; Purchase, Carol E -FS <carol.purchase@usda.gov>; rachel@yubariver.org; Ashley Overhouse <ashley@yubariver.org>; traci.sheehan@gmail.com; Hoobler, Sean@Wildlife <Sean.Hoobler@wildlife.ca.gov>
Cc: Geoff Rabone <grabone@yubawater.org>; Willie Whittlesey <wwhittlesey@yubawater.org>; Avinash Sandher <asandher@yubawater.org>; Jacob Vander Meulen <jvandermeulen@yubawater.org>; Marie Rainwater <marie@rainwater-associates.com>; Vertucci, Charles <Charles.Vertucci@hdrinc.com>; Tansey-Rodarmel, Jenna <Jenna.Tansey-Rodarmel@hdrinc.com>; Robinson, Shakara <Shakara.Robinson@hdrinc.com>; Alvarez, Dawn -FS <dawn.alvarez@usda.gov>
Subject: RE: Yuba Relicensing: Follow-up from 10/2 Conference Call - NEED EMAIL SIGN-OFFS BY COB 10/31

Jim/HDR and YCWA – Thank for getting these edits completed (and thanks to Stephanie for catching the issues in the IVMP). Our comments on the cover letter are attached.

Forest Service staff are in agreement on these revisions to these five management plans - Aquatic Invasive Species, Hazardous Material Management Plan, Bald Eagle, Integrated Vegetation Management Plan, and New Bullards Bar Fish Stocking.

Robinson, Shakara

From:	Lind, Amy -FS <amy.lind@usda.gov>
Sent:	Wednesday, October 23, 2019 2:28 PM
To:	Lynch, Jim; 'Thomas.holley@noaa.gov'; 'alison_willy@fws.gov'; Stephanie Millsap (USFWS; Cornell, MaryLisa@Wildlife; Lawson, Beth@Wildlife; Lose, Sarah@Wildlife; Smith, Jordan@Waterboards; blancapaloma@msn.com; 'traci@foothillswaternetwork.org'; Teater, Dan -FS; Purchase, Carol E -FS; rachel@yubariver.org; Ashley Overhouse; traci.sheehan@gmail.com; 'sean.hoobler@wildlife.ca.gov'
Cc:	Geoff Rabone; Willie Whittlesey; Avinash Sandher; Jacob Vander Meulen; Marie Rainwater; Vertucci, Charles; Tansey-Rodarmel, Jenna; Robinson, Shakara; Alvarez, Dawn -FS
Subject:	RE: Yuba Relicensing: Follow-up from 10/2 Conference Call - NEED EMAIL SIGN-OFFS BY COB 10/31
Attachments:	2019 - Filng of Five Amended Management Plans - Draft - JML100919_FS.docx

Jim/HDR and YCWA – Thank for getting these edits completed (and thanks to Stephanie for catching the issues in the IVMP). Our comments on the cover letter are attached.

Forest Service staff are in agreement on these revisions to these five management plans - Aquatic Invasive Species, Hazardous Material Management Plan, Bald Eagle, Integrated Vegetation Management Plan, and New Bullards Bar Fish Stocking.

I checked in with our Regional Office on the process for revising these Plans previously filed as Forest Service FPA Final 4e Conditions. As I understand it at this point, YCWA would refile the plans with FERC, and then the Forest Service would do a limited refiling of our Final 4e Conditions referencing the new filing dates and FERC eLibrary accession numbers for the five plans. Please provide an update on your timeline for filing the revised plans, so that I can work with our Regional Office to follow with the revised 4e's in a timely manner.

Thank you,
Amy

Amy Lind
Hydroelectric Coordinator

Forest Service
Tahoe and Plumas National Forests

p: 530-478-6298
amy.lind@usda.gov

631 Coyote St.
Nevada City, CA 95959
www.fs.fed.us

Caring for the land and serving people

Please note my new email, and update your address books.

From: Lynch, Jim [mailto:Jim.Lynch@hdrinc.com]
Sent: Wednesday, October 9, 2019 9:45 AM
To: Lind, Amy -FS <amy.lind@usda.gov>; 'Thomas.holley@noaa.gov' <Thomas.holley@noaa.gov>;