



**U.S. Fish and Wildlife Service**

Final Environmental Assessment  
for the  
Issuance of an Eagle Take Permit  
for the Lower Klamath Project

Prepared by

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## 1.0 Introduction

This Environmental Assessment (EA) has been prepared to analyze the environmental consequences of us, the U.S. Fish and Wildlife Service (Service), issuing an incidental take permit for the take of bald and golden eagles associated with the proposed Lower Klamath Project (Federal Energy Regulatory Commission [FERC] Project No. 14803) pursuant to the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] §§ 4321–4347). Our issuance of an eagle incidental take permit (permit) for take that is incidental to otherwise lawful activities under the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. §§ 668–668d and 50 Code of Federal Regulations [CFR] § 22.80<sup>1</sup>) constitutes a discretionary federal action that is subject to NEPA. This EA assists us in ensuring NEPA compliance, and in making a determination as to whether the proposed action is likely to have significant effects and is therefore appropriate for an Environmental Impact Statement (EIS) under 40 CFR § 1501.3. This EA incorporates by reference elements of the FERC final EIS (FEIS), including the project description, alternatives, and biological impacts analyses prepared for the Project (FERC 2022). This EA evaluates the effects of alternatives for our decision whether to issue an eagle incidental take permit.

The Eagle Act authorizes us to issue eagle take permits only when the take is compatible with the preservation of each eagle species (Service 2016a), defined in the Service’s 2016 Programmatic Environmental Impact Statement (PEIS) for the Eagle Rule Revision (Service 2016b) as “consistent with the goals of maintaining stable or increasing breeding populations in all eagle management units (EMUs) and the persistence of local populations throughout the geographic range of each species.”

The Applicant, Klamath River Renewal Corporation (KRRC), is requesting Eagle Act take coverage for activities associated with the Project. This Project includes the removal of four dams and associated restoration activity on the Klamath River in Klamath County in south-central Oregon, and in Siskiyou County in north-central California. KRRC has requested a five (5) year incidental take permit for bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) under the Eagle Act. KRRC’s Eagle Conservation Plan (ECP) is the foundation of the permit application for the Project (Appendix A).

KRRC is requesting a permit to authorize take from disturbance of bald eagles and golden eagles that would prevent territorial pairs from successfully nesting and producing young. This EA evaluates whether issuance of the eagle incidental take permit will have significant effects on the potentially affected environment and the degree of the effects of the action. In considering this, 40 CFR § 1501.3 directs an agency to consider the affected area (national, regional, or local) and its resources. In evaluating the degree of the affects, we must also consider short-term, long term,

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<sup>1</sup> Effective February 7, 2022, 50 CFR 22.26 was re-numbered to 50 CFR 22.80 (87 FR 876, Migratory Bird Permits: Administrative Updates).

beneficial, and adverse effects; impacts to public health and safety; and compliance with other environmental protection laws.

This proposal conforms with, and carries out, the management approach analyzed in, and adopted subsequent to, the PEIS (Service 2016b). Accordingly, this EA tiers from the 2016 PEIS. We will consider project-specific information not considered in the PEIS in this EA as described below.

### 1.1 Purpose and Need

The need for this action is for us to make a decision on an eagle incidental take permit application from KRRC. The decision must comply with all applicable regulatory requirements and be compatible with the preservation of eagles.

### 1.2 Authorities

Our authorities are codified under multiple statutes that address management and conservation of natural resources from many perspectives, including, but not limited to the effects of land, water, and energy development on fish, wildlife, plants, and their habitats. This analysis is based on the Eagle Act (16 USC 668–668e) and its implementing regulations (50 CFR §§ 22.80). The PEIS has a full list of authorities that apply to this action (Service 2016b: Section 1.6, pages 7–12), which are incorporated by reference here.

### 1.3 Background

The Project consists of removing four hydroelectric dams and powerhouses, and other associated infrastructure, located along the Klamath River (Figure 1; figures referenced herein are located in Appendix B). In September 2016, KRRC filed an Application for Surrender of License (License Surrender) for Major Project and Removal of Project Works with FERC, FERC Project Nos. 2082-063 & 14803-001 (KRRC 2016). KRRC filed the License Surrender Application as the dam removal entity for the purpose of implementing the Klamath River Hydroelectric Settlement. KRRC filed its final Definite Decommissioning Plan (DDP) as Exhibits A-1 and A-2 to its Amended License Surrender Application in November 2020 (KRRC 2020). The DDP is KRRC's comprehensive plan for implementing the Project by physically removing the four dams and associated infrastructure, achieving a free-flowing condition and volitional fish passage, site remediation and restoration, and avoidance of adverse downstream impacts.

The Project includes the deconstruction of J.C. Boyle Dam and Powerhouse (Figure 2), Copco No. 1 and No. 2 Dams and Powerhouses (Figure 3), and Iron Gate Dam and Powerhouse (Figure 4), as well as other associated features. Associated features vary by development, but generally include powerhouse intake structures, embankments and sidewalls, penstocks and supports, decks, piers, gatehouses, fish ladders and holding facilities, pipes and pipe cradles, spillway gates and structures, diversion control structures, aprons, sills, tailrace channels, footbridges, powerhouse equipment, electrical distribution and transmission lines and support poles/towers, switchyards, original cofferdams, portions of the Iron Gate Fish Hatchery, residential facilities, and warehouses. The Project also includes construction of Fall Creek Fish Hatchery, modification of roads, and restoration actions in Klamath River tributaries following

reservoir drawdown. The Project's delineated overall limits of disturbance (hereafter "footprint") are illustrated in Figure 1, with relevant portions also shown in Figures 2–4. For the purpose of discerning eagle survey requirements and estimating take, the Project's disturbance footprint includes primary construction-access and haul roads, equipment and supply staging areas, and areas where electric-utility power lines will be decommissioned and removed. The FEIS prepared for the Project by FERC (2022) indicates that removal of the Project facilities and draining of the reservoirs will take approximately 20 months, followed by at least 5 years of restoration and monitoring activities.

KRRC prepared an ECP to support an application to the Service for an eagle incidental take permit under the Eagle Act for the Project (RES and PJD Environmental Consulting 2022). An incidental take permit was requested because the Project is expected to result in take caused by disturbance of bald and golden eagle nesting attempts. KRRC's ECP considers the potential effects of the Project on bald and golden eagles, including all known nest sites, and it proposes relevant avoidance, minimization, and mitigation measures. The January 2022 version of KRRC's ECP is also a subplan to the Project's Terrestrial and Wildlife Management Plan, which is one of 16 management plans prepared by KRRC for FERC review and approval as conditions of a license surrender order (FERC 2021: Attachment A-6).

### *1.3.1 Surveys Conducted and Results*

KRRC and its consultants conducted an initial desktop analysis of existing nesting records for bald and golden eagles in the vicinity of the Project, based on data received from the Oregon State University Cooperative Research Unit; Oregon Eagle Foundation (OEF); Bureau of Land Management (BLM), Klamath Falls Resource Area; the Service's Klamath Falls Fish and Wildlife Office; U.S. Forest Service, Klamath National Forest; and California Natural Diversity Database. Guided by this initial analysis, KRRC's consultants conducted ground and aerial surveys in an effort to determine the status of previously documented eagle breeding territories and nests, and search for other evidence of nesting eagles primarily within 2 miles of the Project footprint along the Klamath River. These surveys spanned four nesting seasons with variable coverage (Table 1; KRRC 2019a, RES 2022). During this period, KRRC and its consultants also incorporated additional information derived from ongoing annual nest surveys conducted by Green Diamond Resources Company and the BLM on properties they manage. They were unable to assess 26 historically active nest sites because of poor visibility, resulting from dense tree cover, limited access through private property, or poor road conditions (KRRC 2019a).

In their consideration of risk outlined in the ECP, KRRC and its consultants generally considered only territories known to be occupied with one or more nests used (meaning eggs were laid) during at least one year from 2017–2022. To evaluate unidentified territories, KRRC's consultants reviewed survey observations of eagles away from nests and evaluated gaps between known nests using survey data, remote imagery, and additional field observations (RES and PJD Environmental Consulting 2022).

Surveys conducted by KRRC and their consultants in the Project area from June 2017 through April 2022 located 14 confirmed bald eagle nests associated with 13 individual breeding

**Table 1. Summary of pre-construction ground and aerial surveys conducted by the Applicant’s consultants to document bald and golden eagle breeding territories and nest sites along the Klamath River within 2 miles of the Lower Klamath Project limits of disturbance.**

<b>Year</b>	<b>Ground Surveys</b>	<b>Helicopter Surveys</b>
2017	Reconnaissance-level – 6 days: July, November	None
2018	10 days: January, February, June, August	2 days: June
2019	13 days: February, May, June	3 days: May, June
2020	Reconnaissance-level – 3 days: March	None
2021	8 days: March, April, June	None
2022	3 days: March	1 day: April

territories, and nine known golden eagle nests associated with six breeding territories. All of the documented bald eagle nests and seven of eight documented golden eagle nests were located within 2 miles of the Project disturbance footprint. These surveys revealed recently used nests in 10 bald eagle breeding territories and four golden eagle breeding territories situated within approximately 2 miles of the Project disturbance footprint. Conversely, KRRC’s consultants found no eagles or evidence of used nests in four other historical bald eagle breeding territories and four other historical golden eagle breeding territories previously documented within 5 miles of the Project disturbance footprint.

#### 1.4 Scoping and Coordination

This EA incorporates by reference the scoping performed for the PEIS (Chapter 6, page 175).

#### 1.5 Tribal Coordination and Consultation

Tribal participation is an integral part of the NEPA and the National Historic Preservation Act (NHPA) process, as well as a key component of determining whether to issue an eagle take permit. In accordance with Executive Order 13175, Consultation and Coordination with tribal governments (65 Federal Register 67249, November 9, 2000), the NHPA Section 106 (36 CFR 800), and the Service’s Native American Policy, we consult with Native American tribal governments whenever actions taken under the authority of the Eagle Act may affect tribal lands, resources, or the ability to self-govern. This coordination process is also intended to ensure compliance with the American Indian Religious Freedom Act.

We sent letters to 12 federally recognized tribal governments. Our letters informed them of the permit application we received and our preparation of this EA. The geographic extent of our tribal coordination corresponds to the definitions of local area population (LAP) extents for the two eagle species, which are based on the average natal dispersal distances of golden eagles (109 miles) and bald eagles (86 miles) (Service 2016c). We received no responses following this notice about preparing the EA or our eagle take permit considerations.

FERC also conducted tribal consultations relative to their authorities to support preparation of their FEIS for the Project, and participating Tribes indicated strong support for removal of the dams (FERC 2022).

## **2.0 Proposed Action and Alternatives**

### **2.1 Alternative 1: No Action**

Under the No-Action alternative we analyze here, the Service would take no further action on KRRC's eagle incidental take permit application. Based on FERC's No-Action alternative, the Lower Klamath Project would continue to operate as it does today, under the terms and conditions of the existing annual license granted by FERC. There would be no disturbance of existing environmental conditions at the site, and there would be no new environmental protection, mitigation, or enhancement measures. The Project's dams and related infrastructure would remain in place. Under this alternative, the Project would not occur, there would be no Project impacts to eagles requiring an eagle incidental take permit, and we would not issue an eagle incidental take permit to KRRC.

### **2.2 Measures Common to All Action Alternatives**

In this analysis and in our consideration of take authorization to KRRC, each incident of "take" results in loss of productivity for a single nesting season for a single eagle breeding pair. Take that may result in injury or mortality of eagles is not expected nor would it be authorized under this permit. Although the available data indicate specific breeding territories are most likely to be impacted by Project activities, eagle populations are dynamic, and territories and nest locations often shift from year to year. Hence, new breeding territories and nest locations may be identified within the Project area over the life of the permit. To allow for operational flexibility, KRRC may use the total species-specific take authorizations as needed should nest locations differ within the Project area compared to our analysis here. The nature of effects potentially resulting in take are expected to be the same, so the analyses in this EA would still apply.

Action alternatives are those under which we make a decision regarding issuance of an eagle take permit. Below are measures common to our action alternatives.

#### *2.2.1 Risk Assessment*

As required by our eagle incidental take permit regulations, we conducted an independent risk assessment for the Project. In the ECP (Appendix A), KRRC presents their proposed risk analysis, summarized in Section 1.3 of this document; our risk assessment is described below (see Appendix C for bald and golden eagle analysis details). Our assessment follows the ECP's explanation of activities planned to occur in given Project years.

- Year 1 – year prior to reservoir water drawdown
- Year 2 – reservoir water drawdown year
- Year 3 – year following reservoir water drawdown

Activities expected in post-drawdown years (Project Years 4–9) include restoration monitoring, restoration maintenance, water quality monitoring, and adaptive management. Based upon the permit request submitted and our evaluation of the Project activities, we would issue a 5-year permit because impacts to eagles are not expected to exceed 5 years.

To assess risk to eagles, we reviewed the Project footprint and activities planned each year proximate to known eagle breeding territories and their nest sites. Next, we evaluated available data and information for each breeding territory using the nest site location and survey data that is detailed in KRRC’s ECP (Appendix A). We further evaluated the data using geographical information systems, maps, and figures, including species-specific nest buffers (Figures 2–4; and also see Appendix A in the ECP: Figures). If Project activities occur outside of the nesting season or outside of the activity specific nest buffers for the species, we determined take would be avoided. We determined Project activities that occur during the nesting season within an eagle nest buffer would likely result in take from disturbance that prevents a breeding pair from producing young in the given Project Year. Our final risk determinations accounted for uncertainty in the datasets and our knowledge of eagle biology in the Project area habitats.

We reviewed the FERC (2022) FEIS and our risk analysis applies to the Project footprint identified as part of FERC’s preferred Action Alternative: Proposed Action with Staff’s Modifications. Therefore, the risk analysis evaluated in this EA is applicable.

Bald eagle nest buffers are 660 feet for most disturbances, 1000 feet for aircraft fly zones, and 0.5 miles for blasting, which would occur during dam deconstruction (Figures 2–4 and ECP Appendix A: Figures). Golden eagle nest buffers are 1 mile for most types of disturbances and 2 miles for blasting (Figures 2–4 and ECP’s Appendix A: Figures). We also evaluated habitat changes and associated impacts to eagles, such as the loss of reservoirs, river water quality changes, and impacts to fish that provide important prey for bald eagles. We considered historic nest locations, survey methodologies, and the likelihood of undetected golden eagle territories. Our analyses are conservative in order to protect eagle populations and to account for uncertainty. We analyzed the impact of the full amount of take that could occur to bald and golden eagles from the Project activities, but our estimate is conservative and less could occur.

### Bald Eagle

We do not expect the Project to result in any direct killing or injury of adult or post-fledging immature eagles; it will also not result in removal of any eagle nests. Appendix C: Table C1 summarizes our risk assessment for bald eagles. Our analysis is conservative in order to protect eagle populations and to account for uncertainty. We do not expect to lose any bald eagle breeding territories as a result of Project activities. We do expect temporary reductions in breeding activity and productivity to occur at up to 10 breeding territories known to have been occupied within 2 miles of the Project footprint during at least one nesting season from 2017–2021. We anticipate up to 26 instances of take, based on three breeding pairs being adversely affected during a single nesting season, five pairs being affected for three nesting seasons, and two pairs being affected for four nesting seasons (Appendix C: Table C1).

## Golden Eagle

We do not expect the Project to result in any direct killing or injury of adult or post-fledging immature golden eagles, removal of any golden eagle nests, nor loss of any golden eagle breeding territories. We do expect temporary reductions in nesting activity and lost productivity to seven breeding territories known to have been occupied within 2 miles of the Project footprint during at least one nesting season from 2017–2021. We anticipate no adverse consequences at one other recently occupied territory, which is located more than 2 miles away from all anticipated Project-related disturbances. We anticipate up to 17 instances of take involving the other seven recently occupied territories, based on one breeding pair being adversely affected during one nesting season, two pairs being adversely affected during two nesting seasons, and four pairs being adversely affected during three nesting seasons (Appendix C: Table C2).

## Other Migratory Birds

As detailed in FERC’s FEIS (FERC 2022: Section 2.1.2.12), to avoid disturbance to native nesting birds, KRRC would implement the following management measures with respect to nests identified during a survey: (1) limit vegetation removal and trimming to areas where construction or restoration actions (ground disturbance) are already occurring; (2) limit vegetation removal/trimming (other than willow cutting and harvesting) to September 1 to April 1 (outside the nesting season for most non-raptors), if practicable; (3) limit willow cutting harvesting to September 1 to January 31, if practicable; (4) leave transmission/distribution poles with occupied osprey (*Pandion haliaetus*) nests in place and insert nest deterrents prior to the nesting season (March – September); (5) observe nesting ospreys during construction to determine if birds are exhibiting stress behaviors; (6) if birds are exhibiting stress behaviors, establish a setback for Project activities, if practicable given other factors, including the Project schedule and nature of the construction/demolition activities; and (7) alter the timing of activities, if practicable given other factors, including the Project schedule (FERC 2022). We provided technical assistance to FERC and KRRC to refine the Project’s migratory bird protection measures, with a focus on efforts to further minimize impacts to nesting birds.

We do not expect that issuance or denial of the requested eagle take permit will have any noteworthy consequences for other migratory birds or species listed under the Endangered Species Act due to the measures discussed in Sections 3.3 and 3.4.

### *2.2.2 Conservation Measures*

This section identifies KRRC’s appropriate and practicable avoidance and minimization measures as defined by our eagle take permit regulations and summarizes other beneficial measures to which they are committed.

#### Avoidance and Minimization Measures

- Wherever possible, conduct clearing, cutting, and grubbing activities outside of the eagle nesting period (January 1 through August 31).
- Constrain use of aircraft near occupied eagle nests.

## Other Beneficial Measures

- Conduct preconstruction occupancy surveys; restrict the timing of construction-related disturbances to outside of the breeding season where practicable; monitor occupied eagle nests; and coordinate with the Service as appropriate and required under an eagle take permit.
- Before beginning the Project, complete a 2-year baseline survey of eagle usage and nesting patterns within 2 miles of the Project footprint by a qualified eagle biologist approved by the Service, CDFW, and ODFW. The first-year surveys should determine general usage patterns during the time of year most likely to detect eagle activity. Focused surveys should be conducted in the second year to identify bald eagle nests within 1 mile and golden eagle nests within 2 miles of the Project disturbance footprint. The focused surveys should include one survey conducted early in the nesting season at a time when eagles are most likely to be found at their nests and a second survey conducted later in the nesting season before fledging occurs to confirm nesting activity.
- More than 2,000 acres of previously inundated reservoir land will be restored and eventually compose new golden eagle foraging habitat, per the measures stated in KRRC's Reservoir Area Management Plan (KRRC 2021).
- As electric-utility power lines are decommissioned as part of the Project, retain selected power poles to serve as eagle perch sites after all other power-transmission hardware and lines are removed.
- Removal of approximately 70,000 feet of electric-utility power lines, as an inherent part of the Project, will reduce the risk of electrocution and collision for both eagle species.
- Report on the status of bald and golden eagle surveys within 1 month of survey completion to the Service, CDFW, California State Water Resources Control Board, and ODFW.
- Comply with notification and reporting requirements identified by the Service, CDFW, and ODFW through consultation to develop the ECP.

### *2.2.3 Power Line Removals*

As part of the Project's inherent design, more than 220 low and medium voltage electric-utility power poles and associated energized infrastructure will be removed. The existing electric infrastructure represents electrocution and collision risk for both bald and golden eagles and will be decommissioned and removed as part of the Project. However, to provide supplemental perches for use by eagles, selected power poles will be left in place after all other power-transmission hardware and lines are removed.

### *2.2.4 Monitoring*

KRRC is committed to continuing ground-based surveys for bald and golden eagles during Project Years 1–3 in a manner similar to the focused surveys conducted from 2018 through 2021; similar surveys are currently underway in 2022 (RES and JPD Environmental Consulting 2022). The purpose of these surveys is to determine on an annual basis if eagles are occupying

breeding territories and using nest sites in the vicinity of the Project footprint (Service 2020). The surveys will include all areas suited to breeding bald and golden eagles within 2.0 miles of the Project footprint, including areas where no eagle nests have been found previously and where historic breeding territories may be reoccupied. KRRC will ensure that all such surveys are conducted consistent with Pagel et al. (2010) for golden eagles, Jackman and Jenkins (2004) for bald eagles, and Service (2020) for both species.

### 2.2.5 *Supplemental Benefits to Eagles*

Other elements of the overall Project design are likely to benefit eagles in the long run, including:

- Mainstem and tributary restoration will create stream conditions favorable for anadromous and resident fish, which is expected to bolster resource availability in support of breeding bald eagles, per measures stated in KRRC's Reservoir Area Management Plan (KRRC 2021).
- Reservoir removal and restoration are expected to reduce aquatic disease and algal toxicity by improving water quality (California Water Boards 2020), which is expected to benefit bald eagles.
- More than 8,000 acres of Project lands will be conveyed to the CDFW and Oregon Department of Land Conservation and Development (ODLCD) for management in perpetuity, which is expected to benefit golden eagles by helping to maintain quality nesting habitat and supplemental terrestrial foraging habitat.

## 2.3 Alternative 2: Proposed Action – Issuance of an Eagle Take Permit

We propose to issue a 5-year permit to authorize up to 26 incidents of bald eagle and 17 incidents of golden eagle take from disturbance of breeding pairs caused by Project activities, with associated conditions, as allowed by regulation. To allow for operational flexibility, KRRC may utilize their take authorizations for up to 5 years and for nest locations within the Project Area that are not yet specifically identified. The effects of the authorized take to eagle populations are expected to be the same, regardless of the exact locations of nesting eagles.

FERC's FEIS (FERC 2022) outlined two Action Alternatives, the Proposed Action and the Proposed Action with Staff's Modifications, and they selected the latter option as the preferred alternative. Both alternatives included physically removing the four dams and associated infrastructure, achieving a free-flowing condition and volitional fish passage, site remediation and restoration, and avoidance of adverse downstream impacts as further described in Section 1.3 above, and the selected alternative did not emphasize any substantive changes relative to eagles.

We reviewed the FERC FEIS (FERC 2022) and our risk analysis applies to the Project footprint identified as part of the selected Action Alternative. Therefore, the risk analysis evaluated in this EA is applicable.

### *2.3.1 Avoidance and Minimization Measures*

In addition to the measures outlined in Section 2.1.2, under the Proposed Action we will recommend KRRC conduct electric-utility powerline removals outside of the eagle nesting season (January 1 through August 31) to the degree practicable. Alternatively, they may conduct an additional pre-activity survey within 2 weeks of implementing powerline removals during the nesting season following appropriate protocols (Pagel et al. 2010 for golden eagles and Jackman and Jenkins 2004 for bald eagles). To not exceed their authorized take thresholds, KRRC may be required to establish protective nest buffers to avoid disturbing some in-use nests but may otherwise proceed where no nest buffering is required. These measures could apply to both species of eagles.

### *2.3.2 Offsetting Mitigation*

Under our eagle incidental take permits, compensatory mitigation is scaled to project impacts and is required for any permit authorizing take that would exceed the applicable eagle management unit take limits. Typically, compensatory mitigation is accomplished by retrofitting electric utility poles, as discussed in our ECP Guidance (Service 2013) and our 2016 PEIS. This compensatory mitigation work is often done in areas away from a project, but for the Proposed Action, effects would be offset within the Project's vicinity as part of the proposal. The intent would be to reduce the potential for golden eagle electrocutions and ensure that the effects of eagle take caused by KRRC are fully offset at the EMU level.

Quantifying required retrofits depends on the longevity of each pole's retrofit. Simple retrofits are accomplished by placing plastic covers on electric components. As plastic covers are a temporary solution, once retrofitted, the power pole is considered "eagle safe" for 10 years. If a pole is instead reframed or reconstructed to provide adequate spacing between electrical components, the pole is made permanently safe for eagles; the Service (2013) gives a 30-year credit for this type of retrofit. Decommissioning and removal of electric utility poles would also receive a 30-year credit.

We have determined in this case that the permanent removal of electric-utility power poles and infrastructure, including removal of 220 low to medium voltage power poles of a design that is not eagle safe, will fulfill the Project's 1.2:1 mitigation obligation to fully offset impacts to golden eagles. The number of electric poles being removed from the landscape exceeds our Resource Equivalency Analysis (REA) (Service 2013) calculation for required mitigation of 171 long-term retrofits or removals. Removal of approximately 70,000 feet of associated power lines will further benefit eagles by reducing the risk of collision with those lines.

Accepting the Project's permanent removal of electric utility lines as mitigation also satisfies our regulatory requirement for that mitigation to occur within the Pacific Flyway EMU. Further, we recognize the value of mitigation implemented at a local scale near where the impacts occur as means to ensure that the LAP specifically benefits from the reduced risk of mortality.

### 2.3.3 *Monitoring*

Under the Proposed Action, KRRC will be required to implement a monitoring plan using a Project-specific protocol approved by the Service. The eagle nest monitoring will inform KRRC and the agencies when and where bald and golden eagle nests are in-use within 2 miles of the Project footprint, which allows for validation of the number of take incidents that occur and ensures compliance with the permit authorization. Each nesting season during the 5-year permit term, the surveys will cover all areas within 2 miles of the Project footprint during three periods: 1) January through February to confirm territory occupancy and identify new nests/breeding territories and initial activity at nest sites; 2) March through mid-April to determine if eagles are nesting; and 3) June to July to determine the fate of all breeding attempts. No additional monitoring would be required under the Proposed Action, unless monitoring during the 5-year permit period indicates that adaptive management is required to maintain take of eagles at or below the level authorized in the eagle take permit (see next section).

### 2.3.4 *Adaptive Management*

Under the Proposed Action, we will require KRRC to provide us with annual site-specific eagle reports during the life of the permit, which we will use to review permit compliance and verify authorized take was not exceeded. As stated above, KRRC would be required to monitor all eagle nests and territories for occupancy within 2 miles of the Project footprint during the eagle nesting season each year the permit applies. The surveys will seek to annually reaffirm the occupancy status of the known bald and golden eagle breeding territories and nest sites that we considered in our risk assessment. These surveys may also reveal new occupied nests in known territories, occupied historical breeding territories with new or updated nests, or new or previously undetected breeding territories, and nest sites. Such nesting attempts could be adversely affected by ongoing or pending Project activity.

In our risk assessment, we accounted for the potential that historic nest sites may still be part of occupied breeding territories where eagle pairs were not detected. If monitoring during the Project suggests that take resulting from Project-related disturbances is likely to exceed the level authorized by this permit for either eagle species, KRRC will implement adaptive management to reduce the likelihood of that occurring, involving the following measures:

- a. Delineate protective buffers around selected occupied nests of the affected eagle species per Service (2017, 2021) guidelines.
- b. Restrict activity within buffers from January 1 – August 31, or until third-party monitoring confirms that either a given breeding pair is not nesting or has completed its nesting cycle for a given season (including a minimum 4-week post-fledging period).
- c. At KRRC's discretion as permit holder, minimizing the risk of supplemental take may involve either (a) protecting eagles establishing new territories and nests that might otherwise be disturbed by Project activities or (b) implementing specific no-disturbance buffers around previously known and currently occupied territories with recently used nest sites to reduce the likelihood of take in these territories below the level we project in our risk assessment.

- d. Implement protective measures at a sufficient number of breeding territories and focal nest sites to maintain take at or below the level authorized in the take permit for the relevant eagle species.

#### 2.4 Alternative 3: Issue Permit based on the Applicant's Requested Take

Under this alternative, we would issue an incidental eagle take permit, with associated conditions, to KRRC for disturbance to and loss of productivity of bald eagles and golden eagles for the amount of take they requested in their permit application. Under this alternative, we would authorize 12 instances of take from disturbance of bald eagles and four instances of take from disturbance of golden eagles. Avoidance and minimization measures, mitigation, monitoring, and adaptive management would still occur under Alternative 3.

Based on our independent analysis of the Project elements and disturbance, we anticipate that the amount of take would likely be greater than the amount requested by KRRC. Therefore, under this Alternative, KRRC would be required to implement seasonal buffers (i.e., avoid work during nesting season near some nests) and/or spatial buffers to avoid exceeding the amount of take authorized by their permit.

#### 2.5 Other Alternatives Considered but Not Evaluated in this Environmental Assessment

We considered an alternate variation of the No-Action Alternative, one where again the Service would take no further action on KRRC's eagle incidental take permit application, but where FERC could select one of their Action Alternatives, either the Proposed Action or Proposed Action with Staff's Modifications. In this scenario, the removal of facilities associated with the Project would likely proceed without an eagle incidental take permit being issued. We assume that KRRC would implement all measures required by other agencies and jurisdictions to conduct the activity at this site, but any supplemental conservation measures proposed in the eagle incidental take permit application package would not be required. The Project proponent may choose to implement some, none, or all of those conservation measures. We assume KRRC would take some reasonable steps to avoid taking eagles, but as the Project proponent they will not be protected from enforcement for violating the Eagle Act should eagle take occur. This alternative was not carried forward as it did not adequately address the risk of take at the Project. Therefore, we did not assess the potential environmental impacts.

### **3.0 Affected Environment**

This section describes the current status of the environmental resources and values that are affected by the proposed action and alternative.

#### 3.1 Bald Eagle

General information on the population trends, distribution, and habitat of bald eagles are detailed in the PEIS (Service 2016b: Sections 3.3 and 3.4). This section more specifically describes the bald eagle population in the Project area.

The bald eagles that nest in the Project area are part of a larger breeding population that is distributed throughout much of the western United States and Canada in suitable habitats and is well-represented in northern California and southwestern Oregon. The Service (2016c) defines a LAP of bald eagles based on an average natal dispersal distance for females of 86 miles. The LAP for this Project comprises hundreds of breeding pairs (Isaacs and Anthony 2011, CDFW 2020), with an estimated total population of more than 13,000 bald eagles in the Pacific Flyway North subregion (Service 2016c). Bald eagles that occur in the Project area comprise a mix of year-round residents and migratory individuals that collectively represent much of western North America, with many individuals following variable circuits outside of the nesting season to exploit seasonally abundant food sources such as regionally variable salmonid runs (Hunt et al. 1992, Jackman et al. 2001, Watson and Pierce 2001, Buehler 2020). The Klamath Basin wetland complex in southwestern Oregon also attracts hundreds of wintering bald eagles that congregate to feed on abundant waterfowl aggregated on the marshlands of Lower Klamath and Tule Lake National Wildlife Refuges (NWRs) (Keister et al. 1987). This wintering population utilizes several communal roosts, including a primary site located in a secluded area of conifer forest of Bear Valley NWR several miles southeast of J. C. Boyle Dam and adjacent to Lower Klamath NWR (Keister et al. 1983).

In the Project area, bald eagles build large stick nests mostly in large conifers or other suitably robust, mostly live trees, but sometimes on large rock outcrops, cliff ledges, or artificial structures such as utility towers (Jackman and Jenkins 2004, Isaacs and Anthony 2011). They generally nest within 1 mile of, but sometimes up to 2 miles from, a riverine or lacustrine ecosystem that provides access to favored prey (Jackman et al. 1999, Isaacs and Anthony 2011). Bald eagles favor diverse fish (e.g., in the Project area ranging from introduced species such as yellow perch [*Perca flavescens*], bass [*Micropterus* spp.], and catfish [*Ictalurus* spp.], to native species such as the tui chub [*Siphateles bicolor*], redband trout [*Oncorhynchus mykiss newberri*], and Klamath smallscale suckers [*Catostomus rimiculus*]) and waterfowl as prey, but also routinely supplement their diet through opportunistic scavenging, terrestrial foraging, and kleptoparasitism (i.e., stealing food or other resources from other individuals), with ospreys (*Pandion haliaetus*) often a primary target of the latter (Buehler 2020). Bald eagles may exhibit initial courtship and nest building/tending behaviors as early as November, but in the Project area typically begin their nesting cycle in February (Jackman and Jenkins 2004). One to three eggs are generally laid beginning from late February through early April, incubation takes about 35 days, and young fledge at 11–12 weeks of age, typically in June and July (Hunt et al. 1992, Isaacs and Anthony 2011, Buehler 2020). New fledglings then remain dependent on their parents for variable periods of a few to several weeks.

Bald eagles exhibit variable sensitivities to human disturbance, depending on the circumstances and type of disturbance (Stalmaster and Newman 1978, Knight and Knight 1984, Anthony and Isaacs 1989, McGarigal et al. 1991, Watson 1993, Steidl and Anthony 1996, Stalmaster and Kaiser 1998, Brown and Stevens 1997, Buehler 2020). Breeding pairs are often most sensitive during the early nesting cycle—spanning final courtship/nest tending through egg laying and early incubation—when unexpected, acute disturbances may lead to nest abandonment or egg mortality from excessive exposure. However, documentation of direct cause-and-effect associations between nest failures and specific human disturbances is rare (Jackman and Jenkins 2004). Excessive disturbance during the fledging and post-fledging dependency period also may

result in deleterious premature fledging or other calamities while fledglings are learning to fly (Buehler 2020).

Human activities may negatively affect bald eagle foraging activity and thereby indirectly compromise a pair's ability to sustain a nesting attempt. However, in other circumstances, human activities such as the operation of hydroelectric plants, fish hatcheries, commercial fishing enterprises, and sports hunting and angling may benefit foraging bald eagles by providing readily available sources of killed or injured fish and waterfowl for them to exploit (Jackman and Jenkins 2004). The National Bald Eagle Management Guidelines (Service 2007) and updated Service (2017) guidelines currently stipulate that 660-foot buffers should be established around occupied bald eagle nests to help prevent the possibility of most types of human development activity from disturbing an active nesting attempt. The recommended buffer distance is decreased to 330 feet for most types of recreational activity but is increased to 1,000 feet for aircraft and to 0.5 miles for blasting and other loud, intermittent noises (e.g., pile pounding and fireworks).

As summarized in the Project's ECP (RES and PJD Environmental Consulting 2022), KRRC and its consultants identified 15 historically and/or recently occupied bald eagle breeding territories within approximately 2 miles of the Project footprint (Figures 1–4). Based on surveys conducted from 2017–2021, they concluded that 11 breeding territories were occupied with one or more used nests during the 5-year survey period. Three of the occupied territories were located upstream of J. C. Boyle Dam along the Klamath River in Oregon, with inter-territory spacing varying from approximately 0.7–2.0 linear (or air) miles. Three territories were occupied downstream of J. C. Boyle Dam in Oregon, with relatively consistent inter-territory spacing of approximately 3.5 linear miles. A further 10 linear miles downstream, in California, two territories were occupied in the vicinity of Copco Dams 1 and 2. The final occupied territory of interest was located approximately 4.2 linear miles farther downstream next to Iron Gate Reservoir. Surveys of four other historical breeding territories revealed single inactive nests in three territories with no eagles evident (including a territory the BLM no longer considers occupied), and no existing nests or eagles in the fourth area.

The higher density of breeding pairs in the northern portion of the Project area partly reflects a higher availability of suitably large trees used as nest substrate. Mixed pine and fir forest cover is prevalent in the vicinity of J. C. Boyle Dam and surrounding the upper half of the Project footprint, whereas forest cover is sparser and shrub/scrub and herbaceous/grassland vegetation predominates in the vicinity of the Copco and Iron Gate reservoirs (California Water Boards 2020, RES and PJD Environmental Consulting 2022). In addition, two major wildfires burned more than 70,000 acres immediately adjacent to and downstream of the latter reservoirs in 2014 and 2018.

### 3.2 Golden Eagle

General information on the population trends, distribution, and habitat of golden eagles are detailed in the PEIS (Service 2016b: Sections 3.3 and 3.4). This section more specifically describes the golden eagle population in the Project area.

Breeding golden eagles in the Project vicinity generally are year-round residents and are part of a larger population spread throughout the western mountains and Great Basin (Katzner et al. 2020). Statewide surveys have documented at least 1,000 golden eagle breeding territories in Oregon and approximately 50 territories within approximately 50 miles of the Project footprint (Isaacs 2021). Though not as well documented, many more territories exist in northern California. Recent predictive modeling of golden eagle nesting habitat in the western United States suggested that the Project lies within an area of relatively low overall density of breeding pairs within the Northern Great Basin region (Dunk et al. 2019). Northern migrants and wandering/dispersing nonbreeders also may pass through the region or winter in the area; however, most northern migrants travel along the Rocky Mountain corridor rather than down along the West Coast (Goodrich and Smith 2008, McIntyre et al. 2008, Brown et al. 2017).

Throughout the Great Basin and many other parts of their range, golden eagles most commonly build their large stick nests on cliffs and large rock outcrops; however, throughout much of California and Oregon from the Cascades and Sierra Nevada westward, they more commonly nest in large conifers, oaks, and other stout trees (Hunt et al. 1995, Kolar and Wiens 2017, Katzner et al. 2020, Smith et al. 2020, Isaacs 2021). Transmission towers also are commonly used as a nest substrate throughout both regions. Golden eagles typically nest in topographically diverse areas on ridgelines and hillsides with good access to open woodland, savanna, grassland, and/or shrub/scrub habitats, where they are able to forage efficiently on favored prey. They forage primarily for medium-sized mammals such as ground squirrels (e.g., *Spermophilus* spp.), rabbits (*Sylvilagus* spp.), hares (e.g., *Lepus* spp.), and marmots (*Marmota* spp.), but also opportunistically for a broad range of other mammals, birds, reptiles, and carrion (Katzner et al. 2020). Golden eagles may exhibit initial courtship and nest building/tending behaviors in mid-winter, but in the Project area typically begin their nesting cycle in January/February (Isaacs 2021). One to three eggs are generally laid beginning from late January through early April, incubation takes about 42 days, and young fledge at 9–10 weeks of age typically between late May and mid-July (Katzner et al. 2020, Isaacs 2021). New fledglings then remain dependent on their parents and their nest site during the post-fledgling dependency period for variable periods of a few to several weeks.

Nesting golden eagles are generally thought to be more sensitive to direct human disturbance than bald eagles, but their responses to various human activities are not as well studied and understood as for bald eagles. Breeding golden eagles appear to be more sensitive to atypical human disturbance in remote landscapes where human activity is uncommon, and they are known to abandon breeding territories as human developments and activity pressures encroach (Boeker and Ray 1979, Scott 1985, Steenhof et al. 2014, Spaul and Heath 2016, Hansen et al. 2017, Tracey et al. 2018). However, they may also return to temporarily abandoned breeding territories after initial development disturbance subsides in areas where good nesting and foraging habitat remains (Smith et al. 2010). Unlike for bald eagles (Zimmerman et al. 2022), the Service's recent evaluation concerning sustainable take determined that the western golden eagle population could not sustain any additional lost productivity or mortality as a result of human caused activities unless that take is fully offset (Service 2016c). Hence, we currently recommend that a 1-mile no-disturbance buffer should be established to protect an occupied golden eagle nest from most types of human disturbance, with the recommended buffer of 2 miles for blasting and other loud, intermittent noises, such as recreational shooting (Service 2021). If

implementation of our recommended nest protection buffers are not practicable, we recommend an eagle take permit be secured for the proposed activities. Substantial loss of foraging habitat within the expected home range of a breeding pair also may trigger a projection of take under the Eagle Act due to an expectation of lost breeding productivity and possible territory abandonment.

KRRC describes their early coordination efforts in a report to FERC (KRRC 2019a). They learned of 26 historically active nests that they were unable to access because of poor visibility resulting from dense tree cover, limited access through private property, and/or poor road conditions. However, this report did not describe how many of the inaccessible nest sites involved bald versus golden eagles. KRRC's ECP focuses on knowledge extracted from existing databases and gleaned during surveys conducted in the Project area from 2017–2021, including 13 historically and/or recently occupied golden eagle breeding territories surrounding the Project area. Figures 1–4 illustrate the locations of eagle nests in the Project area, classified as recent or historic based on the available data KRRC provided. Our final risk assessment accounted for uncertainty based on our knowledge of golden eagles in these habitats, the implemented survey methodology, and the likelihood that some occupied breeding territories were not detected.

One of the known occupied territories was located in Oregon, approximately 2.9 linear miles south of J. C. Boyle Dam. The other seven known occupied territories were located in California, with the next closest approximately 8.6 linear miles farther southwest along the Klamath River, and the last relevant territory located approximately 2.5 miles west-southwest of Iron Gate Dam. The eight occupied breeding areas were situated approximately 0.1–1.3 miles from either the river corridor or Copco Lake, with inter-territory spacing ranging from approximately 1.1–8.6 linear miles. Of the nests associated with the eight occupied territories, one was located in a large conifer snag and the rest were located on cliffs (RES and PJD Environmental Consulting 2022). Surveys of five other historical breeding territories revealed no extant nests or eagles.

In the Project vicinity, surrounding grasslands, shrublands, burned forest areas, and certain agricultural areas provide foraging habitat for golden eagles. Compared to bald eagles, it is unlikely that golden eagles would establish a breeding territory in the vicinity of a reservoir specifically to take advantage of aquatic prey resources. Moreover, it is unlikely that the terrestrial foraging conditions around the margins of a reservoir would be superior compared to those along free-flowing stretches of the Klamath River. It may be noteworthy that four of the eight occupied golden eagle territories were concentrated within 1 mile of Copco Lake and the upper margin of Iron Gate Reservoir (RES and PJD Environmental Consulting 2022); however, this distribution pattern could simply reflect the availability of larger cliffs and trees favored as nest substrates.

### 3.3 Migratory Birds

Effects to migratory birds have been analyzed in the PEIS (Service 2016b). A variety of migratory birds have been identified in the Project area; however, we do not anticipate issuance of the proposed eagle take permit to substantively affect any other species of migratory birds. Additionally, KRRC would conduct preconstruction surveys for native nesting birds (including special status species and non-listed species) if habitat removal activities are scheduled to occur

during the primary nesting period (FERC 2022). As detailed in FERC’s FEIS (FERC 2022), to avoid disturbance to nesting birds, KRRC would implement the following management measures with respect to nests identified during a survey: (1) limit vegetation removal and trimming to areas where construction or restoration actions (ground disturbance) are already occurring; (2) limit vegetation removal/trimming (other than willow cutting and harvesting) to September 1 to April 1 (outside the nesting season for most non-raptors), if practicable; (3) limit willow cutting harvesting to September 1 to January 31, if practicable; (4) leave transmission/distribution poles with occupied osprey (*Pandion haliaetus*) nests in place and insert nest deterrents prior to the nesting season (March – September); (5) observe nesting ospreys during construction to determine if birds are exhibiting stress behaviors; (6) if birds are exhibiting stress behaviors, establish a set-back for Project activities, if practicable given other factors, including the Project schedule and the nature of Project the construction/demolition activities; and (7) alter the timing of activities, if practicable given other factors, including the Project schedule (FERC 2022).

### 3.4 Species Listed under the Endangered Species Act

Several species listed under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §§ 1531–1544), occur within the Project area and relevant LAP domains for bald and golden eagles. Federally listed species—and in some cases their associated critical habitat—that are also affected by FERC’s selected Action Alternative (FERC 2022, RES and JPD Consulting 2022) include Lost River sucker (*Deltistes luxatus*), shortnose sucker (*Chasmistes brevirostris*), bull trout (*Salvelinus confluentus*), northern spotted owl (*Strix occidentalis*), Oregon spotted frog (*Rana pretiosa*) and Franklin’s bumble bee (*Bombus franklini*). We prepared a separate Biological Opinion to address the Project’s potential impacts to species listed under the ESA, and KRRC would implement minimization measures outlined in FERC (2022) and during the associated ESA Section 7 consultation. Our decision regarding an eagle take permit would not alter the physical footprint of the Project and therefore would not alter the Project impacts to these federally threatened and endangered species in the Project boundary.

### 3.5 Cultural and Socio-economic Interests

Issuance of this eagle take permit is not expected to have any noteworthy consequences for any cultural or socio-economic interests.

### 3.6 Climate Change

Climate change was considered in the PEIS (Service 2016b; Section 3.9, page 144) and is incorporated by reference here.

## 4.0 **Environmental Consequences**

This section summarizes the direct, indirect and cumulative effects on the environment of implementing the proposed action or alternatives to the action. The discussion of overall effects of the eagle incidental take permit program is provided in the PEIS (Service 2016b) and is incorporated by reference here. This section of this EA analyzes only the effects that were not analyzed in the PEIS that may result from the issuance of an eagle incidental take permit for this specific Project.

In determining the significance of effects of the Project on eagles, we screened the proposed action against the analysis provided in the PEIS (Service 2016b); the Service’s 2016 report, *Bald and Golden Eagles: Status, Trends, and Estimation of Sustainable Take Rates in the United States;*” and the Service’s updated 2022 report, *Estimating Allowable Take for an Increasing Bald Eagle Population in the United States* (Zimmerman et al. 2022). We also used our eagle risk analysis tools (Service 2007, 2017, 2020, 2021) and Cumulative Effects Analysis (Service 2013: Appendix F) to quantify eagle risk of take and cumulative local population level effects. In this section, we summarize the outcomes of these analyses for bald and golden eagles. Detailed territory and nest-site-specific risk analyses are presented in Appendix C for both species, and our cumulative effects analyses are described in Section 4.1.6.

## 4.1 Alternative 1: No Action

### 4.1.1 *Bald Eagle*

As the Project would not occur under the No Action Alternative, take of bald eagles from disturbance caused by dam removals and other Project activities also would not occur.

The No Action Alternative would not address the water quality and disease issues in the Klamath River system (see FERC 2022 for full analysis). These issues, when combined with the ongoing trend of increased temperatures, pose a substantial risk to the survival of one of the few remaining Chinook salmon populations in California. The salmon fisheries in the Klamath River system are an important prey resource for bald eagles. Reduced salmon populations could have long-term negative effects on bald eagle populations and the breeding pairs that depend upon fish in the river system.

Retention of the reservoirs under the No Action Alternative would continue to provide foraging opportunities to nesting and wintering bald eagles, resulting in long-term beneficial effects.

Powerlines would not be removed under this Alternative, therefore the risk of electrocution and collision with powerlines would remain the same.

### 4.1.2 *Golden Eagle*

As the Project would not occur under the No Action Alternative, take of golden eagles from disturbance caused by dam removals and other Project activities would not occur.

Retention of the reservoirs under the No Action Alternative would not result in conversion of more than 2,000 acres of aquatic habitat to upland foraging habitat for golden eagles.

Powerlines would not be removed under this Alternative, therefore the risk of electrocution and collision with powerlines would remain the same.

#### 4.1.3 *Migratory Birds*

As the Project would not occur under the No Action Alternative, impacts to migratory birds from the Project caused by dam removals and other Project activities would not occur. Migratory birds would not be affected.

#### 4.1.4 *Species Listed under the Endangered Species Act*

There would be no effect to any species listed under the ESA under the No Action Alternative.

#### 4.1.5 *Cultural and Socio-economic Interests*

There would be no effect to any cultural or socio-economic interests related to our eagle take permit decision under the No Action Alternative.

#### 4.1.6 *Cumulative Effects*

Under the No Action Alternative, there would be no new or additional impacts contributing to cumulative effects to any elements of the human environment analyzed as part of our eagle incidental take permit decision.

#### 4.1.7 *Conclusion*

In summary, there would be both beneficial and negative long-term effects to bald and golden eagles foraging and breeding within the Project area under the No Action Alternative. There would be no effect to migratory birds, species listed under the ESA, or any cultural or socio-economic interests related to our eagle take permit decision under the No Action Alternative. Furthermore, there would be no new or additional impacts contributing to cumulative effects to any elements of the human environment analyzed.

### 4.2 Alternative 2: Proposed Action – Issue Eagle Take Permit Based on Service’s Risk Assessment

Under the proposed action, nearby breeding pairs may fail to produce young at nest sites near the Project activities. They may use an alternate nest to breed successfully, or they may avoid the established nesting area for the remainder of the nesting season. Alternatively, the breeding pair may adapt to the human activities and successfully reproduce in the coming nesting season and beyond. If the breeding pair is disturbed during Project activities, they may resume breeding activities at the same nest site in future years.

Our overall estimates of projected take are based on a conservative approach to account for uncertainty in the available data and associated Project impacts, and to be protective of eagle populations.

#### 4.2.1 *Bald Eagle*

We expect no direct mortality of bald eagles to occur as result of the Project, and no such take would be authorized under the permit. We evaluated 15 known breeding territories based upon the data presented in KRRC’s ECP (Appendix A) and supporting documents (KRRC 2017,

2019a, 2019b; FERC 2021). Temporary reductions in breeding activity and productivity are likely to occur at up to 11 breeding territories known to have been occupied within 2 miles of the Project footprint during at least one nesting season from 2017–2021 (Appendix C: Table C1). We anticipate up to 26 instances of take, based on three breeding pairs being adversely affected during a single nesting season, five pairs being affected for three nesting seasons, and two pairs being affected for four nesting seasons. Although we expect some bald eagle nest locations and breeding territory domains to shift as a result of the reservoir drawdowns and other Project disturbances, we generally do not anticipate that the Project will result in the permanent abandonment and loss of bald eagle breeding territories. We anticipate that current territory spacing will be sufficient for the pairs to maintain their current, general domains while potentially adjusting their nesting locations to focus on restored river resources rather than reservoir resources. Should they in fact relocate, we do not expect to lose any bald eagle breeding territories along the Klamath River or in the LAP.

Compared to the No Action Alternative, some bald eagle breeding pairs will experience short-term negative impacts caused by disturbance that prevents them from successfully rearing young. Even so, we have determined there will be no significant effect to bald eagles at the population level. Removal of power lines under the Project and Proposed Action will prevent eagle injury and mortality caused by electrocution and collisions with the electric utility infrastructure. This is a benefit to eagle populations that would not occur under the No Action Alternative.

#### 4.2.2 *Golden Eagle*

We expect no direct mortality of golden eagles to occur as a result of the Project, and no such take would be authorized under the permit. We evaluated 11 known breeding territories based upon the data presented in KRRC's ECP (Appendix A) and supporting documents (KRRC 2017, 2019a, 2019b; FERC 2021). We anticipate up to 17 instances of take to breeding golden eagle pairs. Further, although some nesting locations may shift within some eagle pairs' territories, and some pairs may forgo nesting for one or more nesting seasons as a result of Project activities, we do not expect Project-related disturbances and habitat change to result in the permanent abandonment of any golden eagle breeding territories. However, we expect Project-related disturbances leading to at least temporary reductions in breeding activity and/or productivity to occur at breeding territories within 2 miles of the Project footprint. Although golden eagles are opportunistic, we do not expect reservoir drawdowns and temporary degradations of river quality to adversely affect golden eagles in the Project area because the species typically does not exploit aquatic prey resources to a significant degree.

Under the Proposed Action, approximately 2,000 acres of former reservoir footprint will be restored to functioning terrestrial golden eagle foraging habitat; this long-term beneficial effect for golden eagles would not occur under the No Action Alternative.

Compared to the No Action Alternative, some golden eagle breeding pairs will experience short-term negative impacts caused by disturbance that prevents them from successfully rearing young. Even so, we have determined there will be no significant effect to golden eagles at the population level.

Removal of power lines under the Project and Proposed Action will prevent eagle injury and mortality caused by electrocution and collisions with the electric utility infrastructure. This is a long-term benefit to eagle populations that would not occur under the No Action Alternative.

#### *4.2.3 Migratory Birds*

Effects to migratory birds by issuance of our eagle incidental take permits have been analyzed in our PEIS (Service 2016b). The Project's impacts to migratory birds were analyzed by FERC in their FEIS; we coordinated with FERC and KRRC to refine their protection measures for nesting birds. A variety of migratory birds have been identified in the Project boundary; however, issuance of the proposed permit is not anticipated to affect any other species of migratory birds. Additionally, KRRC is committed to reduce potential impacts to migratory birds within the Project area as summarized in Section 3.3.

Removal of power lines under the Project and Proposed Action will prevent injury and mortality caused by electrocution and collisions with the electric utility infrastructure. This is a benefit to migratory bird populations that would not occur under the No Action Alternative.

Approval of the Proposed Action, issuance of an eagle incidental take permit, is not expected to affect other species of migratory birds.

#### *4.2.4 Species Listed under the Endangered Species Act*

Approval of the Proposed Action is not expected to affect any species listed under the ESA.

#### *4.2.5 Cultural and Socio-economic Interests*

Approval of the Proposed Action is not expected to affect cultural or socio-economic interests.

#### *4.2.6 Cumulative Effects*

Cumulative impacts are defined as incremental impacts of the action on the environment when added to other past, present, and reasonably foreseeable future actions. Take of eagles has the potential to affect the larger eagle population. Accordingly, the 2016 PEIS analyzed the cumulative effects of permitting take of bald and golden eagles in combination with ongoing unauthorized sources of human-caused eagle mortality and other present or foreseeable future actions affecting populations of bald and golden eagles. As part of the analysis, the Service determined sustainable limits to permitted take within each EMU. The take that would be authorized by this permit will not significantly impact the EMU eagle populations because for bald eagles it does not exceed the EMU take limit and for golden eagles it will be offset by compensatory mitigation provided by KRRC. The avoidance and minimization measures that would be required under the permit, along with the additional adaptive management measures, are designed to further ensure that the permit is compatible with the preservation of bald and golden eagles at the regional EMU population scale.

Additionally, to ensure that eagle populations at the local scale are not depleted by cumulative take in the local area, the Service analyzed in the PEIS (Service 2016b) the amount of take that can be authorized while still maintaining LAPs of eagles. In order to issue a permit, cumulative

authorized take must not exceed 5% of a LAP, and the known unauthorized human-caused take should not exceed 10% of a LAP, unless the Service can demonstrate why allowing take to exceed that limit is still compatible with the preservation of eagles. The eagle incidental take permit regulations require the Service to conduct an individual LAP analysis for each permit application as part of our application review.

We, therefore, considered cumulative effects to the LAP surrounding the Project to evaluate whether the take to be authorized under this permit, together with other sources of permitted take and unpermitted eagle take, mostly from known mortalities, may be incompatible with the persistence of the Project LAP. We incorporated data provided by KRRC, our data on other eagle take authorized and permitted by the Service, and other reliably documented unauthorized eagle take to estimate cumulative impacts to the LAP. The scale of our analysis is an 86-mile radius around the Project site for bald eagles and a 109-mile radius around the Project site for golden eagles. We conducted our cumulative effects analysis as described in the Service's ECP Guidance (Service 2013: Appendix F).

From the Service's available data on eagle incidents within each species LAP over the past 10 years, we know of 40 bald eagle and 106 golden eagle unauthorized deaths from human-related causes such as electrocution, gun shot, or vehicle collision. This information indicates that on average at least four bald eagles and 11 golden eagles are killed each year in their respective LAPs as a result of human activities.

Our final cumulative effects analysis takes into account eagle incidental take permits previously issued within the relevant LAPs, and all known incidents within those LAPs. Under our Proposed Action Alternative, our cumulative effects analysis indicated the total anticipated cumulative authorized take of bald eagles would be 1.93%, and the total known unauthorized human caused take is 1.00% per year within the LAP. The total anticipated cumulative authorized take of golden eagles would be 4.33%, and the total known unauthorized human caused take is 2.39% per year within the LAP. These values are below our benchmarks that would warrant concern or consideration of additional conservation measures.

Cumulative impacts to eagles under this Alternative would be greater than under the No Action Alternative and Alternative 3.

#### *4.2.7 Conclusion*

In summary, although we expect Project activities to adversely affect individual pairs of bald eagles, the projected impacts fall below our designated take thresholds for the relevant LAP and EMU (Service 2016b). Our risk assessment was conservative to account for uncertainties regarding how long bald eagles may be impacted by changes in water quality and impacts to their waterfowl and fishery prey base at the reservoirs and in the river system. We do not expect our issuance of an eagle incidental take permit to KRRC for this Project to result in a significant population-level effect for bald eagles.

Although we expect Project activities to adversely affect individual pairs of golden eagles, authorized take will be fully offset, stemming from the Project reducing electrocution risk by

decommissioning more than 220 electric-utility power poles. Therefore, the cumulative effects contributed to golden eagle populations from our authorizations under an eagle take permit would result in no net loss at the population level. The cumulative impact from our permit to KRRC is within the range of what we have determined is compatible with our goals of maintaining stable or increasing breeding populations of eagles in all EMUs, and the persistence of local populations throughout the geographic range of the species. Therefore, issuance of this eagle take permit would not result in significant effects to golden eagles.

### 4.3 Alternative 3: Issue Permit Based on Applicant's Requested Take

Similar to effects under the Proposed Action, nearby breeding pairs may fail to produce young at nest sites near the Project activities. They may use an alternate nest to breed successfully, or they may avoid the established nesting area for the remainder of the nesting season. Alternatively, the breeding pair may adapt to the human activities and successfully reproduce in the coming nesting season and beyond. If the breeding pair is disturbed during Project activities, they may resume breeding activities at the same nest site in future years.

#### 4.3.1 *Bald Eagle*

Under Alternative 3, impacts to bald eagles will be similar to but less than impacts under Alternative 2, our Proposed Action. Under this Alternative, KRRC would be authorized for up to 12 instances of take from Project disturbance that would prevent eagles from successfully breeding and rearing young. Our risk assessment predicts there would likely be 26 instances of take from disturbance to bald eagles over the 5-year permit period, so under this Alternative, KRRC would be required to implement a combination of seasonal avoidance and/or nest protection buffers to avoid exceeding the authorized amount of take and remain in compliance with their permit.

#### 4.3.2 *Golden Eagle*

Under Alternative 3, impacts to golden eagles will be similar to but less than impacts under Alternative 2, our Proposed Action. Under this Alternative, KRRC would be authorized for up to four instances of take from Project disturbance that would prevent eagles from successfully breeding and rearing young. Our risk assessment predicts there would likely be 17 instances of take from disturbance to golden eagles over the 5-year permit period, so under this Alternative, KRRC would be required to implement a combination of seasonal avoidance and/or nest protection buffers to avoid exceeding the authorized amount of take and remain in compliance with their permit.

Under this Alternative the permanent removal of 41 electric utility power poles would offset the authorization of four instances of take from disturbance, preventing pairs from successfully producing young. The Project would still remove a total of 220 electric utility poles as proposed and 13 instances of golden eagle take would be avoided compared to the Proposed Action. Therefore, Alternative 3 would have a lower impact and a greater population level benefit to golden eagles compared to our Proposed Action Alternative. The impacts to golden eagles under Alternative 3 are greater than under the No Action Alternative but the benefits of utility pole replacement would not be realized in the No Action Alternative.

#### 4.3.3 *Migratory Birds*

Effects to migratory birds under this Alternative would be the same as analyzed under Alternative 2.

#### 4.3.4 *Species Listed under the Endangered Species Act*

Effects to listed species under this Alternative would be the same as analyzed under Alternative 2.

#### 4.3.5 *Cultural and Socio-economic Interests*

Effects to cultural and socio-economic interests under this Alternative would be the same as analyzed under Alternative 2.

#### 4.3.6 *Cumulative Effects*

We analyzed cumulative impacts as described under our Proposed Action cumulative effects discussion in Section 4.1.6. Cumulative effects for bald eagles under this Alternative are the same as the Proposed Action impacts due to the highest estimated total take among Project years being the same under both Alternatives (Year 2, 13.3 bald eagle young not produced due to disturbance).

Under Alternative 3, our cumulative effects analysis indicates the total anticipated cumulative take of golden eagles authorized take would be 1.38% and the total known un-permitted human caused take is 2.39% of the population per year within the LAP. Both values are below our benchmarks that would warrant concern or consideration of additional conservation measures.

Cumulative effects to golden eagles under this Alternative would be greater than under the No Action Alternative, and lower compared to our Proposed Action Alternative.

#### 4.3.7 *Conclusion*

In summary, impacts under this Alternative would be similar to our Proposed Action. Although we expect Project activities to adversely affect individual pairs of eagles, the projected impacts fall below our designated take thresholds for the relevant LAP and EMU (Service 2016c). Impacts to both bald and golden eagles would be greater than impacts as analyzed under the No Action Alternative, but less than impacts analyzed under our Proposed Action Alternative.

Similar to the Proposed Action Alternative, although we expect Project activities to adversely affect individual pairs of golden eagles, authorized take will be fully offset from the Project reducing electrocution risk by decommissioning more than 220 electric-utility power poles. Therefore, the cumulative effects contributed to golden eagle populations from our authorizations under an eagle take permit would result in no net loss at the population level. The cumulative impact from our permit to KRRC is within the range of what we have determined is compatible with our goals of maintaining stable or increasing breeding populations in all EMUs, and the persistence of local populations throughout the geographic range of the species.

Therefore, issuance of this eagle take permit would not result in significant effects to golden eagles.

#### 4.4 Comparison of Effects of Alternatives

Table 2 presents a comparison of the effects of the Proposed Action and other alternatives.

### **5.0 Mitigation, Monitoring, and Adaptive Management**

The proposed action incorporates measures to minimize and avoid impacts to the maximum degree practicable, as required by regulation. To ensure that regional eagle populations are maintained consistent with preservation standards, our regulations require that any take that cannot practicably be avoided and is above EMU take limits must be offset by compensatory mitigation. In this case for bald eagles, authorized take remains below the EMU take threshold and no compensatory mitigation is needed to meet the Eagle Act preservation standard.

To ensure that regional populations are maintained consistent with the preservation standard, regulations require that any golden eagle take that cannot practicably be avoided and is above EMU take limits must be offset by compensatory mitigation at a 1.2 to 1 ratio. As golden eagle take limits for all EMUs were determined to be zero (Service 2016c), compensatory mitigation is necessary to offset any authorized take of golden eagles. As previously discussed in Section 4.1.2, we have determined that the Project will achieve effective mitigation for golden eagles by virtue of the inherent Project design, which includes decommissioning and removing all power hardware from about 220 electric-utility power poles and removing more than 70,000 feet of associated power lines. Our REA projected that offsetting the projected take of golden eagles would require reducing electrocution risk for eagles by retrofitting or removing 171 operating power poles. As part of the overall dam and powerhouse removal effort, more than 220 low and medium voltage power poles and associated lines, representing potential electrocution risk for eagles, will be decommissioned, more than achieving the required mitigation offset.

Under the Proposed Action with an eagle take permit issued, KRRC has proposed and will be required to survey and monitor eagle nest sites and breeding territories annually during the 5-year permit period. These surveys will be designed to effectively monitor the nesting status of all known golden eagle and bald eagle breeding pairs situated within 2 miles of the Project footprint, and to survey other areas of suitable nesting habitat where new nesting activity could occur, or currently unoccupied historical breeding areas could be reoccupied. All known pairs of eagles may not attempt to breed at each known breeding territory each year of the Project, and KRRC may utilize their authorized take (17 incidents of take for golden eagles, and 26 incidents of take for bald eagles) as needed during the permit term to meet their needs. However, if the annual monitoring indicates that take of eagles resulting from Project-related disturbances could exceed the level authorized by the eagle incidental take permit (e.g., if new occupied breeding areas are found or historical territories are reoccupied in areas that could be affected by Project activities), KRRC would implement the adaptive management measures as outlined in Section 2.2.5. Alternatively, they could request an amendment to their eagle take permit for additional take.

**Table 2. Comparison of effects of alternative options.**

Component of Interest	Alternative 1: No Action		Alternative 2: Proposed Action – Issue Permit Based on Service’s Take Assessment		Alternative 3: Issue Permit Based on Applicant’s Requested Take	
	Golden Eagle	Bald Eagle	Golden Eagle	Bald Eagle	Golden Eagle	Bald Eagle
Eagle Take Level	Potential for ongoing, existing take from powerline electrocutions and collisions	Potential for ongoing, existing take from powerline electrocutions and collisions. Potential for ongoing diminished productivity due to poor health of river and salmon populations.	17 incidents of take from disturbance to golden eagle breeding pairs over 5 years	26 incidents of take from disturbance to bald eagle breeding pairs over 5 years	4 incidents of take from disturbance to golden eagle breeding pairs	12 incidents of take from disturbance to golden eagle breeding pairs
Avoidance and Minimization	None	None	1. Aircraft avoid occupied nests. 2. Wherever possible, conduct clearing, cutting, and grubbing activities outside of eagle breeding period (January 1 through August 31).	1. Aircraft remain >1,000 feet from occupied nests. 2. Wherever possible, conduct clearing, cutting, and grubbing activities outside of eagle breeding period (January 1 through August 31).	Same	Same
Compensatory Mitigation	None	None	~220 low-to-medium voltage electric utility poles removed or decommissioned, mitigating all predicted take.	None required, but decommissioning ~220 low-to-medium voltage electric utility poles will also reduce electrocution risk for bald eagles.	Same	Same

Component of Interest	Alternative 1: No Action		Alternative 2: Proposed Action – Issue Permit Based on Service’s Take Assessment		Alternative 3: Issue Permit Based on Applicant’s Requested Take	
	Golden Eagle	Bald Eagle	Golden Eagle	Bald Eagle	Golden Eagle	Bald Eagle
Other Supplementary Benefits	None	Reservoirs continue to provide foraging habitat.	1. ~2,000 acres of former reservoir footprint restored to functioning terrestrial habitat for golden eagles. 2. ~8,000 acres conveyed to CDFW and ODLCD for in-perpetuity conservation 3. ~70,000 feet of powerlines removed, reducing electrocution and collision risk. 4. Selected decommissioned power poles left standing to serve as eagle perches.	1. Klamath River restored to support native anadromous and resident fishes, and improve water quality. 2. ~8,000 acres conveyed to CDFW and ODLCD for in-perpetuity conservation 3. ~70,000 feet of powerlines removed, reducing electrocution and collision risk. 4. Selected decommissioned power poles left standing to serve as eagle perches.	Same	Same
Unmitigated Eagle Take	Not applicable.	Not applicable.	None	Not applicable	None	Not applicable
Monitoring	None	None	Third-party monitor annually for 5-year permit term	Third-party monitor annually for 5-year permit term	Same	Same

<b>Component of Interest</b>	<b>Alternative 1: No Action</b>		<b>Alternative 2: Proposed Action – Issue Permit Based on Service’s Take Assessment</b>		<b>Alternative 3: Issue Permit Based on Applicant’s Requested Take</b>	
	<b>Golden Eagle</b>	<b>Bald Eagle</b>	<b>Golden Eagle</b>	<b>Bald Eagle</b>	<b>Golden Eagle</b>	<b>Bald Eagle</b>
Adaptive Management	None	None	Should additional nests/breeding pairs be discovered and require protection: Nest buffers are implemented as needed to ensure authorized take levels are not exceeded, and extended annual monitoring occurs to confirm compliance with authorized take.	Should additional nests/breeding pairs be discovered and require protection: Nest buffers are implemented as needed to ensure authorized take levels are not exceeded, and extended annual monitoring occurs to confirm compliance with authorized take.	Same	Same
Data Collected by Service	None	None	Annual nesting survey report	Annual nesting survey report	Same	Same
Company Liability for Eagle Take	No	No	No (if in compliance with permit conditions)	No (if in compliance with permit conditions)	No (if in compliance with permit conditions)	No (if in compliance with permit conditions)

## **6.0 List of Acronyms**

BLM	Bureau of Land Management
CDFW	California Department of Fish and Wildlife
DPS	Distinct Population Segment
EA	Environmental Assessment
ECP	Eagle Conservation Plan
EIS	Environmental Impact Statement
EMU	Eagle Management Unit
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
LAP	Local Area Population
NEPA	National Environmental Policy Act
NWR	National Wildlife Refuge
ODFW	Oregon Department of Fish and Wildlife
ODLCD	Oregon Department of Land Conservation and Development
OEF	Oregon Eagle Foundation
PEIS	Programmatic Environmental Impact Statement
REA	Resource Equivalency Analysis
USFS	U.S. Forest Service

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## **Appendix A. Applicant's Eagle Conservation Plan**



**Lower Klamath Project  
FERC Project No. 14803**

**Bald and Golden Eagle  
Conservation Plan**

**Klamath River Renewal Corporation  
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January 2022

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## Executive Summary

This Bald and Golden Eagle Conservation Plan was prepared by the Klamath River Renewal Corporation to support an application to the U.S. Fish and Wildlife Service for incidental take permits under the Bald and Golden Eagle Protection Act for removal of facilities associated with the Lower Klamath Project (FERC No. 14803). Incidental take permits are needed because the Proposed Action may result in otherwise prohibited disturbance to bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*). This document demonstrates that potential effects to bald and golden eagles, including to all known nest sites, from the Proposed Action have been thoroughly considered and are addressed through avoidance, minimization, and mitigation measures.

After the review of data on the locations of historic bald and golden eagle nest territories, surveys conducted by the Klamath River Renewal Corporation from 2017 through 2021 identified recently occupied nest sites at 11 bald eagle and 8 golden eagle territories within the Project Area as of July 1, 2021. Reproduction at 10 bald eagle nest sites and 2 golden eagle nest sites may be disturbed if the nests are occupied during activities associated with the Proposed Action, but no adult or post-fledging immature bald or golden eagles will be injured or killed.

The purpose of the Proposed Action is to physically remove the Lower Klamath Project and achieve a free-flowing condition and volitional fish passage, site remediation and restoration, and avoidance of adverse downstream impacts. However, the underlying purpose of the Proposed Action is the restoration of anadromous fish access upstream of Iron Gate Dam (the current barrier to anadromy) and the timely improvement of water quality in the Klamath River downstream of J.C. Boyle Dam. Restoration of the Project to a free-flowing condition will modify the foraging resources of bald eagles and may disrupt their breeding until their riverine prey resources (anadromous and resident species) have stabilized. Restoration will add approximately 2,200 acres of terrestrial foraging habitat, including an 18 percent increase in foraging habitat within the core area of one golden eagle territory and a 3 percent increase in another golden eagle territory. Potential adverse effects that may occur if eagle nest sites are occupied would be limited to disturbance from construction- and restoration-related activities.

The Proposed Action will incorporate avoidance, minimization, and mitigation measures. These include restoration of up to 2,200 acres of terrestrial and over 400 miles of riverine habitats and an increase in primary eagle prey species associated with these habitats, removal of approximately 73,000 feet of power lines and over 200 12-69 kV power poles, and elimination of 200+ acres of human footprint. More than 8,000 acres of watershed lands will be conveyed to State agencies, including 6,998 acres to the California Department of Fish and Wildlife and 1,060 acres to the Oregon Department of Land Conservation and Development. In addition, lands owned by the Bureau of Land Management adjacent to J.C. Boyle Reservoir that are now managed by PacifiCorp for hydropower generation will be restored and returned to the Bureau of Land Management. Overall, restoration of the Klamath River and tributaries in this area will realize a significant net conservation benefit to bald and golden eagles in perpetuity.

## 1.0 Introduction

The Lower Klamath Project (FERC No. 14803) consists of four hydroelectric developments on the Klamath River: J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate (Figure 1). Specifically, the reach between J.C. Boyle dam and Iron Gate dam is known as the Hydroelectric Reach. In September 2016, the Klamath River Renewal Corporation (Renewal Corporation) filed an *Application for Surrender of License for Major Project and Removal of Project Works*, FERC Project Nos. 2082-063 & 14803-001 (License Surrender). The Renewal Corporation filed the License Surrender Application as the dam removal entity for the purpose of implementing the Klamath River Hydroelectric Settlement (KHSA). In November 2020, the Renewal Corporation filed its Definite Decommissioning Plan (DDP) as Exhibits A-1 and A-2 to its Amended License Surrender Application (ALSA). The DDP is the Renewal Corporation's comprehensive plan to physically remove the Lower Klamath Project and achieve a free-flowing condition and volitional fish passage, site remediation and restoration, and avoidance of adverse downstream impacts (Proposed Action).

The Proposed Action (or Project) includes the deconstruction of the J.C. Boyle Dam and Powerhouse (Figure 2), Copco No. 1 Dam and Powerhouse (Figure 3), Copco No. 2 Dam and Powerhouse (Figure 4), and Iron Gate Dam and Powerhouse (Figure 5), as well as associated features. Associated features vary by development, but generally include powerhouse intake structures, embankments and sidewalls, penstocks and supports, decks, piers, gatehouses, fish ladders and holding facilities, pipes and pipe cradles, spillway gates and structures, diversion control structures, aprons, sills, tailrace channels, footbridges, powerhouse equipment, distribution lines, transmission lines, switchyards, original cofferdams, portions of the Iron Gate Fish Hatchery, residential facilities, and warehouses. Facility removal will be completed within an approximately 20-month period. The term Proposed Action also includes construction of Fall Creek Fish Hatchery, modification of roads, and restoration actions in Klamath River tributaries following reservoir drawdown.

The term Project Reach is the entire portion of the Klamath River that includes the Hydroelectric Reach and J.C. Boyle Reservoir above J.C. Boyle Dam (up to approximately River Mile 234) and downstream through Iron Gate Fish Hatchery (at approximately River Mile 192) below Iron Gate Dam. It includes Copco No. 1 Reservoir, the small Copco No. 2 Reservoir, and Iron Gate Reservoir. This area is separately defined because these features are within the extent of the river affected by the removal of the Lower Klamath Project facilities.

In this Bald and Golden Eagle Conservation Plan (Eagle Conservation Plan), the term Project Area includes the Hydroelectric Reach, the Project Reach, and the broader neighboring area where activities or effects may occur. The Project Area contains the Fall Creek Fish Hatchery, tributaries to the reservoirs, roads associated with the hydroelectric facilities, the local human communities, and the bald and golden eagle territories and nest sites that are being considered for potential effects from the Proposed Action.

This Eagle Conservation Plan was prepared by the Renewal Corporation to support an application to the U.S. Fish and Wildlife Service (USFWS) for an incidental take permit under the U.S. Bald and Golden Eagle Protection Act (BGEPA) for the Proposed Action (FERC No. 14803). An incidental take permit is needed because the Proposed Action may result in otherwise prohibited disturbance to bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*). This document demonstrates that the potential effects of the Proposed Action to bald and golden eagles, including to all known nest sites, have been avoided, minimized, and/or mitigated through measures included in the Eagle Conservation Plan and therefore incorporated into the Proposed Action.

This Eagle Conservation Plan is a subplan to the Terrestrial and Wildlife Management Plan, one of 16 Management Plans prepared by the Renewal Corporation for the Federal Energy Regulatory Commission's (FERC, or Commission) review and approval as conditions of a license surrender order. These Management Plans were developed in consultation with federal, state, and county governments and tribes.

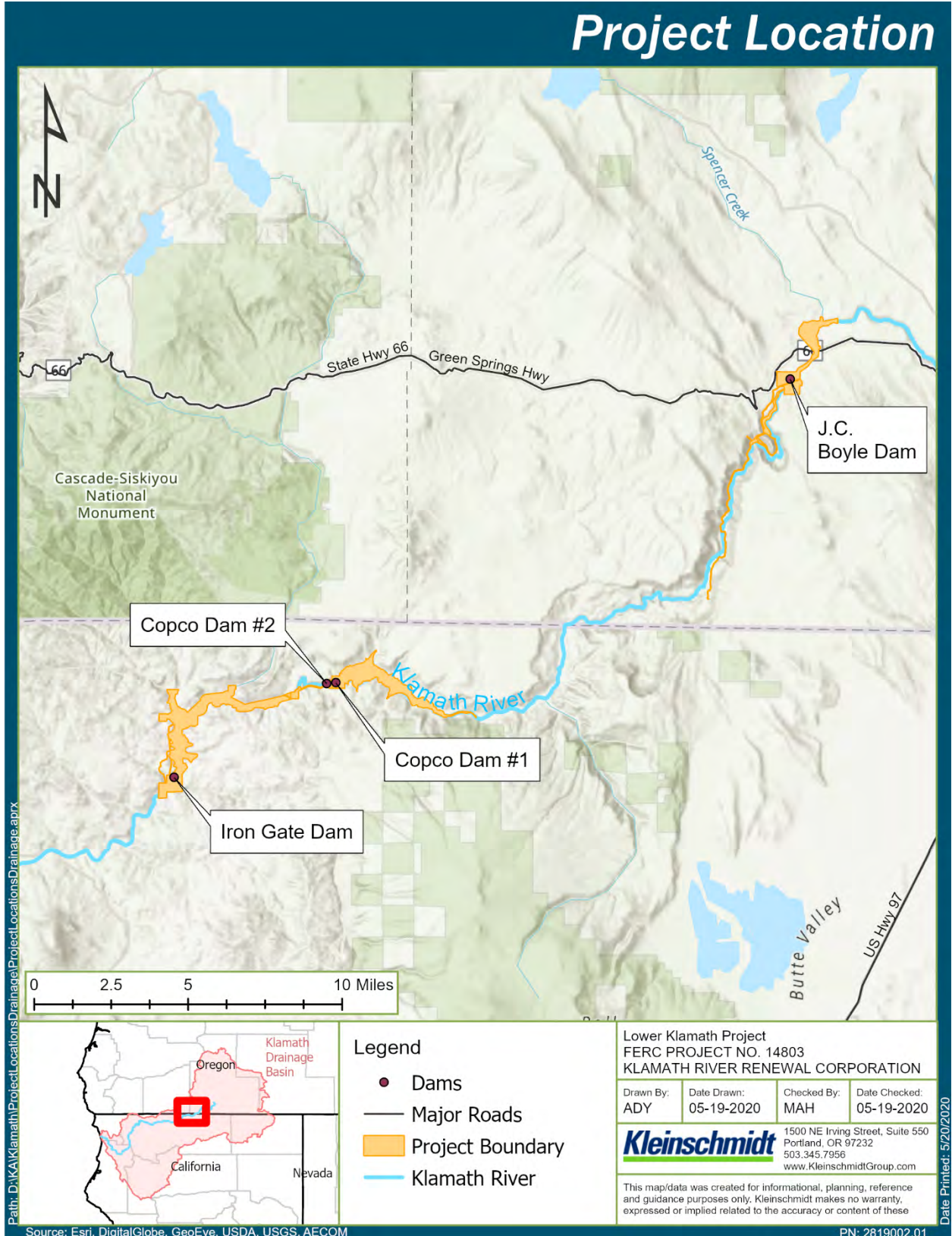


Figure 1. Lower Klamath Project Location

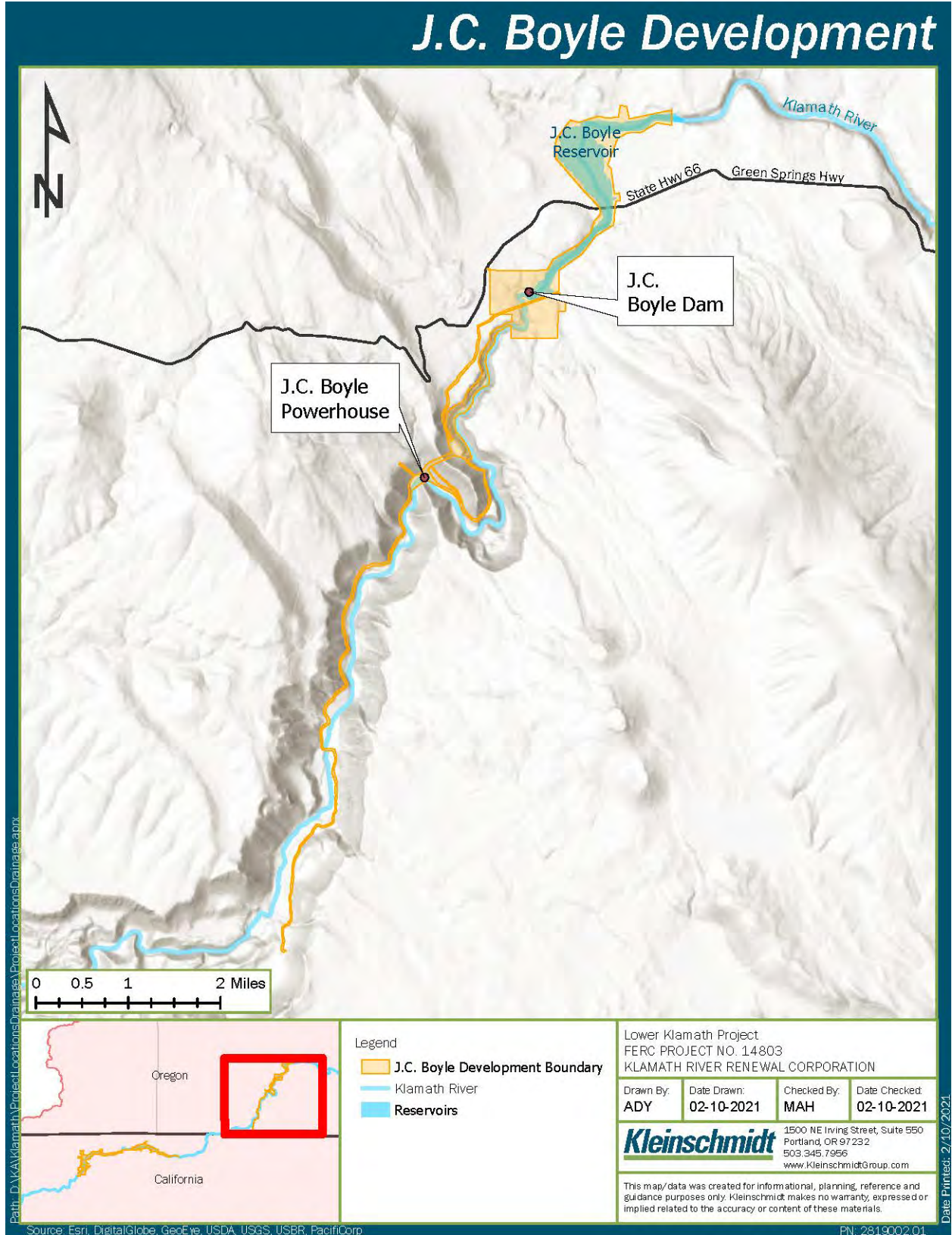
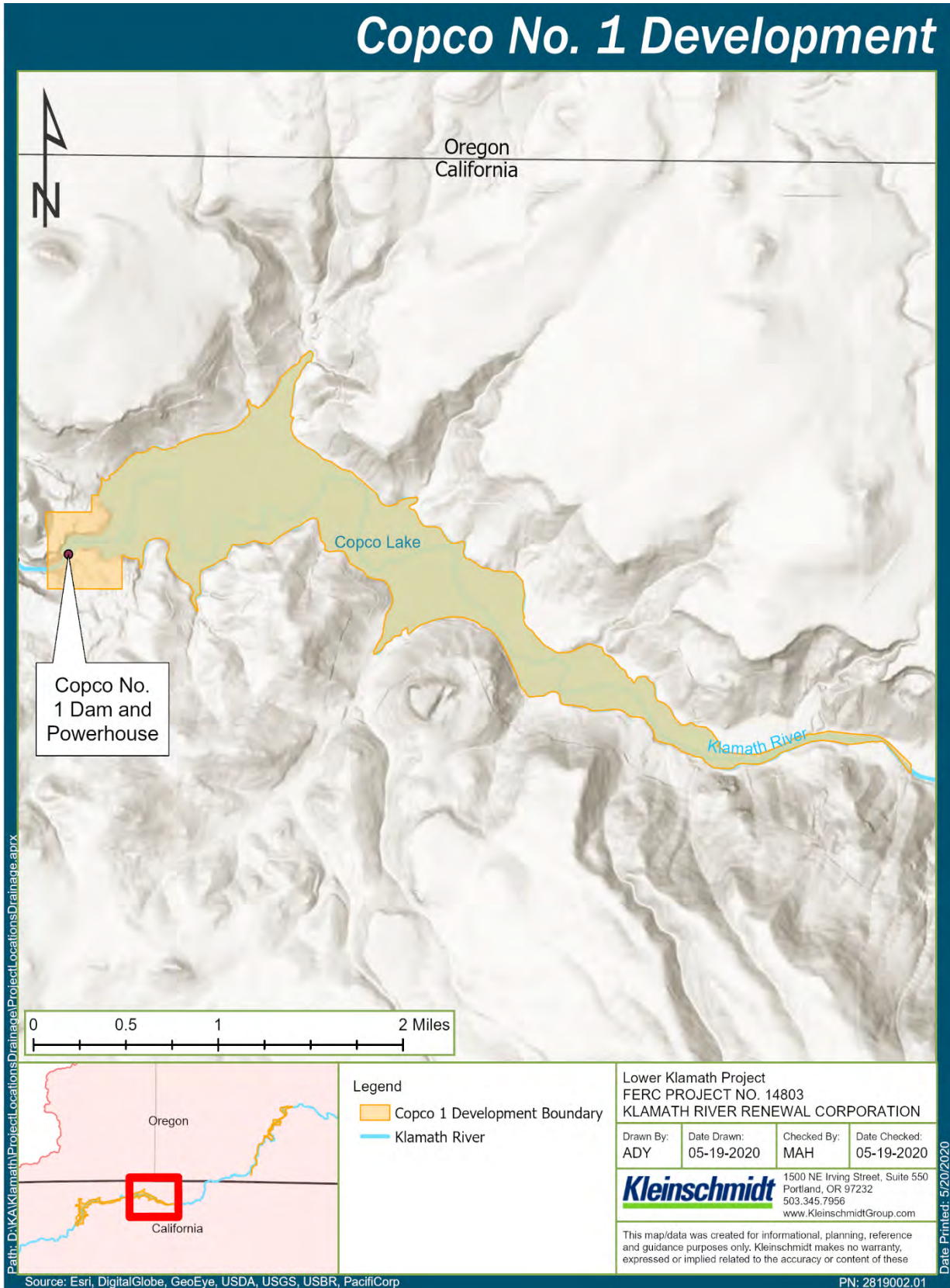


Figure 2. J.C. Boyle Development Area



**Figure 3. Copco No. 1 Development Area**

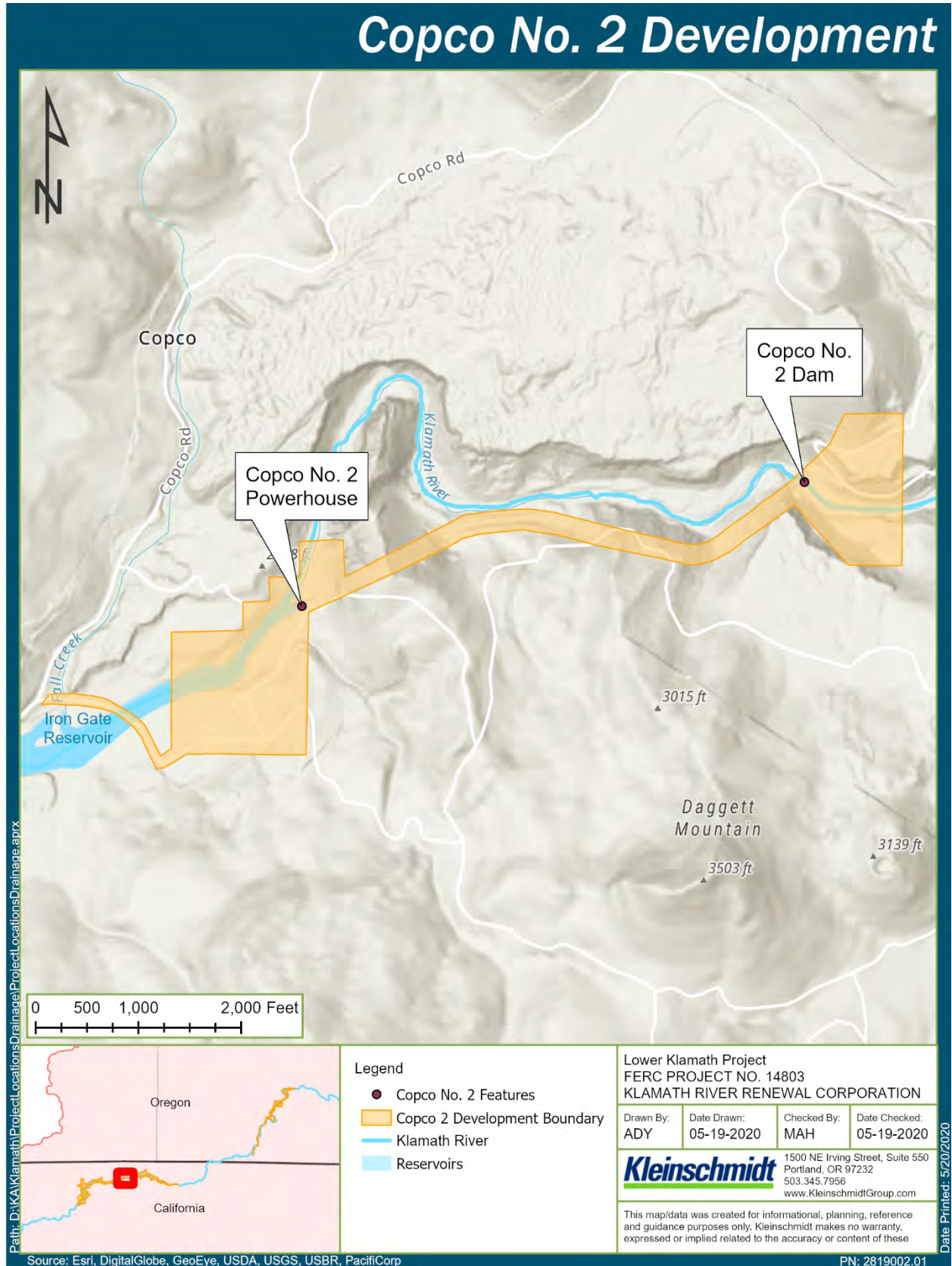


Figure 4. Copco No. 2 Development Area

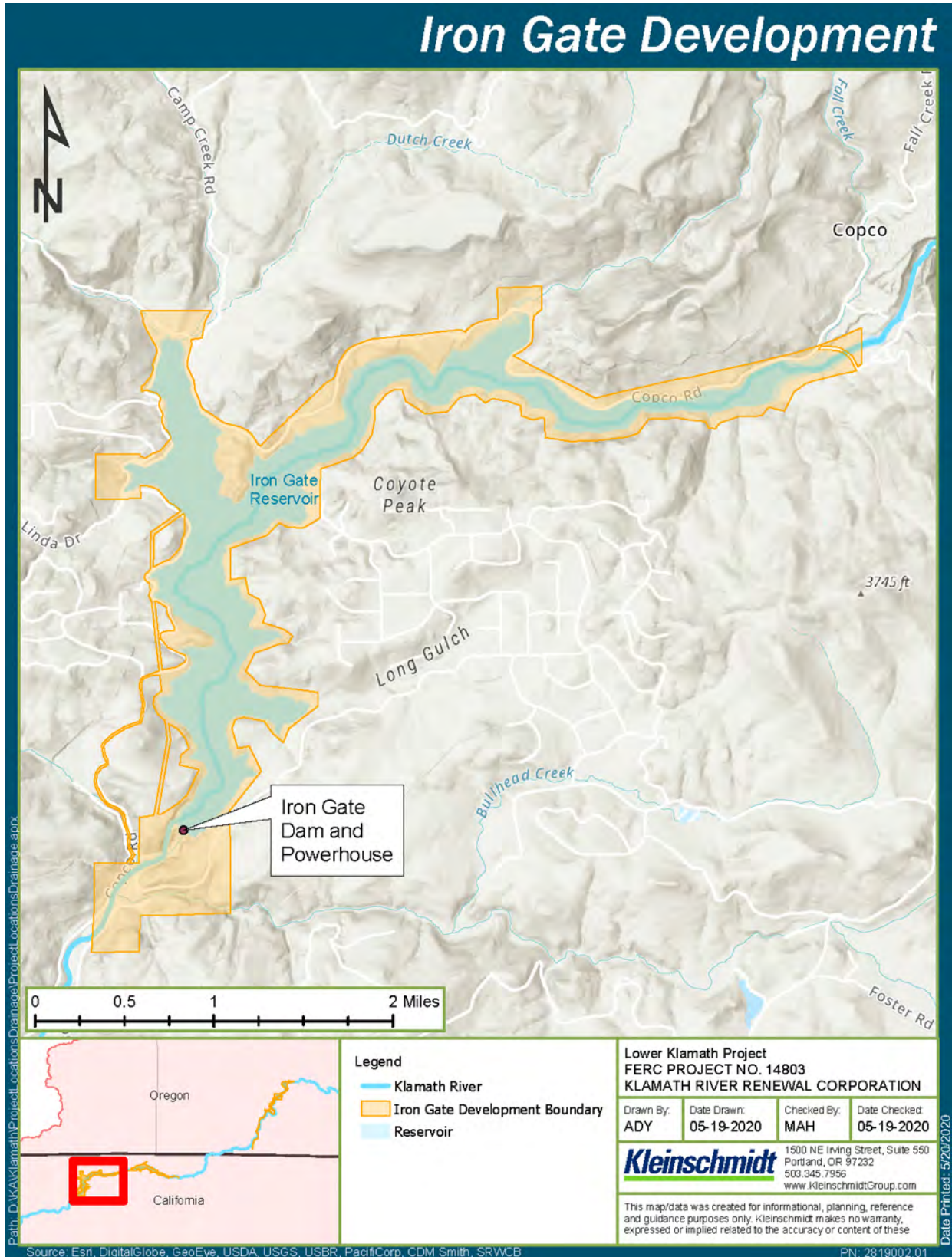


Figure 5. Iron Gate Development Area

## **1.1 Purpose of Bald and Golden Eagle Conservation Plan**

The purpose of the Proposed Action is to physically remove the Lower Klamath Project and achieve a free-flowing condition and volitional fish passage, site remediation and restoration, and avoidance of adverse downstream impacts. This will lead to the restoration of anadromous fish access upstream of Iron Gate Dam (the current barrier to anadromy) and the timely improvement of water quality in the Klamath River downstream of J.C. Boyle Dam.

The Renewal Corporation has identified four objectives for the Proposed Action to achieve this purpose:

1. Restore volitional anadromous fish passage in the Klamath Basin to viable habitat currently made inaccessible by the Lower Klamath Project dams.
2. Advance the long-term restoration of the natural fish populations in the Klamath Basin, with particular emphasis on restoring the salmonid fisheries used for subsistence, commerce, Tribal cultural purposes, and recreation.
3. Improve the long-term water quality conditions associated with the Lower Klamath Project in the California and Oregon reaches of the Klamath River, including water quality impairments due to *Microcystis aeruginosa* and associated toxins, water temperature, and levels of bio-stimulatory nutrients.
4. Ameliorate conditions underlying high disease rates among Klamath River salmonids.

Meeting these objectives is expected to provide long-term benefits to bald and golden eagles in the Project Area by returning inundated areas to terrestrial habitat and restoring anadromous and resident fish to the ecosystem. Because the benefits of the Proposed Action will accrue in perpetuity, they will far outweigh the short-term impacts to eagles of both species. Incidental take permits under the BGEPA are needed because activities required to accomplish the above objectives (i.e., dam removal and habitat restoration) are likely to temporarily disturb bald and golden eagles in the Project Area. In support of the application for appropriate permits, the following sections 1) evaluate the likelihood and severity of potential effects to both eagle species, 2) identify the avoidance, minimization and mitigation measures that will be implemented, 3) demonstrate the net conservation benefit to the species, and 4) quantify the effects requiring permits.

## **2.0 Regulatory Setting**

### **2.1 Federal Statutes and Regulations Protecting Eagles**

Bald and golden eagles are protected by the BGEPA (16 U.S.C. §§ 668–668d) and the Migratory Bird Treaty Act (16 U.S.C. §§ 703–712).

#### **2.1.1 Bald and Golden Eagle Protection Act, 16 U.S.C. §§ 668–668d**

The BGEPA protects bald and golden eagles by prohibiting take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, or export or import any eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. See 16 U.S.C. § 668(a); 50 C.F.R.

Part 22. “Take” is defined as to “pursue, shoot, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb” (50 C.F.R. § 22.3). “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, by substantially interfering with normal breeding, feeding, or sheltering behavior.” *Id.*

### **2.1.2 Migratory Bird Treaty Act, 16 U.S.C. §§ 703–712**

The Migratory Bird Treaty Act provides that it shall be unlawful, except as permitted by regulations, to “pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export” any migratory bird, or any part, nest, or egg of any migratory bird (16 U.S.C. § 703(a)). The Migratory Bird Treaty Act’s general prohibition covers all migratory birds, including bald and golden eagles (50 C.F.R. § 10.13(c)). “Take” is defined as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect” bald and golden eagles and other migratory bird species covered under the Act (*Id.* § 10.12). This prohibition does not include harassment and habitat modification that does not result in direct loss of birds, nests, or eggs (*Id.* § 10.14). While there currently is no procedure to obtain authorization for the incidental take of migratory birds, the USFWS announced in an advance notice of proposed rulemaking its intention to establish a permitting program (86 Fed. Reg. 54667, Oct. 4, 2021).

### **2.1.3 USFWS Eagle Take Regulations, 50 C.F.R. Part 22**

On June 5, 2007, concurrent with removing the bald eagle from listing under the Federal Endangered Species Act (ESA), the USFWS published a proposed rule for a new permit that would authorize take under the BGEPA (72 Fed. Reg. 31141). The rule was finalized on September 11, 2009 (74 Fed. Reg. 43686) and was subsequently revised as described below. The new permit type authorizes take of bald eagles and golden eagles that is associated with, but not the purpose of, an activity; it also creates a second permit type that authorizes purposeful take of eagle nests that pose a threat to human or eagle safety. The second permit type was subsequently broadened to accommodate additional circumstances for purposeful take.

On April 13, 2012, the USFWS initiated two additional rulemakings for eagles: (1) a proposed rule to extend the maximum permit tenure for programmatic, nonpurposeful take permit regulations from 5 to 30 years, among other changes (Duration Rule) (77 Fed. Reg. 22267); and (2) an advance notice of proposed rulemaking soliciting input on all aspects of those nonpurposeful take regulations (77 Fed. Reg. 22278). The Duration Rule was finalized on December 9, 2013 (78 Fed. Reg. 73704). As a next step, on June 23, 2014, the USFWS issued a notice of intent to prepare an Environmental Assessment or Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (79 Fed. Reg. 35564); for the previous rulemaking. The USFWS then developed proposed regulations and a Draft Programmatic EIS

was issued on May 6, 2016 (81 Fed. Reg. 27934). In December 2016, a Final Programmatic EIS and Record of Decision were issued along with a Final Rule (81 Fed. Reg. 91494) revising the regulations for nonpurposeful take of eagles and eagle nests.

The revised regulations and accompanying materials sought to clarify various aspects of the requirements for compensatory mitigation for the take of eagles. Of particular relevance to the Lower Klamath Project, the Questions and Answers provided by the USFWS (<https://www.fws.gov/migratorybirds/pdf/management/eagleregsQandA.pdf>) stated “if the activity that necessitates the nest removal will, in and of itself, provide a net benefit to eagles, compensatory mitigation is not needed.” While this passage refers specifically to the regulation regarding nest removal, 50 C.F.R. § 22.27, it describes the Proposed Action, which will be permitted under 50 C.F.R. § 22.26. The regulations also provide that compensatory mitigation will be “scaled to project impacts” (50 C.F.R. § 22.26(c)(1)(i)). The temporary actions that will remove the dams, restore streams and volitional fish passage, and increase the local amount of terrestrial habitat necessitate possible short-term disturbance of eagles.

## **2.2 State Statutes and Regulations Protecting Eagles**

### **2.2.1 California State Regulations**

The bald eagle is listed as endangered under the California Endangered Species Act (CAL. FISH & G. CODE §§ 2050–2115.5), and both the bald eagle and golden eagle are listed as Fully Protected Species (*id.* § 3511). As Fully Protected Species, bald and golden eagles may not be taken or possessed at any time, and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the species for the protection of livestock (*id.*). Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird and specifically states that it is unlawful to take, possess, or destroy any raptors (e.g., hawks, owls, eagles, and falcons), including their nests or eggs.

### **2.2.2 Oregon State Regulations**

Bald and golden eagles are not listed under Oregon’s Threatened and Endangered Species Act (OR. REV. STAT. §§ 496.171–496.192). Bald eagle nest sites are afforded protection pursuant to the Oregon Department of Forestry’s “Specified Resource Site Protection Rules” (Or. Admin. R. 629-665-0100 and 0130).

## **2.3 Proposed Action Compliance with Other Federal Legal Requirements**

### **2.3.1 Federal Power Act, 16 U.S.C. §§ 791a–828c**

Pursuant to the Federal Power Act, on September 23, 2016, the Renewal Corporation applied to FERC to remove the dams and associated facilities that together form the Lower Klamath Project (FERC No. 14803). The Renewal Corporation filed a “Joint Application for Approval of License Amendment and License Transfer” (Transfer Application) with FERC. PacifiCorp was seeking a separate license for the J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate developments, known as the Lower Klamath Project, and to transfer the license from PacifiCorp

to the Renewal Corporation. Concurrent with this filing, the Renewal Corporation filed an Application for Surrender of License for Major Project and Removal of Project Works, seeking FERC’s approval of an application to surrender the license for the Lower Klamath Project. In response to a subsequent Commission ruling, on November 17, 2020, the Renewal Corporation, PacifiCorp, and the States of California and Oregon signed a Memorandum of Agreement that called for the transfer of the license from PacifiCorp to the Renewal Corporation and the States and the removal of PacifiCorp from the license. In January 2021, the Renewal Corporation, PacifiCorp, and the States jointly submitted a License Transfer Application to FERC, which stipulated that the Renewal Corporation would lead the effort to remove the four Klamath hydroelectric dams in partnership with the States. On June 17, 2021, FERC approved the transfer of the Lower Klamath Project from PacifiCorp to the Renewal Corporation and the States of Oregon and California. The BGEPA permits for bald and golden eagles will be submitted to FERC as part of the license transfer and surrender process.

### **2.3.2 Clean Water Act, 33 U.S.C. §§ 1251–1389**

Pursuant to Section 404 of the Clean Water Act (33 U.S.C. § 1344), the Renewal Corporation submitted an application for a Department of Army Corps of Engineers (Corps) permit for the discharge of dredged or fill material into Waters of the U.S.

The Renewal Corporation acquired Section 401 Water Quality Certifications (33 U.S.C. § 1341) from the States of Oregon and California on September 7, 2018 and April 7, 2020, respectively.

The Renewal Corporation will submit a Section 402 National Pollutant Discharge Elimination System (NPDES) Stormwater Construction General Permit No. 1200-C (33 U.S.C. § 1342) to the Oregon Department of Water Quality and a Section 402 NPDES Construction General Permit to California’s North Coast Regional Water Quality Control Board prior to license surrender. Work associated with the Proposed Action will not commence until these permits are approved.

### **2.3.3 Endangered Species Act, 16 U.S.C. §§ 1531–1544, and Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. §§ 1801–1891d**

On August 2, 2021, FERC initiated formal consultation on the Proposed Action with the USFWS and the National Marine Fisheries Service (NMFS) pursuant to Section 7 of the ESA and the joint agency implementing regulations (50 C.F.R. Part 402), and with NMFS pursuant to Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and its implementing regulations (50 C.F.R. § 600.920). A Biological Assessment (BA) prepared in coordination with the USFWS and NMFS was provided with the Commission’s request for formal consultation. The Commission has designated PacifiCorp and the Renewal Corporation as the Commission’s non-federal representatives for carrying out informal consultation, pursuant to the ESA and the MSA.

### **2.3.4 National Historic Preservation Act, 54 U.S.C. §§ 300101–307108**

The Commission has initiated consultation on the Proposed Action with the California and Oregon State Historic Preservation Officers, as required by Section 106 of the National Historic Preservation Act, and has designated the Renewal Corporation as its non-Federal representative pursuant to 36 C.F.R. § 800.2(c)(4). Consultation has included Historic Preservation Officers from all relevant Tribes.

### **2.3.5 National Environmental Policy Act, 42 U.S.C. §§ 4321–4347**

Regarding the proposed license surrender and removal of the Lower Klamath Project (FERC No. 14803), the Commission issued a Notice of Intent to Prepare an Environmental Impact Statement and Notice of Scoping Sessions on June 24, 2021 (86 Fed. Reg. 33262) for the Proposed Action. The USFWS has provided comments to the Commission regarding this Project on numerous occasions. The Renewal Corporation expects that the USFWS will prepare an Environmental Assessment for the eagle permit issuance.

## **3.0 Project Reach Description and Environmental Setting**

The Proposed Action is located in the Klamath River Basin of northern California and southern Oregon (Figure). The Klamath River Basin can be divided into three physical geographic regions: the Upper, Middle, and Lower Klamath sub-basins. The Proposed Action will be located within a portion of the Upper Klamath sub-basin upstream from Iron Gate Dam (approximately 2,200 ft elevation) and includes the Copco No. 1 and 2 Dams (approximately 2,700 ft elevation) and the J.C. Boyle Dam (approximately 3,800 ft elevation). The Upper Basin continues up through Upper Klamath Lake and its contributing watershed. The Middle and Lower Klamath sub-basins occur below Iron Gate Dam and continue down to the Klamath River's confluence with the Pacific Ocean.

### **3.1 Terrestrial Setting**

Vegetation in the Project Reach is described in detail in the Final Environmental Impact Report for the Lower Klamath Project License Surrender (State Water Resources Control Board (SWRCB) 2020). Vegetation communities include Klamath mixed conifer, ponderosa pine, juniper, mixed chaparral, montane chaparral, montane hardwood, montane hardwood-conifer, grassland, riparian, and wet meadow and are recognized for their biological diversity.

Terrestrial resources within the High Cascade and Klamath Range Subregions are defined in Baldwin et al. (2012). The High Cascade Subregion is characterized by ponderosa pine (*Pinus ponderosa*), other montane fir/pine species, and lodgepole pine (*Pinus contorta* subsp. *murrayana*) forests. The Klamath-Siskiyou mountain ranges are recognized for their biological diversity, supporting more than 3,000 plant species including 30 temperate conifer tree species, more than any other ecosystem in the world; these temperate conifer tree species include Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), ponderosa pine, and sugar pine (*Pinus lambertiana*) (Wallace 1983, Baldwin et al. 2012).

In addition to their ecological significance, many plants, especially wetland plants, in the Klamath River Basin are culturally important to Indian Tribes in the Klamath River region for food, basketry, regalia, and medicine, and some have importance for ceremonial use as well. See Cultural references cited in FERC (2007).

The vegetation near the J.C. Boyle facilities is dominated by stands of several species of fir and pine. Industrial timber management has been conducted near the J.C. Boyle Development for decades. Further downstream, vegetation gradually becomes dominated by pine, juniper, brush, and grassland.

Recent and historic wildfires have affected vegetation cover within and adjacent to the Project Reach. The 2014 Oregon Gulch fire affected approximately 35,000 acres immediately adjacent to Copco No. 1 Reservoir and the 2018 Klamathon fire affected 38,000 acres adjacent to and west of Iron Gate Reservoir, including the Scotch Creek and Camp Creek area and the river reach downstream of Iron Gate Reservoir.

The major land uses in the Project Reach include rangeland, timber management, recreation (hunting, fishing, boating), small rural communities, and dispersed ranchettes. The main nearby urban areas are Klamath Falls, Oregon (15 air miles northeast of J.C. Boyle) and Yreka, California (17 air miles southwest of Iron Gate). A portion of the Project Reach is developed as hydroelectric facilities and recreation sites, and residential developments occur around portions of Copco No. 1 Reservoir.

### **3.2 Hydrologic Setting**

Major hydrologic changes to the Klamath Basin were triggered by construction of the U.S. Bureau of Reclamation's (Reclamation's) Klamath Project ([www.usbr/mp/kbao](http://www.usbr/mp/kbao)) following its authorization in 1905. This irrigation project includes Link River Dam at Klamath Falls, Oregon, and Keno Dam near Keno, Oregon, along with several hundred miles of irrigation ditches, large diversion and conveyance canals, and pumping plants that divert water from the Klamath River watershed for agricultural use and return excess water to the Klamath River. This infrastructure supported the agricultural community that was already established to some extent in the Upper Klamath Basin and reclaimed thousands of acres of additional wetlands for homesteading purposes.

The water diversions and returns of Reclamation's Klamath Project are all upstream of the Proposed Action but influence the river flows through that project's reservoirs and hydroelectric generation facilities. Development of hydroelectric plants in the Klamath Basin began as early as 1891 on the Shasta River to provide electricity for the City of Yreka. Klamath Hydroelectric Project facilities were constructed by the California Oregon Power Company (Copco) beginning with Copco No. 1 (1918), followed by Copco No. 2 (1925), and reconstruction of the old Eastside facility at Klamath Falls in 1924. After World War II, regional population growth prompted a new round of hydroelectric power expansion highlighted by Copco's Big Bend project (J.C. Boyle Dam and Powerhouse) in 1958 and the construction of the Iron Gate facilities

in 1962. The Copco corporation merged with Pacific Power and Light in 1961; the utility is now known as PacifiCorp.

## **4.0 Description of the Proposed Action**

The location of the primary facilities, along with important geographic features, included in the Proposed Action are depicted in Appendix A (Figure A-1 through Figure A-9). The Proposed Action includes the decommissioning and removal of four dams (Iron Gate, Copco No. 1, Copco No. 2, and J.C. Boyle) and their associated reservoirs and hydropower generation facilities; the reconstruction of the Fall Creek Fish Hatchery and modification and demolition of the Iron Gate Fish Hatchery; and wetland, riparian, and upland habitat restoration within the former reservoir footprints, the mainstem Klamath River, and priority tributaries (Scotch, Camp, Jenny, Beaver, and Spencer Creeks).

The Proposed Action will occur between approximately River Miles 193 and 234 upstream from the Pacific Ocean and generally between Hornbrook, California and Keno, Oregon. The Proposed Action will include preparation of bridges, roads, and work sites; equipment transport; reservoir drawdown; demolition and removal of structures; site rehabilitation; and habitat restoration. Currently, the Proposed Action is anticipated to occur over a three-year period starting in 2023. In this document, we refer to the three years of activities as Year One (year prior to drawdown), Year Two (drawdown year), and Year Three (year following the drawdown year); however, the exact timing is subject to regulatory approvals.

Pre-drawdown activities are scheduled to begin in April of Year One. Copco No. 2 Dam, which impounds a reservoir of only a few acres, will be demolished during June through August of Year One. Because the three larger dams are all constructed differently, the early stages of preparation and demolition will begin at different times in Year One prior to beginning the drawdown of the reservoirs in November of Year One. Drawdown will extend into spring months of Year Two, and demolition and removal of materials will occur throughout the spring and summer of Year Two. All demolition is planned to be completed by the end of Year Two. Restoration will begin simultaneously with reservoir drawdown, sediment evacuation and vegetation seeding will begin immediately, and significant restoration activities, including revegetation and tributary reconstruction, will be mostly completed in Year Three.

The major structures and features proposed for removal, modification, reconstruction, and restoration include the following (reservoir acres are approximate and vary with hydropower operations):

- The J.C. Boyle Dam, power canal, penstocks, timber bridge, and powerhouse (demolition), with the associated 350-surface-acre J.C. Boyle Reservoir
- J.C. Boyle bypass flow “scour hole” (restoration)
- Copco No. 1 Dam and Powerhouse (demolition), with the associated 972-surface-acre Copco No. 1 Reservoir

- Copco No. 2 Dam, penstocks, and powerhouse (demolition)
- Iron Gate Dam, powerhouse, and fish-holding facilities (demolition) with the associated 942-surface-acre Iron Gate Reservoir
- Removal of transmission and distributions lines and over 200 supporting pole structures
- Iron Gate Fish Hatchery (modification and demolition)
- Fall Creek Fish Hatchery (reconstruction)
- City of Yreka water supply transport facility (reconstruction)
- Re-exposed river channel, channels of primary tributaries, wetlands, and floodplain (restoration)

The following general list of activities is roughly aligned in planned order of occurrence. Many activities have overlapping schedules. Detailed discussions of the potential impacts to eagles from each activity are included below in section 5.2.2. References to schedules are derived from “Lower Klamath Project Schedule of Activities: Presentation to Agencies, April 1, 2021” (Renewal Corporation 2021a) and “Klamath River Reconstruction Project, Implementation Work Schedule:100% DCD 2022 Start” (Renewal Corporation 2021b), supplemented by personal communications with Renewal Corporation contractors and subcontractors.

1. Prior to hauling of heavy equipment to work sites, several types of temporary modifications to bridges will be installed on the public Copco Road at Dry Creek below Iron Gate Dam and at Fall Creek, on the public Lakeview Road across the Klamath River below Iron Gate Dam, and on PacifiCorp's Daggett Road across Fall Creek and the Klamath River near Copco No. 2 Powerhouse. This work will occur beginning July 15 of Year One, extending through September of Year One.
2. The paved public Copco Road from Ager Road below Iron Gate Dam eastward to the Copco Access Road near Copco No. 1 Dam will provide access to those facilities. This road will be improved during July 15 through January 16 of Years One and Two.
3. New fish hatchery facilities will be constructed at the site of the old hatchery on Fall Creek during July through December of Year One.
4. Beginning in May of Year One, equipment will be hauled over Copco Road to the demolition sites at the Copco No. 1 and 2 facilities and Iron Gate Dam. When no longer needed, this equipment will be hauled away during Year Two.
5. During July through November of Year One, Copco No. 2 Dam will be removed.
6. During September through November of Year One, 13 recreation sites around the reservoirs will be removed along with their access roads, and native vegetation reestablished. The recreation sites are small, and demolition will entail use of bulldozers, tractors, and other small equipment.

7. At Copco No. 1 Dam and Iron Gate Dam, site preparation and dam modifications will begin during May of Year One. These activities will include building access roads; setting up trailers, etc.; construction of equipment platforms at the downstream side of the dams; and construction of diversion structures. Demolition activities will begin at Copco No. 1 Dam in July and will continue through the end of Year One. At J.C. Boyle Dam and Powerhouse, preparation will begin in December of Year One and January of Year Two.
8. At the end of July of Year One, a dredging barge will be constructed at the PacifiCorp boat ramp on the south side of Copco No. 1 Reservoir (Keaton Cove aka Mallard Cove) for use at the upstream side of Copco No. 1 Dam. The barge will be demobilized in September of Year One.
9. Drawdown of reservoir pools will begin in November and December of Year One at the three large reservoirs. In Year Two, the drawdown will primarily occur in January at J.C. Boyle Reservoir, from January to July at both Copco Reservoirs, and from January to October at Iron Gate Reservoir. Reservoir levels may fluctuate during these periods with variations in precipitation. During drawdown, small boats equipped with pumps along with workers on foot may wash sediment from slopes and tributary stream channels exposed by drawdown, particularly in areas where focused restoration will occur.
10. Demolition of the three large dams, powerhouses, and associated facilities including transmission/distribution lines and poles will begin at Copco No. 1 Dam and Copco No. 2 Dam in the summer of Year One and continue through most of Year Two. At J.C. Boyle Dam and Iron Gate Dam, most demolition activities will occur during Year Two. Demolition at each site, including blasting, is described below in section 5.0.
11. The Fall Creek Fish Hatchery, which is currently inactive, will be reconstructed during July 15 of Year One through January 16 of Year Two. The existing fish collection facilities at Iron Gate Dam will be demolished along with the dam during Year Two, but the Iron Gate Fish Hatchery may remain in limited operation for a limited period after dam removal to support fish production.
12. Several electrical switching yards will be removed along with more than 14 miles of transmission/distribution lines and more than 200 12-69kV power poles (Table 4-1). The schedule will vary depending on when different facilities are disconnected and demolished.

**Table 4-1. Power Pole Removals**

<b>LINE VOLTAGE (kV)</b>	<b>NUMBER OF POLES TO BE REMOVED</b>
2.4	10
2.5	9
12	43

LINE VOLTAGE (kV)	NUMBER OF POLES TO BE REMOVED
12.5	52
69	108
<b>TOTAL</b>	<b>222</b>

13. Concrete, rock, and earth materials from demolished dams and powerhouses will be hauled and buried at nearby sites to the greatest extent possible. Disposal sites often will incorporate pits where material was excavated at the time of construction.
  
14. Steel and treated wood from dams and other structures along with waste from electrical facilities will be separated from concrete at the demolition sites and hauled over public roads to transfer stations during January through October of Year Two. Material from facilities at J.C. Boyle Dam and Powerhouse will be carried east over Highway 66 to a landfill near Klamath Falls, Oregon. Material from facilities at the two Copco Dams and Iron Gate Dam will be carried west over Copco Road to Interstate 5 and on to a transfer station near Yreka, California, and a landfill near Anderson, California.
  
15. Following completion of demolition and hauling, the existing culverts and road approaches at Scotch Creek and Camp Creek will be removed, larger box culverts constructed, and Copco Road rebuilt during October through November of Year Two. The Daggett Road bridge across the Klamath River will also be reconstructed.
  
16. Improvement of four fish-bearing tributaries to the Klamath River is a primary objective of the post-drawdown restoration program. Approximately 2 miles of newly exposed stream courses will be treated. Work will typically involve tractors and trucks and will include placement of logs to reduce erosion and create instream habitat. Logs will be purchased from local timber companies and transported to work areas by helicopter, then placed in the stream courses with loaders. Potential disturbances from these activities are discussed in section 5.2.2.
  
17. Restoration and revegetation of re-exposed floodplain and riparian areas will be carried out during Year Two and into late Year Three and may extend over broader areas within the reservoir footprints. Tractors, light trucks, and manual labor will be the primary means of this work.
  
18. Five new recreation facilities and river access points will be constructed. These locations are as follows: 1) near Highway 66 crossing of the Klamath River, 2) at Moonshine Falls near the present location of J.C. Boyle Dam, 3) at Copco Valley beneath the existing reservoir, 4) at Fall Creek, 5) near the current location of the Iron Gate Hatchery.

19. Temporary modifications to bridges will be removed during September through December of Year Two. Final pavement and culvert rehabilitation on Copco Road will occur during late Year Two.

The current schedule is the product of more than a decade of detailed planning. It represents the best available advanced compilation of the anticipated sequence of events in this very complex undertaking, involving engineering challenges and possible natural events. Planning of the Proposed Action continues to be refined and verified; accordingly, changes relevant to effects will continually be reassessed. During implementation, adjustments will likely be necessary in real time in response to uncontrollable variables such as logistics, condition of the facilities undergoing demolition, and environmental factors. After agency approval and as planning and activities progress, material changes will be reported and coordinated with the agencies.

## **5.0 Effects of the Proposed Action on Bald Eagles and Golden Eagles**

To support an application for permits for potential take of bald and golden eagles, beginning in 2017, the Renewal Corporation and its contractors and subcontractors (AECOM, Inc.; Resource Environmental Solutions, Inc. (RES); and PJD Environmental Consulting, Inc. (PJD)) have conducted studies of both species in the Project Area and evaluated the activities associated with the Proposed Action for potential effects on these species. The Renewal Corporation consulted with the USFWS on a regular basis during these studies. The following sections describe the methods used and the results of this evaluation, including surveys for both species within the Project Area through June 2021.

### **5.1 Methods**

Beginning in 2017, biologists from Renewal Corporation's contractor AECOM contacted several agencies and researchers to obtain existing records of nest sites of bald eagles and golden eagles in the vicinity of the Proposed Action. Data were received from the Oregon State University Cooperative Research Unit and the Oregon Eagle Foundation (OEF); the Bureau of Land Management (BLM), Klamath Falls Resource Area; the USFWS, Klamath Falls Fish and Wildlife Office; the U.S. Forest Service (USFS), Klamath National Forest; and the California Natural Diversity Database (CNDDB).

AECOM biologists carried out preliminary reconnaissance field surveys during July and November 2017, followed by multiple ground and helicopter surveys during the eagle nesting seasons in 2018 and 2019. Methods generally incorporated USFWS survey guidance for bald eagles (Jackman and Jenkins 2004) and golden eagles (Pagel et al. 2010) adapted for local access conditions and terrain. AECOM conducted the surveys as follows:

- During 2017, reconnaissance-level ground surveys on six dates in July and November;

- During 2018, ground surveys on 10 dates in January, February, June, and August and helicopter surveys on two dates in June; and
- During 2019, ground surveys on 13 dates in February, May, and June and helicopter surveys on three dates in May and June.

Details from the AECOM surveys and related observations are contained in Appendix 1 of its annual reports submitted to the Renewal Corporation for 2018 and 2019, respectively (Renewal Corporation 2019, 2020). AECOM's helicopter surveys focused on potential nesting habitat for both eagle species, especially large coniferous trees along with cliffs and rock outcrops. The 2018 helicopter survey routes were recorded and are included in Appendix 1 of the 2018 annual report (Renewal Corporation 2019). Technical issues prevented recording and review of 2019 helicopter survey routes, so AECOM's lead survey biologist provided personal communications to PJD regarding areas surveyed in 2019.

In late 2019 and early 2020, staff from Renewal Corporation contractors RES and PJD worked with AECOM staff to interpret data and compiled summaries of nest observations into groupings representing known or likely territories of breeding eagles of both species. For ease of identifying locations and related discussion, names were assigned to putative territories based on geographical features near known nesting sites, or, where available, territory names already in use by local agencies. The Renewal Corporation and RES established a consistent system of numbering and labelling eagle nest sites within the Project Area for use in tables and figures. Where recent surveys of historic nest locations did not find existing nests, no new nest numbers were assigned; in most cases, figures and tables depict only nest sites known to be occupied during at least one year of the study period, or where nests are still present. To assess the likelihood of unidentified territories, survey observations of eagles away from nests were reviewed and gaps between known nests evaluated using survey data, remote imagery, and additional field observations.

During March 2020, RES and PJD biologists conducted three days of reconnaissance visits at various eagle sites to the Project Area and evaluated observation points for future use. These biologists were accompanied by BLM Redding District Biologist Steve Laymon at the Iron Gate and Copco areas, and by Green Diamond Resources Company (GDRC) Forester/Biologist Robert Douglas at the J.C. Boyle area.

During a total of eight dates in March, April, and June 2021, RES and PJD biologists visited known nest sites of both species to determine their status and searched the Project Area from roads and advantageous observation sites. Results of regular annual nest surveys by GDRC and BLM were also obtained.

RES and PJD compared maps and imagery of eagle nest locations and schedules and maps of planned activities, as described in Renewal Corporation (2021a, b), with USFWS eagle disturbance guidelines (USFWS 2017a, b) and other literature cited in the text to evaluate the potential for disturbance of eagle nests by the Proposed Action.

During October 2019, January 2020, April 2020, and April 2021, Renewal Corporation contractors met with staff from the USFWS Pacific Southwest Region, Migratory Bird Office, to discuss methods, results, and the permitting process. During August through November 2021, Renewal Corporation contractors met regularly with USFWS staff to provide more detailed information and prepare for submission of the take permit application.

## **5.2 Results**

This section provides brief general descriptions of bald and golden eagle occurrence in the Project Area, detailed evaluation of potential effects of the Proposed Action on these sites, and a review of potential effects on each bald and golden eagle nest territory.

### **5.2.1 Eagles Associated with the Project Area**

#### **5.2.1.1 Bald Eagles in and near the Project Area**

As of July 1, 2021, 11 bald eagle nest territories, as represented by occupied nest sites, were known to have been associated with the Project Area during at least one year of the study period (2017 through 2021). See Appendix A. Two of these occupied bald eagle nest territories occurred within a few miles upriver from J.C. Boyle Reservoir. Three bald eagle nest territories were in the 14-mile river reach between J.C. Boyle Dam and Copco No. 1 Reservoir. Seven bald eagle territories had nests directly associated with reservoirs; four of these were at J.C. Boyle Reservoir, one at Copco No. 1 Reservoir, and two at Iron Gate Reservoir. Prior to the study period, two other territories were known to be occupied within the last decade, one near J.C. Boyle Reservoir and one near Copco No. 1 Reservoir. No evidence was found to indicate that nesting occurred at these two sites during the study period. Sites of several other older territories known in the Project Area were also investigated in the field and through inquiries with agency personnel, with no evidence of use by eagles during the study period.

Bald eagles in the Project Area are part of a population spread across northern California and southern Oregon. For example, the California Department of Fish and Wildlife depicted approximately 60 nest sites that were known in California within 100 miles of the Project Reach during the period from 2000 through 2016 (CDFW 2020). In Oregon, over 100 occupied nest territories were known in the Klamath River watershed in 2007 (Isaacs and Anthony 2011).

Bald eagles prey primarily on fish and waterfowl and also utilize carrion such as livestock and road-killed deer (Buehler 2020). Aquatic foraging habitat is present at all the Project reservoirs and in the Klamath River between J.C. Boyle and Copco No. 1 Reservoirs. Surveys found that bald eagles were widely distributed and apparently foraging along reservoir shorelines. Data on the forage base for nesting eagles within the Project Area are not available. Bald eagles are likely foraging on the fish species that are of appropriate size and are available near their nest sites (Jackman et al. 1999). Thus, in the Project Area, bald eagles nesting near reservoirs are most likely foraging on warm water non-native fish such as yellow perch (*Perca flavescens*), bass (*Micropterus* spp.), crappie (*Pomoxus* spp.), and catfish (*Ictalurus* spp.) as well as native fish including tui chub (*Siphateles bicolor*), blue chub (*Gila coerulea*), redband trout (*Oncorhynchus mykiss newberri*), and Klamath smallscale suckers (*Catostomus rimiculus*) (B.

Tinniswood, pers. comm.). At other reservoirs in California, waterfowl are also important prey items for bald eagles (Jackman et al. 1999) and are likely to be prey here as well.

Forage availability is known to be positively related to bald eagle nest density (Detrich 1986; Dzus and Gerrard 1993) and use of foraging areas (Hunt et al. 1992). Observed bald eagle nesting density is higher at J.C. Boyle Reservoir than at other Klamath River Project reservoirs. At J.C. Boyle Reservoir, two known sources of bald eagle prey are provided by springtime spawning runs of redband trout and smallscale suckers into Spencer Creek and by diseased and dead fish coming down the Klamath River from Keno Reservoir (B. Tinniswood, pers. comm.).

Bald eagles that presently nest at the three locations in the river canyon probably forage on native rainbow trout and Klamath smallscale suckers, the species of appropriate size that are most common in that reach (B. Tinniswood, pers. comm.).

In the Project Area, all known bald eagle nests are in large pines, except for one 2021 nest on an osprey platform mounted on a transmission pole that will remain post-Project. Large trees are uncommon in the western portion of the Klamath River Project Reach near Iron Gate Reservoir, and generally are more common from Copco No. 1 Reservoir eastward.

#### **5.2.1.2 Golden Eagles in The Project Area**

In contrast to bald eagles, golden eagles probably did not establish their territories based on available prey at the reservoirs, and there is no apparent advantage to golden eagles in placing their nests in proximity to the Project Reach. Instead, the cliffs and topography of the Klamath River canyon provide nesting habitat amid a much larger region of golden eagle nesting and foraging habitat. According to Katzner et al. (2020), “Golden eagles drink occasionally, but most or all liquid requirements, particularly for nestlings, are met by ingesting prey.” We note that many golden eagle nests in the Great Basin are far from water sources.

As of July 1, 2021, eight golden eagle nest territories, as represented by occupied nest areas, were known to have been occupied within the Project Area during at least one year of the study period (2017 through 2021, see Appendix A). While precise population estimates for the region surrounding the Project Reach are not available, it is known that the golden eagle population in the Project Area is part of a population across the northern California–southern Oregon region. For instance, Isaacs (2020) depicted approximately 50 known golden eagle nesting areas in Klamath and Jackson Counties, Oregon, within approximately 50 miles of the Project Reach.

Dunk et al. (2019) classified golden eagle nesting habitat in the western United States based on geographic characteristics. According to their classification, the Project Reach is in the Modoc Plateau subregion of the Northern Great Basin region. Habitat modeling for this region was based on more than 1,000 golden eagle nest sites. The Project Reach comprises a narrow strip within Great Basin golden eagle habitat, with a narrow belt of forested montane habitat crossing from north to south below J.C. Boyle Reservoir and downriver to Copco No. 1 Reservoir.

Generalized predicted nesting density maps from Dunk et al. (2019) show the Project Area as located within an area of relatively low nesting density.

Golden eagles in Great Basin habitats primarily forage on open country small mammals such as hares (*Lepus* spp.), rabbits (*Sylvilagus* spp.), various ground squirrels, and marmots (*Marmota flaviventris*), and readily use carrion such as livestock and road-killed deer (Katzner et al. 2020). They primarily use cliffs and large trees as nesting locations; Isaacs (2020) reported that 76 percent of 1,000 Oregon golden eagle nest sites were on cliffs, 22 percent in trees, and 2 percent on transmission towers. However, the proportion of tree nests and on transmission towers in Klamath County, Oregon, was much higher. In the Project Area as of 2021, one known golden eagle nest was in a large dead conifer and the remainder were on cliffs. The extensive cliffs along the Klamath River canyon and scattered large mature conifers on public and private lands provide plentiful potential nesting sites, and surrounding grasslands, agricultural areas, and burned forested areas may provide widespread foraging habitat.

### **5.2.2 Potential Disturbance of Eagles**

As summarized in section 4.0, Description of the Proposed Action, the Proposed Action will bring a range of increased year-round human activity to the Project Area for approximately three years. Some activities, such as dam demolition, will be focused on specific areas for a limited period. Other activities, especially reservoir drawdown and restoration, will permanently affect large areas. Effects on eagles will depend on the location and timing of actions in relation to seasonal eagle use of nests during the breeding season.

Generally, the breeding season for both species extends from approximately January 1 through mid-July. Isaacs (2020) stated that egg-laying by golden eagles in Oregon has been documented from the last week of January through the first week of April. Egg-laying among bald eagles in Oregon has occurred in the months of February, March, and April (Isaacs and Anthony 2011). Bald eagles incubate their eggs for approximately 5 weeks (Buehler 2020), and golden eagles incubate for approximately 6 weeks (Katzner et al. 2020). Breeding eagles are especially sensitive to disturbance in the early months of the breeding period, when courtship, incubation, and hatching take place. Golden eagles are generally more sensitive to disturbance than bald eagles.

Later in the breeding period, the growth of nestlings creates energetic demands that require increased foraging by adults. Disturbance may reduce the rate of food delivery by adults. Northern California bald eagle nestlings leave the nest on their first flights (fledging) at approximately 12 weeks of age (Hunt et al. 1992), while the age at which golden eagles fledge averages approximately 9 weeks (Katzner et al. 2020). Hunt et al. (1992) reported that most juvenile bald eagles in the Pit River region of northern California fledged in mid- to late June. Isaacs (2020) reported that most Oregon golden eagle nestlings had reached 8 to 10 weeks of age before July 1.

Toward the end of the nesting period, eagle nestlings may be prone to premature fledging if disturbed at the nest (Buehler 2020). Premature fledging can result in injury or death. Following

fledging, young eagles are still dependent on adults for food and may revisit the nest site. Gradually over a period of weeks, fledging activity shifts away from the nest site.

Our assessment of potential disturbance of the two eagle species incorporates USFWS guidelines (USFWS 2017a, 2017b) that provide recommended distances to avoid disturbance of eagles. In addition, using the professional judgement of the Renewal Corporation surveyors, we incorporated literature review, site-specific conditions, our knowledge of eagle behavior, and the observations of the known nest sites during the surveys to assess the risk that the Proposed Action would disturb nesting eagles and whether take is likely to occur.

In particular, we cannot precisely predict whether a given activity during the late nesting period will result in meaningful disturbance because fledging dates at different territories vary, as does tolerance of individuals. While it is reasonable to expect that adults and fledged young would react to some activities by leaving the specific location, a displacing disturbance of this sort might not be likely result in injury. Our estimates of potential take are based on distance and terrain, the potential for sustained or sudden loud noises from the activity, and professional judgement.

The following discussion expands upon the list of specific Proposed Actions provided in section 5.0 and adds site-specific information regarding potential disturbance of eagle breeding attempts, based on available information on eagle nest site locations in relation to proposed activities and schedules. All references to schedules are derived from Renewal Corporation (2021a, b), supplemented by personal communications with appropriate Renewal Corporation contractors and subcontractors. The complex sequence of proposed activities will require adherence to a demanding schedule, and there will be little opportunity to alter the timing or location of activities to protect eagles from temporary disturbance. Facility locations and eagle nest sites along with distance zones are depicted in Appendix A. Discussion of effects at each specific nest site is found in sections 5.2.3.1 and 5.2.3.2 below.

1. Prior to hauling of heavy equipment to work sites, temporary bridge modifications of several types will be installed on the public Copco Road at Dry Creek below Iron Gate Dam and at Fall Creek; on the public Lakeview Road across the Klamath River below Iron Gate Dam; and on PacifiCorp's Daggett Road across the Klamath River near Copco No. 2 Powerhouse. This work will occur beginning July 1 of Year One and extending through October of Year One. The bridges at Dry Creek, Lakeview Road, and Daggett Road are all over 1.0 mile from any known eagle nest and work on these bridges will occur after the breeding season; therefore, this work is not expected to result in disturbance to eagle nests (see discussion of territories in section 5.2.3 below). The Fall Creek bridge is approximately 0.75 mile from the Sloan Butte golden eagle nest (GE-6) and 0.4 mile from bald eagle nest BE-10, but work on this bridge will be done outside the breeding season. Potential disturbance at this site is discussed in section 5.2.3.2. During late July and early August of Year One, erosion protection may be placed at the existing Jenny Creek bridge, which is more than 1.0 mile from known eagle nests; no disturbance is expected from this activity (see discussion of specific territories in section 5.2.3.2).

2. The paved public Copco Road from Ager Road below Iron Gate Dam eastward will provide access to the activities near Copco No. 1 Dam and Copco No. 2 Dam. This road will be improved during July to October of Year One. This period is mostly outside the eagle breeding season, so the road work is not likely to disturb nests of bald and golden eagles, except possibly at the bald eagle nests at Fall Creek (BE-10) and on the west side of Iron Gate Reservoir (BE-11) and the golden eagle nest at Sloan Butte (GE-6) (see discussion in section 5.2.3). However, eagles at these nests are accustomed to traffic, and by early July most juvenile eagles of both species have fledged; disturbance resulting in take is therefore not likely. Subsequent maintenance and rehabilitation of road pavement will be ongoing throughout the activities, but this road work carries no risk of disturbance to nests other than the three mentioned above (BE-10, BE-11, GE-6).
3. New fish hatchery facilities will be constructed at the site of the old hatchery on Fall Creek during July 15 through January 16 of Years One and Two. The only eagle nest near enough to the construction site to be potentially subject to disturbance is the golden eagle nest at Sloan Butte (GE-6). This potential disturbance is discussed further in section 5.2.3.2.
4. Beginning in July of Year One, heavy equipment will be hauled over Copco Road to the demolition sites at Iron Gate Dam and the Copco No. 1 and No. 2 facilities. This equipment will be hauled away during Year Two. Noise from heavy trucks could be a potential source of disturbance at a few nest locations. At the present time, these are believed to be limited to the bald eagle nests at Fall Creek (BE-10) and on the west side of Iron Gate Reservoir (BE-11) and the golden eagle nest at Sloan Butte (GE-6). Section 5.2.3 below includes a discussion for each nest site. Various access and preparation activities will take place at the dam sites through the fall of Year One, but all these activities will be outside the eagle breeding season.

Also beginning in July of Year One, heavy equipment will be hauled over Highway 66 west from Klamath Falls and Keno, Oregon, and from Worden on Highway 97 west to Highway 66 at Keno. From Highway 66 west of Keno, some hauling traffic will cross the Klamath River at J.C. Boyle Reservoir. Traffic on the east side of the dam will use Topsy Grade Road, and traffic on the west side will use PacifiCorp access roads. The J.C. Boyle Powerhouse will be accessed via PacifiCorp access roads either from the dam or from Highway 66 west of the reservoir. By early July most juvenile eagles of both species have fledged, so disturbance resulting in take is not likely. See the discussion of specific territories in section 5.2.3.1.

5. During September through October of Year One at J.C. Boyle Reservoir, October of Year One at Copco No. 1 Reservoir, and October through November of Year One at Iron Gate Reservoir, 13 PacifiCorp recreation sites around the reservoirs will be removed along with their access roads and native vegetation reestablished. All these activities will be outside the eagle breeding season.
6. During August of Year One, a dredging barge will be constructed at the PacifiCorp boat ramp on the south side of Copco No. 1 Reservoir (Keaton Cove aka Mallard Cove) for use at

Copco No. 1 Dam. The barge will be demobilized in late September of Year One. This period is outside the period when disturbance might result at the Lennox Rock golden eagle nest (GE-5) overlooking Keaton Cove. Potential disturbance of this site is further discussed in section 5.2.3.2.

7. Water levels during the initial stages of drawdown at the reservoirs during late Year One will be within normal operating levels and will not be further described here. As demolition proceeds at each dam, drawdown will continue toward complete drainage of the reservoirs and re-exposure of the flowing Klamath River. Drawdown at J.C. Boyle Reservoir will begin in January of Year Two and be completed by early February of Year Two. Drawdown of the reservoir pool at Copco No. 1 Reservoir will begin in January of Year Two and extend into July of Year Two. At Iron Gate Reservoir, drawdown will begin in January of Year Two and extend into October of Year Two. During drawdown, small boats and workers on foot equipped with pumps may wash sediment from slopes and tributary stream channels exposed by drawdown, particularly in areas where focused restoration will occur.

Most warm-water fish in the reservoirs are expected to disappear downriver, though some may persist in the remaining flowing river and tributaries. These reservoir fish probably provide an important food source for bald eagles. Resident redband trout and Klamath smallscale suckers inhabiting the reservoirs may remain in the exposed riverine reaches. If remaining prey is insufficient, nonbreeding eagles would be expected to depart the Project Area. In the early months of Year Two, loss of food supply may result in failure to breed among all bald eagle breeding pairs near the reservoirs and possibly along the river below J.C. Boyle Dam, or in later nest failures if breeding is attempted beginning in March. In subsequent years, re-establishment of native resident fish and anadromous fish in the Klamath River and tributaries may eventually support a similar or larger bald eagle nesting population (see discussion of specific territories in section 5.2.3.1).

Drawdown is not expected to negatively affect existing food sources for golden eagles because they prey primarily on terrestrial mammals. The restored reservoir footprint should eventually provide increases in terrestrial foraging habitat for golden eagles. These outcomes are discussed in more detail in section 5.2.3.2.

8. Preparation of work sites at Copco No. 1 Dam and Iron Gate Dam will begin in May of Year One. Demolition at Copco No. 1 Dam will include regular blasting beginning in August of Year One and extending through January of Year Two. Bald eagles breeding at the site 0.35 mile east of Copco No. 1 Dam (BE-9) are likely to be disturbed during both years. Also, if golden eagles are using the Sloan Butte nest site (GE-6), they also may be disturbed. Demolition at Copco No. 1 Dam will continue into September of Year Two.

Blasting is planned at Iron Gate Dam during Year 1, but preparation and demolition will be at a sufficient distance from eagle nests of both species so disturbance from this location is not expected.

At J.C. Boyle Dam, most demolition actions will occur beginning in May of Year Two and continuing through the summer months. Two blasts are planned in January/February of Year Two. According to the USFWS guidelines (USFWS 2017a), these actions are at sufficient distance from eagle nests that disturbance is not anticipated.

At J.C. Boyle Powerhouse, preparation of the access roads and demolition sites will begin in May of Year Two, and removal of utility and mechanical equipment will occur that month. The more intensive work involved with demolishing the powerhouse and penstocks will occur after July 1. It is uncertain whether these actions will be intense enough to disturb the Riffle Rapids golden eagle site downstream from the powerhouse (GE-1), but several factors suggest that the site will not be affected. The potential for demolition noise to disturb this site is further discussed in section 5.2.3.2.

9. Along the Project Reach, several electrical switching yards will be removed along with approximately 5.4 miles of electrical distribution lines, approximately 10 miles of transmission lines, and over 200 12-69 kV poles. In most cases, these activities will be near the demolition sites where electrical facilities are concentrated but will also include removal of a 6.6-mile transmission line that parallels the north and west shore of Iron Gate Reservoir and crosses the valley of Camp Creek. All line removal is planned to be carried out from the ground without helicopter use. The lines to be removed are specifically associated with the hydroelectric project. Other transmission and distribution lines will remain in the Project Reach, but the overall existing risk of collision and electrocution will be reduced. In most cases, the removals will occur at distances outside the construction buffer distances recommended by the USFWS guidelines (USFWS 2017a, b) or outside the nesting season. A few specific concerns related to the removal of electrical facilities and equipment in certain territories are discussed in section 5.2.3.

Poles that support transmission and distribution lines provide advantageous perching by both eagle species in key locations. Renewal Corporation biologists and engineers will coordinate to identify and retain poles at key locations when power lines are removed.

10. Concrete, rock, and earth materials from demolished dams and powerhouses will be hauled to and buried at nearby sites to the greatest extent possible. Disposal sites often will incorporate pits where material was excavated at the time of construction. These short hauls by heavy trucks will occur during the demolition period and should not result in additional disturbance to eagles.
11. Steel from dams and other structures along with waste from electrical facilities will be separated from concrete at the demolition sites and hauled over public roads to transfer stations during January through October of Year Two. Material from facilities at the two Copco dams and Iron Gate Dam will be carried west over Copco Road to Interstate 5 and a transfer station near Yreka, California. Noise from heavy trucks may cause disturbance at the same eagle nest sites near Copco Road that would be affected by equipment hauling, i.e., the bald eagle nest on the west side of Iron Gate Reservoir (BE-12), the nest near Fall

Creek (BE-10), and the golden eagle nest at Sloan Butte (GE-6). Material from J.C. Boyle Dam and Powerhouse will be carried over local roads to Highway 66 and then eastward to a transfer station near Klamath Falls, Oregon. The removal of the powerhouse and penstocks will not begin until July of Year Two at the close of the bald eagle breeding season, so the Big Bend bald eagle nest 1.0 mile upriver from the J.C. Boyle Powerhouse (BE-6) should not be affected by hauling on the road across the river from the nest. The bald eagle nest on the west side of J.C. Boyle Reservoir (BE-4) is more than 1.0 mile from Highway 66 and is not expected to be disturbed by hauling. The new Topsy bald eagle nest location 1.0 mile east of J.C. Boyle Dam (BE-5) is very close to the haul route on Topsy Grade Road toward Highway 66. See the discussion in section 5.2.3.1 regarding potential disturbance of these nests.

12. Following completion of demolition and hauling, the existing culverts and road approaches at Scotch Creek and Camp Creek will be removed, new culverts will be constructed, and Copco Road realigned during October and November of Year Two. This period is outside the eagle breeding season.
13. Improvement of four fish-bearing tributaries to the Klamath River is a primary objective of the post-drawdown restoration program. About 1.6 miles of newly exposed stream courses will be treated in four high-priority restoration areas: Spencer Creek (J.C. Boyle Reservoir), Beaver Creek (Copco No. 1 Reservoir), Jenny Creek (Iron Gate Reservoir), and Scotch and Camp Creeks (Iron Gate Reservoir). As described in the Renewal Corporation's Reservoir Area Management Plan (2021c) "fish-friendly" culverts will be installed at specified tributaries. Weather, water year, and work area conditions may substantially affect the final schedule and methods. If conditions allow, activities will be sequenced approximately as follows:

During Year One, the Renewal Corporation will acquire logs from private timber companies with nearby lands in California and Oregon, subject to the timber harvest regulations of the states. Logs will be transported by helicopters to landings near work sites and decked for future use. If this activity occurs during the eagle nesting season, helicopter flight paths will be designed to avoid eagle nest sites by at least 1,000 ft. This should avoid disturbance of nest sites of both species.

In the spring and summer months of Year Two after reservoir drawdown, the logs will be placed in stream courses in the four restoration areas by ground-based equipment to provide erosion control and in-stream habitat structure. Portions of the restoration area at Beaver Creek are within the 1.0-mile distance recommended by the USFWS guidelines (USFWS 2017b) for avoidance of disturbance by construction activities in the vicinity of golden eagle nests. Potential for disturbance remains uncertain and is further discussed in section 5.2.3.2.

As the reservoirs recede during Year Two drawdown, accumulated sediment in the restoration areas will be flushed using pumps carried by small boats and workers on

foot. The potential for disturbance of golden eagles is primarily limited to the restoration area at Beaver Creek as further discussed in section 5.2.3.2.

In spring of Year Two following drawdown, fixed-wing aircraft, helicopters, or drones, along with workers on foot, will spread “pioneer” grass seed over the exposed reservoir footprints. Per USFWS guidelines (USFWS 2017a), aerial activity may have the potential to disturb any active bald eagle nest within 1,000 ft. This distance includes BE-4, BE-9, and BE-11; no other existing bald eagle nests are within this distance from the reservoirs. Disturbance avoidance buffers for golden eagle nests recommended by the USFWS (USFWS 2017b) do not specify distances for aerial activities. The potential for disturbance of golden eagle nests from aerial activities is uncertain and discussed in more detail in section 5.2.3.2.

Following drying of remaining sediment, continuing restoration work in Years Two and Three will involve shaping of channels and wetlands, erosion control, and planting grass and trees in the restoration focus areas. This work will involve large tractors, trucks, ATVs, and foot traffic. One golden eagle site, Beaver Creek (GE-4), is close enough to restoration actions to possibly be disturbed (see discussion in section 5.2.3.2)

14. After reservoir drawdown and demolition of dams and powerhouses, five new recreation facilities and river access points will be constructed. These locations are as follows: 1) near Highway 66 crossing of the Klamath River, 2) at Moonshine Falls near the present location of J.C. Boyle Dam, 3) at Copco Valley beneath the existing reservoir, 4) at Fall Creek, 5) near the current location of the Iron Gate Hatchery. All these locations are greater than 0.5 mile from any known eagle nest, thus no disturbance will occur from these activities.
15. The temporary bridge modifications at Dry Creek, Lakeview Road, Daggett Road, and Fall Creek will be removed during September through December of Year Two. As discussed earlier, these actions will not disturb eagle nest sites because bridge work will take place following the eagle breeding season. Final pavement and culvert rehabilitation will take place at the end of Year Two.

### **5.2.3 Disturbance Potential at Individual Eagle Territories**

The following subsections describe each known bald eagle and golden eagle territory in the Project Area, as indicated by the presence of nest sites. As described in section 5.1, Methods, above, the descriptions incorporate historical and recent records gathered from several agencies as well as the findings of surveys by AECOM biologists during 2017, 2018, and 2019, and by RES and PJD biologists during 2020 and 2021.

These detailed analyses and discussions thoroughly consider potential effects of the Proposed Action for all known nest sites and proposed activities. The Proposed Action includes the measures to avoid, minimize, and mitigate effects summarized in section 8.0 below. For each eagle territory, we describe our conclusion as to the potential for activities to affect eagles to the

extent that take is likely, thus requiring authorization. In the paragraphs below, we describe background guiding our analyses and conclusions.

We have used the regulatory definitions of take and disturbance in 16 U.S.C. § 668c and 50 C.F.R. § 22.3 and drawn on our professional judgement as suggested at the Comment and Response section of the Final Rule (*Eagle Permits; Revisions to Regulations for Eagle Incidental Take and Take of Eagle Nests*) (81 Fed. Reg. 91494) to reach conclusions regarding the likelihood of take.

In our application of judgment to the question of the likelihood of prohibited disturbance, we have considered several sources. The primary source is the USFWS Region 8 guidelines (USFWS 2017a, b), which provide recommended buffer distances to avoid disturbance. While these guidelines do not establish a take standard, they do provide perspective on avoidance of take. Where an activity's distance from potential disturbance sources will exceed the guidelines, we have consistently concluded that take is not likely. Where proposed actions will occur within the buffer distances suggested by the guidelines, we added consideration of other factors, especially distance, terrain, and timing. This approach is consistent with USFWS suggestions in the introductions to the guidelines.

In a few instances we considered the findings of Hansen et al. (2017), a draft manuscript prepared for the USFWS Western Golden Eagle Team. We did not use Hansen et al. (2017) as the sole source of our judgement in any individual case, but used it to inform some of our judgement-based decisions regarding likelihood of take.

Regarding potential disturbance from aircraft, we relied on the review by Pagel et al. (2010), in which, citing Dubois (1984) and McIntyre (1995), the authors stated, "most golden eagle respond to fixed wing aircraft and helicopters by remaining on their nests, and continuing to incubate or roost," as well as personal experience.

Our analyses and conclusions also incorporated judgement based on our observations in the field, especially of terrain and visibility around and between activity sites and nest sites. We also used satellite imagery and GIS functions to evaluate terrain and to measure distances.

The following subsections discuss considerations, judgement, and conclusions concerning the likelihood that disturbance will reach the level of take at each eagle nest in the Project Area.

### **5.2.3.1 Bald Eagles**

The potential impacts at each bald eagle territory in the Project Area are discussed below, including several historic sites where no current nest was located, and no nest ID was assigned. Information specific to effects of the Proposed Action contained in these individual territory narratives is summarized in tables in Appendix B.

Seven of the 11 occupied bald eagle territories discussed are closely associated with the Project reservoirs. The rate of drawdown of reservoirs in late Year One and early Year Two may vary depending on inflow but could concentrate reservoir fish and thus temporarily enhance prey availability for bald eagles beginning early in the nesting season. As the reservoirs drop and reservoir fish are forced into the flowing river, their availability will decrease in the reservoirs and increase downstream, depending on flow and the characteristics of various river reaches as the eagle breeding season proceeds (N. Hetrick, pers. comm.). Waterfowl that contribute to bald eagle foraging would be expected to leave the area. Some existing important bald eagle foraging sources for the period from February through June may not be negatively affected by drawdown, especially at Spencer Creek near J.C. Boyle Reservoir as described earlier (B. Tinniswood, pers. comm.). However, streambed restoration actions may be important to maintain access to tributary streams by removing barriers caused by accumulated sediment.

At the sites of Copco No. 1 and Iron Gate Reservoirs, reservoir fish from upstream may be passing through the newly exposed river reaches and perhaps lingering in slower reaches. Resident bald eagles foraging in rivers are known to repeatedly use specific perches to access prey (Hunt et al. 1992), but perch locations will likely not be immediately available along the newly exposed river channel, so access to these transient fish may be limited. We predict that drawdown of reservoirs will alter the fish and waterfowl prey base for bald eagles to the extent that reproduction will be substantially reduced at the seven existing reservoir bald eagle territories and is likely to result in take in Year Two.

By the middle of the Year Two eagle breeding season, most reservoir fish will be gone as a result of habitat loss, predation, cold water, and winter flows. The prey base will be at an unusually low level, and bald eagle reproduction is likely to be negatively affected. Effects to bald eagles that presently use Project reservoir territory locations could be expected to occur for several years, but the temporal extent of that effect is uncertain. Over several years immediately following dam removal, the riverine foraging base (predicted to consist of Klamath smallscale suckers and native redband trout, along with the gradual reappearance of anadromous steelhead and salmon) is expected to increase and stabilize. Spawning fall-run Chinook salmon (*Oncorhynchus tshawytscha*) (the run that will spawn in the largest quantity in the re-opened river) will not contribute directly to bald eagle foraging during the eagle breeding season, but spawning salmon will provide carcasses, eggs, and fry that will contribute to increases in riverine fish that are prey for bald eagles year-round. Redband trout are predicted to increase greatly due to the restoration of favorable river reaches and improved access to traditional spawning tributaries (B. Tinniswood, pers. comm.) and anadromous steelhead will appear throughout the river and tributaries. Lack of perches near the river probably will limit forage availability until trees become established; however, that habitat element could be provided artificially.

In the longer term, bald eagle territories currently arrayed in relation to reservoirs may realign in response to the improved and re-distributed forage biomass in the restored Klamath River. Because the numbers of bald eagle territories on Copco No. 1 and Iron Gate Reservoirs are low (one and three territories, respectively), eventual establishment of a few territories along the restored river in that area would replace the lost reservoir territories. In addition, dam removal is

expected to improve populations of resident and anadromous fish in the Klamath River system above and below the Project Reach, which should contribute to improved conditions for bald eagles throughout the watershed. In particular, the elimination of toxic algae that currently exists in the reservoirs and improved water quality throughout the system should benefit bald eagles.

Along the Klamath River between J.C. Boyle and Copco No. 1 Reservoirs, the three existing bald eagle territories may experience mixed effects to prey availability for one breeding season (Year Two), as J.C. Boyle Reservoir drawdown in January will create turbid conditions but will also send reservoir fish downstream into high-gradient rocky water, where their survival will be poor. High turbidity may continue for several months as precipitation runs off the reservoir footprint. These sediment effects from J. C. Boyle Reservoir are not expected to be severe and should be temporary (SWRCB 2020), and the availability of dead and injured reservoir fish may overcome the effects of turbidity on the availability of usual riverine forage fish. We predict that these effects will reduce bald eagle reproduction, which would likely constitute take of the three river territories in Year Two. In Year Three, the year following dam removal, the forage base in that reach should return to the pre-project condition, and in the longer term the improved foraging resource should stabilize and perhaps lead to an increase in the number of bald eagle territories on the free-flowing river reaches throughout the Project Reach.

During the three years of the Proposed Action, depending on their location, some bald eagle territories may also be disturbed by preparation, demolition, transportation, and restoration activities. The potential effects of those activities on each territory are discussed below.

In general, the following discussion begins at the eastern upstream end of the Project Reach and proceeds downstream. Project territory numbers have been assigned by RES/PJD for consistency and ease of interpretation in the evaluation of effects. All information from BLM regarding bald eagles was provided in personal communications from Klamath Falls BLM biologist Steve Hayner. All information from GDRC was provided by their Klamath Falls forester/biologist Robert Douglas. Records from agencies and consultants that assigned territory numbers using other systems are available on request.

#### **5.2.3.1.1 Bald Eagle Territories**

- A. Keno Reach (BE-1), (42.13717, -121.971): The original record at this site was provided by OEF; that nest was classified as active from 2007 to 2014. AECOM surveys found an occupied nest at that site in 2018 (AECOM BE1-15) but saw no eagles at or near the nest during aerial or ground surveys in 2019. The most recent site is over 3 miles up-river from the upper end of J.C. Boyle Reservoir and over 4 miles cross-country from J.C. Boyle Dam. It is approximately 1.7 miles downriver and at an approximately 1.0-mile direct distance from Keno Dam and Reservoir; the Keno Dam and Reservoir will not be removed as part of the Proposed Action. The site is owned by a private forest products company, GDRC. Based on proximity, it is likely that these bald eagles are associated with the river and Keno Reservoir rather than J.C. Boyle Reservoir. The known nest tree is near Highway 66, which carries logging and commercial truck traffic. Whether the substantial increase in hauling

during Years One and Two associated with the Proposed Action will result in disturbance is unknown. No alternate nest sites have been identified, but use of an alternate nest site might reduce disturbance. Since these eagles already selected a nest tree near the highway and potential alternate trees suitable for nesting are available, take is not likely.

- B. Above J.C. Boyle Reservoir (BE-2), (42.15323, -122.005): An original record location (42.14976, -121.9094) was provided by OEF; that site was known from 1979 to 1991 near the Klamath River approximately 1.0 mile above J.C. Boyle Reservoir. In most of those years, the status of the site was not recorded. AECOM surveys in 2018 and 2019 did not find a nest at that location, but in 2019 found an active bald eagle nest (AECOM F-19-BE7) approximately 0.6 mile downriver, approximately 0.5 mile upstream from the head of J.C. Boyle Reservoir. Lacking more specific information, we combined the historic and recently located sites into one designated territory. RES/PJD did not survey this site in 2021 because access is difficult, and the site is beyond the distance where disturbance is expected. The site is owned by PacifiCorp. This recently reported nest is approximately 0.9 mile from Highway 66, with intervening terrain between the nest and the highway, and about 1.2 miles from the Spencer Creek restoration area. While this nest would probably not be subject to direct disturbance from activities and, as described above, some existing foraging resources will not be affected, reduced reproduction due to drawdown will likely result in take in Year Two.
- C. Cemetery (Spencer Creek/Boyle Reservoir) (BE-3), (42.151088-122.03410): The original records of a bald eagle nest site in this area were provided by OEF for the years 2004 to 2007 and 2013 and 2014. The site is locally named after the nearby Spencer Creek Cemetery. AECOM surveys found an unoccupied nest at this site in 2018 (AECOM BE1-31). In 2019 AECOM found an unused nest in a dead tree at the same location and classified the nest site as occupied based on an eagle in flight early in the breeding season, but eagles were not seen there during several surveys by AECOM and GDRC. The nest was not found in 2021. The site is on land owned by GDRC, about 0.1 mile from J.C. Boyle Reservoir. The nest site is approximately 2 miles from J.C. Boyle Dam and is not visible from the dam due to terrain. It possible that there could be another active bald eagle nest nearby in this long-standing territory, but neither RES/PJD nor GDRC has found another nest here and there are few trees large enough to support a bald eagle nest. The former nest site was about 0.3 mile from the Spencer Creek restoration area. Unless a new nest site is established closer, no direct disturbance is expected. As described above, some existing foraging resources will not be affected, but reduced reproduction due to drawdown will likely result in take in Year Two if the area is re-occupied by bald eagles. Because known occupancy was relatively recent, we are treating this territory as occupied and subject to disturbance.

In the longer term, the improved forage base may result in persistence of a territory at this location. Spencer Creek is an important spawning area for redband trout and Klamath smallscale suckers, and bald eagles are often observed foraging there (B. Tinniswood. pers. comm.).

- D. West Side Boyle Reservoir (BE-4), (42.14197, -122.041): BLM recorded an occupied bald eagle nest area in the vicinity in 1995 (AECOM BE4-25), and OEF records (AECOM BE1-32) include the years 2006 to 2013. AECOM surveys found the nest to be active in 2018 and 2019. Two nestlings of near-fledging age were seen here in late June 2021 (PJD/RES). The site is approximately 0.55 mile north of the Highway 66 bridge and approximately 1.5 air miles from J.C. Boyle Dam. The nest site is owned by GDRC. It is not visible from the dam due to terrain. Reduced reproduction due to drawdown will likely result in take in Year Two.
- E. Chase Mtn. and Lower Boyle East Side Complex (Project terr. number not assigned): This location (AECOM BE1-35) was at approximately 42.1245, -122.0122. AECOM BE1-33 was approximately 1.0 mile south. The original set of OEF records included several bald eagle nest sites (AECOM BE1-33, 34, 35) within approximately 1.0 mile of each other from 1983 through 2014. Available information indicates that these were alternate nests within a single territory, as they were apparently used in different years. The location is in an upland area 1.5 to 2 miles east of J.C. Boyle Dam and 1 to 2 miles southeast of J.C. Boyle Reservoir. AECOM surveys in 2018 and 2019 found only one inactive bald eagle nest in a dead tree and an osprey nest in the vicinity. All three recorded nest sites are on BLM lands in an area of checkerboard ownership. BLM no longer regards this location as an existing territory, so no project nest identification number has been assigned. We do not regard take as likely at this location.
- F. Topsy (BE-5), (42.12093, -122.032) (New location: 42.1316, - 122.0313): OEF records include a bald eagle nest at a location off Slip Easy Road near Topsy Road from 1998 to 2014 (AECOM BE1-36). It was about 0.8 mile east of J.C. Boyle Dam in mature forest on BLM land along a boundary with young forest on private timberland. Although only approximately 1.0 mile from the Lower Boyle East Side Complex described in “E” above, records of simultaneous occupancy indicate that these were two separate territories. AECOM surveys found evidence in 2017 of activity beneath the nest and observed activity in 2019. BLM reported that the nest was occupied in 2020. However, in 2021 BLM found the site unused and a new nest location 0.75 mile to the north, very near Topsy Road and the J.C. Boyle Reservoir shoreline on GDRC property about 1 mile east of J.C. Boyle Dam. Two explosive blasts at the dam are anticipated in January and/or February of Year Two, which should be prior to incubation. In addition, according to the USFWS guidelines (USFWS 2017a), the 1-mile distance is sufficient that demolition of J.C. Boyle Dam will not disturb this nest. However, reduced reproduction due to drawdown is likely to result in take in Year Two and the nest will also be vulnerable to disturbance from hauling on Topsy Road in that year.
- G. Big Bend (BE-6), (42.08405, -122.056): This bald eagle nest is approximately 2 miles down the Klamath River canyon below J.C. Boyle Dam and approximately 1.0 mile upstream from the J.C. Boyle Powerhouse. The active nest was found during an AECOM helicopter survey (AECOM F19-BE5) in May 2019. BLM reported that the nest produced young in 2020. A bald eagle appeared to be incubating in the nest in late March 2021 (PJD/RES and BLM), but BLM found the nest empty in early June. The nest site is on BLM land approximately 1.0 mile downstream from the west end of the J.C. Boyle power canal, which will be

demolished during April to August of Year Two. Concrete and debris from the demolished power canal will be deposited in the “Scour Hole” located approximately 1.0 mile from the nest in late June to August of Year Two. At the J.C. Boyle Powerhouse, electrical equipment will be removed starting in May of Year Two and the powerhouse and penstock will be demolished during July. Concrete will be buried on site, but metal, treated wood, and electrical materials will be hauled past the nest location on the road across the river canyon at a distance of approximately 0.25 mile. The distances from demolition and hauling should be sufficient to avoid disturbance per the USFWS guidelines (USFWS 2017a).

The degree to which eagles at this territory depend on prey from J.C. Boyle Reservoir is unknown. The nest site is midway through the 4.0-mile “bypassed reach” of the river, where present flows are consistently very low but are augmented by large springs. (For over 50 years, most of the flow has been in the power canal between the dam and powerhouse.) Reservoir drawdown will increase the flow in this river reach, with turbid water and reservoir fish passing the nest site for several months before the river returns to a more natural flow regime. Thus, foraging habitat for this territory will be substantially altered the Proposed Action, and prey base disruption will likely cause take at this bald eagle territory in Year Two. In the longer term, stability of the foraging base is expected to resume and to increase as a result of improved populations of riverine and anadromous fish.

- H. Klamath River (Boyle Reach complex) (BE-7), (42.02574, 1122.103): Original records from OEF include five different bald eagle nest sites (BE1-25, 26, 27, 28, 29) at nearby locations over the years 1979 to 2012. AECOM surveys located an active nest (AECOM F-BE2) in this area in 2018 and 2019. BLM's site name is “Klamath River” because it is near the BLM's Klamath River campground. The nest site is on GDRC property along the northwest rim of the Klamath River canyon. BLM reported that young eagles were produced at this nest in 2020. The nest was not surveyed by RES/PJD during 2021 because it outside the area of potential disturbance from dam removal activities. The area is approximately 3.5 miles downstream from the J.C. Boyle Powerhouse and is not vulnerable to disturbance from that source.

The river in this area has been subject to variable power generation flows for over 50 years but has the character of a natural stream with substantial white water reaches. During drawdown of J.C. Boyle Reservoir in Year Two, turbid flows and reservoir fish will be passing this location for several weeks. Variable and increased turbidity could persist into the following year, depending on river flows and upstream precipitation passing through the exposed reservoir footprint. Native trout and suckers in the river may be negatively affected by these flows. The potential for short-term effects on the foraging base in this bald eagle territory is uncertain, but foraging and reproduction will be affected to a degree that is likely to cause take. In the longer term, stability of the foraging base is expected to resume and to increase as a result of improved populations of riverine and anadromous fish.

- I. Pony Express (BE-8), (42.01352, -122.156131): According to OEF records, bald eagle nests were known at this site during 1999 to 2014 (AECOM BE1-43). AECOM surveys found an active bald eagle nest at this location during both 2018 and 2019, and BLM

reported that young were produced at this nest site in 2020. The nest site is on BLM land, and it was named by BLM after a nearby rapid on the Klamath River. The site is just north of the California-Oregon border, about 5 air miles upstream from the head of Copco No. 1 Reservoir and about 7 air miles downstream from J.C. Boyle Powerhouse. No activities will affect this nest other than the temporary effects on the river from the drawdown of J.C. Boyle Reservoir, as described previously. We predict that foraging and reproduction at this bald eagle territory will be affected to a degree likely to cause take. In the longer term, stability of the foraging base is expected to resume and to increase as a result of improved populations of riverine and anadromous fish.

- J. Secret Spring (East of upper Copco No. 1 Reservoir (Project nest number not assigned) (41.94725, -122.23907): Several nests representing an apparent bald eagle territory were recorded in this area by the USFS and CDFW intermittently during 1993 to 1997 and 2000 to 2010 (AECOM BE3-1). These former nest sites were on USFS land. AECOM helicopter surveys in 2018 and 2019 did not find a nest in this area, which is approximately 1.25 miles upstream from the head of Copco No. 1 Reservoir and approximately 4.5 miles east of Copco No. 1 Dam. However, nesting and foraging habitat appears to be present, and AECOM staff regularly saw bald eagles along the upper portion of Copco No. 1 Reservoir. Therefore, it is possible that a bald eagle territory may exist in this area. The area is unlikely to be disturbed by the Proposed Action, except for effects on the river as described above and, possibly, loss of foraging habitat when Copco No. 1 Reservoir is drawn down in January to July of Year Two. We predict that foraging and reproduction in the territory will be affected, resulting in take only if a bald eagle territory is indeed present. In the longer term, stability of the foraging base is expected to resume and to increase as a result of improved populations of anadromous fish. Because no nest or eagle nesting behavior was seen, we do not regard this area as a current territory, and thus have not assigned a project nest identification number and do not regard take as likely at this location.
- K. Copco Dam (BE-9), (41.97515, -122.329): USFS records reported that a bald eagle nest (AECOM BE3-2) failed just north of Copco No. 1 Dam in 2004. AECOM surveys did not find a nest there in 2018 or 2019, but 2019 helicopter surveys found bald eagles using a different nest (AECOM BE2-3) approximately 0.65 mile to the south on the opposite side of the river and approximately 0.35 mile southeast from the dam. RES/PJD saw a pair of adult bald eagles in this area in late March 2021 but could not locate the nest. Based on survey records, proximity, and timing, these sites appear to represent a single bald eagle territory. The known nest site is on private land within 0.5 mile of a residential area. This nest may be disturbed by preparation and demolition activities during Year Two, and by loss of the reservoir fishery during drawdown in Year Two. We conclude that foraging and reproduction at the territory will be affected to a degree likely to cause take. In the longer term, stability of the foraging base is expected to resume and to increase as a result of improved populations of riverine and anadromous fish.
- L. Fall Creek (BE-10), (41.978408, -122.363741): This bald eagle nest was discovered by RES/PJD in April 2021. The eagles were nesting on a former osprey nest near the Yreka water plant at Fall Creek. A nestling was observed in late April, but the nest was abandoned

sometime in the weeks that followed. Because of the high visibility of the site, we are certain that it was not present in previous years. The nearest potential foraging areas are the nearby upper end of Iron Gate Reservoir and the bypassed reach of the Klamath River below Copco No. 2 Dam. Drawdown of Iron Gate Reservoir during January to October of Year Two will disrupt the forage base for this territory, resulting in take. This site is approximately 0.45 mile from the Fall Creek Hatchery and 0.35 mile from the Copco No. 2 Powerhouse; both are outside the distance at which disturbance from construction and demolition actions would be anticipated to disturb bald eagle nesting. However, it is only 0.15 mile from the Copco No. 2 switchyard, where modifications will occur in May of Year Two. It is also close to Copco Road, where hauling will be continuous during Years Two and Three. If the site is reoccupied, it would be subject to disturbance that is likely to cause take. Sustained use of osprey nests by bald eagles is uncommon in northern California (R. Jackman, pers. comm.) and it is likely that this pair will nest in another nearby location in the future. Monitoring of this area is a priority for Year One.

- M. Jenny Creek canyon (41.99614, -122.377) (Project territory number not assigned): CDFW (CNDDDB) records include an active bald eagle tree nest (AECOM BE3-6) in the Jenny Creek canyon in 2002. AECOM helicopter surveys in this area on June 6, 2018, and May 22, 2019, found only an inactive nest (AECOM F-BE1). Although an inactive nest was seen, we have no observations indicating the territory was active during the study and the site is well outside areas that would potentially be disturbed by the Proposed Action. Therefore, we have not assigned a project territory number. The nest site is on private property 5.25 miles north of Iron Gate Dam and 1.8 miles from the Jenny Creek bridge and restoration area. The site is not visible from the Jenny Creek bridge. Due to the distance from reservoir foraging habitat and the presence of abundant but unused apparently-suitable nesting habitat nearer to the reservoir, it seems unlikely that eagles at this territory are dependent on the reservoir forage base. Therefore, we conclude that reservoir drawdown is not likely to result in take even if an occupied bald eagle territory is present in this area. In the longer term, the foraging base in Jenny Creek is expected to improve as a result of increased populations of riverine and anadromous fish.
- N. Scotch Creek (41.97728, -122.44605) (Project nest number not assigned): AECOM helicopter surveys in May and June 2019 noted a possible old bald eagle nest in a dead tree at this location (AECOM F19-BE6). The site is on State of California land 3.0 miles north of Iron Gate Dam and is not visible from Copco Road 0.3 mile away due to terrain (PJD/RES). It appears likely that the Scotch Creek area was abandoned because there are no visible trees suitable for alternate bald eagle nesting near that location. Also, a prominent new bald eagle nest (BE-11) (see below) was found in 2019 approximately 1.9 miles to the south. Along the west side of Iron Gate Reservoir, trees large enough to support eagle nests are quite rare, so it seems likely that these two sites are part of the same territory. Unless new information comes to light, we regard the Scotch Creek site as abandoned and not subject to take. Because no nest was found and no eagles seen, we do not regard this area as a current territory. Thus, we have not assigned a project nest identification number and do not regard take as likely at this location.

O. West Side of Iron Gate Reservoir (BE-11), (41.94931, -122.438): This site (AECOM F19-BE1) was first found by an AECOM survey in February 2019, approximately 1.0 mile north of Iron Gate Dam. Bald eagles were nest-building at that time and produced young at this site that year. The site also produced young in the 2020 and 2021 nesting seasons (PJD/RES). The nest tree is on BLM land. Although somewhat obscured by foliage in an atypically small pine tree, it is visible from Copco Road a few hundred feet away. It is not visible from the Iron Gate Dam area and, per the USFWS guidelines (USFWS 2017a), should not be vulnerable to demolition noise. However, this nest would be disturbed by increased traffic on Copco Road during Year Two, and, if still extant, increased traffic during restoration actions in Year Three. Thus, take is likely due to hauling in Year Two and Three. Also, the forage base and reproduction will be disrupted by drawdown of Iron Gate Reservoir during January to October of Year Two to a degree likely to result in take. In the longer term, stability of the riverine foraging base should resume and be increased by improved populations of resident and anadromous fish.

#### **5.2.3.1.2 Potential for Unlocated Bald Eagle Territories**

Based on concentrations of bald eagle observations in 2018 and 2019, combined with gaps in mapped distribution of known nest sites, it appears possible that unlocated bald eagle territories may exist in two areas: the east end of Copco No. 1 Reservoir (as discussed above under East Side Upper Copco Reservoir) and the central portion of Copco No. 1 Reservoir. In the latter area, the number of suitable nest trees appears limited, and the prominence of suitable trees that do exist should have enhanced the visibility of bald eagle nests during repeated surveys from the air and ground. Review and discussion with AECOM's lead aerial survey biologist (J. DiDonato, pers. comm.) indicated that AECOM aerial surveys had a high likelihood of finding existing bald eagle nest sites within 1.0 mile of the shorelines at Iron Gate Reservoir and most of Copco No. 1 Reservoir and within the distances recommended by the bald eagle disturbance guidelines (USFWS 2017a). Thus, the best available information suggests that the only area where a bald eagle territory is reasonably likely to remain undiscovered is near the upper end of Copco No. 1 Reservoir. RES/PJD surveys during 2021 were attentive to this area and no nest was found.

#### **5.2.3.1.3 Summary of Effects on Bald Eagles in the Project Area**

The effects of the Proposed Action are summarized in Table 5-1. The table does not include historic sites where no nest was located during the study period.

The Proposed Action will not result in the death or injury of adult or post-fledging immature bald eagles or remove any nest sites. Demolition noise may disturb nesting at one site (BE-9), resulting in take through loss of reproduction during Year Two. At one reservoir nest site, Year Two reproduction will likely be reduced by both reservoir drawdown and demolition noise, resulting in one instance of take. Reservoir drawdown will disrupt the forage base for bald eagles at six other reservoir nest territories, which is likely to result in take through loss of reproduction in Year Two. Effects on breeding attempts and reproduction from reservoir drawdown may extend into future years, but duration and magnitude of these effects are speculative, as discussed below. The forage base for bald eagles that presently nest at three

sites along the 14-mile river reach between J.C. Boyle Dam and Copco No. 1 Reservoir may be affected for several months by water quality impacts while J.C. Boyle Reservoir is drained in early Year Two. While subject to uncertainty, we expect that this effect at these three riverine sites will likely result in take only in Year Two.

The temporal extent of impacts to individual nest territories is uncertain, but it is reasonable to assume that the bald eagle population along the Project Reach eventually will stabilize at a density reflective of the availability of forage resources and nesting habitat. As river conditions improve, it is likely that the foraging base in the river will improve compared to current conditions. While lack of perches near the river may reduce the availability of forage habitat until trees become established, that habitat element could be provided artificially.

In the future, almost all bald eagles nesting in the Project Reach will be associated with riverine habitat. (An exception will be BE-1, where eagles will have continued access to Keno Reservoir.) The estimates of future numbers and density of nesting bald eagles described below are conjectural but may be informed by current nesting densities in the river canyon. In recent years, there have been 11 occupied bald eagle nest territories associated with the entire Project Area; three of these (BE-6, BE-7, and BE-8) occur in the 14-mile river reach between J.C Boyle Dam and Copco No. 1 Reservoir and average approximately 4.7 river miles from their nearest neighbors. If bald eagles throughout the Project Reach attain a similar nesting density when the riverine forage base stabilizes, there could be approximately nine bald eagle territories in the 42-mile reach between the present upper extent of J.C. Boyle Reservoir and the present location of Iron Gate Dam. This suggests that the loss of reservoirs might cause a small reduction in the nesting bald eagle population. However, this estimate does not incorporate the potential effect of a greatly improved forage base, which could stimulate an increase in the number and density of breeding bald eagles. Thus, the bald eagle nesting population in the Project Area will not suffer long-term declines caused by the Proposed Action and is likely to increase. The effects to bald eagle territories are summarized in Table 5-1 below.

As detailed in section 5.1, Methods, Renewal Corporation contractors obtained available historic data on nest and territory locations of bald eagles prior to the 2017 surveys (Renewal Corporation 2019, 2020). Their analyses included zones of potential effects based on a preliminary understanding of activities and nest site locations (Renewal Corporation 2019, 2020). Subsequent surveys and analyses have refined the nest site locations and evaluated potential impacts using more detailed information concerning the Proposed Action. All 15 bald eagle territories previously documented or recently known to occur are summarized in Table 5-1. At four of these territories, recent surveys (2017 through 2021) did not detect nest sites or eagle activity indicating the presence of a nearby nest site, and/or communications with State and Federal wildlife officials and local landowners indicated nests no longer exist. Those sites are labelled as “Unassigned/No ID” (Chase Mountain, Secret Spring, Jenny Creek, Scotch Creek). Three recently occupied territories (Big Bend, Klamath River, Pony Express) were determined to be beyond potential disturbance zones but may be affected temporarily by turbidity during reservoir drawdown. These three and the eight other territories that Renewal Corporation has now determined as potentially affected by the Proposed Action are highlighted in green in Table 5-1 and were evaluated more thoroughly for potential of take.

**Table 5-1. Bald Eagle Territories Evaluated for Effects from the Proposed Action**

TERRITORY NAME (LOCATION)	TERRITORY ID KRRC/RES (KRRC/AECOM NEST) <sup>1</sup>	RECENT STATUS <sup>2</sup>	DISTANCE FROM ACTIVITY <sup>3</sup>	WILL TAKE OCCUR? WHAT YEAR? <sup>4</sup>
Keno Reach	BE-1 (BE1-15)	Nest active: 2018. Eagles not detected: 2019. Nest not found: 2021.	2.6 miles from drawdown at J.C. Boyle Reservoir. 4 miles from blasting and demolition at J.C. Boyle Dam. 3 miles from restoration at Spencer Creek. 100 ft from hauling at Highway 66.	No
Above J.C. Boyle Reservoir	BE-2 (F19-BE7)	Nest Active: 2019. Not surveyed: 2020, 2021.	0.7 mile from drawdown at J.C. Boyle Reservoir. 3 miles from blasting and demolition at J.C. Boyle Dam. 1.2 miles from restoration at Spencer Creek. 0.9 mile from hauling at Highway 66.	Yes Year 2*
Cemetery (Spencer Creek, J.C. Boyle Reservoir)	BE-3 (BE1-31)	Eagle seen in territory 2019. Eagles not seen at old nest:2018, 2019. Nest not found: 2021.	0.1 mile from drawdown at J.C. Boyle Reservoir. 2 miles from blasting and demolition at J.C. Boyle Dam. 0.3 mile from restoration at Spencer Creek.	Yes Year 2*
West Side J.C. Boyle Reservoir	BE-4 (BE4-25)	Nest active: 2018, 2019, 2021.	0.1 mile from drawdown at J.C. Boyle Reservoir. 1.3 miles from blasting and demolition at J.C. Boyle Dam. 0.8 mile from restoration at Spencer Creek. 0.5 mile from hauling at Highway 66.	Yes Year 2*
Chase Mountain (Lower Boyle East Side Complex)	Unassigned/No ID (BE1-33, 1-34, 1- 35)	Historic territory. Nest active: 2014. Eagles not detected: 2018, 2019. Not surveyed: 2020, 2021 (BLM).	1 mile from drawdown at J.C. Boyle Reservoir. 1.5 miles from blasting and demolition at J.C. Boyle Dam. 1 mile from hauling at Highway 66.	No

TERRITORY NAME (LOCATION)	TERRITORY ID KRRC/RES (KRRC/AECOM NEST) <sup>1</sup>	RECENT STATUS <sup>2</sup>	DISTANCE FROM ACTIVITY <sup>3</sup>	WILL TAKE OCCUR? WHAT YEAR? <sup>4</sup>
Topsy (Slip Easy Road)	BE-5 (2021 location) (BE1-36)	Nest active: 2019, 2020, 2021 (new location)	0.1 mile from drawdown at J.C. Boyle Reservoir 1.0 mile from blasting and demolition at J.C. Boyle Dam. 1.2 miles from restoration at Spencer Creek. 100 ft from hauling at Topsy Road.	Yes Year 2*
Big Bend	BE-6 (F19-BE5)	Nest active:2019, 2020, 2021.	2.2 miles from drawdown at J.C. Boyle Reservoir. 0.1 mile from potential turbidity effects at Klamath River. 2.0 miles from blasting and demolition at J.C. Boyle Dam. 1 mile from demolition at power canal. 1 mile from demolition at J.C. Boyle Powerhouse. 0.25 mile from hauling on Powerhouse Road.	Yes Year 2*
Klamath River (Boyle Reach Complex)	BE-7 (BE1-25-29) (F-BE2)	Nest active: 2012, 2018, 2019, 2020, 2021.	0.1 mile from potential turbidity effects at Klamath River. 3.5 miles from demolition at J.C. Boyle Powerhouse.	Yes Year 2*
Pony Express	BE-8 (BE1-43)	Nest active: 2014, 2018, 2019, 2020. 2021?	0.1 mile from potential turbidity effects at Klamath River. 7 miles from demolition at J.C. Boyle Powerhouse.	Yes Year 2*
Secret Spring (East of Upper Copco No. 1 Reservoir)	Unassigned/No ID (BE3-1)	Historic territory. Nest active: 2010. Nest not found: 2018, 2019. Not surveyed: 2021.	1.25 miles from drawdown at Copco No. 1 Reservoir. 4.5 miles from demolition/blasting at Copco No. 1 Dam.	No
Copco No. 1 Dam	BE-9 (BE3-2, BE2-3)	Nest active: 2019. Territory occupied: 2020, 2021	0.35 mile from demolition/blasting at Copco No. 1 Dam. 0.6 mile from demolition/blasting at Copco No. 2 Dam. 0.1 mile from drawdown at Copco No. 1 Reservoir.	Yes Year 2*

TERRITORY NAME (LOCATION)	TERRITORY ID KRRC/RES (KRRC/AECOM NEST) <sup>1</sup>	RECENT STATUS <sup>2</sup>	DISTANCE FROM ACTIVITY <sup>3</sup>	WILL TAKE OCCUR? WHAT YEAR? <sup>4</sup>
Fall Creek Osprey Nest	BE-10	Nest active:2021	0.45 mile from construction at Fall Creek Hatchery. 0.1 mile from drawdown at Iron Gate Reservoir. 0.15 mile from modifications at Copco No. 2 Switchyard. 0.35 mile from demolition at Copco No. 2 Powerhouse. 100 ft from hauling at Copco Road.	Yes Year 2* and year 3
Jenny Creek	Unassigned/No ID (BE3-6, F-BE1)	Historic territory. Nest active: 2004. Eagles not detected: 2018, 2019.	1.0 mile from construction at Fall Creek Hatchery. 5.25 mile from demolition at Iron Gate Dam. 1.8 miles from hauling on Copco Road, drawdown at Iron Gate Reservoir, and restoration at Jenny Creek.	No
Scotch Creek (Iron Gate Reservoir)	Unassigned/No ID (F19-BE6)	Old nest, eagles not detected: 2018, 2019.	0.1 mile from drawdown at Iron Gate Reservoir. 3.0 miles from demolition at Iron Gate Dam. 0.3 mile from hauling on Copco Road and restoration at Scotch Creek.	No
West Side Iron Gate Reservoir	BE-11 (F19-BE1)	Nest active: 2019, 2020, 2021	0.1 mile from drawdown at Iron Gate Reservoir. 1.0 mile from demolition at Iron Gate Dam. 100 ft from hauling at Copco Road. 0.6 mile from restoration at Scotch/Camp Creek.	Yes Year 2 <sup>5</sup> and Year 3

**Legend:**

- Territories that may be affected by activities
- Territories not affected by activities

**Notes:**

1. KRRC/RES refers to field work conducted by Renewal Corporation subcontractor RES in 2020 and 2021, and KRRC/AECOM refers to field work conducted by AECOM in 2017, 2018, and 2019 (see detailed description of surveys in section 5.1 of this Eagle Conservation Plan).
2. "Territory occupied" means golden eagles were seen near nesting areas but no nesting activity was observed. "Nest Active" means nesting behavior was seen in a specific nest. Limited surveys were conducted in 2020; some incidental observations are included.
3. Also see detailed descriptions on timing and activities in individual territory narratives and tables (section 5.2.3).
4. See details in tables on individual territories.
5. Effects of forage disruption and re-establishment will extend into an unknown number of future years.

### 5.2.3.2 Golden Eagles

Nest sites representing eight golden eagle territories are known in the Project Area as of July 1, 2021. With an anticipated increase of approximately 2,200 acres in open grassland and brush, restoration of a free-flowing river should have a positive effect on the foraging habitat of golden eagles that hunt in the Klamath River canyon. Also, the improvement of anadromous fish populations above and below the Project Reach will increase general nutrient availability in the entire Klamath River watershed. While unquantifiable, this effect may increase forage availability for golden eagles even to locations beyond the Project Reach. In general, the only negative effect of the Proposed Action on golden eagles may be one to three years of possible disturbance at nest sites that are near project roads and facilities.

The following discusses the locations of each known golden eagle nest and their likelihood of being affected by the project, based on the most current description of the Proposed Action and schedule. Also note the discussion of the schedule in section 4.0, Description of the Proposed Action. Information specific to Project effects contained in these individual territory narratives is summarized in tables in Appendix C.

- A. NW of Boyle Dam, (41.98895, -122.3739) (Project territory number not assigned): The original record provided by OEF (AECOM GE1-6) was labeled “unverified” and had no data regarding years of use. Location data indicated the site was approximately 1.5 miles northwest of J.C. Boyle Dam in an area now owned by GDRC. No nests were found during AECOM helicopter surveys during 2018 and 2019 or during a ground survey during 2019. Observers noted the generally small size of trees in the area, and no cliffs are evident. Because no nest was found and no eagles seen, we do not regard this area as a current territory and thus have not assigned a project nest identification number.
  
- B. Chase Mountain, (approximately 42.10227; 122.00446) (Project territory number not assigned): The original records for this site are from the 1980s (AECOM GE1-7 and GE4-5). BLM records state “Last documented use was 1984. Nest was in bad shape in 1997 and down by 2004.” The site is on BLM land over 2.5 miles east-southeast of J.C. Boyle Dam. AECOM helicopter surveys in 2018 and 2019 found no nests or eagles, though they noted “nice trees.” If golden eagles are nesting in this area, they would not be disturbed by the project. Because no nest was found and no eagles seen, we do not regard this area as a current territory and thus have not assigned a project identification number.
  
- C. Riffle Rapids (GE-1), (Nest #2: 42.08129, -122.06998): This golden eagle nesting area is on the northwest-facing slope above the Klamath River downstream from J.C. Boyle Powerhouse, visible from across the river on the BLM access road. The nest site is on BLM land and was named by BLM after a nearby rapid on the Klamath River. At the location of the original record (AECOM GE4-206) in 2018, AECOM found an old nest (Nest #1) and saw a nestling in a different nest (Nest #2). AECOM's 2019 surveys noted that the 2018 nest tree was dead and the nest dilapidated and inactive. On March 12, 2020, and April 12, 2020 (PJD/RES), an adult golden eagle was visible in exposed nest #2 in a dead tree; coordinates were ascertained at that time. Later in 2020, BLM reported that the site had

produced young that year. In 2021, a nestling was observed by RES/PJD biologists in late April, but BLM reported the nest was empty in early June.

This 2020/2021 nest site is at a linear distance of over 3 miles from J.C. Boyle Dam, with visibility blocked by intervening ridges. The nest site is approximately 1.25 linear miles from the site where demolished spoil material will be deposited (“Scour Hole”) during July and August 2023, but visibility to this site is completely blocked by a major ridge and most of the period scheduled for that activity will occur after the breeding season. Regular recreational traffic occurs on the BLM access road to the Spring Island rafting put-in and to campgrounds further down river. The nest site is across the river at an approximately 0.32-mile horizontal distance and approximately 600 ft above this recreational site. This recreational site will not be removed by the Proposed Action.

The nest tree is approximately 0.9-mile linear distance down the canyon to the south from the J.C. Boyle Powerhouse area and approximately 600 ft in elevation above the powerhouse. Terrain appears to block the view from the nest to the powerhouse. Utility and hydromechanical equipment will be removed from the powerhouse area during May and June of Year Two and hauled out the powerhouse access road, which is not visible from the nest. A transmission line that crosses the ridge above the powerhouse will be removed during the same period using ground-based equipment. The powerhouse and other buildings will be demolished during July to October of Year Two. The concrete will be buried on site and the metal and electrical waste hauled out the access road toward Highway 66. The metal penstocks will be removed during July to September of Year Two. Thus, loud noises related to demolition will mostly occur after the breeding season. These activities will be at the edge of the 1.0-mile construction disturbance zone recommended by USFWS (USFWS 2017b). Due to distance, terrain, and the schedule of activities, disturbance of the nest to a degree causing take is unlikely.

- D. Hessig Ranch (GE-2), (41.98345, 122.17470): AECOM surveys found this cliff nest (AECOM F-GE3) in uplands approximately 1.5 miles south of the California/Oregon border, approximately 4.8 miles east of Copco No. 1 Reservoir and 1.0 mile east of the “Hessig Ranch” along the Klamath River. The nest was active in 2018 and 2019. The site, which is owned by PacifiCorp, is 1.0 mile from Copco Lake Road (the eastern extension of Ager-Beswick Road), which in this area will not be used for activities associated with the Proposed Action. There is no potential for disturbance or take, and the site will not be surveyed in the future.
- E. Ranch Bridge (GE-3), (41.96721, -122.228): This nest is on a cliff just above the north side of the Klamath River approximately 0.33 mile downstream from a private ranch bridge over the river. AECOM ground surveys saw two juvenile golden eagles in flight near this site in August 2018. Helicopter and ground surveys located the cliff nest in 2019 (AECOM F-GE4) and saw an adult golden eagle nearby but found no nest activity. The site was not surveyed in 2021 because it is outside the distance at which disturbance would potentially occur. The site is owned by PacifiCorp. The cliff is 1.1 miles east of the upper end of Copco No 1 Reservoir and 1.75 miles east of the Copco Road bridge across the upper end of the

reservoir. Construction activities are not planned at the Copco Road bridge unless reinstated river flows cause erosion at the abutments; demolition equipment and debris hauling will not use this route. Aerial seeding will not proceed up the river into proximity with this nest site. The Ager-Beswick Road across the river from the nest will not be used for activities associated with the Proposed Action. An intervening ridge apparently blocks visibility between the nest and Copco No. 1 Reservoir and Copco Road bridge. Restoration traffic will likely use the bridge, but the nest site is outside the 1.0-mile zone in which disturbance might be likely (USFWS 2017b). Due to distance and terrain, disturbance or take at this nest site is not likely to occur. No further monitoring is planned.

- F. South Side Klamath River above Copco Road Bridge, (41.9611, -122.2482) (Project territory number not assigned): The CNDDDB provided a 1979 BLM record of a cliff nest (AECOM GE3-8 and F-GE4) with occupancy reported as unknown at that time. AECOM surveyed the area from the ground and helicopter in 2018 and 2019 and found no nests, and RES/PJD biologists saw no nest here in 2021. There is no indication that a nest site existed here during the study period or that the record represents a territory that is currently present; thus, no identification number is assigned. A golden eagle nest site near this location might be vulnerable to disturbance from aerial seeding during Year Two or work at the Copco Road Bridge during Years Two and Three, but no disturbance will occur if the area is not occupied. We conclude that take is not likely at this location.
- G. Beaver Creek (GE-4), (42.00088; -122.303945): This nest is on a small outcrop face on the ridge between the forks of Beaver Creek. The nest is approximately 0.5 mile up the canyon above Beaver Creek Cove on the north side of Copco No. 1 Reservoir. AECOM found the active nest (AECOM F19-GE1) during a 2019 helicopter survey. PJD /RES biologists observed an adult golden eagle and a nestling here in May 2020 and saw an adult at the nest in late March and late April 2021. The nest is on private property, and a residence is approximately 0.3 mile away.

The cliff is approximately 2.2 miles northeast of Copco Dam, outside the 2.0-mile zone recommended for avoiding disturbance from blasting (USFWS 2017b). Terrain probably blocks the line of sight from the cliff to the dam, and the removal of the reservoir will reduce the spread of noise across the area.

Beginning in the spring of Year Two, helicopters will bring logs from harvest areas southeast of Copco No. 1 Reservoir to a landing and storage deck at the southeastern area of Beaver Creek Cove. This location is approximately 0.9 mile from the nest site, and the view is blocked by terrain. The flight path will not directly approach the nest and will be partially obscured by terrain. Available information does not indicate that golden eagles are susceptible to disturbance from aircraft unless the nest is approached. The guidelines make no recommendations regarding aircraft, so disturbance from this activity is not likely to occur.

Following drawdown in Year Two, aerial seeding will occur in the reservoir footprint in the lower Beaver Creek area during the eagle breeding season. The aircraft (fixed-wing, helicopter, or drone) will not directly approach the nest site and will operate near the ground. Available information does not indicate that golden eagles are susceptible to disturbance from aircraft unless the nest is approached, and the guidelines make no recommendations regarding aircraft, so disturbance from this activity is not likely to occur.

The nest cliff is approximately 0.45 mile from the Beaver Creek bridge and from Copco Road along Beaver Creek Cove. It is 600 ft above the elevation of the road and reservoir pool elevation and is intermittently screened by deciduous trees. The bridge and the road are not planned for reconstruction, and this portion of Copco Road will not carry demolition equipment or spoils. However, the road will carry restoration traffic beginning in Year Two and extending into Year Three, when Beaver Creek and the Copco Valley floodplain will be the scene of several months of focused tributary restoration, including use of tractors, trucks, and human foot traffic.

The activities described in the previous paragraph are within the 1.0-mile distance recommended by the guidelines (USFWS 2017b) for avoidance of disturbance from vehicles, human foot traffic, and construction activities. Based on the guidelines, it is therefore possible that the restoration operations might disturb nesting activities. Of concern are factors such as a direct line of sight and hearing from the nest to the restoration area; furthermore, eagles at this site are not accustomed to high levels of vehicle traffic. Other factors include the fact that the nest site is high above the restoration area, although Spaul et al. (2016) reported that height of a nest site was not related to better success in an environment disturbed by recreationists. While acknowledging uncertainty, we conclude that the Beaver Creek golden eagle nest site is at sufficient risk of disturbance by restoration activities during Years Two and Three that take would be likely.

The drawdown of Copco No. 1 Reservoir, restoration of a free-flowing river, control of invasive/non-native vegetation, and restoration of native vegetation will result in an addition of approximately 950 acres of terrestrial habitat in the Copco No. 1 Reservoir footprint. This includes approximately 43 acres within 1.0 mile of the Beaver Creek golden eagle territory, an increase of approximately three percent over the pre-project amount. The USFWS Updated Survey Protocol (USFWS 2020) indicates a 1.0-mile radius from the nest site as inclusive of approximately 75 percent of the locations of 101 satellite-tagged breeding golden eagles in the western United States (see Figure 1 in USFWS 2020). The addition of habitat could be expected to improve forage availability around the site and potentially improve adult survival and reproduction in perpetuity.

- H. Lennox Rock (GE-5), (Approx. 41.9683, -122.2983): The original record from CNDDDB (AECOM GE3-3) has no date. Local biologists and residents have been aware of the site since at least the 1980s (B. Woodbridge, pers. comm.). The nest site is on a prominent cliff on a butte above the south side of Copco No. 1 Reservoir and visible from Ager-Beswick Road. AECOM biologists saw a nestling during a ground survey; they designated the site as active on June 5, 2018, and classified it as occupied during helicopter survey on May 21,

2019. The site was not known to be occupied during limited surveys in 2020. Adults were present at the nest in late February 2021, and RES/PJD saw a territorial display above the cliff in late March 2021. Land ownership is primarily private, although part of the butte is on BLM land.

The cliff is approximately 2 miles east of Copco No. 1 Dam and approximately 700 ft above the elevation of the dam and reservoir. The cliff is at a direct distance of approximately 0.3 mile from Ager-Beswick Road and the Mallard Cove boat ramp and more than 600 ft above the elevation of the road and reservoir surface.

A dredging barge will be constructed at the Mallard Cove recreation area boat ramp from Ager-Beswick Road below the cliff during August of Year One. Several truckloads of equipment will be involved. The barge will work in Copco No. 1 Reservoir near the dam and will be removed from the lake in late September of Year One. The existing recreation facilities (restrooms, a few picnic tables, boat ramp) at Mallard Cove will be removed with a tractor during September or October of Year One. While the hauling and construction will be within the 1.0-mile construction disturbance avoidance zone recommended by USFWS (USFWS 2017b), these activities are planned to occur after the breeding season, so disturbance is not likely to occur.

At 1.9 miles, the Lennox site is barely inside the 2.0-mile zone recommended by the guidelines (USFWS 2017b) for avoidance of disturbance due to blasting noise. This suggests that demolition noise from Copco No. 1 Dam might result in disturbance in Year Two. However, the line of sight and sound to the dam from the nest cliff is interrupted by terrain (RES/PJD observation), and the drawdown will have reduced the potential for blasting noise to carry across the area. In addition, the source of noise is beyond the distance for which Hansen et al. (2017) expressed concern regarding military activities. We conclude that take of golden eagles at Lennox Rock is not likely to result from demolition activities at Copco No. 1 Dam.

During Year Two following drawdown, aerial seeding will occur in the reservoir footprint below Lennox Rock during the eagle breeding season. The aircraft (fixed-wing, helicopter, or drone) will not directly approach the nest site and will operate near the ground. Available information does not indicate that golden eagles are susceptible to disturbance from aircraft unless the nest is approached and the guidelines make no recommendations regarding aircraft, so disturbance from this activity is not likely to occur.

During Year Two and Three, the Mallard Cove boat ramp area may provide access for ATVs carrying workers for manual activities in the restoration along the Klamath River. The site is within the 1.0-mile zone recommended by the guidelines (USFWS 2017b) for avoidance of disturbance from vehicles and humans on foot. Also, the distance is within that for which some experts (Hansen et al. 2017) expressed concern regarding OHV activities. The nest is high above the potential disturbance source, but Spaul and Heath (2016) reported that the height of a nest site was not related to nest success in an environment disturbed by

recreationists. The nest site has a direct line of sight and sound to restoration traffic or activities; however, eagles at this site are probably accustomed to traffic at the recreational boat ramp as well as humans in the residential area below the cliff. Moreover, the restoration ATV traffic will be limited and unlike the noisy OHV traffic evaluated by Hansen et al. (2017). The Lennox site is over 1.0 mile from the focused restoration area at Beaver Creek. In combination, these circumstances indicate disturbance reaching the level of take is unlikely.

The restoration of a free-flowing river, the control of invasive/non-native vegetation, and the restoration of native vegetation in and around priority tributaries where Copco No. 1 Reservoir currently stands will result in an addition of approximately 950 acres of terrestrial habitat in the Copco No. 1 Reservoir footprint. The additional acreage includes approximately 362 acres within 1.0 mile of the Lennox Rock territory, an increase of approximately 18 percent over the pre-project amount. (These acres are separate from those discussed above for the Beaver territory.) The USFWS Updated Survey Protocol (USFWS 2020) indicates a 1.0-mile radius from the nest site as inclusive of approximately 75 percent of the locations of 101 satellite-tagged breeding golden eagles in the western United States (see Figure 1 in USFWS 2020). The additional acreage could be expected to improve forage availability in the core area around the site and potentially improve adult survival and reproduction in perpetuity.

- I. Sloan Butte (GE-6), (41.99159, -122.3513): Sloan Butte is a prominent topographic feature north of the two Copco dams. AECOM surveyed this site (AECOM F19- GE2) on several occasions in 2019 by helicopter and from the ground. An old nest was found, and a golden eagle was seen perched on the cliff early in the 2019 nesting season. A local resident told AECOM that eagles produced young there in 2018. Observers did not see eagles here in 2020. In 2021, an adult golden eagle was seen perched at a prominent snag approximately 0.4 mile east of the nest location. The presence of the adult indicated that the territory was occupied, but no eagles were seen at the known nest and the nest did not appear to have been rebuilt. The known nest is on a west-facing cliff face that is clearly visible at approximately 0.5 mile from Fall Creek Road, a dirt public road with light local traffic. It is also visible from Copco Road, which is used several times daily by PacifiCorp vehicles accessing Copco No. 1 Dam. The cliff is on private land, with PacifiCorp land nearby. Most of the area within a 1.0-mile radius of Sloan Butte is visible from roads, but neither repeated ground searches of surrounding areas from roads by AECOM and RES/PJD nor the 2019 helicopter surveys located any alternate nests.

The Sloan Butte cliff is within 0.5 mile from, and 400 ft above, the closest point along Copco Road, which will be upgraded during July through October of Year One. This portion of Copco Road will be used during July of Year One through December of Year Two for hauling heavy equipment and materials to and from the Copco No. 1 Development while they are being demolished, and during Year Three for hauling equipment to and from restoration activities at Beaver Creek and Copco Valley. During September to October of Year One, road work will include modifying the Copco Road bridge over Fall Creek, which is approximately 0.75 mile southwest of Sloan Butte. The nest is within the 1.0-mile zone

recommended by the guidelines (USFWS 2017b) for avoidance of disturbance due to construction activities.

The Sloan Butte cliff is approximately 0.7 mile from, and 400 ft above, the CDFW Fall Creek Fish Hatchery facilities, which will be reconstructed during July of Year One through January of Year Two. While the nest is within the 1.0-mile zone recommended by the guidelines (USFWS 2017b) for avoidance of disturbance due to construction activities, the nest site will not be disturbed in Year One because hatchery construction will not begin until late in the nesting season. The nest will likely be disturbed by hauling in Years Two and Three.

The Sloan Butte nest cliff is 1.0 to 1.5 miles from dams and generation facilities at Copco No. 1 and Copco No. 2. The small Copco No. 2 Dam will be partially removed during June to November of Year One, with demolition completed in Year Two. This structure is in a deep gorge, and noise should be attenuated by terrain. The large facilities at Copco No. 1 Dam and Copco No. 2 Dam and Powerhouse will be demolished during the spring months of Year Two. Numerous explosive blasts will occur at Copco No. 1 Dam beginning in August of Year One and extending through January of Year Two. The known nest is approximately 1.25 miles from Copco No. 1 Dam and 800 vertical ft above the level of the facilities, within the 2.0-mile zone the guidelines (USFWS 2017b) recommend for avoidance of disturbance from loud noises. However, the dam is in a deep gorge, and a large hill above the gorge blocks the line of sight and is likely to reduce noise to a level that disturbance rising to the level of take is unlikely to occur.

During April and May of Year Two, a transmission line will be removed approximately 0.3 mile from the nest cliff using ground-based equipment. This is within the distance recommended by the guidelines for avoidance of construction-related disturbance (USFWS 2017b) and also within the distance where experts expressed concern regarding construction activities for sensitive eagles (Hansen et al. 2017). However, removal of power lines using trucks would not be expected to create the “extended noisy construction” contemplated by the expert opinion exercise.

Overall, the Sloan Butte nest site will encounter more potentially disturbing activities than any other nest site in the Project Area. However, in most cases the activities are beyond or near the outer limits of distances where the guidelines and Hansen et al. (2017) estimated that important effects could occur and are minimized by terrain, or the activities will take place outside the nesting season. We conclude that the only sources of potential disturbance over the three years likely to result in take requiring authorization are related to hauling on Copco Road in Years Two and Three.

- J. Jenny Creek canyon (GE-7), (F-GE2) 41.99261, -122.37138; other coordinates available): Three golden eagle cliff nests are known within a 1.4-mile reach of Jenny Creek canyon, which enters Iron Gate Reservoir from the north. Two were found by a 1979 USFWS/BLM helicopter survey (AECOM GE3-5, GE3-6); according to records, no eagles were seen on those early surveys. AECOM's helicopter surveys in 2018 and 2019 found inactive nests at

those locations, with a golden eagle perched near GE3-5 (the northernmost site) in 2018. The southernmost nest (GE3-6), near where the transmission lines cross the canyon, was apparently active in 2015 (J. Harper, BLM, pers. comm.) The AECOM surveys also found a third inactive nest (F-GE2) mid-way between the two earlier sites. The northernmost nest (GE3-5) is on PacifiCorp property; the middle nest (GE-7, AECOM F-GE2), near Jenny Creek Falls, is on BLM land; and the southernmost (AECOM GE3-6), is on private land. No available records indicate that any of these nests have been occupied simultaneously, so we are treating all three known golden eagle nests in Jenny Creek canyon as part of one territory.

Jenny Creek canyon is remote and ground access is difficult. The three sites are all more than 5 miles northeast of Iron Gate Dam, and are all more than 1.5 miles north of, and an estimated 500 ft above, the Jenny Creek bridge. The Jenny Creek bridge is in sufficient condition to carry traffic, but abutments may be reinforced during April and May of Year One. Due to distance and terrain, disturbance from the dam, the road, and the bridge is unlikely. Also, during spring of Year Two and in Year Three, restoration actions will be conducted on approximately 0.2 mile of Jenny Creek, which will be re-exposed by drawdown of Iron Gate Reservoir. These action areas are all more than 1.5 miles from the nearest alternate nest in the canyon (AECOM's GE3-6), which is visible from the Jenny Creek bridge; however, disturbance is unlikely due to distance and terrain.

The most recently known occupied nest in Jenny Creek canyon (GE3-5, the northernmost nest) is a linear distance of 1.4 miles west of the Copco No. 2 Powerhouse, the site of construction activities at Fall Creek Hatchery, and restoration actions along the Klamath River, which will be re-exposed in the current upper portion of Iron Gate Reservoir. The ridge on the east rim above the canyon nests blocks the line of sight to these locations.

The Renewal Corporation analyzed the potential effects to the southern-most site (AECOM site GE3-6; KRRC site GE-7), which is the site that is nearest to activities. This nest site is 0.6 mile from the Fall Creek Hatchery, 1.2 miles from Copco No. 2 Powerhouse, 1.8 miles from Copco No. 2 Dam, 0.7 to 1.5 miles from Copco Road, and 1.5 miles from restoration actions at Jenny Creek. In our judgement, disturbance of golden eagle nests in Jenny Creek canyon from the Copco No. 2 area is unlikely because of these distances and the substantial terrain along the ridge above the nests.

- K. Dry Creek (GE-8), (41.9265, -122.4822): The original record for this site is from USFWS/BLM in 1979 (AECOM GE3-7). Based on a review of remote images, the original coordinates were erroneous as there is no visible nesting substrate at that specific location. On the west-facing cliff of a large outcrop at a nearby location, an AECOM helicopter survey on June 6, 2018, found three inactive nests and a perched golden eagle. An AECOM helicopter survey on May 23, 2019, found no eagles. Based on imagery of the site, we assigned corrected coordinates to the location observed by AECOM. This upland site is 2.4 miles west of Iron Gate Dam and is not visible from high points immediately above the dam (PJD/RES observations). The site is 1.3 miles north of Copco Road near the point where

the road crosses Dry Creek. The prominent south face of the rock outcrop is visible from Copco Road, but the west face with the known nests is not visible from the road.

Copco Road at this location carries regular local traffic from the hydroelectric project, the Iron Gate Fish Hatchery, residents, and recreationists. Beginning in July of Year One, the road will be upgraded and will carry greatly increased traffic to and from the Copco and Iron Gate areas during all three years. The bridge over Dry Creek on Copco Road will be reinforced during September of Year One and returned to its original status sometime during late Year Two. Terrain blocks the line of sight from the bridge location to the cliff (PJD/RES observations). All activities will be beyond the disturbance distances suggested by USFWS guidelines (USFWS 2017b). Due to distance, elevation, terrain, and visibility, and the fact that activities will be confined to the road, disturbance of this site to the degree that take will occur is unlikely.

L. Cold Creek (41.93288, -122.35192) (Project nest number not assigned): This cliff nest (AECOM F19-GE3) was found by an AECOM helicopter survey on May 22, 2019, and it was rechecked by helicopter on June 17, 2019. No golden eagles were seen at the site, and observers noted that the visible nest structures appeared small. Another larger cliff is across the road. The site was of interest because golden eagles had been seen earlier from the ground 1.5 miles away. The site is 2.5 to 3 miles from project facilities or reservoirs, but the cliff overlooks Ager-Beswick Road, which will carry trucks and equipment to and from the barge construction site at Mallard Cove (Copco No. 1 Reservoir) during August to October of Year One. The area was checked on several occasions in 2021 and there is no evidence of a golden eagle nest site at this location. Therefore, no project identification number was assigned and there is no likelihood of take at this location.

### **5.2.3.3 Potential for Unlocated Golden Eagle Territories**

We considered three factors that might indicate the presence of as-yet-unlocated golden eagle territories in the Project Area. These are (1) observed courtship/territorial behaviors, (2) observed unoccupied nest structures, and (3) the occurrence of such sites in gaps in the mapped distribution of known occupied nest sites.

The latter of these three factors is the most difficult to interpret. Golden eagle home ranges, densities, and mean nearest neighbor distances are variable throughout the western United States (Dunk et al. 2019) and have not been described in the region surrounding the Project Reach. The Proposed Action will affect only golden eagle territories in which an occupied nest is within disturbance range, and unlike for bald eagles, will not remove habitat that attracts golden eagles. The Klamath River canyon survey area is basically a narrow linear transect across many undefined potential territories whose nests could be outside the survey area. Therefore, an apparent gap in distribution of golden eagle nest locations along the Klamath River canyon does not necessarily mean that unknown nest sites have been missed or will be disturbed by the Proposed Action.

AECOM biologists observed instances of apparent golden eagle courtship or territorial behavior at three locations that were more than 0.5 mile from a known nest site. These included the cliffs above Copco No. 2 Powerhouse, cliffs at the south end of the ridge between the Jenny Creek drainage and the Fall Creek drainage on the north side of Iron Gate Reservoir, and the ridge above the east fork of the Camp Creek drainage above Iron Gate Reservoir.

All these locations were surveyed repeatedly by helicopter (J. DiDonato, pers. comm.) and, where possible, from the ground. Ground observations included focused work by RES/PJD in 2021. No nests were found, and no other observations of golden eagles were reported in these areas. The cliffs at Copco No. 2 Powerhouse are approximately 0.8 mile from Sloan Butte and could be part of that territory. A nest at this area would be subject to disturbance. The ridge above Jenny Creek is approximately 1.3 miles from the nearest golden eagle nest in Jenny Creek canyon. Ravens nested on this cliff in 2020 and 2021, which may indicate that it was not used for nesting by golden eagles. The cliffs are several hundred feet above the road and reservoir. The potential for disturbance is unknown.

The upper Camp Creek area is 2.5 to 3.0 miles from the nearest known golden eagle nest, so is perhaps more likely as a potential territory location. Most of the area is over 0.5 mile from Copco Road and Iron Gate Reservoir and 3.0 miles from Iron Gate Dam. Helicopter surveys would likely have found a nest on the side of the ridge facing the reservoir (J. DiDonato, pers. comm.), so any undiscovered nest is likely to be at a greater distance and disturbance potential is likely to be low.

In the canyon of Long Prairie Creek above the north side of the upper end of Copco No. 1 Reservoir, AECOM helicopter surveyors in 2019 reported a cliff cavity that appeared suitable for golden eagle nesting, although no golden eagles were seen. This site is approximately 1.1 miles from the nearest known occupied golden eagle nest (GE-3, Ranch Bridge), so it might be within that territory. This site is on private land approximately 0.9 mile from the Copco Road bridge and is not visible from Copco Road due to terrain (PJD). If it is a golden eagle nest site, it is not expected to be subject to disturbance.

In summary, the presence of as-yet-unlocated golden eagle nest sites in locations subject to disturbance appears unlikely at this time.

#### **5.2.3.3.1 Summary of Effects on Golden Eagles in the Project Area**

The Proposed Action is not expected to result in the death or injury of adult or post-fledging immature golden eagles or remove any nest sites. Based on the assessment described above, we have concluded that effects of disturbance on golden eagle reproduction at two territories (GE-4 and GE-6) is likely to result in take at both sites during Year Two and Year Three.

These golden eagle territories will not be permanently altered in a negative manner and the effects of disturbance are expected to be temporary. Terrestrial foraging habitat should increase by a total of approximately 2,200 acres as reservoirs are drained and vegetation restored in the re-exposed areas of the three larger reservoirs. This increase includes habitat in

the 1.0-mile core foraging area of two golden eagle territories. Nesting habitat on cliffs or in forested areas will not be modified. Once disturbance ceases, golden eagles will be able to resume breeding activities at all the Project Area nest sites. Thus, no long-term adverse effects are expected. The effects to golden eagle territories are summarized in Table 5-2.

As detailed in section 5.1 (Methods), Renewal Corporation contractors obtained available historic data on nest and territory locations of golden eagles prior to the 2017 surveys (Renewal Corporation 2019, 2020). Their analyses included zones of potential impacts based on a preliminary understanding of activities and nest site locations (Renewal Corporation 2019, 2020). Subsequent surveys and analyses have refined nest site locations and evaluated potential effects using more detailed information on activities.

All 13 golden eagle territories previously documented or recently known to occur are summarized in Table 5-2. At five of these territories, recent surveys (2017 to 2021) did not detect nest sites or eagle activity indicating presence of a nearby nest site or occupied territory, and/or communications with State and Federal wildlife officials and local landowners indicated that nests no longer exist. Those sites are labelled as “Unassigned/No ID” (northwest of J.C. Boyle Dam, Chase Mountain, South Side of Klamath River, Long Prairie Creek, and Cold Creek). In addition, three recently occupied territories (Hessig Ranch, Ranch Bridge, and Dry Creek) were determined to be beyond potential disturbance zones and were not further analyzed. The five remaining territories that the Renewal Corporation has now determined as having the potential to be affected by activities are highlighted in green in Table 5-2.

**Table 5-2. Golden Eagle Territories Evaluated for Effects from the Proposed Action**

<b>TERRITORY NAME (LOCATION)</b>	<b>TERRITORY ID KRRC/RES (KRRC/AECOM)<sup>1</sup></b>	<b>RECENT STATUS<sup>2</sup></b>	<b>DISTANCE FROM ACTIVITY<sup>3</sup></b>	<b>WILL TAKE OCCUR?<sup>4</sup> WHAT YEARS?</b>
NW JCB-Unconfirmed (NW of J.C. Boyle Dam)	Unassigned/No ID <sup>5</sup> (GE1_6)	Historic territory. Nest not found: 2018, 2019.	≈1.8 miles from J.C. Boyle Dam demolition and blasting	No
Chase Mtn.-Unconfirmed (SE J.C. Boyle Dam)	Unassigned/No ID (GE1_7, GE4_5)	Historic territory. Eagles not detected: 1997. Nest not found: 2004, 2018, 2019.	>2.0 miles from any activity	No
Riffle Rapids (J.C. Boyle Dam and Powerhouse)	GE-1 (GE4_206)	Nest active: 2018, 2020, 2021. Eagles not detected: 2019	>2.0 miles from dam blasting ≈ 0.8-1.0 mile from powerhouse demolition	No
Hessig Ranch (Upriver from Copco No. 1 Reservoir)	GE-2 (F_GE3)	Nest active: 2018, 2019. Not surveyed: 2020, 2021	> 2.0 miles from any activity	No
Ranch Bridge (Upriver from Copco No. 1 Reservoir)	GE-3 (F_GE4)	Territory occupied: 2018, 2019. Nest not found and eagles not detected: 2021	> 2.0 miles from any activity	No
South Side Klamath River (Upper Copco No. 1 Reservoir)	Unassigned/No ID GE3_8, F-GE_4	Unknown Status: 1979. Nest not found and eagles not detected: 2018, 2019, 2021	> 2.0 miles from any activity	No
Long Prairie Creek (Upper Copco No. 1 Reservoir)	Unassigned/No ID (F19_GE4)	Nest not found and eagles not detected: 2019.	> 2.0 miles from any activity	No

TERRITORY NAME (LOCATION)	TERRITORY ID KRRC/RES (KRRC/AECOM) <sup>1</sup>	RECENT STATUS <sup>2</sup>	DISTANCE FROM ACTIVITY <sup>3</sup>	WILL TAKE OCCUR? <sup>4</sup> WHAT YEARS?
Beaver Creek (Copco No. 1 Reservoir)	GE-4 (F19_GE1)	Nest active: 2019, 2020, 2021	≈ 0.5 mile from restoration activities >2.0 miles from blasting at Copco No. 1 Dam	Yes Years 2 and 3
Lennox Rock (Copco No. 1 Reservoir)	GE-5 (GE3_3)	Nest active: 2018, 2019, 2021.	≈ 0.3 mile from barge assembly ≈ 0.3 mile from ATV use ≈ 2.0 miles from blasting at Copco No. 1 Dam	No
Sloan Butte (Copco No. 1 Reservoir)	GE-6 (F19_GE2)	Territory occupied: 2018, 2019, 2021.	≈ 0.75 mile from hatchery construction ≈ 0.3 mile from haul road ≈ 1.2 miles from blasting at Copco No. 1 Dam ~1.1 miles from blasting at Copco No. 2 Dam ≈ 1.0 mile from Copco No. 2 powerhouse demolition	Yes Years 2 and 3
Cold Creek (Copco No. 1 Reservoir)	Unassigned/No ID (F19_GE3)	No nest found and eagles not detected: 2019	> 2.0 miles from any activity	No
Jenny Creek Canyon (Iron Gate Reservoir)	GE-7 <sup>6</sup> (GE3_5, GE3_6, F_GE2)	Territory occupied: 2018 (GE3_5). No eagles detected: 2018, 2019 (GE3_6, F_GE2), 2021 (GE3-6).	(GE3-6) =0.6 mi. from hatchery construction ~1.8 mile from demolition and blasting at Copco No. 2 Dam	No

TERRITORY NAME (LOCATION)	TERRITORY ID KRRC/RES (KRRC/AECOM) <sup>1</sup>	RECENT STATUS <sup>2</sup>	DISTANCE FROM ACTIVITY <sup>3</sup>	WILL TAKE OCCUR? <sup>4</sup> WHAT YEARS?
			≈ 1.0 mi. from Copco No. 2 Powerhouse demolition	
Dry Creek (Downriver from Iron Gate Dam)	GE-8 (GE3_7)	Territory occupied: 2018, 2021. Eagles not detected: 2019.	≈ 1.3 miles from haul road >2.0 miles from demolition at Iron Gate Dam	No

**Legend:**

- Territories that may be affected by activities
- Territories not affected by activities

**Notes:**

1. KRRC/RES refers to field work conducted by Renewal Corporation subcontractor RES in 2020 and 2021, and KRRC/AECOM refers to field work conducted by AECOM in 2017, 2018, and 2019 (see detailed description of surveys in section 5.1 of this Eagle Conservation Plan).
2. “Territory occupied” means golden eagles were seen near nesting areas, but no nesting activity was observed. “Nest Active” means nesting behavior was seen in a specific nest. Limited surveys were conducted in 2020; some incidental observations are included.
3. Also see detailed descriptions on timing and activities in individual territory narratives and tables (section 5.2.3).
4. See details in tables on individual territories.
5. Territories identified as “Unassigned/No ID” are reported historic sites where nests were not located in recent surveys.
6. GE-7 (RES) evaluated GE3\_6 (AECOM) as this nest site is closest to activities at Fall Creek Hatchery and Copco No. 2.

## **6.0 Quantified Estimates of Disturbance**

### **6.1 Bald Eagles**

As demonstrated in this Eagle Conservation Plan, in Year Two the Proposed Action is expected to reduce reproductive output at ten bald eagle territories by disrupting forage availability during reservoir drawdown, resulting in ten instances of take. At the three of these nests (BE-6, BE-7, and BE-8) that are along the river below J.C. Boyle, this effect is expected for only one year. At the seven of these territories that are near reservoirs, the forage-related effect on reproduction may persist for an unknown period into the future. At one of the same reservoir territories (BE-9), reproduction will also be subject to disturbance by demolition in Year Two, but this will not be counted as an additional take. Similarly, reproductive output at three of the reservoir territories (BE-5, BE-10, and BE-11) is expected to be reduced by hauling-related disturbance in Year Two, but this will not be counted as an additional take. Thus, ten total instances of take of bald eagles are expected in Year Two.

In Year Three, bald eagle reproductive output at two sites (BE-10 and BE-11) is expected to be disturbed by nearby hauling, resulting in two instances of take in that year.

### **6.2 Golden Eagles**

As demonstrated in this Eagle Conservation Plan, the Proposed Action is expected to result in reduced reproductive output and likely take due to hauling on roads near one golden eagle nest site (GE-6) in both Year Two and Year Three. Also, reduced reproductive output and take are likely due to stream restoration activities near another golden eagle nest site (GE-4) in both Year Two and Year Three. Thus, instances of take of golden eagles are expected to total two in Year Two and two in Year Three.

## **7.0 Avoidance, Minimization, and Mitigation Measures**

Project biologists conducted surveys over a five-year period (2017–2021) and used historical information to identify all known or potential nest sites. Throughout project planning, biologists and engineers coordinated to develop measures that would reduce the likelihood of take. Where feasible, project tasks were adapted to the timing of the eagle nesting season. The Proposed Action incorporates the Renewal Corporation's plan to avoid, minimize, and mitigate take.

Avoidance, minimization, and mitigation measures based on USFWS guidance and guidelines were developed and will be implemented including the following:

1. No killing or injury (e.g., collision with project equipment or facilities) of adult or post-fledging immature eagles is expected to occur. No nest removal will occur.
2. Over 220 potentially hazardous power poles and 70,000 feet of power line will be removed. Poles for perching will be retained at key locations as practicable.

3. Project surveys for eagles in Years 1, 2 and 3 will confirm the status of known nest sites and identify previously unknown nest sites. Potential additional avoidance and minimization measures to avoid disturbance or mortality will be coordinated with the appropriate agencies.
4. Use of aircraft will avoid active nest sites.
5. Over 2,000 acres of reservoir footprint will be restored and will be suitable golden eagle foraging habitat, per the measures stated in Renewal Corporation's Reservoir Area Management Plan (2021c)
6. Mainstem and tributary restoration will create stream conditions favorable for anadromous and resident fish, per the measures stated in the Renewal Corporation's Reservoir Area Management Plan (2021c).
7. Reservoir removal and restoration is expected to reduce aquatic disease and algal toxicity by improving water quality (SWRCB 2020).
8. More than 8,000 acres of Project lands will be conveyed to the California Department of Fish and Wildlife and Oregon Department of Land Conservation and Development for management in perpetuity.

The Renewal Corporation will continue to conduct ground-based surveys for bald and golden eagles during Years One, Two, and Three in a manner similar to the surveys conducted from 2019 through 2021.

The purpose of the surveys will be to determine if eagles are occupying territories and known nest sites within 2.0 miles of the Proposed Action (USFWS 2020). In addition, surveys will include areas suitable for nesting of both bald and golden eagles within 2.0 miles of activities where nests have not been previously known or where historic nest sites may be reoccupied.

Surveys will generally be conducted consistent with USFWS (2020), Pagel et al. (2010), and Jackman and Jenkins (2004), but adapted for local conditions and project goals. Three survey periods will occur during each breeding season, with the first set in January to March to determine if eagles are active at nest sites, March to May to determine if eagles are nesting, and June to July to determine if eagles continue to nest or have completed nesting activities. Typically, it takes three days to cover the Project Reach from the Iron Gate Development to the J.C. Boyle Development.

In addition, designated biologists will be on the work sites at various times over all three years to monitor construction activities and to implement avoidance and minimization measures for a variety of plant and animal species. During the general species monitoring, the designated biologists will be instructed to be observant for and report all bald and golden eagle activities to the eagle survey team.

## **8.0 Benefits of the Proposed Action for Eagles**

The Proposed Action will have long-term positive effects. Following the removal of the dams and the beginning of restoration actions, over 2,000 acres of terrestrial foraging habitat and prey resources for golden eagles will increase in quantity and quality in the long term. The aquatic

foraging resource for bald eagles will also improve quickly and provide benefits over the long term as resident and anadromous fish respond to return of a free-flowing river and reduction of toxic algae and fish parasites. The transfer of over 8,000 acres of lands to natural resource agencies will open possibilities for long-term habitat management that is likely to further increase habitat value and eagle response, especially the re-occupation by breeding bald eagles. Both species will benefit in the long term from removal of hazardous power poles and lines. Thus, the short-term impacts will be greatly outweighed by the long-term outcomes of the Proposed Action for both species.

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Ron Jackman, Wildlife Biologist, contractor to Pacific Gas and Electric Co., Redding, California

Bill Tinniswood, Fisheries Biologist, Oregon Department of Fish and Wildlife, Klamath Falls, Oregon

Brian Woodbridge, Wildlife Biologist (retired), U.S. Fish and Wildlife Service, Corvallis, Oregon

## **Appendix A**

### **Figures**



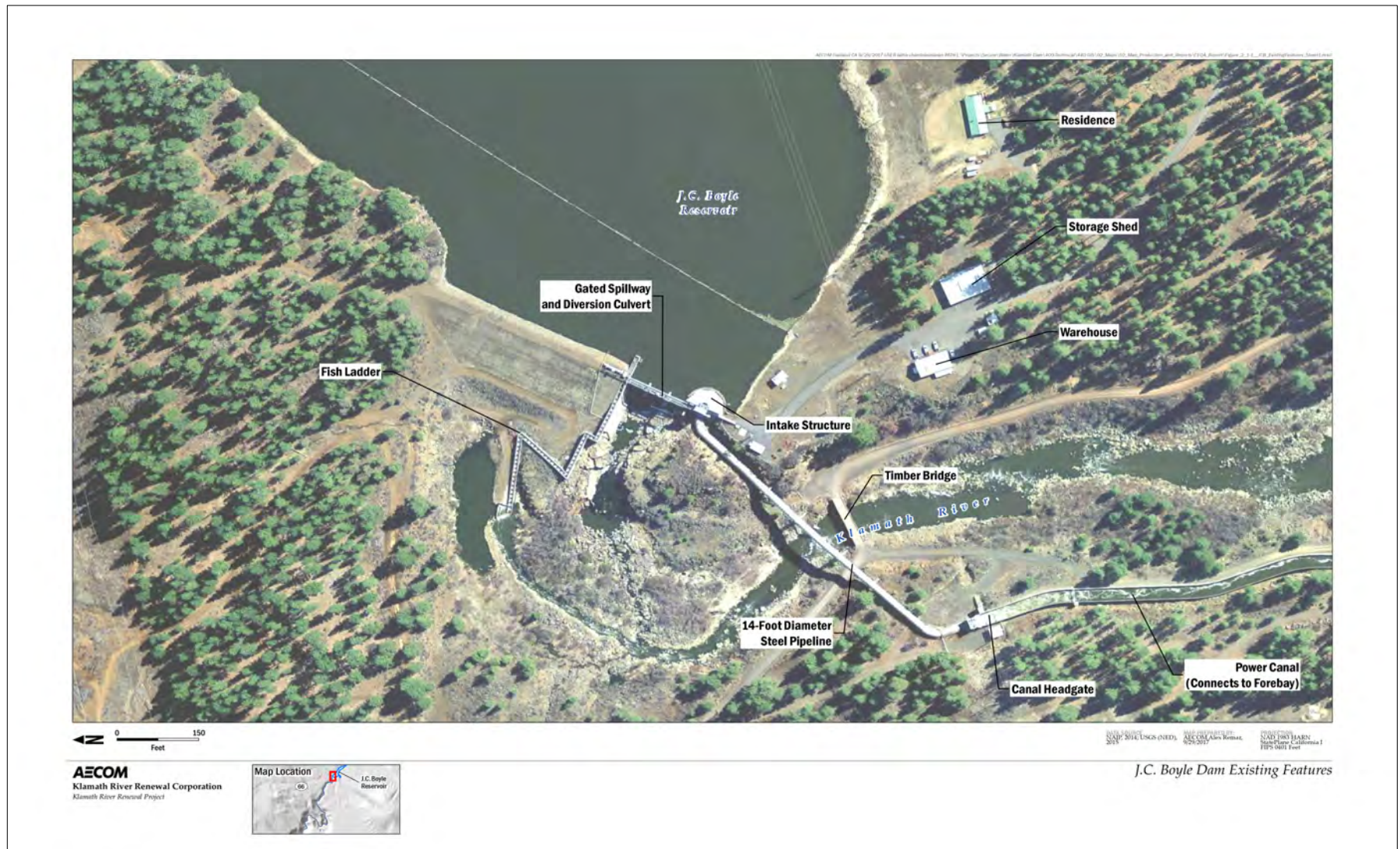
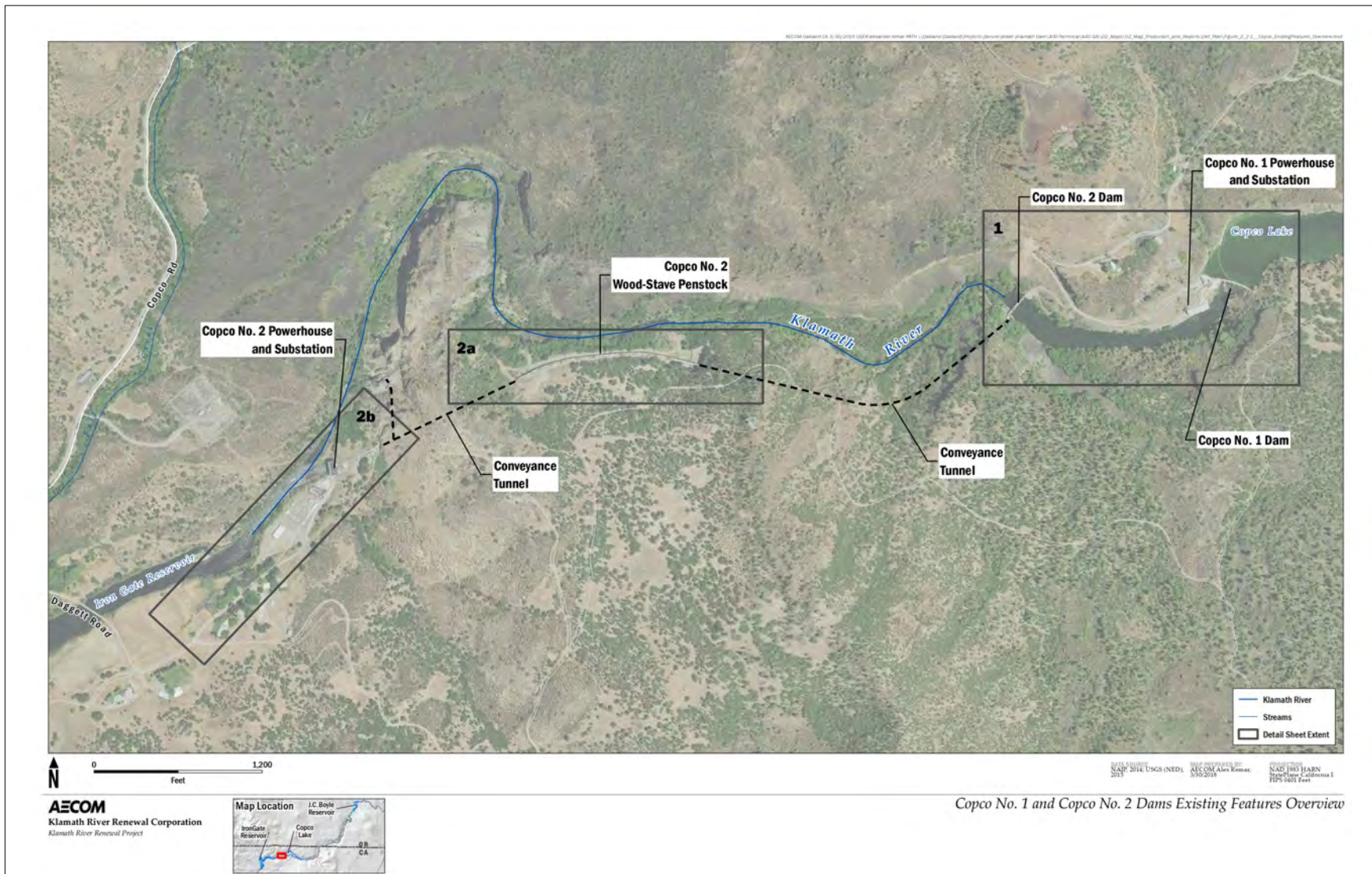


Figure A-2. J.C. Boyle Dam Existing Features in Proposed Action



Figure A-3. J.C. Boyle Dam Forebay, Spillway, Penstock, and Powerhouse in Proposed Action



Copco No. 1 and Copco No. 2 Dams Existing Features Overview

Figure A-4. Copco No. 1 and Copco No. 2 Developments Overview



Figure A-5. Copco No. 1 and Copco No. 2 Developments' Features in Proposed Action



Figure A-6. Copco No. 2 Wood Stave Penstock and Powerhouse in Proposed Action

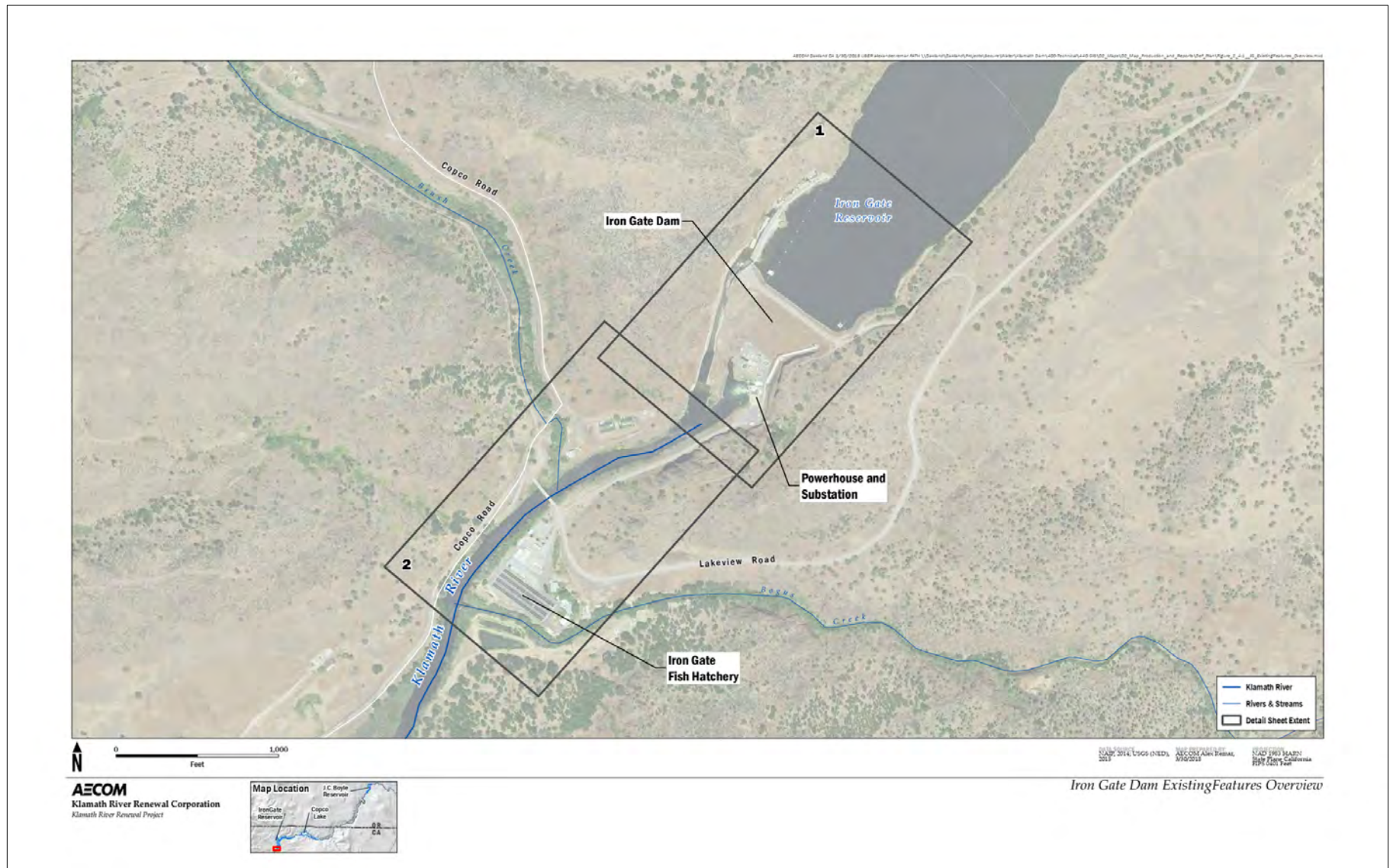


Figure A-7. Iron Gate Dam Existing Features Overview



Figure A-8. Iron Gate Dam Existing Features in Proposed Action



Figure A-9. Iron Gate Dam – Iron Gate Fish Hatchery

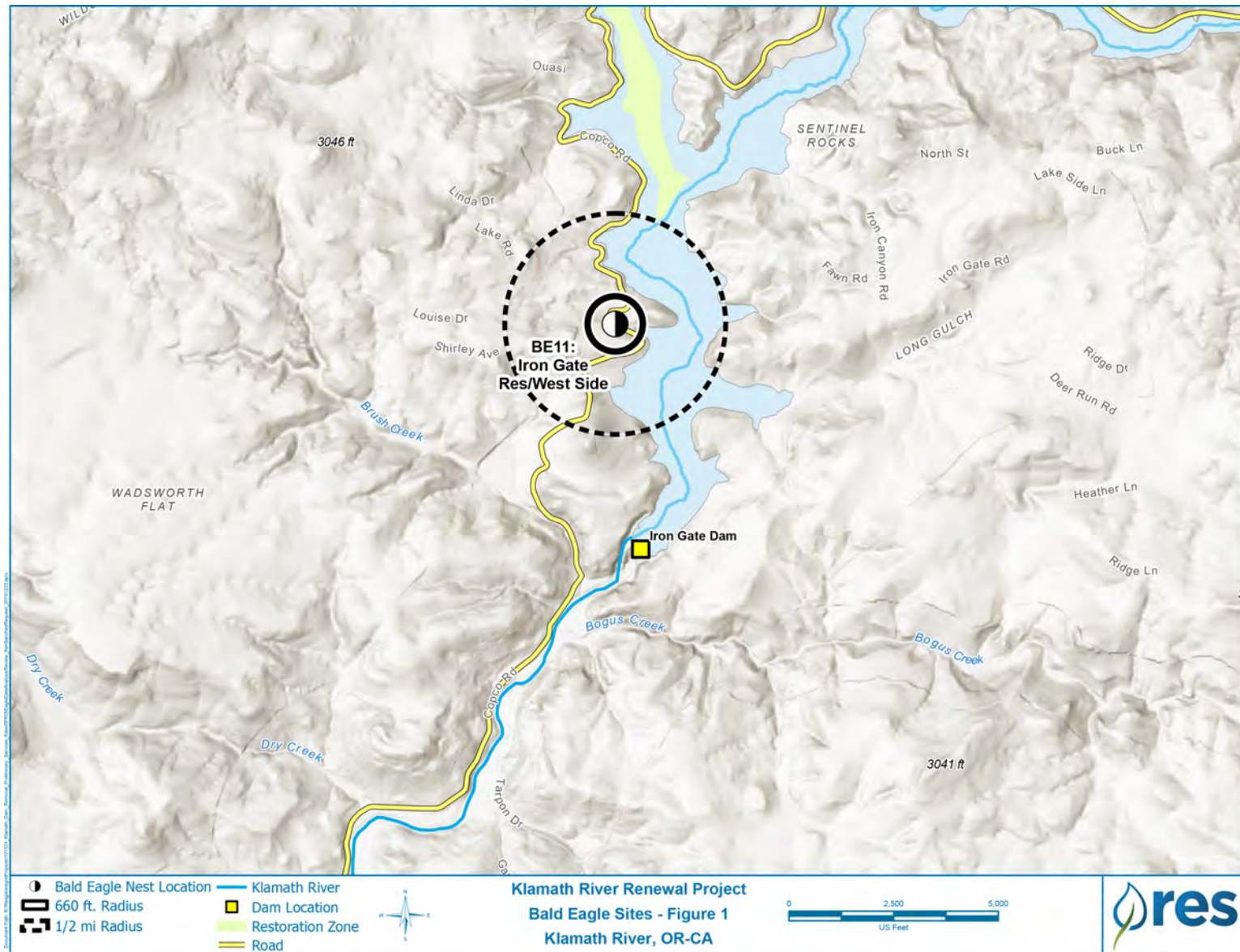


Figure A-10. Bald Eagle Sites – Location #1

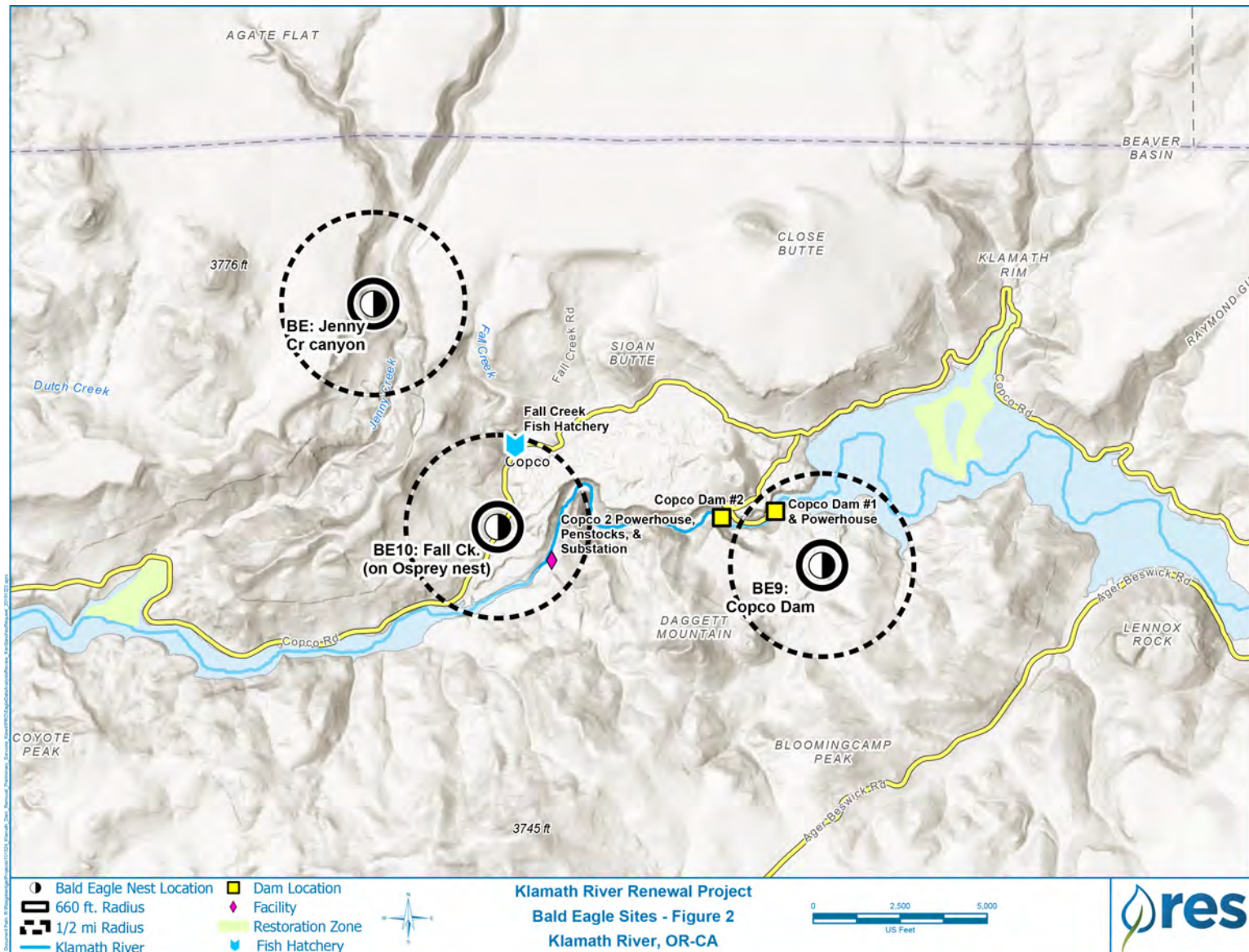


Figure A-11. Bald Eagle Sites – Location #2

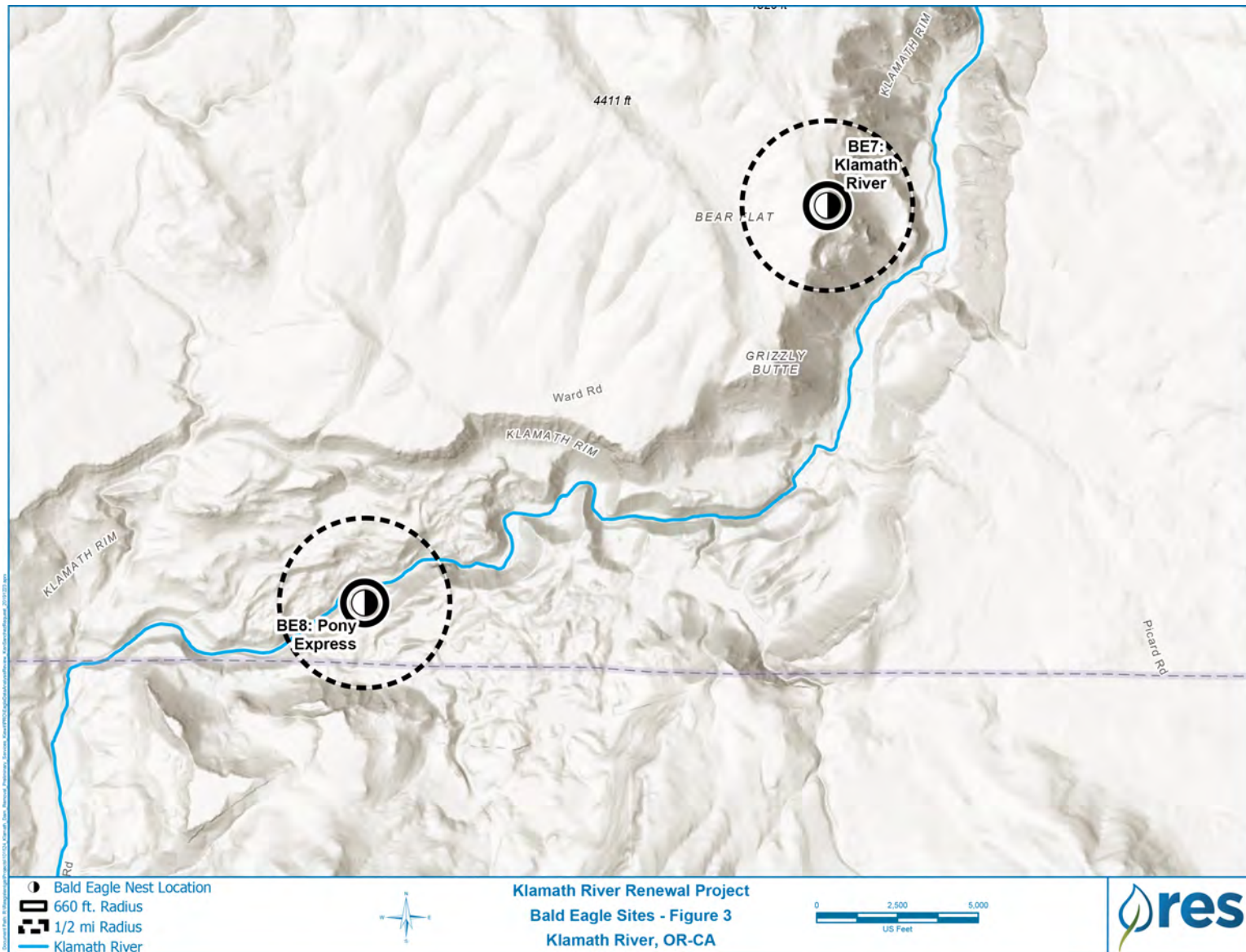


Figure A-12. Bald Eagle Sites – Location #3

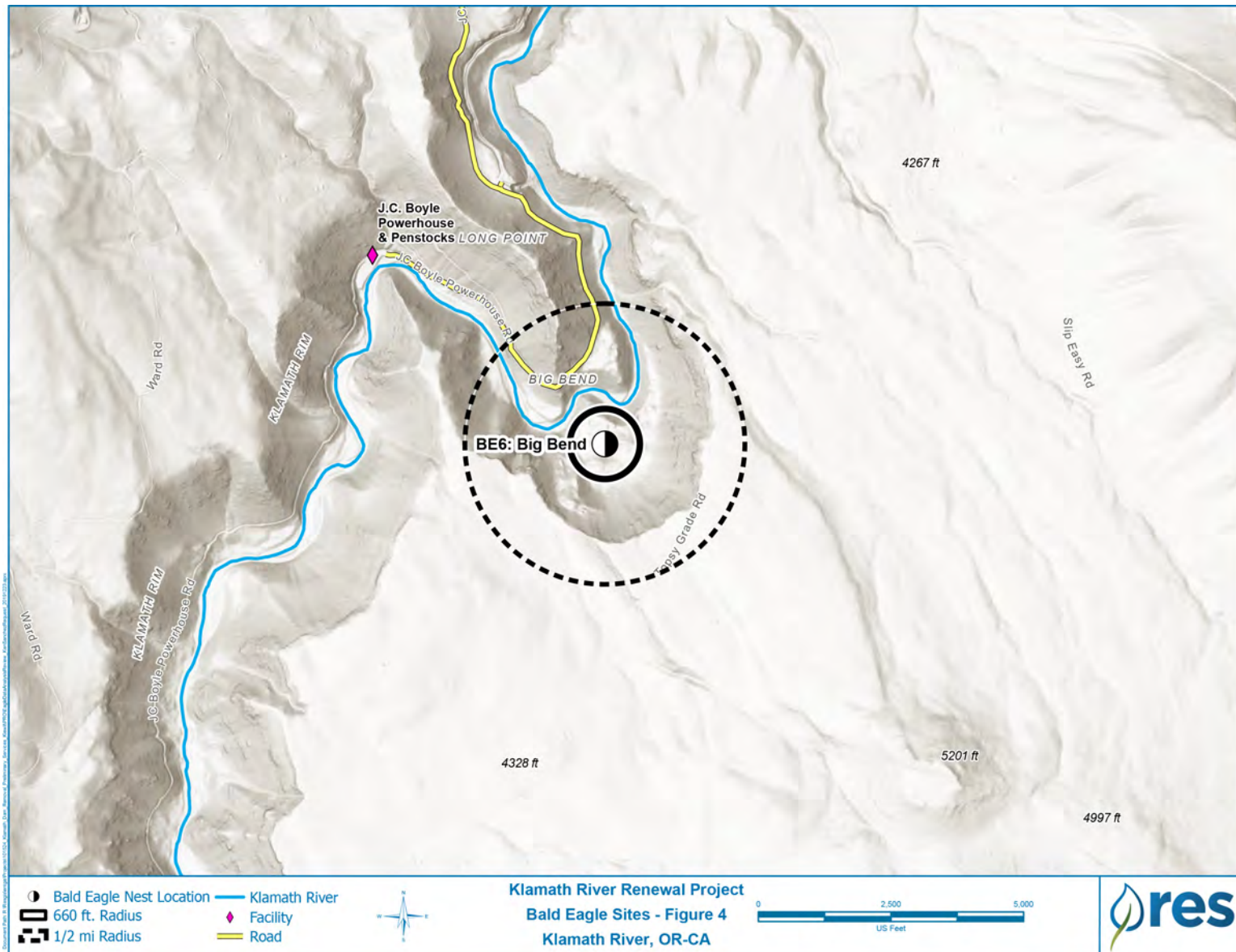


Figure A-13. Bald Eagle Sites – Location #4

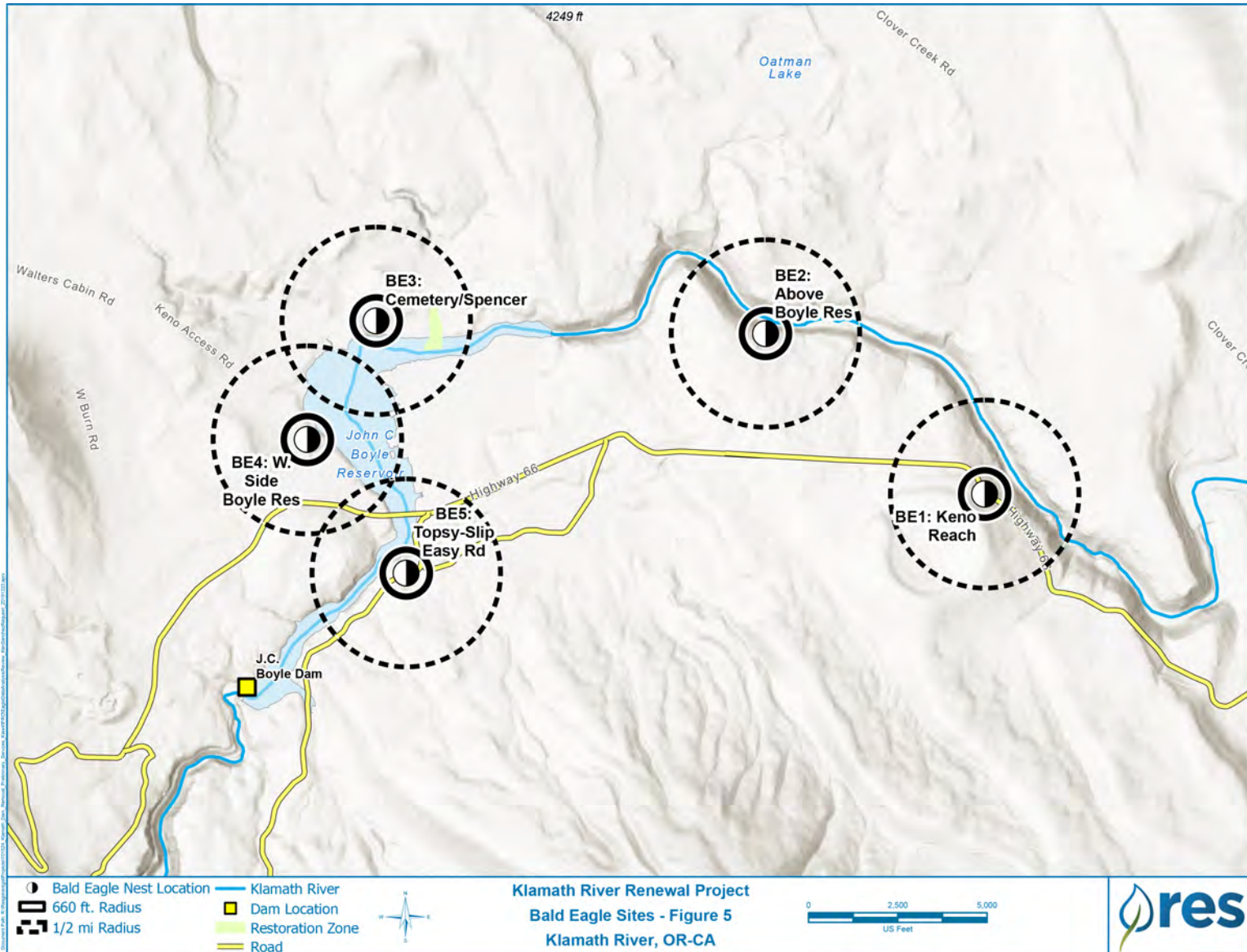


Figure A-14. Bald Eagle Sites – Location #5

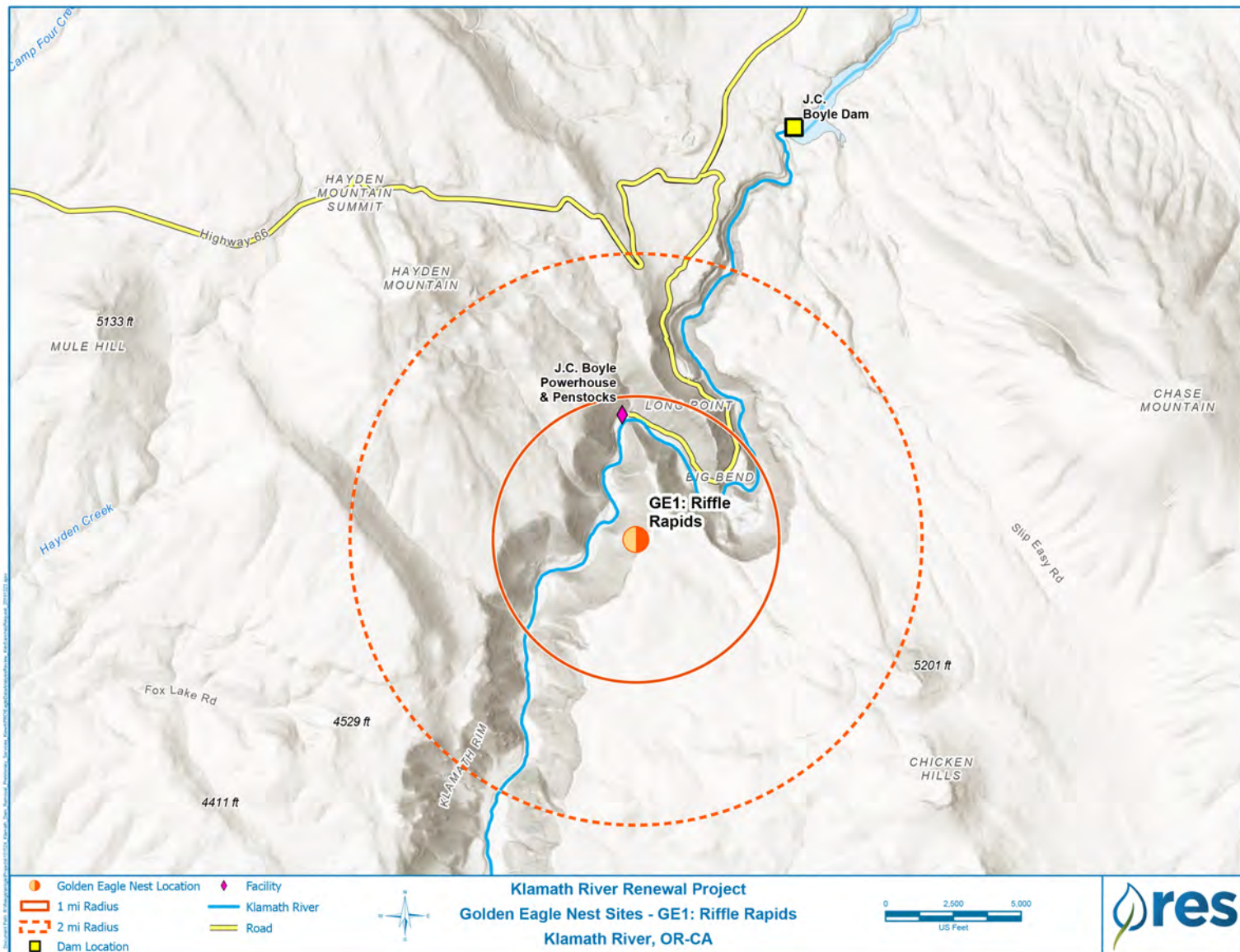


Figure A-15. Golden Eagle Nest Sites - Location #1

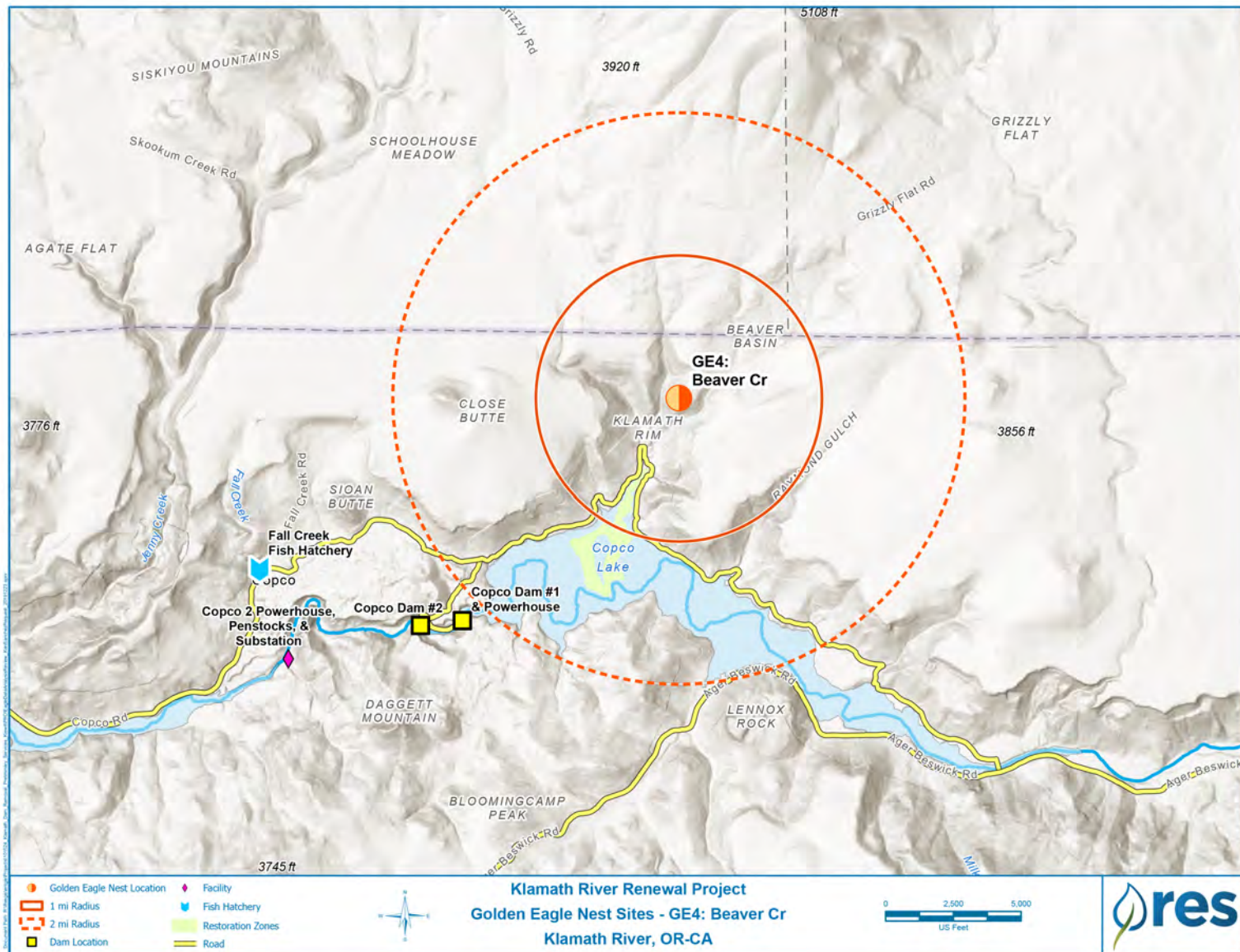


Figure A-16. Golden Eagle Nest Sites - Location #2

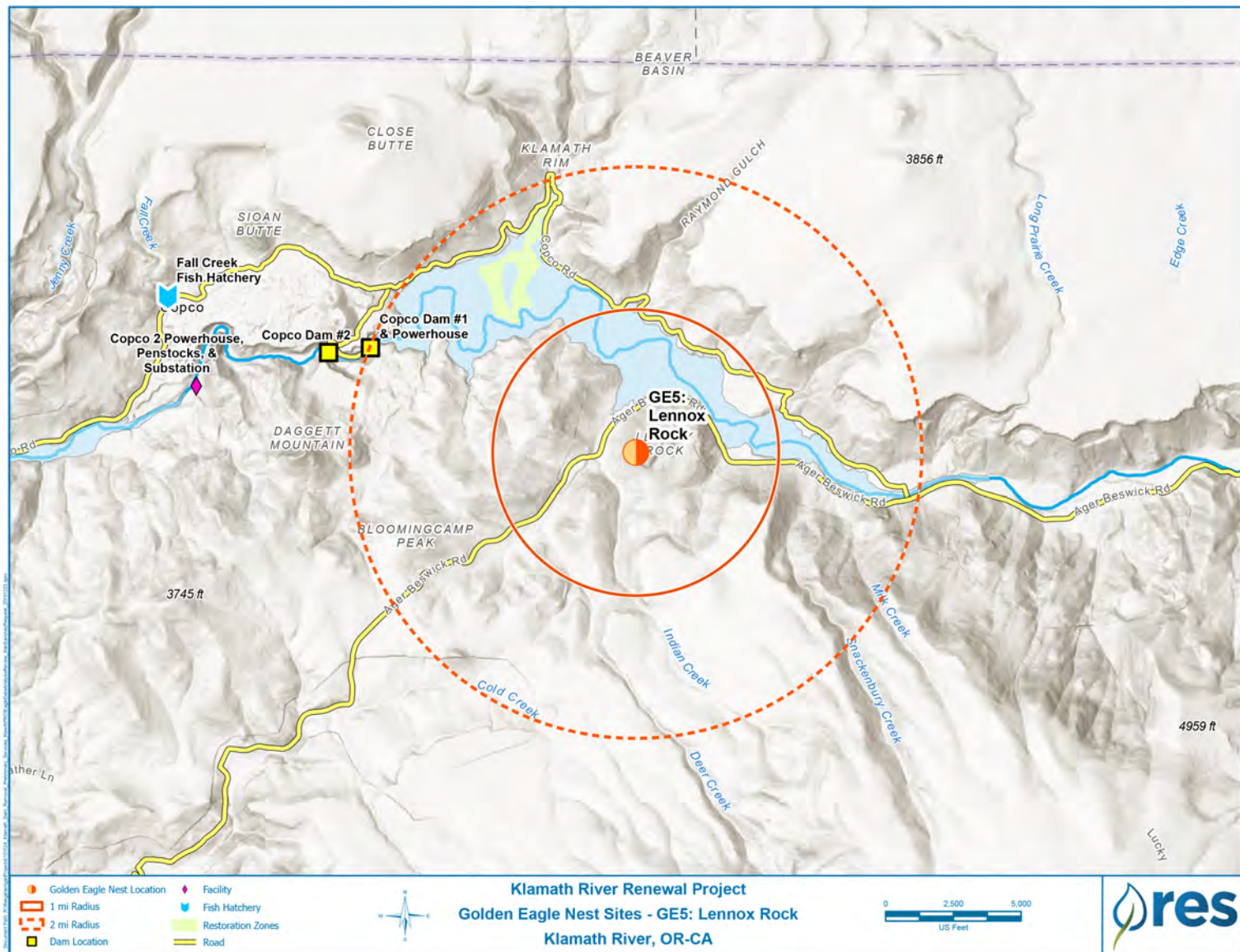


Figure A-17. Golden Eagle Nest Sites - Location #3

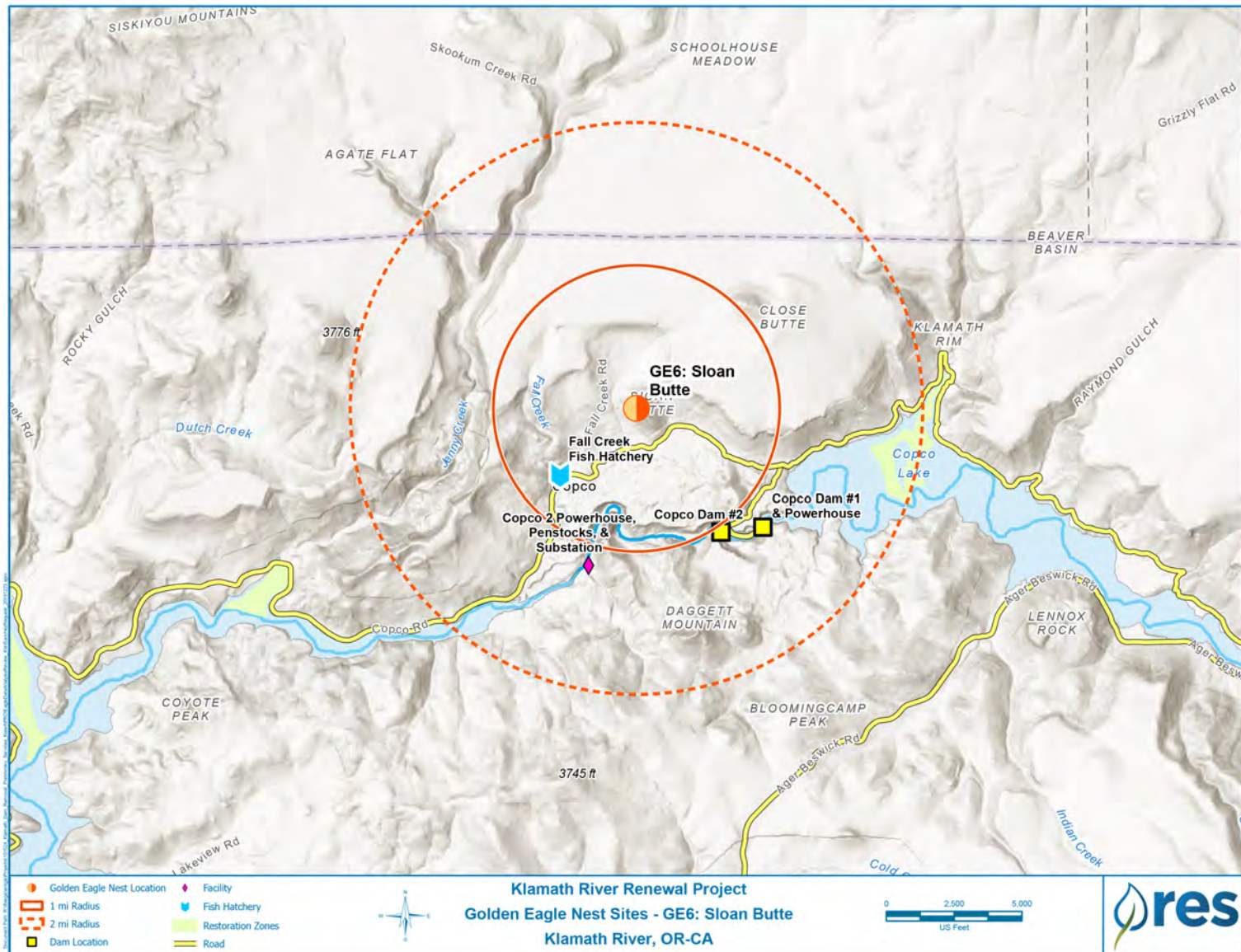


Figure A-18. Golden Eagle Nest Sites - Location #4

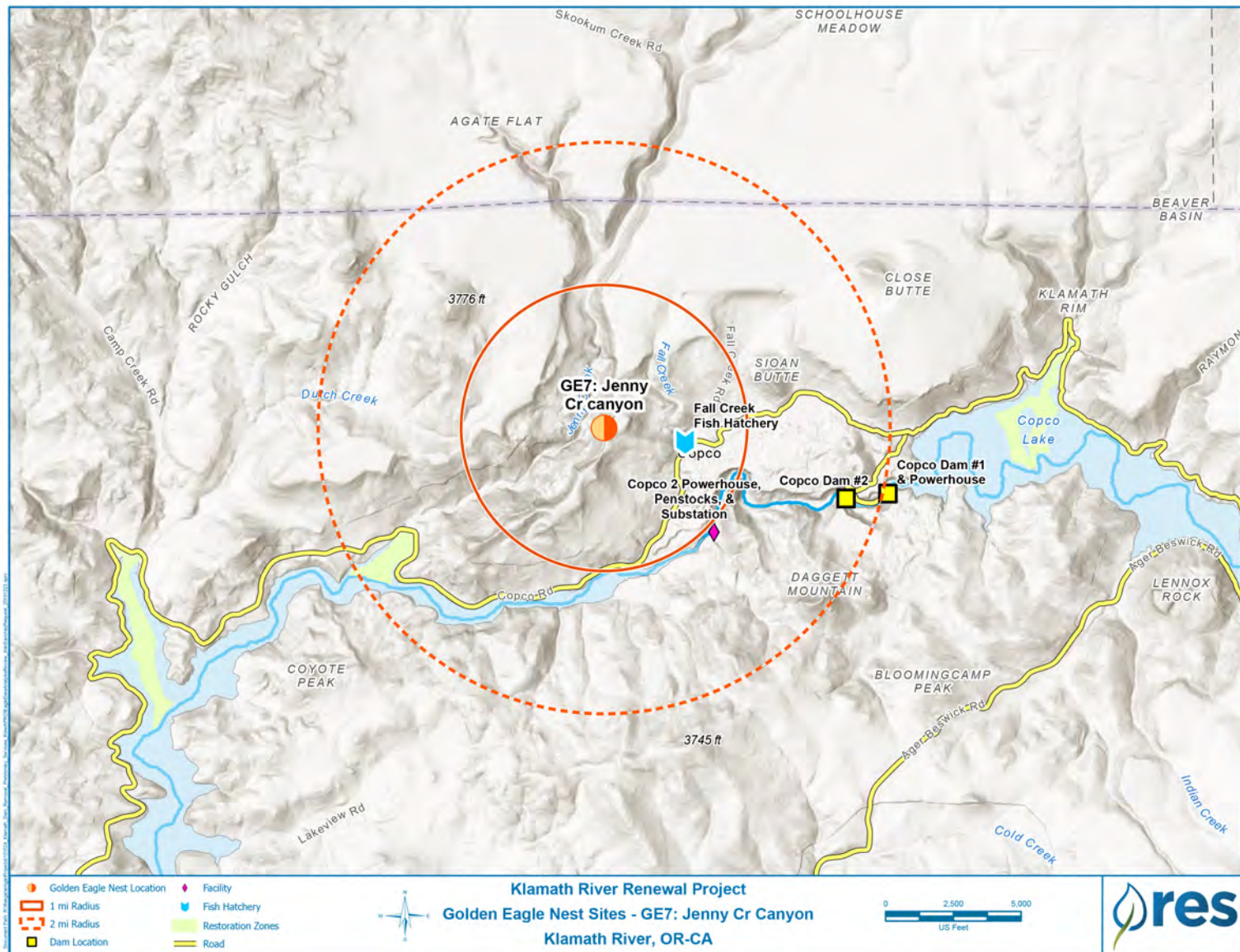
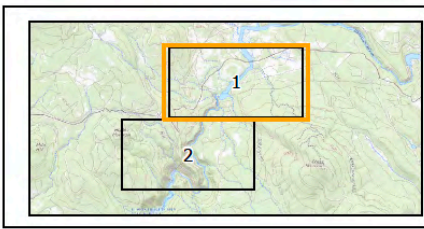
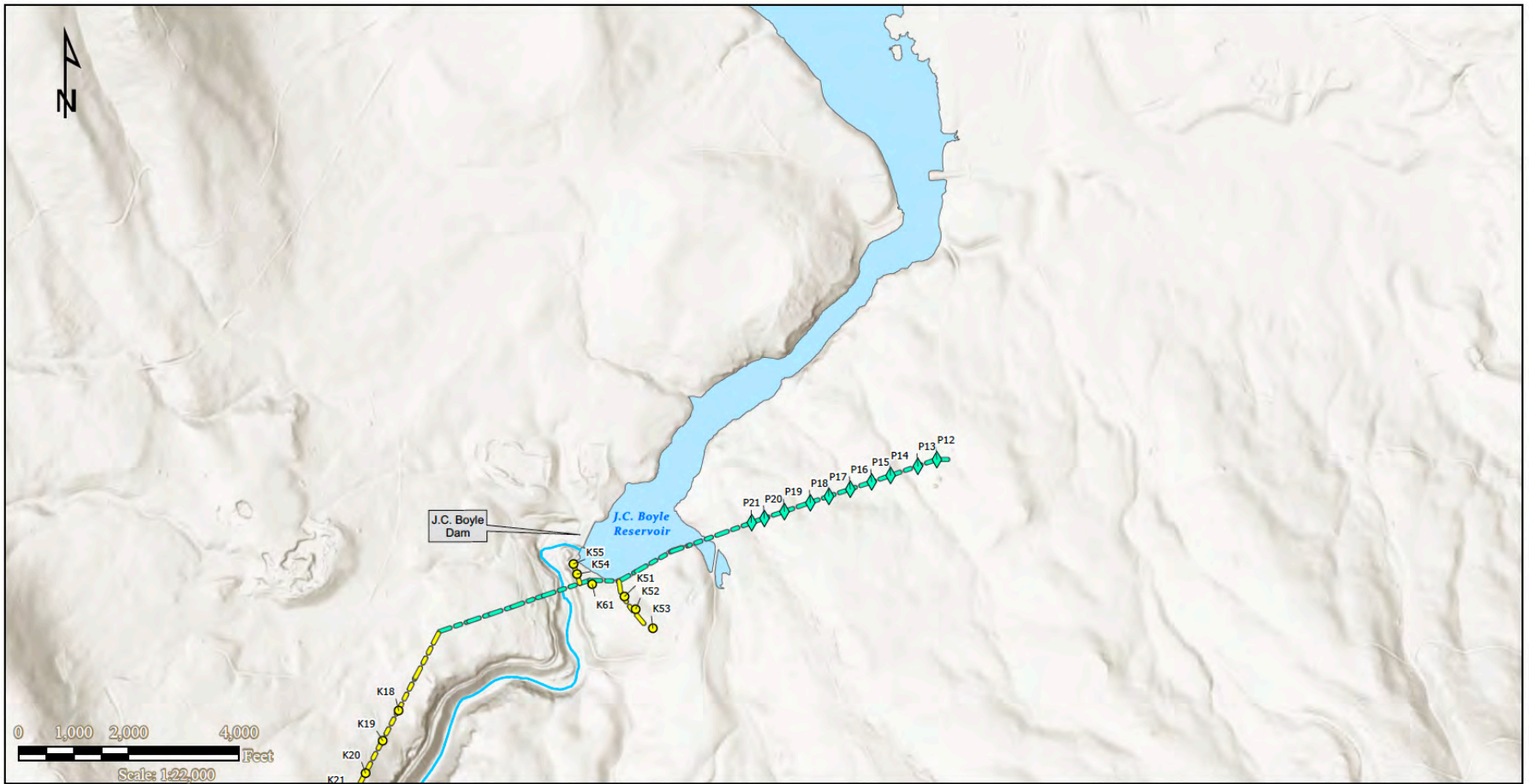


Figure A-19. Golden Eagle Nest Sites - Location #5



**Legend**

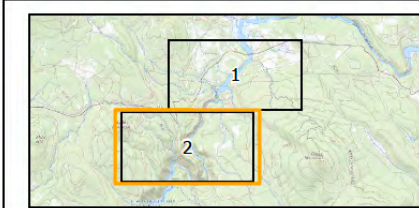
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—●— 2.4, 2.5, 12, 12.5 kV Lines	◆ 230 kV Poles
	—◆— Lines

**Lower Klamath Project  
Powerline Removal  
Sheet: 1**



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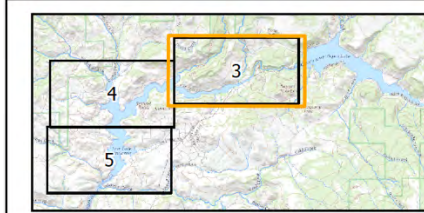
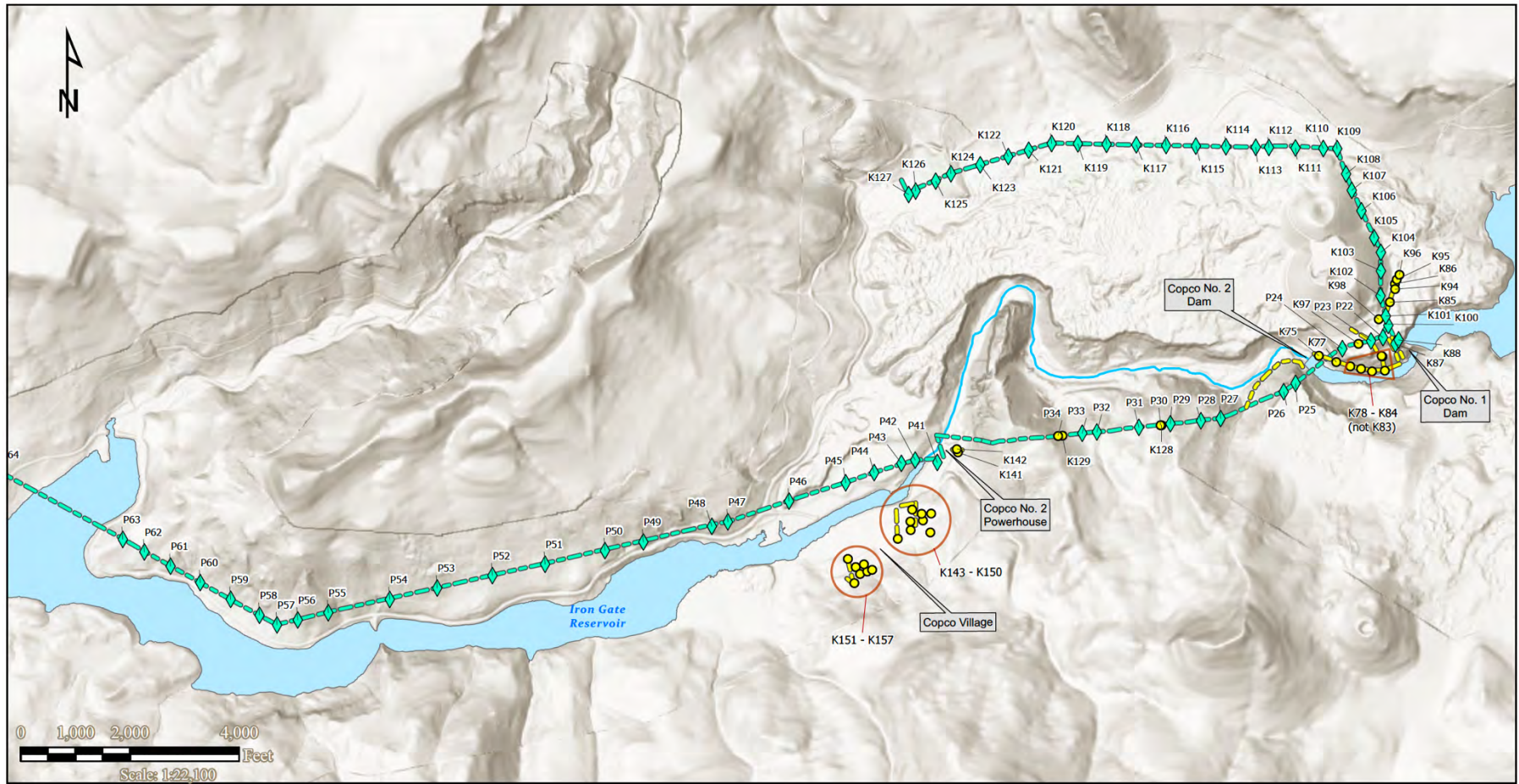
**Legend**

<b>Distribution (to be Removed):</b>	<b>Transmission (to be Removed):</b>
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—●— 2.4, 2.5, 12, 12.5 kV Lines	◆ 230 kV Poles
	—◆— Lines

**Lower Klamath Project  
Powerline Removal  
Sheet: 2**

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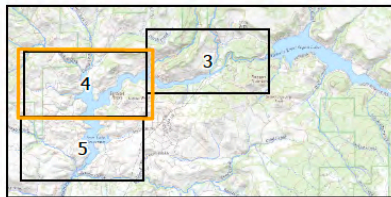
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—●— 2.4, 2.5, 12, 12.5 kV Lines	◆ 230 kV Poles
	—◆— Lines

**Lower Klamath Project  
Powerline Removal  
Sheet: 3**



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**Legend**

Distribution (to be Removed):

- 2.4, 2.5, 12, 12.5 kV Poles
- 2.4, 2.5, 12, 12.5 kV Lines

Transmission (to be Removed):

- ◆ 69 kV Poles
- ◆ 230 kV Poles
- Lines

**Lower Klamath Project  
Powerline Removal  
Sheet: 4**



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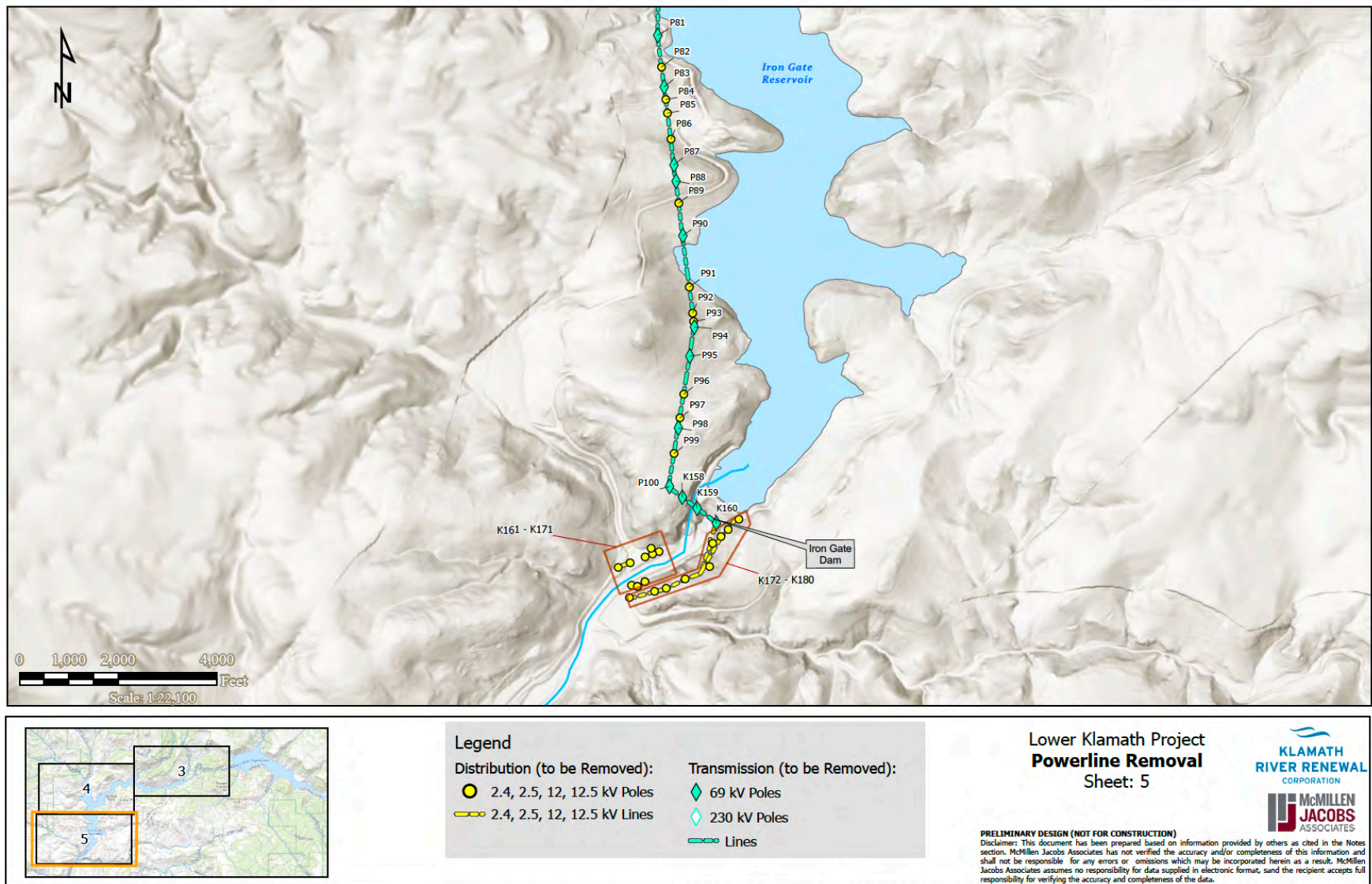


Figure A-20. Power Pole Removals (5 Sheets)

## **Appendix B**

### **Bald Eagle Nest Details**

**Table B-1. Keno Reach (BE-1)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Pioneer Park East and West Recreation Site Demolition: September 12–October 3	3.1 miles	480 ft	No	Yes – Distance – Actions occur after nesting season	No
Year 2	J.C. Boyle Reservoir Drawdown: January	2.6 miles	480 ft	No	Yes – Prey base unlikely to be based in J.C. Boyle Reservoir	No
Year 2	J.C. Boyle Dam Demolition using construction equipment: January–October Includes 2 blasts: January or February	4.0 miles	480 ft	No	Yes – Distance	No
Year 2	Highway 66 Hauling: January–October	0.1 mile	50 ft	No	Yes – Site is established near busy highway; eagles likely habituated	No
Years 2 and 3	Spencer Creek Stream restoration using helicopters, other aircraft, tractors, and foot traffic: March–October	3.0 miles	300 ft	No	Yes – Distance	No

**Table B-2. Above J.C. Boyle Reservoir (BE-2)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Pioneer Park East and West Recreation Site Demolition: September–October	1.7–1.9 miles	0 ft	No	Yes – Distance – Actions occur after nesting season	No
Year 2	J.C. Boyle Reservoir Drawdown: January	0.7 mile	0 ft	No	No	Yes <sup>1</sup>
Year 2	J.C. Boyle Dam Demolition using construction equipment: January–October Includes 2 blasts in January–February	3.0 miles	0 ft	No	Yes – Distance	No
Years 2 and 3	Spencer Creek Stream restoration using helicopters, other aircraft, tractors, and foot traffic: March–October	1.2 miles	0 ft	No	Yes – Distance	No

<sup>1</sup> Effects of forage disruption and reestablishment will extend into an unknown number of future years.

**Table B-3. Cemetery (aka: Spencer Creek) (BE-3) <sup>2</sup>**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Pioneer Park East and West Recreation Site Demolition: September–October.	1.0–1.2 miles	0 ft	No	Yes –Distance – Actions occur after nesting season	No
Year 2	J.C. Boyle Reservoir Drawdown: January	0.1 mile	0 ft	No	No	Yes <sup>3</sup>
Year 2	J.C. Boyle Dam Demolition using construction equipment: January–October. Includes 2 blasts in January–February.	2.0 miles	0 ft	No	Yes – Distance	No
Year 2	Highway 66 Hauling: January–October	1.0 mile	0 ft	No	Yes – Distance	No
Years 2 and 3	Spencer Creek Stream restoration using helicopters, other aircraft, tractors, and foot traffic: March–October	0.3 mile	0 ft	No	Yes – Distance	No

<sup>2</sup> As of 2021 nesting season, nest location unknown. Distances measured from apparent best trees.

<sup>3</sup> Effects of forage disruption and reestablishment will extend into an unknown number of future years.

**Table B-4. West Side J.C. Boyle Reservoir (BE-4)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Pioneer Park East and West Recreation Site Demolition: September–October	0.7 mile	0 ft	No	Yes – Distance – Actions occur after nesting season	No
Year 2	J.C. Boyle Reservoir Drawdown: January	0.1 mile	0 ft	No	No	Yes*
Year 2	J.C. Boyle Dam Demolition using construction equipment: January–October. Includes 2 blasts in January or February.	1.3 miles	100 ft	No	Yes – Distance	No
Year 2	Highway 66 Hauling: January–October	0.35 mile	0 ft	No	Yes – Distance – Intervening forest screening	No
Years 2 and 3	Spencer Creek Stream restoration using helicopters, other aircraft, tractors, and foot traffic: March–October	0.8 mile	0 ft	No	Yes – Distance	No

\* Effects of forage disruption and reestablishment will extend into an unknown number of future years

**Table B-5. Topsy Road (BE-5) (2021 location)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Pioneer Park East and West Recreation Site Demolition: September–October	1.1 miles	100 ft	No	Yes – Distance – Actions occur after nesting season	No
Year 2	J.C. Boyle Reservoir Drawdown: January	0.1 mile	100 ft	No	No	Yes*
Year 2	J.C. Boyle Dam Demolition using construction equipment: January–October. Includes 2 blasts in late January–early February	1.0 mile	100 ft	No	Yes – Distance	No
Year 2	Topsy Road Hauling: January–October	100 ft	0 ft	No	No	Yes
Years 2 and 3	Spencer Creek Stream restoration using helicopters, other aircraft, tractors, and foot traffic: March–October	1.2 miles	100 ft	No	Yes – Distance	No

\* Effects of forage disruption and reestablishment will extend into an unknown number of future years

**Table B-6. Big Bend BE (BE-6)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE/BELOW ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 2	J.C. Boyle Reservoir Drawdown: January	2.2 miles (upstream of nest)	-200 ft	No	No	Yes*
Year 2	J.C. Boyle Dam Demolition: January–October Includes 2 blasts in late January–early February	2.0 miles	-200 ft	No	Yes – Distance	No
Year 2	Power Canal Demolition: May–August	1.0–2.0 miles	-100 ft	No	Yes – Distance	No
Year 2	Power Canal Road Hauling: May–October	0.25–1.0 mile	-100 ft	No	Yes – Distance	No
Year 2	J.C. Boyle Forebay and Scour Hole Fill and restore: May–September	1.0 mile	-100 ft	No	Yes –Distance	No
Year 2	J.C. Boyle Powerhouse Demolition w/construction equipment: May–October	1.0 mile	-400 ft	No	Yes –Distance –Visibility blocked by terrain	No

\* Effects of forage disruption and reestablishment will extend into an unknown number of future years

**Table B-7. Klamath River (BE-7)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 2	J.C. Boyle Reservoir Drawdown: January	7 miles (upstream of nest)	400 ft	No	No	Yes*
Year 2	J.C. Boyle Powerhouse and penstocks Demolition using construction equipment: May–October	3.5 miles	700–1,000 ft	No	Yes – Distance	No

\* Effects of forage disruption and reestablishment will extend into an unknown number of future years

**Table B-8. Pony Express (BE-8)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 2	J.C. Boyle Reservoir Drawdown: January	~ 9 miles (upstream from nest)	-775 ft	No	No	Yes*
Year 2	J.C. Boyle Powerhouse and penstocks Demolition: May–October	~ 7 miles	-325 ft	No	Yes – Distance	No

\* Effects of forage disruption and reestablishment will extend into an unknown number of future years

**Table B-9. Copco Dam (BE-9)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Copco No. 1 Dam Demolition using construction equipment: May–December  Blasting: August 1–November 1	0.35 mile	100 ft	Yes	Yes – Distance – Blasting is after nesting season	No
Year 1	Copco No. 2 Dam Demolition using construction equipment: May–August  Blasting: July 1–November 1	0.60 mile	300 ft	No	Yes. – Distance – Blasting is at end of breeding season	No
Year 2	Copco No. 1 Reservoir Drawdown: January–July	0.1 mile	100 ft	No	No	Yes*
Year 2	Copco No. 1 Dam Demolition using construction equipment: April 1–September  Blasting: January 4–February 1	0.35 mile	100 ft	Yes	No	Yes
Year 2	Copco No. 2 Dam and Penstock	0.6–1.0 mile	100 ft	No	Yes – Distance	No

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
	Demolition using construction equipment: April–November Blasting: July 1–November 1					

\* Effects of forage disruption and reestablishment will extend into an unknown number of future years

**Table B-10. Fall Creek (Power Pole Osprey Nest) (BE-10)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Copco Road Hauling: Mid-July–December	150 ft	50 ft	No	Yes – Activity begins after nesting season	No
Year 1	Fall Creek Hatchery Construction: Mid-July through December	0.40 mile	50 ft	No	Yes – Distance –Activity after nesting season	No
Year 1	Copco No. 1 Dam Demolition using construction equipment: May–December  Blasting: August 1–November 1	1.5 mile	200 ft	No	Yes – Distance –Activity after nesting season	No
Year 1	Copco No. 2 Dam and penstock Demolition: May–August  Blasting: July 1–November 1	1.2 mile	0 ft	No	Yes –Distance – Visibility blocked by terrain	No
Year 1	Copco Village Demolition using construction equipment: August–September	0.4 mile	100 ft	No	Yes – Activity after nesting season	No

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 2	Copco No. 1 Dam Demolition using construction equipment: January–October  Blasting: January 4–February 1	1.5 miles	200 ft	No	Yes – Distance –Blasting is prior to beginning of nesting season	No
Year 2	Iron Gate and Copco Reservoirs Drawdown: January–March	0.5–3.0 miles	50 ft	No	No	Yes*
Year 2	Copco No. 2 Dam Demolition using construction equipment: January–November  Blasting: July 1–November 1	1.2 miles	0 ft	No	Yes –Distance – Visibility blocked by terrain	No
Year 2	Copco No. 2 Powerhouse & Substation Demolition using construction equipment: April–July.	0.35 mile	100 ft	No	Yes – Distance	No
Years 2 and 3	Copco Road Hauling: Year-round	150 ft	50 ft	No	No	Yes (2 years)

\* Effects of forage disruption and reestablishment will extend into an unknown number of future years

**Table B-11. West Side Iron Gate Reservoir (BE-11)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Copco Road Hauling: July–December	100 ft	100 ft	No	Yes – Increased activity will begin near end of nesting season.	No
Year 1	Iron Gate Dam Site preparation: April–December	1.0 mile	100 ft	No	Yes – Distance – Visibility blocked by terrain	No
Year 2	Iron Gate Reservoir Drawdown: January–October	0.1–3.0 miles	100 ft	No	No	Yes*
Year 2	Iron Gate Dam Demolition using construction equipment: April–September	1.0 mile	100 ft	No	Yes – Distance – Visibility blocked by terrain	No
Years 2 and 3	Camp and Scotch Creek Stream restoration using helicopters, other aircraft, tractors, and foot traffic: March–October	0.6 mile	100 ft	No	Yes – Distance	No
Years 2 and 3	Copco Road Hauling: Year-round	100 ft	100 ft	No	No	Yes (2 years)

\* Effects of forage disruption and reestablishment will extend into an unknown number of future years

**Table B-12. Jenny Creek Canyon (BE - No ID)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 0.5 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Copco Road Hauling: January–December	1.2–1.8 miles	200 ft	No	Yes – Distance	No
Year 1	Fall Creek Hatchery Construction: July 15–December 31	1.0 mile	550 ft	No	Yes – Distance – Visibility blocked by terrain	No
Year 2	Iron Gate Reservoir Drawdown: January–October	1.8 –3.0 miles	800 ft	No	No	No
Year 2	Copco No. 2 Powerhouse Demolition using construction equipment: April–May	1.7 miles	700 ft	No	Yes – Distance – Visibility blocked by terrain	No
Years 2 and 3	Jenny Creek Stream restoration using helicopters, other aircraft, tractors, and foot traffic: March–October	1.8–2.5 miles	200 ft	No	Yes – Distance	No
Years 2 and 3	Copco Road Equipment hauling. January–December	1.2–1.8 miles	200 ft	No	Yes – Distance	No

\* Effects of forage disruption and reestablishment will extend into an unknown number of future years

## **Appendix C**

### **Golden Eagle Nest Details**

**Table C-1. Riffle Rapid (GE-1)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST <sup>4</sup> ABOVE ACTIVITY	BLASTING W/IN 2.0 MILE	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 2	J.C. Boyle Dam Demolition: January–October Includes 2 blasts in late January–early February	3 miles	N/A	No	Yes. –Distance – Intervening terrain	No
Year 2	J.C. Boyle Forebay and Scour Hole Fill and restore: May–September	1.1 miles	500 ft	No	Yes –Distance – Intervening terrain	No
Year 2	J.C. Boyle Powerhouse Road Hauling: May–October	0.65 mile	100–500 ft	No	Yes –Distance – Intervening terrain	No
Year 2	J.C. Boyle Powerhouse Demolition using construction equipment: May–October. Penstock removal: July 5–August 23	0.8–1.0 mile <sup>5</sup>	150 ft to 550 ft <sup>6</sup>	No	Yes. –Distance – Line of sight blocked by terrain – Powerhouse demolition begins during more tolerant nestling period. Penstock demolition begins after typical fledging date.	No

<sup>4</sup> Nest is at 3,900 ft elevation. Top of penstock is at 3,750 ft and the powerhouse/base of penstock is at 3,350ft

<sup>5</sup> Distance varies based on elevation and slope of penstock removal location

<sup>6</sup> Distance varies based on elevation and slope of penstock removal location

**Table C-2. Beaver (GE-4)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 2.0 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Copco No. 1 Dam Demolition using construction equipment: May–December  Blasting: August – November	2.2 miles		No	Yes. – Distance – Line of sight blocked by terrain –Blasting after nesting season	No
Year 2	Copco No. 1 Dam Demolition using construction equipment: January–October  Blasting: January 4 – February 1	2.2 miles	600 ft	No	Yes – Distance – Line of sight blocked by terrain –Blasting prior to nesting season	No
Years 2 and 3	Beaver Creek Stream restoration using helicopters, other aircraft, tractors, and foot traffic: March–October	0.5–1.5 mile	600 ft	No	No	Yes (2 Years)

**Table C-3. Lennox Rock (GE-5)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST <sup>7</sup> ABOVE ACTIVITY	BLASTING W/IN 2.0 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Mallard Cove Barge and equipment staging, use, and removal: July 29–Sept. 22	0.3 mile	590 ft	No	Yes –Activities will take place outside of nesting season	No
Year 1	Copco No. 1 Dam Demolition using construction equipment: May–December  Blasting: August–November	1.9 miles	590 ft to 710 ft <sup>8</sup>	Yes	Yes –Distance is at or near 2.0 miles –Line of sight is blocked by terrain –Blasting after nesting season	No
Year 1	Copco No. 2 Dam Demolition using construction equipment: July–November Blasting: July 1–November	2.2 miles	600 ft	No	Yes – Distance greater than 2.0 miles – Line of sight is blocked by terrain – Blasting begins very late in nesting season	No

<sup>7</sup> Nest is at 3,200 ft elevation. Reservoir is at 2,609 ft

<sup>8</sup> Top of Copco No. 1 Dam is 2,610 ft and bottom is 2,490 ft

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST <sup>7</sup> ABOVE ACTIVITY	BLASTING W/IN 2.0 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 2	Copco No. 1 Dam Demolition using construction equipment: January–October  Blasting: January 4–February 1	1.9 miles	600 ft	No	Yes –Distance is at or near 2.0 miles –Line of sight is blocked by terrain –Blasting prior to nesting season	No
Year 2	Copco No. 2 Dam Demolition using construction equipment: April–July Blasting: July 1–August 1	2.2 miles	600 ft	No	Yes –Distance greater than 2.0 miles –Line of sight is blocked by terrain – Blasting begins very late in nesting season	No
Years 2 and 3	Mallard Cove Boat Ramp Restoration traffic access at March–October	0.3 mile	590 ft	No	Yes –Activities will be with small vehicles (ATVs) in an existing residential and recreational boat ramp area; partially after nesting season	No

**Table C-4. Sloan (GE-6)**

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 2.0 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Copco No. 1 Dam Demolition using construction equipment: May–December Blasting: August–November	1.5 miles	400 ft	Yes	Yes –Line of sight is blocked by terrain –Blasting after nesting season	No
Year 1	Copco Road Construction and hauling: July 15–December	0.3 mile	400 ft	N/A	Yes – Increased activity will begin near end of nesting season.	No
Year 1	Fall Creek Hatchery Construction: Mid-July–December	0.7 mile	400 ft	No	Yes – Activity will begin near end of nesting season.	No
Year 1	Copco No. 2 Dam Demolition using construction equipment: July–October  Blasting: July 1–November	1.0 mile	500 ft	Yes	Yes –Distance –Intervening terrain – Blasting will not begin until very late in nesting season	No
Year 2	Copco No. 1 Dam Demolition using construction equipment: May–December  Blasting:	1.5 miles	400 ft	Yes	Yes –Distance – Line of sight blocked by terrain – Blasting prior to nesting season	No

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 2.0 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
	January 4–February 1					
Year 2	Copco No. 2 Dam and penstock Demolition using construction equipment: April–November  Blasting: July 1–November 1	1.0 mile	500 ft	Yes	Yes  –Distance –Intervening terrain – Blasting will not begin until very late in nesting season	No
Year 2	Copco Road Hauling for Copco No. 1 and No. 2 Dams: Year-round	0.3 mile	400 ft	N/A	No	Yes
Year 2	Copco No. 2 Powerhouse Demolition using construction equipment: April–May	1.1 miles	500 ft	No	Yes. – Distance – Line of sight blocked by terrain	No
Year 3	Copco Road Hauling for restoration at Beaver Creek: Year-round	0.3 mile	400 ft	N/A	No	Yes

**Table C-5. Jenny Creek Canyon (GE-7)\*\***

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 2.0 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
Year 1	Fall Creek Hatchery Construction: July–December	0.6 mile	600 ft	No	Yes – Activity will begin after breeding season. – Visibility blocked by terrain.	No
Year 1	Copco Road Equipment hauling: May–December	1.5 miles	600 ft	No	Yes – Distance	No
Year 1	Copco No. 2 Dam Demolition using construction equipment: April– November Blasting: July 1–November	1.8 miles	600 ft.	Yes	Yes – Visibility and sound blocked by terrain – Blasting begins very late in nesting season	No
Year 2	Copco No. 2 Dam Demolition using construction equipment: April–November Blasting: July 1–November	1.8 miles	600 ft	Yes	Yes – Visibility and sound blocked by terrain – Blasting begins very late in nesting season	No
Year 2	Copco No. 2 Powerhouse and residences Demolition using construction equipment:	1.0 mile	600 ft	No	Yes. – Distance – Visibility blocked by terrain	No

YEAR OF ACTIVITY	TYPE AND DURATION OF ACTIVITY	DISTANCE FROM NEST TO ACTIVITY	ELEVATION OF NEST ABOVE ACTIVITY	BLASTING W/IN 2.0 MILE?	IS TAKE AVOIDABLE? HOW?	IS TAKE EXPECTED?
	April–July					
Year 2 and 3	Jenny Creek Restoration: March–December	1.5 miles	600 ft		Yes. – Distance	No
Year 2 and 3	Copco Road Hauling: Year-round	0.7–1.5 miles	600 ft		Yes. -Distance	No

## **Appendix D**

### **Terrestrial Species Survey Reports**

## **Appendix E**

### **List of Preparers**

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## Appendix B. Map Figures

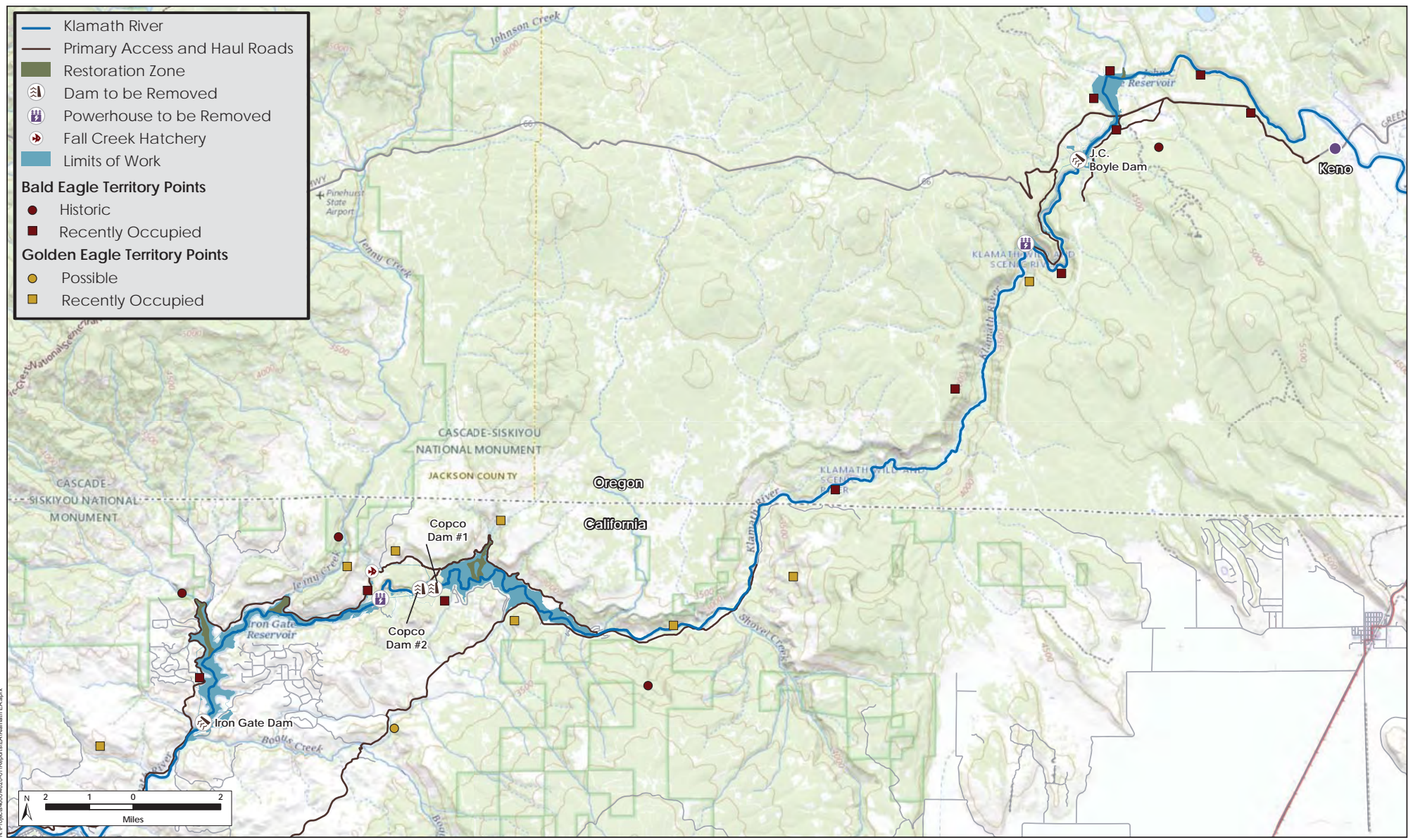
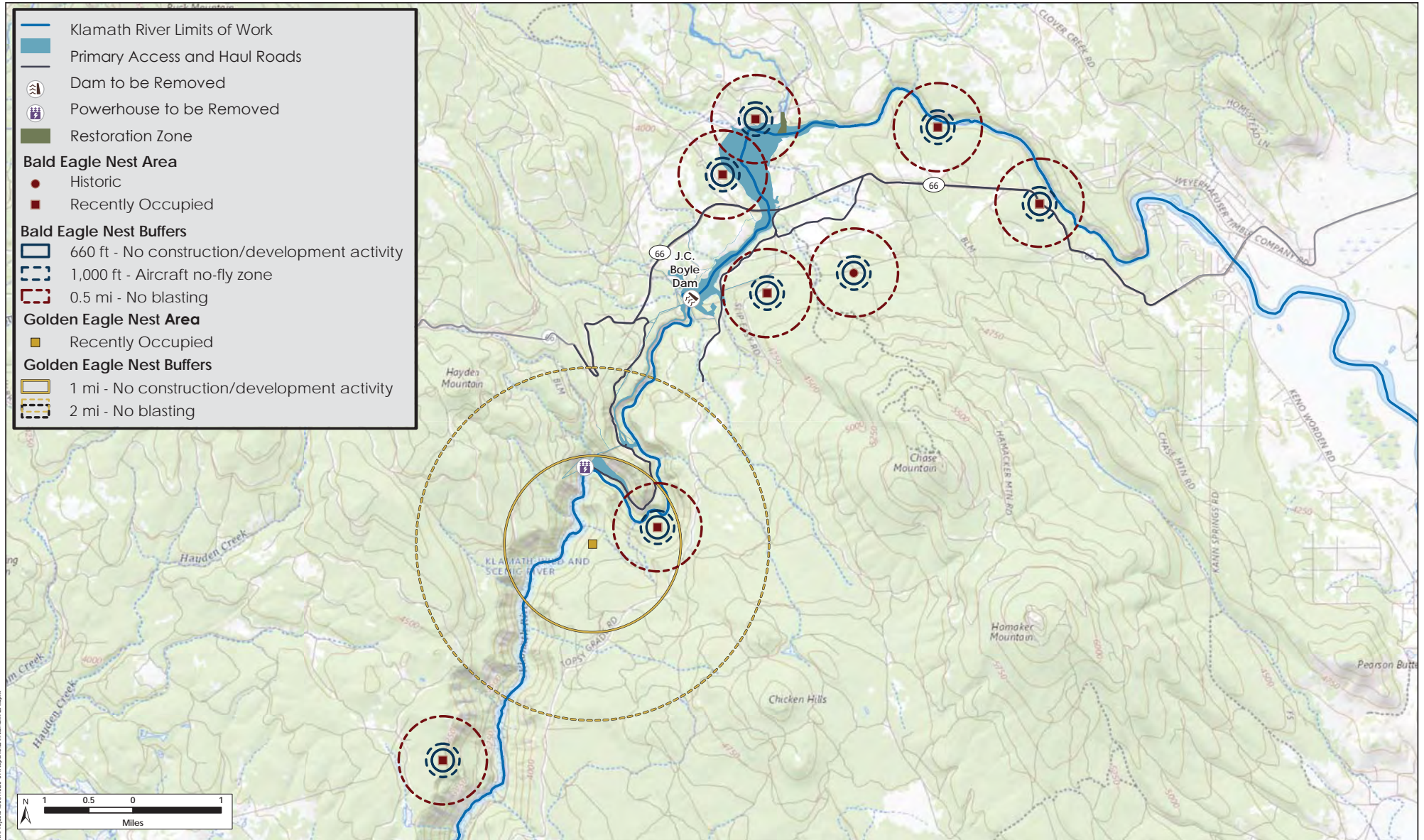


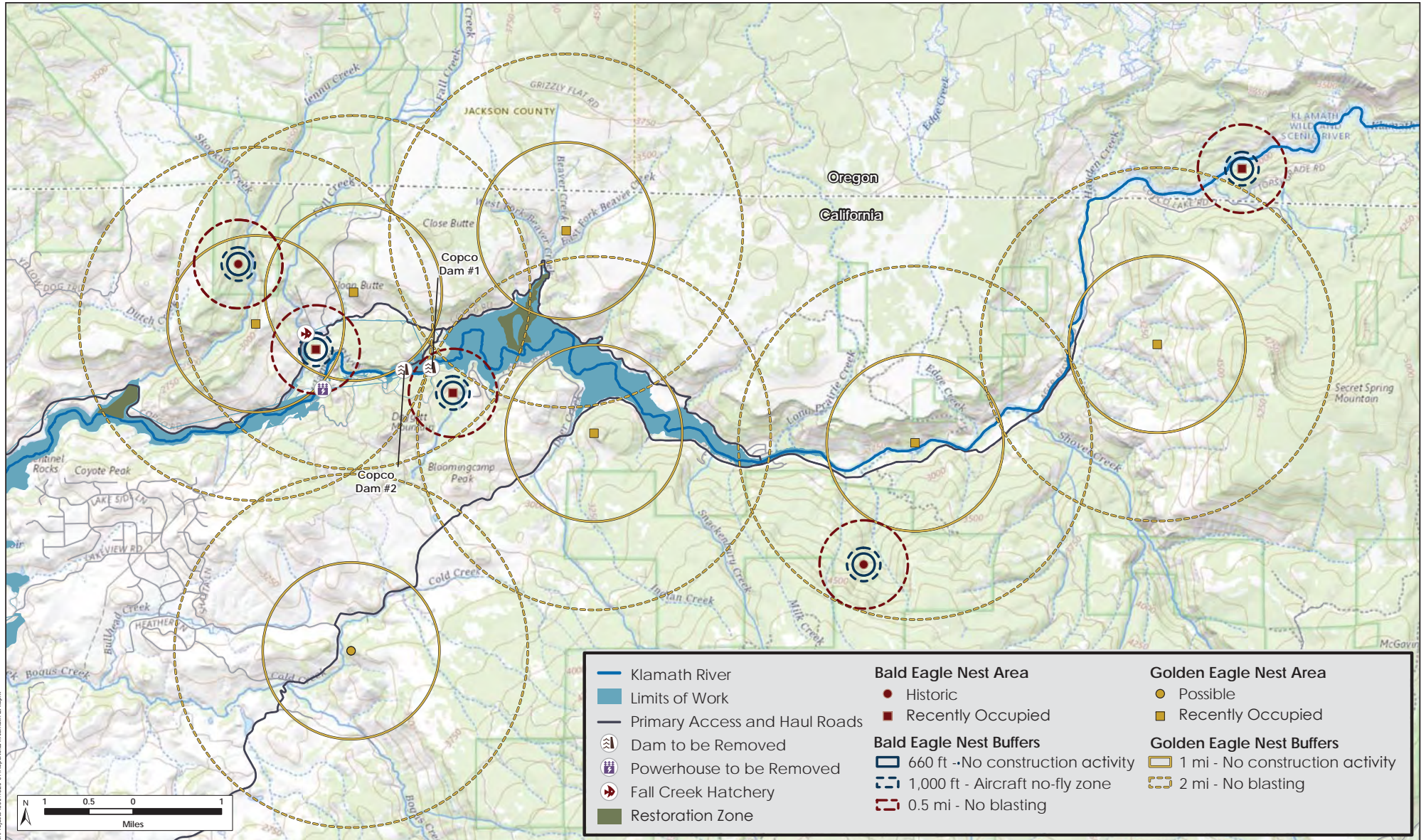
Figure 1. Location of the Lower Klamath Project and known recently occupied and historical bald and golden eagle nesting areas within 2 miles of the project limits of work

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October 2022



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Figure 2. J.C. Boyle development area in northern section of the Lower Klamath Project and known bald and golden eagle breeding areas within 2 miles, with known, extant nest sites surrounded by standard nest buffers used by the Service to protect nesting eagles



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**Figure 3. Copco development area in central section of the Lower Klamath Project and known bald and golden eagle breeding areas within 2 miles, with known, extant nest sites surrounded by standard nest buffers used by the Service to protect nesting eagles**



## **Appendix C. Risk Assessment Summary for Bald and Golden Eagles**

## Introduction

As required by our eagle incidental take permit regulations, we conducted an independent risk assessment for the Project analysis. In their ECP (Attachment 1), KRRC presents their proposed risk analysis, as summarized in Section 1.3 of this document, which differs from the Service's risk assessment summarized below. Our assessment follows the ECP explanation of activities planned to occur in given Project Years.

- Year 1 – year prior to reservoir water drawdown
- Year 2 – reservoir water drawdown year
- Year 3 – year following reservoir water drawdown

Activities expected in post-drawdown years (Project Years 4–9) include restoration monitoring, restoration maintenance, water quality monitoring and adaptive management. Based upon the permit request submitted and our evaluation of the Project activities, we would issue a 5-year permit as impacts to eagles are not expected to exceed 5 years. Although our analysis indicates most take to eagles would occur from disturbance resulting in reduced reproduction of eagles in Project Years 1–4, to allow for Project timeline flexibilities, we are issuing the permit for 5 years.

## Methods

To assess risk to eagles, we reviewed the Project footprint and activities planned each year proximate to known eagle nests/breeding territories, evaluated available data and information for each nest site and breeding territory location which is also detailed in KRRC's ECP (Attachment 1). We further evaluated the data using geographical information system maps and figures including species-specific nest buffers (Figures 1–4, also see ECP's Appendix A). If Project activities occur outside of the nesting season, or outside of the activity specific nest buffers for the species, we determined take would be avoided. We determined Project activities that occur during the nesting season within an eagle nest buffer would result in take from disturbance that prevents a breeding territorial pair from producing young in the given Project year. Our final risk determinations accounted for uncertainty in the data sets and our knowledge of eagle biology in the Project area habitats.

Bald eagle nest buffers are 660 ft for most disturbances, 1000 ft buffers for aircraft fly zones, and 0.5-miles for blasting, which would occur during dam deconstruction (Figures 2–4 and ECP's Appendix A: Figures). Golden eagle nest buffers are 1 mile for most types of disturbances, and 2 miles for blasting, (Figures 2–4 and ECP's Appendix A: Figures). We also evaluated habitat changes and associated impacts to eagles such as the loss of reservoirs, river water quality changes, and impacts to fish populations as important prey for bald eagles. We considered historic nest site locations, survey methods, and the likelihood of the habitat to support undetected golden eagle territories.

To assess impacts to breeding eagles from the Project based upon changes to bald eagle prey populations (primarily fish) within the river and reservoirs, we reviewed the evaluations of water quality and fish in the Lower Klamath Project Final Environmental Impact Statement (FERC 2022), the California Water Boards' Final Environmental Impact Report (California Water

Boards 2020), and the National Marine Fisheries Service's Biological Opinion (National Marine Fisheries Service 2021). We considered effects to bald eagle breeding pairs expected from the Project's impacts to the fish populations bald eagles prey upon both in the reservoirs to be removed and within the river system.

**Table C1. Summary of bald eagle breeding territories risk assessment at the Project for take caused by disturbance of nesting activity and habitat changes affecting prey base.**

Territory	Nests	Location	Nest Habitat	Distance to River or Reservoir	Distance to Other Disturbances	Year 1 Disturbances	Year 2 Disturbances	Year 3 Disturbances	Year 4 Disturbances	Years with Likelihood of Take
BE-1 Keno Reach	Historical territory. One nest in pine used in 2018; no eagles seen in 2019; nest not found in 2021	4.2 mi E of JC Boyle Dam	Dense pine forest	0.15 mi	30 feet from Hwy 66 (eagles accustomed to traffic)	Late-season increase in heavy construction traffic on Hwy 66	Construction traffic on Hwy 66; reliance on river for prey with prey impacted by drawdown	Construction traffic on Hwy 66	None	Y1 Y2 Y3
BE-2 Above Boyle Reservoir	Historical territory. Former nest not found in 2018/2019; new nest in pine used in 2019 0.6 mi away; not surveyed 2020–2021	3.3 mi ENE of JC Boyle Dam	Moderate density pine forest	0.1 mi	0.6 mi from but out of view (OOV) of Hwy 66; 1.1 mi to upper Boyle Reservoir	None	None	None	None	None
BE-3 Cemetery/Spencer Creek	Historical territory. Former nest found but unused in 2018; another nest found in dead pine in 2019 with one eagle present; no nest found in 2021	2.2 mi NE of JC Boyle Dam	Pine stand in semi-open woodland	0.1 mi	0.1 mi from Boyle Reservoir; two dirt roads in 660-foot buffer, one to be used by Project; 0.3 mi from Spencer Creek	None	Reservoir drawdown	Reservoir drawdown. Spencer Creek restoration traffic/aircraft activity?	None	Y2 Y3 Y4
BE-4 W Side Boyle Reservoir	Historical territory. One nest in pine used 2018–2019, 2021	1.4 mi NE of JC Boyle Dam	Scattered pines surrounded by mostly open areas	0.1 mi	0.1 mi from Keno Access Rd; 0.3 mi from Hwy 66	None	Reservoir drawdown	Reservoir drawdown. Spencer Creek restoration traffic on Keno Access Rd.	Residual effects following reservoir drawdown and restoration activity	Y2 Y3 Y4
Chase Mtn/Lower Boyle East Side Complex No Project territory number assigned	Historical territory with several nest sites and records from 1983–2014. BLM no longer considers this an extant territory.	1.5–2 mi E of J.C. Boyle Dam	Moderate to low density pine forest	>1 mi	>1 mi	None	None	None	None	None

<b>Territory</b>	<b>Nests</b>	<b>Location</b>	<b>Nest Habitat</b>	<b>Distance to River or Reservoir</b>	<b>Distance to Other Disturbances</b>	<b>Year 1 Disturbances</b>	<b>Year 2 Disturbances</b>	<b>Year 3 Disturbances</b>	<b>Year 4 Disturbances</b>	<b>Years with Likelihood of Take</b>
BE-5 Topsy-Slip Easy Rd	Historical territory. Former nest in pine used 2017, 2019–2020 (still extant); new nest in pine used in 2021 0.75 mi to N. Former nearby Chase Mtn territory (3 nests) no longer occupied.	0.8 mi E of JC Boyle Dam	Older pine forest near edge of younger stand.	0.5 mi	0.5 mi from Topsy Grade Rd; 0.3 mi from Hwy 66 bridge	None	Reservoir drawdown	Reservoir drawdown	Residual effects following reservoir drawdown and restoration activity	Y2 Y3 Y4
BE-6 Big Bend	Single nest in pine tree newly found in 2019 and used 2019–2021	2.6 mi SW of JC Boyle Dam	Dense pine forest	0.9 mi	0.35 mi from Topsy Grade Rd; 0.25 mi from Boyle Powerhouse Access Rd; 1 mi from Boyle Powerhouse	None	Reservoir drawdown – temporarily degraded river quality	None	None	Y2
BE-7 Klamath River	Historical territory. Five nests; nest in pine used 2018–2020; not surveyed in 2021	6 mi SW of JC Boyle Dam	Dense pine forest bordered by more open pine/shrub mix	0.6 mi	None relevant	None	Reservoir drawdown – temporarily degraded river quality	None	None	Y2
BE-8 Pony Express	Historical territory. Single nest in pine used 2018–2020; not surveyed in 2021	9.3 mi SW of JC Boyle Dam; 9.5 mi E of Copco 1 Dam	Moderate density, tall pine patch surrounded by low density growing pine/shrub mix	0.1 mi	0.2 mi from Topsy Grade Rd	None	Reservoir drawdown – temporarily degraded river quality	None	None	Y2
Secret Spring No Project territory number assigned	Historic territory. Single nest active 2010. Nest not found 2018, 2019. Not surveyed 2021.	5.4 mi SE of Copco 1 Dam	Dense pine forest	1.25 mi	4.5 mi from Copco No 1 Dam demolition	None	None	None	None	None

Territory	Nests	Location	Nest Habitat	Distance to River or Reservoir	Distance to Other Disturbances	Year 1 Disturbances	Year 2 Disturbances	Year 3 Disturbances	Year 4 Disturbances	Years with Likelihood of Take
BE-9 Copco Dam	Historical territory/single nest not found in 2018. Single new nest in pine found and used in 2019; not surveyed in 2020; territory occupied but nest not found in 2021	0.37 mi SE of Copco 1 Dam	Moderate density/stature pine with intermixed shrubs	0.3 mi	0.2 mi to lakeside residences and local road; 0.4–0.6 mi from Copco dams	Copco Dam 1 demo blasting starting August 1.	Reservoir drawdown; dams demo blasting	Reservoir drawdown	Residual effects following reservoir drawdown and restoration activity	Y1 Y2 Y3 Y4
BE-10 Fall Creek	Took over, upgraded, and used former osprey nest on power pole in 2021. In 2022, moved to new nest ~2,000 ft NE.	1.0 mi N of Copco 2 Dam	Low density pines and scattered shrubs on rocky substrate	0.2 mi	900 ft from Copco Rd; 960 ft from Fall Creek Bridge remodel; 790 ft from Fall Creek Fish Hatchery upgrade areas; 1.3 mi from Copco 1 dam	None	Reservoir drawdown	Reservoir drawdown	Residual effects following reservoir drawdown and restoration activity	Y2 Y3 Y4
Jenny Creek Canyon No Project territory number assigned	Historical territory/nest site. Single tree nest occupied in 2002. Inactive nest found and no eagles observed in 2018 and 2019. Not surveyed further.	5.25 mil N of Iron Gate Dam and	Moderately dense pine forest near riparian corridor	1.8 mi	1 mi from Fall Creek Hatchery Construction; 1.8 mi from the Jenny Creek bridge and restoration area	None	None	None	None	None
Scotch Creek (Project nest number not assigned):	Possible old nest located in 2019. No use detected. Considered an abandoned site/territory.	3.0 mi N of Iron Gate Dam	Sparse, mostly dead trees along small riparian corridor	0.1 mi from Iron Gate Reservoir	3.0 mi from demolition at Iron Gate Dam. 0.3 mi from hauling on Copco Road and restoration at Scotch Creek.	None	None	None	None	None

<b>Territory</b>	<b>Nests</b>	<b>Location</b>	<b>Nest Habitat</b>	<b>Distance to River or Reservoir</b>	<b>Distance to Other Disturbances</b>	<b>Year 1 Disturbances</b>	<b>Year 2 Disturbances</b>	<b>Year 3 Disturbances</b>	<b>Year 4 Disturbances</b>	<b>Years with Likelihood of Take</b>
BE-11 Iron Gate Res – West Side	Newly found nest in pine used 2019–2021	1.1 mi NE of Iron Gate Dam	Small pine/hardwood patch surrounded by open grassland/scrub with scattered junipers	0.1 mi	15 feet from Copco Rd; 185 feet from powerline removal	Copco Rd remodel and hauling	Reservoir drawdown; Copco Rd hauling; powerline removal.	Reservoir drawdown; Copco Rd hauling.	Residual effects following reservoir drawdown and restoration activity	Y1 Y2 Y3 Y4

**Table C2. Summary of golden eagle breeding territories risk assessment at the Project for take caused by disturbance to nesting activity.**

<b>Territory</b>	<b>Nests</b>	<b>Location</b>	<b>Nest Habitat</b>	<b>Distance to River or Reservoir</b>	<b>Distance to Other Disturbances</b>	<b>Year 1 Disturbances</b>	<b>Year 2 Disturbances</b>	<b>Year 3 Disturbances</b>	<b>Years with Likelihood of Take</b>
NW of J.C. Boyle Dam  No Project territory number assigned	Unverified historical nest site/territory. 2018–2019 surveys detected no eagles or nests	1.8 mi NW of J.C. Boyle Dam in an area now owned by Green Diamond Resource Company	Observers noted the generally small size of trees and no evident cliffs at historic nest site location.	1.8 mi	>1 mi	Potential	Blasting at J. C. Boyle Dam	Potential	No other nearby territories known; possibly an undetected occupied territory. If an occupied territory, blasting at Boyle Dam could cause disturbance. A tree nesting eagle within 1 mile could also be disturbed. Y1 Y2 Y3
Chase Mountain  No Project territory number assigned	Historical territory/ nest site last documented occupied in 1984. Nest fallen by 2004; 2018–2019 surveys detected no eagles or nests	2.5 mi from JC Boyle Dam	Moderately dense pine forest	2.4 mi	>2 mi	None	None	None	None
GE-1 Riffle Rapids	Historical territory. Old dilapidated nest in pine found 2018; second nest in pine used 2018–2021	3 mi SW of JC Boyle Dam	Scattered pines in shrub/scrub matrix with young reforested area immediately adjacent	0.2 mi	0.8 mi from Topsy Grade Rd; 0.8 mi from Boyle Powerhouse Rd.	None	Boyle powerhouse demo and hauling; powerline removal	None	Y2
GE-2 Hessig Ranch	One cliff nest newly found in 2018; used 2018/2019; not surveyed further	8.2 mi SE of Copco 1 Dam	Cliff band in low density mixed pine/juniper/scrub and open grassland	1 mi	0.9 mi from and OOV of Ager Beswick Rd section not used by Project	None	None	None	None

Territory	Nests	Location	Nest Habitat	Distance to River or Reservoir	Distance to Other Disturbances	Year 1 Disturbances	Year 2 Disturbances	Year 3 Disturbances	Years with Likelihood of Take
GE-3 Ranch Bridge	One nest on cliff/outcrop used 2018; territory occupied, no nesting confirmed 2019; not surveyed further	5.6 mi SE of Copco 1 Dam	Open rocky outcrop area surrounded by low density pine/juniper/scrub	310 ft	1300 ft to ranch house with nearby bridge; 1150 ft to Ager Beswick Rd section not used by Project	None	None	None	None
South Side Klamath River above Copco Road Bridge  No Project territory number assigned	Historic cliff nest site. No nests or eagles detected 2018–2020	4.6 mi SE of Copco 1 Dam	Open rocky area with nearby small to large cliffs and adjacent pine/scrub forest with some large trees suited to supporting a nest.	0.18 mi	820 ft from Ager-Beswick Rd	Hauling on Ager Beswick Rd.	Hauling on Ager Beswick Rd.	Hauling on Ager Beswick Rd.	Based on data for cliff site, suitable tree nesting habitat available. Possible undetected territory/tree nests. If an occupied territory, hauling on Ager Beswick Rd. could cause disturbance in Y1 Y2 Y3
GE-4 Beaver Creek	One nest on outcrop newly found in 2019, used 2019–2021	2.3 mi NE of Copco 1 Dam	Open rocky scrub/grassland with scattered pines/junipers	0.5 mi	0.4 mi from Copco Rd; 0.5 mi from Beaver Creek cove	None	Blasting early nesting season. Aerial delivery of logs to Beaver Creek cove and aerial seeding near mouth of cove during nesting season; restoration traffic on Copco Rd (eagles not accustomed to heavy traffic)	Restoration traffic/activity on Copco Rd and in and near Beaver Creek Cove	Y2 Y3

Territory	Nests	Location	Nest Habitat	Distance to River or Reservoir	Distance to Other Disturbances	Year 1 Disturbances	Year 2 Disturbances	Year 3 Disturbances	Years with Likelihood of Take
GE-5 Lennox Rock	Historical territory known since 1980s; nest on cliff/outcrop used 2018, 2019, and 2021	2 mi E of Copco 1 Dam	narrow cliff/outcrop band surrounded with scattered pines and shrub/scrub	0.36 mi	0.24 mi from Ager Beswick Rd; 0.36 mi and looking directly down on Keaton/Mallard Cove with marina/scattered homes	None	Aerial seeding in and near Mallard Cove during nesting season; OOV but 1.9–2.0 mi from Copco 1 Dam blasting	Restoration traffic/activity including ATVs staging in Mallard Cove	Y2 Y3
GE-6 Sloan Butte	Historical territory. One nest on cliff/outcrop used 2018; territory occupied in 2019; no eagles seen 2020; territory occupied in 2021/nest unused?	1–1.1 mi NW of Copco dams	Butte with small cliffs/outcrops surrounded by sparse woodland patches, shrub/scrub patches, and grassland	1.2 mi	0.26 mi from and in view of Copco/Iron Gate Lake Rd (eagles accustomed to traffic); 0.2 mi from Fall Creek Rd; 0.3 mi from powerline to be removed	Late-season Jun-Aug: 0.75 mi from Fall Creek Bridge remodel; Copco 1 Dam partial demo; Copco Rd remodel and hauling; Fall Creek Fish Hatchery build	Fall Creek fish hatchery build; Dams demo/blasting; Copco Rd hauling; powerline removal	Restoration hauling	Y1 Y2 Y3
GE-7 Jenny Creek Canyon	Historical territory. Three known cliff nests. Last confirmed nesting 2015; territory occupied 2018; status uncertain 2019–2021	1.8–1.9 mi NW of Copco dams	Modest cliff band above tributary surrounded mostly by scattered junipers, scrub, and grassland	1 mi	0.3 mi from transmission line; 1.2–1.4 mi from Copco 2 Powerhouse; 0.6–1.4 mi from Fall Creek Fish Hatchery; 0.6+ mi from Copco Rd; 1.5 mi from Jenny Creek Bridge	Late-season Fall Creek Fish Hatchery build (0.5 mi OOV)	Dams demo/blasting (within 2 mi but OOV); Copco Rd hauling (0.6 mi OOV)	Copco Rd hauling (0.6 mi OOV)	Topographic screening is a risk minimization measure at this nest location. Some uncertainty due to GOEA sensitivity and possible alternative tree nest sites closer to project. Possible take: Y1 Y2 Y3

<b>Territory</b>	<b>Nests</b>	<b>Location</b>	<b>Nest Habitat</b>	<b>Distance to River or Reservoir</b>	<b>Distance to Other Disturbances</b>	<b>Year 1 Disturbances</b>	<b>Year 2 Disturbances</b>	<b>Year 3 Disturbances</b>	<b>Years with Likelihood of Take</b>
GE-8 Dry Creek	Historical territory. Three known cliff nests. Territory occupied/no used nest(?) 2018; no eagles May 2019; not surveyed further	2.4 mi WSW of Iron Gate Dam	Significant cliff band above tributary surrounded by grassland and scrub with scattered junipers	1.4 mi	1.3 mi from Copco Rd	None	None	None	None