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A Confederation of the Salish,
Pend d' Oreille
and Kootenai Tribes

A People of Vision

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12 December 2024

Mr. Shane Hendrickson
Superintendent BIA, Flathead Agency
P.O. Box 40
Pablo, MT 59855

RE: Request for Formal Consultation on North Fork Jocko – Tabor Diversion Project

Dear Mr. Hendrickson:

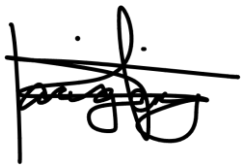
The Confederated Salish & Kootenai Tribes' (CSKT) Division of Engineering and Water Resources (DEWR) is proposing to reconstruct infrastructure at the Tabor Diversion along the North Fork of the Jocko River. The project would replace the existing diversion structure with an updated version that incorporates volitional fish passage, provides fish screening in the Tabor Feeder Canal, and irrigation gates and facility infrastructure intended to improve operational control, including a new stream gage immediately downstream of the Facility. These upgrades would promote water conservation and more effective implementation of instream flows. The project area is located in Lake County, Montana, on the North Fork Jocko River approximately 13 miles east of Arlee, MT (S24, T17 N, R18 W), and six miles upstream of the confluence with the Jocko River. The Project will be funded with federal dollars managed by the Bureau of Indian Affairs (BIA), therefore Section 7(a)(2) of the ESA is required. The existing infrastructure restricts upstream fish passage, presents sedimentation issues, is hydraulically inefficient, and is difficult to maintain.

The CSKT's Wildlife Management Program and GEUM Environmental conducted a Biological Assessment for the determination of effects on federally listed species in accordance with section 7(a)(2) of the Endangered Species Act of 1973 (as amended), codified in 50CFR 402.14, in regards to the North Fork Jocko – Tabor Diversion Project. With this letter, we submit our Biological Assessment containing a description of the proposed action, species addressed, discussion of effects, and our effects determinations for the following federally listed species: Bull Trout (*Salvelinus confluentus*) [Threatened] and Bull Trout Critical Habitat, Canada Lynx (*Lynx canadensis*) [Threatened], Grizzly Bear (*Ursus arctos horribilis*) [Threatened], North American Wolverine (*Gulo gulo luscus*) [Threatened], Yellow-billed Cuckoo (*Coccyzus americanus*) [Threatened], Spalding's Catchfly (*Silene spaldingii*) [Threatened], and Whitebark Pine (*Pinus albicaulis*) [Threatened].

We have determined that the proposed action will have ***No effect*** on yellow-billed cuckoo, Spalding's catchfly, and whitebark pine, for the reasons stated in our assessment. We have determined that the proposed action ***May affect, is not likely to adversely affect*** Canada lynx and North American wolverine, as the effects of the action are insignificant and/or discountable for the reasons stated in our assessment. We have also determined that the project ***May affect, and is likely to adversely affect*** Bull Trout, Bull Trout Critical Habitat, and grizzly bear, for reasons determined in our assessment.

We are committed to the conservation of federally listed species occurring on the Flathead Indian Reservation. Please contact myself in the office (406) 675-2700 ext. 7217 if you have any questions regarding this determination.

Sincerely,



Kari Kingery

Wildlife Program Manger
Confederated Salish and Kootenai Tribes
Wildlife Management Program

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF INDIAN AFFAIRS

North Fork Jocko – Tabor Diversion Project

Lake County, Montana

Biological Assessment

Prepared by:

The Confederated Salish and Kootenai Tribes

PO Box 278

Pablo, MT 59855

With support from:

Geum Environmental, Inc.

307 State St.

Hamilton, MT 59840

December 2024

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1.0 Introduction

The Confederated Salish and Kootenai Tribes (Tribes or CSKT) of the Flathead Indian Reservation (Reservation) are proposing to construct the North Fork Jocko - Tabor Diversion Project (Project or proposed action). The Project would replace the existing Tabor Feeder Diversion and appurtenant infrastructure (Facility) on the North Fork Jocko River (NF Jocko; Figure 1) with an updated diversion structure that incorporates volitional fish passage, provides fish screening in the Tabor Feeder Canal, and irrigation gates and facility infrastructure intended to improve operational control, including a new stream gage immediately downstream of the Facility, thereby promoting water conservation and more effective implementation of instream flows. The Facility is owned by the Department of Interior, Bureau of Indian Affairs (BIA), and operated by the BIA Flathead Indian Irrigation Project (FIIP). Additionally, funding for the Project was authorized by the U.S. Congress in 2021 through the Montana-CSKT Water Compact. The Project is identified as a top three priority in Appendix 3.6 of the Compact based on the need and overlap between multiple objectives. The Project may affect species listed under the Endangered Species Act (ESA). As such, this Biological Assessment (BA) was prepared in support of consultation with the U.S. Fish and Wildlife Service (USFWS) required under Section 7 of the ESA. The Draft 90 % Design Package (Project design; McMillen 2024) for the Project is available upon request, should the Service need more detailed information or drawings/plans related to project design.

The Facility is located on the Reservation in Lake County, Montana, on the North Fork Jocko River approximately 13 miles east of Arlee, MT (S24, T17 N, R18 W), and six miles upstream of the confluence with the Jocko River. Approximate coordinates for the existing diversion structures are -113.8306962°W 47.2226879°N. The Action Area reflects the full Project footprint, including the active construction site and areas required for construction support such as access roads and staging areas, both adjacent to and separate from the Project Area (Figure 1).

The purpose of this BA is to review the proposed activities in sufficient detail to determine whether they may affect any fish, wildlife, and plant species designated as threatened, endangered, or proposed and their associated designated critical habitat. This Biological Assessment has been prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (16 U.S.C. 1536 (c)). Section 7(a)(2) directs federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) when their activities “may affect” a listed species or designated critical habitat. This assures that, through consultation with the USFWS, federally managed or funded actions do not jeopardize the continued existence of any threatened, endangered, or proposed species, or result in the destruction or adverse modification of critical habitat.

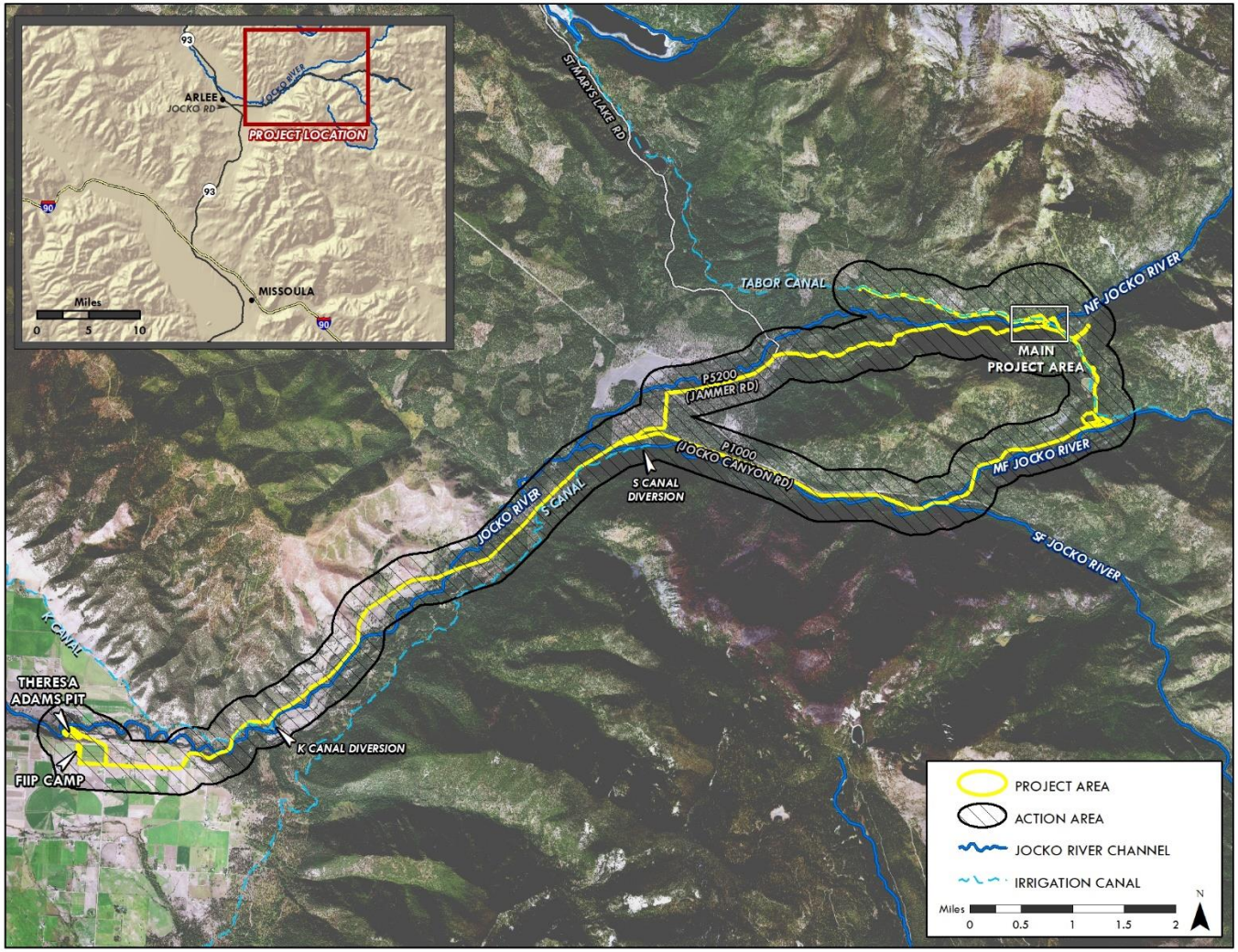

Figure 1: Project location and action area overview.

1.1 Background and Need

The existing Facility comprises a river-spanning concrete gravity diversion dam structure built across the NF Jocko River in 1924. It measures approximately 16 feet in height and 106 feet in length with an approximately 10-foot wide manually operated radial gate to bypass water and sediment; a 9-foot wide manually operated radial gate diverts flows into the Tabor Feeder Canal. The river and site were modified for the original construction of the Facility. These modifications included slope regrading, rip rap revetments, and road construction to access the Facility. The peak diversion capacity into the Tabor Feeder Canal is 450 cubic feet per second (cfs), with diversion occurring in April through early July. Water diverted at the Facility enters the Tabor Feeder Canal and is conveyed to the Tabor Reservoir where it is ultimately routed to reservoirs and irrigated land in the Mission Valley. This trans-basin diversion from the Jocko to the Mission Valley supplies upwards of fifteen percent of Mission Valley irrigation and is the primary source of water supply and inflow (> 70%) to Tabor Reservoir.

The Facility has hit the century mark and numerous structural and operational deficiencies exist. These include deteriorating structural concrete and antiquated sluice gates that have both worker safety and water and sediment management deficiencies. Facility condition is a big concern given its importance to irrigation water supply and given that even partial failure would require ad hoc and incomplete Facility repairs. Worker safety is a critical criterion for all facility designs. Water management and conservation are also key given the pending instream flow increases embedded in the Compact for this location (Table 1). The NF Jocko is designated as critical Bull Trout (*Salvelinus confluentus;* 75 FR 63898) habitat, and supports low numbers of Bull Trout. The existing Facility and operations lead to significant environmental issues, including unnatural sediment transport, barrier to upstream fish movement, and entrainment of fish in the Tabor Feeder Canal. These issues are identified in the 2018 FIIP Biological Opinion (FIIP BO; USFWS 2018) as negatively affecting Bull Trout and critical habitat in the NF Jocko.

Impacts to aquatic habitat result from the lack of appropriate sediment management capabilities and operational practices at the current Facility. River-transported sediment ranging from silt to coarse cobble is stored behind the diversion dam during runoff when the canal is operating. This has resulted in changes to the geomorphic character of the river up and downstream of the Facility gates, which lack sensitivity to meet instream flow and irrigation diversion requirements. Operational practices result in large end-of-season sediment-sluicing events as the canal gates are closed by FIIP operators (Figure 2), causing substrate embeddedness, pool filling, excessive turbidity, and possible gill trauma and disruption of foraging ability for fish downstream of the Facility. This unnatural release of sediment could diminish aquatic macroinvertebrate production and also corresponds with the timing of egg incubation and larval emergence of Westslope Cutthroat Trout (*Oncorhynchus lewisi*), a potential Bull Trout prey species. The FIIP BO (USFWS 2018) identified these sedimentation issues as a threat to Bull Trout and critical habitat, and suggested scheduling and implementing channel-forming bankfull flows in the NF Jocko as one measure to reduce sediment issues downstream of the Facility. The timing, duration, and volume of natural bankfull flows are reduced with current irrigation diversions (including operation of the

Facility). Implementing the Project would provide the infrastructure needed to better execute and manage bankfull flows needed to restore natural sediment transport and other associated ecological benefits in the NF Jocko.

Figure 2: End-of-season sediment sluicing to pass accumulated sediment downstream of the Tabor Diversion.

The Facility is also a barrier to fish passage under most, if not all, flow and operational scenarios, precluding aquatic species from accessing valuable upstream habitat including approximately 2 miles of historic critical Bull Trout habitat. Fish entrainment is also an issue, as the canal does not have a fish screen system, requiring annual end-of-season fish rescues and resulting in loss of fish to the canal, some of which are protected or sensitive species. During the primary months of diversion in May and June, about 80 percent of mean daily discharge of the NF Jocko is diverted down the Tabor Feeder Canal, resulting in a high risk for fish entrainment. Given the importance of the Facility and the structural, operational, and environmental issues, the Tribes prioritized Facility modernization in Appendix 3.6 of the Water Compact with the intent to improve and

expand aquatic habitat for native salmonids. Flow restoration was also an objective, with the intent to increase instream flows in the North Fork and offset reductions in irrigation supply at the Flathead Pumping Plant. These objectives cannot be met without modernization of the existing Facility.

The purpose of the Project is to address significant impacts to aquatic species resulting from the current Facility while simultaneously providing a structurally sound, safe, and operationally effective diversion structure for irrigation deliveries and instream flow compliance. The Project would address the known environmental issues by incorporating volitional upstream fish passage via a roughened rock ramp, by screening to prevent entrainment of fish in the canal, and by adding a sluiceway to eliminate substantial upstream sediment accumulation and the requirement for manual end-of-season sediment sluicing events that harm in-stream habitat and fish.

The Project also aligns with the following actions to address habitat threats listed in the Columbia Headwaters Recovery Unit Implementation Plan for Bull Trout (USFWS 2015), for the Lower Clark Fork Geographic Region, Lake Pend Oreille Core Area where the Project is located:

- **1.1.16 CSKT would enhance Jocko River tributary habitat**. Using both passive and active management actions emphasize restoration of fish habitat in tributaries of the Jocko River watershed, including fish passage. Focus initially on Valley Creek and its tributaries and then on Finley Creek.
- **1.2.1 Improve instream habitat.** Increase or improve instream habitat by restoring recruitment of large woody debris, restoring pool development, or by initiating other appropriate activities in critical habitat streams.
- **2.1.6 CSKT would implement and monitor active fish screening and passage projects on the [FIIP] canals.** Bull trout passage at Jocko Upper S Diversion and Jocko K Diversion canal should continue to be evaluated and improved.

Table 1. Minimum Enforceable Instream Flows (MEFs) and Target Instream Flows (TIFs) for the North Fork Jocko River. Note: the pre-Compact interim minimum instream flow was 18 cfs; MEFs are being incrementally implemented with operational improvements.

North Fork Jocko River below Tabor Feeder Canal near mouth

all values in CFS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MEF	3	4	9	25	40	30	22	8	6	6	6	6
TIF Normal Year	4	4	14	26	70	44	24	12	10	10	12	8
TIF Wet Year	10	8	9	30	110	210	60	14	8	8	12	7

1.2 Species Screening

The USFWS Information for Planning and Consultation (IPaC) planning tool (Attachment A) identified the following ESA-listed species and critical habitat as potentially occurring in the project area:

- Bull Trout (*Salvelinus confluentus*)
- Bull Trout critical habitat
- North American Wolverine (*Gulo gulo luscus*)
- Grizzly Bear (*Ursus arctos horribilis)*
- Canada Lynx (*Lynx canadensis*)
- Yellow-billed Cuckoo (*Coccyzus americanus*)
- Spalding's catchfly (*Silene spaldingii*)
- Whitebark pine (*Pinus albicaulis)*

After reviewing known occurrences and habitat requirements of these species, only Bull Trout, Bull Trout critical habitat, North American wolverine, grizzly bear, and Canada lynx were further analyzed in this BA. This review is presented in greater detail in Section 5, Affected Habitats and Species.

2.0 Consultation History

In September 2024 Craig Barfoot (CSKT Fisheries Program) discussed Bull Trout protection measures and the consultation process with USFWS staff member Brian Ham.

Throughout the Project planning process and in the development of this BA, the Project team has also conducted internal coordination with CSKT Wildlife Biologists Amber Swicegood and Kari Kingery, and CSKT Fisheries Biologist Craig Barfoot. Bi-weekly meetings throughout the Project design process incorporated input from Craig Barfoot and when needed, representatives of USFWS, to ensure design specifications met fisheries objectives and NMFS criteria.

Project design began with Design Criteria in December of 2021 and included close collaboration with CSKT Fisheries biologists and USFWS staff. Multiple technical memorandums and formal design documents were produced, representing changes to the design based on the incorporation of input provided by resource specialists and technical experts through this interdisciplinary process.

3.0 Proposed Action

An overview of the full Action Area is presented in Figure 1. The area surrounding the main project area is presented in Figure 3. Access roads to the site are remote gravel roads with moderate traffic volume and use by the public. Traffic, heavy equipment use, noise, and dust pollution will increase along these roads during project implementation and construction. A summary of Project operations post-construction is presented in Section 3.5.

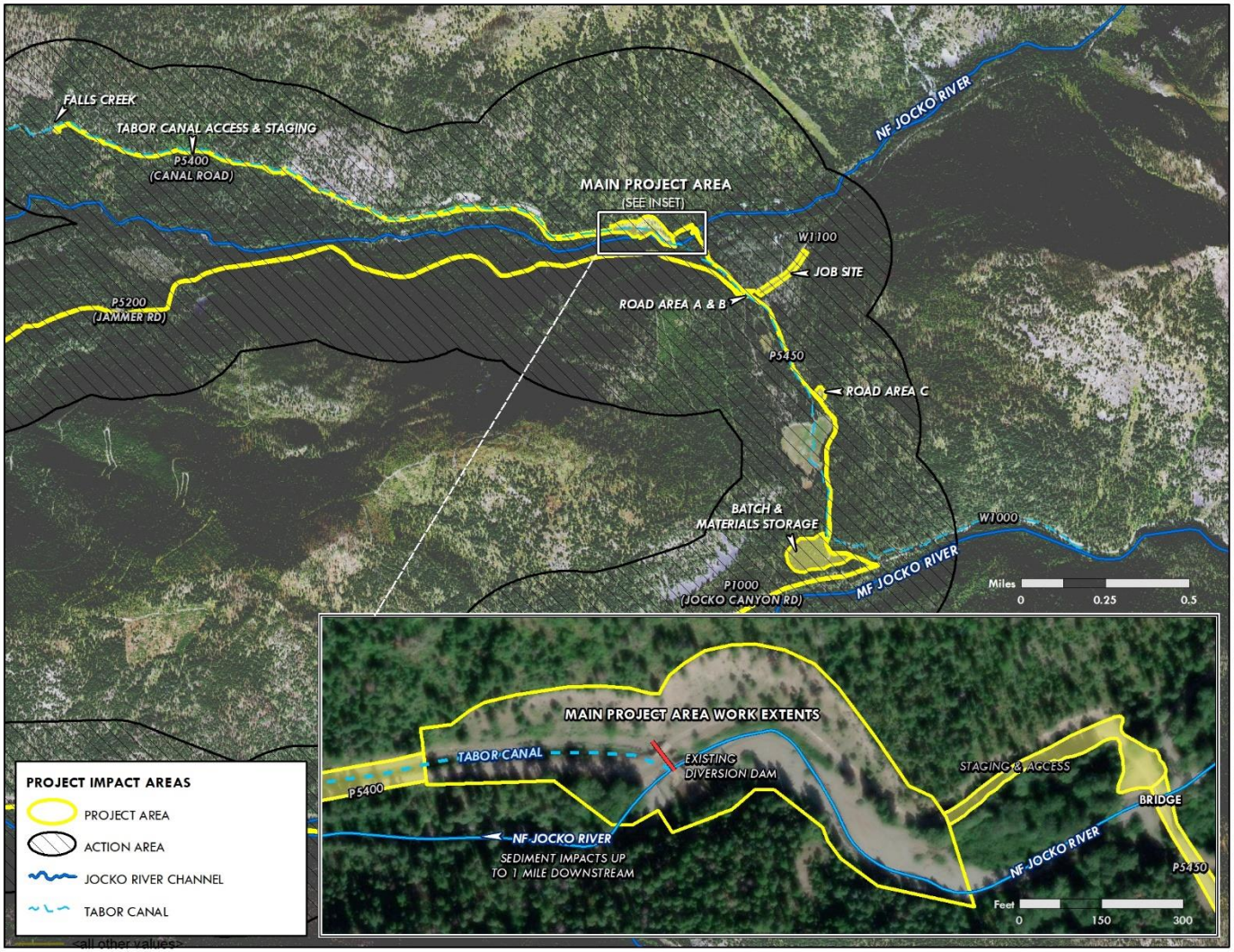

Figure 3: Project area and existing conditions.

3.1 Construction Schedule and In-Water Work Window

Table 2 presents a summary of the Project construction schedule, which would occur over a four-year period. Year 1 construction would commence in July, and the construction season would occur between April and November of each following year. Construction is anticipated to begin in 2025. If project delays occur, construction would occur in the same months and commence the following year. Work within the ordinary high-water mark (OHWM) would be limited to the greatest extent practicable.

The construction schedule was developed to feasibly implement the Project over a four-year window due to the confined nature of the canyon at the diversion, restricted construction access, the requirement to maintain irrigation delivery through the construction period, and the need to terminate work during winter months. In Bull Trout spawning and rearing habitat (such as the Project Area) every effort would be made, when possible, to limit in-water work to July 15-August 31. In-water work is defined by the USFWS as any work below the OHWM (dry or wetted channel), including on the stream banks abutting the OHWM, that could subsequently produce sediment in the channel. Therefore, in-water work includes work occurring not only in the wetted channel, but also below the OHWM but under dry working conditions due to channel re-routing or work occurring within the confines of a cofferdam.

Table 2 also presents which activities would occur below the OHWM (dry or wet) within and outside of the in-water work window, to support assessment of potential impacts to Bull Trout. Color coding is used to differentiate between work that would be done in the wet (sediment producing) and work that would be done in the dry (isolated by a cofferdam or re-routing of the channel). The CSKT, design team, and construction contractors made every effort to schedule in-water work within the in-water work window wherever practicable. However, it was not feasible to schedule all construction activities within the in-water work window due to physical and operational site constraints (noted above). Several conservation measures and best management practices (BMPs) would be in place to avoid impacts to Bull Trout from in-water work completed outside the in-water work window (Section 3.6, Conservation Measures and Best Management Practices). These include implementation of the fish rescue procedure any time fish may be stranded, such as during channel re-routing (see Section 3.6.1.1 Bull Trout Project-specific measures), a Water Control Plan, and erosion and sediment control measures (Section 3.6.2 Construction Best Management Practices). Fish would also be isolated from most of the in-water work activities, as river flow would be separated from work by a cofferdam.

Table 2. Project construction schedule by phase, with in-water work activities noted[1,2,3,4].

Phase	Construction Activity	Apr	May	Jun	Jul 1-14	Jul 15-31	Aug	Sep	Oct	Nov
Year 1	Mobilization and Site Prep, install BMPs			x	x	x				
	Access Road improvements			x	x	x	x			
	Prep staging areas (clear and grub, strip topsoil, place geotextile and gravel)			x	x	x	x			
	Shoring on steep slope above road (retaining wall)					x	x	x	x	
	Grade NF Jocko streambed to move channel to left bank				x					
	Install sheet pile cutoff wall (up to cofferdam) and upstream cofferdam				x	x	x	x	x	
	Cofferdam work zone dewatering				x	x	x	x	x	x
	Demo bridge over Tabor Feeder Canal inlet				x	x				
Year 2	Channel Maintenance to ensure channel in left bank			x	x					
	Cofferdam work zone dewatering		x	x	x	x	x	x	x	x
	Mobilize concrete batch plant	x								
	Structure excavation for project features	x	x	x	x	x	x	x	x	
	Construct sluiceway, headworks, and upstream fishway	x	x	x	x	x	x	x	x	
Year 3	Channel Maintenance to ensure channel in left bank			x	x					
	Cofferdam work zone dewatering		x	x	x	x	x			
	Install box culvert under road	x	x	x						
	Cofferdam work zone dewatering	x	x	x						
	Construct sluiceway and fishway	x	x	x	x	x	x			
	Install fish bypass structure							x	x	x
	Install bypass return pipes and temporary plunge pool			x	x	x				
	Remove upstream cofferdam				x	x	x			
	Install lower sheet pile wall and remaining upper sheet pile wall (not tying into river left bank)						x	x		
	Backfill in-water structures with rip rap to protect against high flows				x	x	x	x		
	Install temporary structure to isolate work zone, construct Micro-Hydro vault, then remove temp. structure						x	x	x	

Phase	Construction Activity	Apr	May	Jun	Jul 1-14	Jul 15-31	Aug	Sep	Oct	Nov
Year 4	Streambed re-grading to move channel to right bank and sluiceway			x	x					
	Demolish existing diversion structures (see section 1.1.1)				x	x	x	x	x	
	Stream gauge relocation					x	x			
	Construct grouted rip rap channel (rock ramp)				x	x	x	x	x	
	Tie in upper and lower sheet pile walls to left bank								x	
	Install electrical and solar array		x	x			x	x		
	Construct utility buildings		x							
	Streambed grading and restoration								x	x
	Final upland grading and seeding								x	x
Year 5	Commissioning – Fish Screen		x	x	x	x	x	x		
	Commissioning – Gate flow calibration, gate operations, and PLC logic programming		x	x	x	x	x	x		
	Maintenance of revegetation and restoration features		x	x	x	x	x	x		

[1] Work activities that would occur below the OHWM in the active channel, or "in the wet", and therefore would have the potential to produce sediment are shaded in brown. Work activities occurring below the OHWM but would be isolated from the active channel by a cofferdam, channel re-routing, or other method, or "in the dry", are shaded in green.

[2] USFWS in-water work window for spawning and rearing habitat is July 15-August 31. In-water work includes work in the dry or wet, below the OHWM in the NF Jocko.

[3] Dewatering of the work zone in years 1-3 within the confines of the cofferdam would occur as needed, particularly during deeper excavations such as for the construction of the sluiceway. Discharges are expected to be up to 100 gallons per minute (gpm) and would occur along the longest flow path possible in conjunction with sediment filtration techniques such as sediment socks would be utilized in order to ensure minimal sediment transport into the NF Jocko. Filtered water would be discharged into vegetated banks, ensuring no sedimentation into the NF Jocko.

[4] Initial channel regrading to left bank in year 1 and channel regrading to right bank in year 4 would be expected to produce the largest amount of sediment during the channel activation. In subsequent years, the channel would be maintained only as necessary to ensure that flow is maintained along the designated route and would entail brief (0-1 days) excavations necessary for this purpose between June 15th and July 10th (or as needed) during low flows.

3.2 Primary Project Features

Primary project features (i.e., construction and demolition) within the main Project Area are presented in Figure 4 and summarized below.

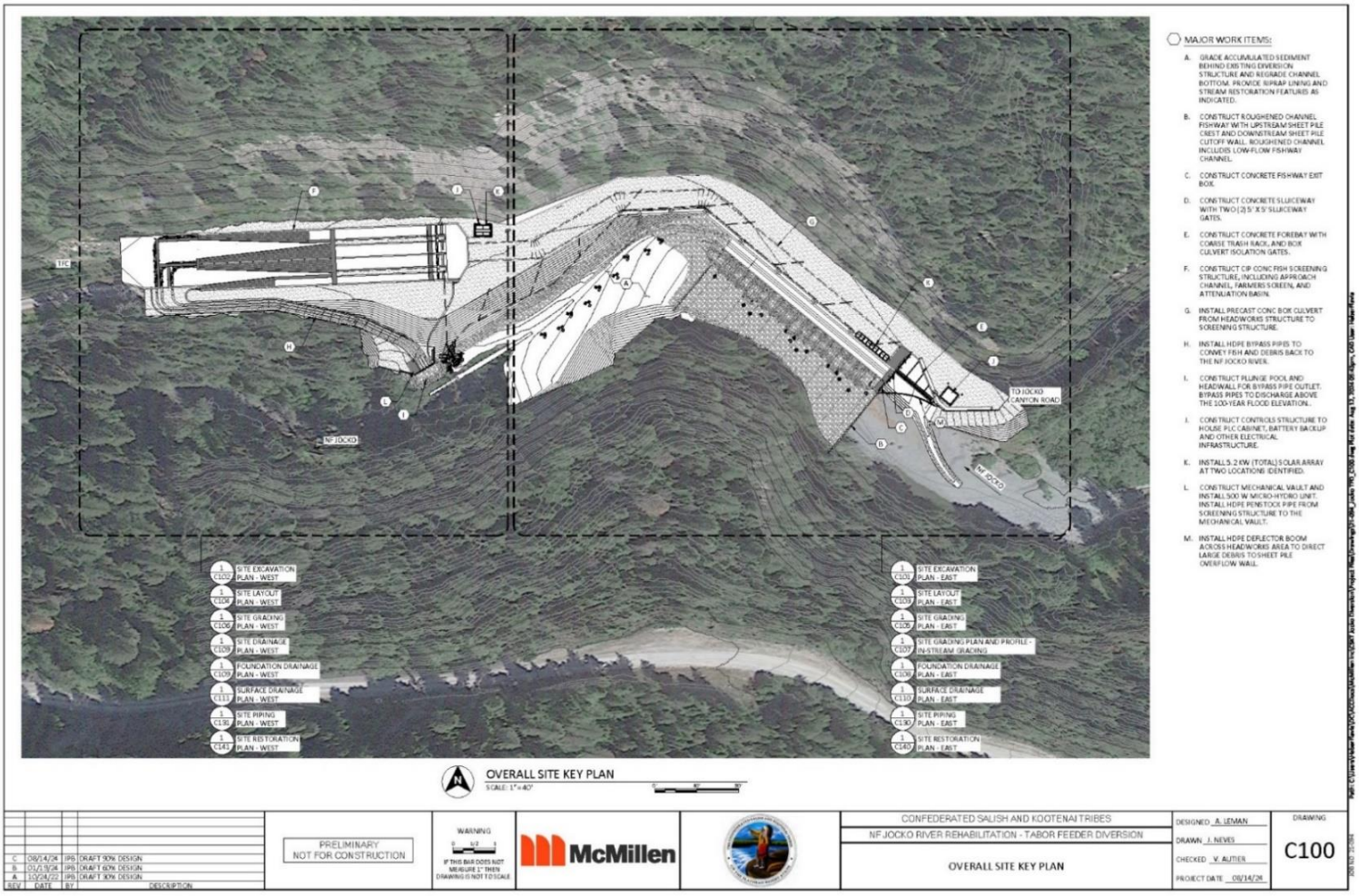

Figure 4: Primary project features within and adjacent to NF Jocko River.

3.2.1 Cut-Slope Shoring

A section of cut slope above road P-5400 directly to the north of the main project area (Figure 4) is unstable due to unconsolidated materials and steep slope. This has resulted in sloughing of material into the roadway and risk of tree fall at the top of the slope. A shoring wall would be driven horizontally into and along the toe of the hillslope to preclude material from damaging future infrastructure and to minimize safety risks to workers and equipment during construction. Hazard trees would be identified and removed during construction as necessary.

3.2.2 Diversion and Headworks

A new diversion and headworks would be constructed approximately 400 feet upstream of the current diversion dam (Figure 4, Figure 5, Design Sheets S101-S110). The diversion structure design can be considered a series of engineering elements from river left to river right. Design of this structure is centered around the concept of a roughened rock ramp that would provide upstream and downstream fish passage and adjacent gates that would provide additional sediment sluicing. The rock ramp would be constructed with a sheet pile cutoff wall at the upstream and downstream ends. The rock ramp would check up water to allow the diversion to route water into a headworks structure on river right, then into a box culvert, and into the Tabor Feeder Canal where a set of fish screens would route any fish that had entered the canal into a set of pipes that would return fish to the NF Jocko downstream (Figure 6).

- The grouted rock ramp serves as a diversion check, a spillway to pass low recurrence interval floods, and a channel segment that can pass sediment and large wood during the time they are mobilized.
- The fishway exit (upstream extent) is a control weir with geometry capable of passing low flows up to 36 cfs. Instream flows up to the fishway capacity would be routed down the fishway.
- The sluiceway would be controlled with two gates and has a capacity of 600 cfs. The sluiceway is intended to pass sediment during the time it is mobilized by the river and to provide downstream fish passage. The sluiceway gates are the primary operational control gates and would be set to maintain instream flows in the fishway.
- The irrigation supply intake is controlled by an array of three sluice gates with a combined capacity equal to the canal capacity plus the fish bypass pipe(s) flow level at full canal capacity (510 cfs).

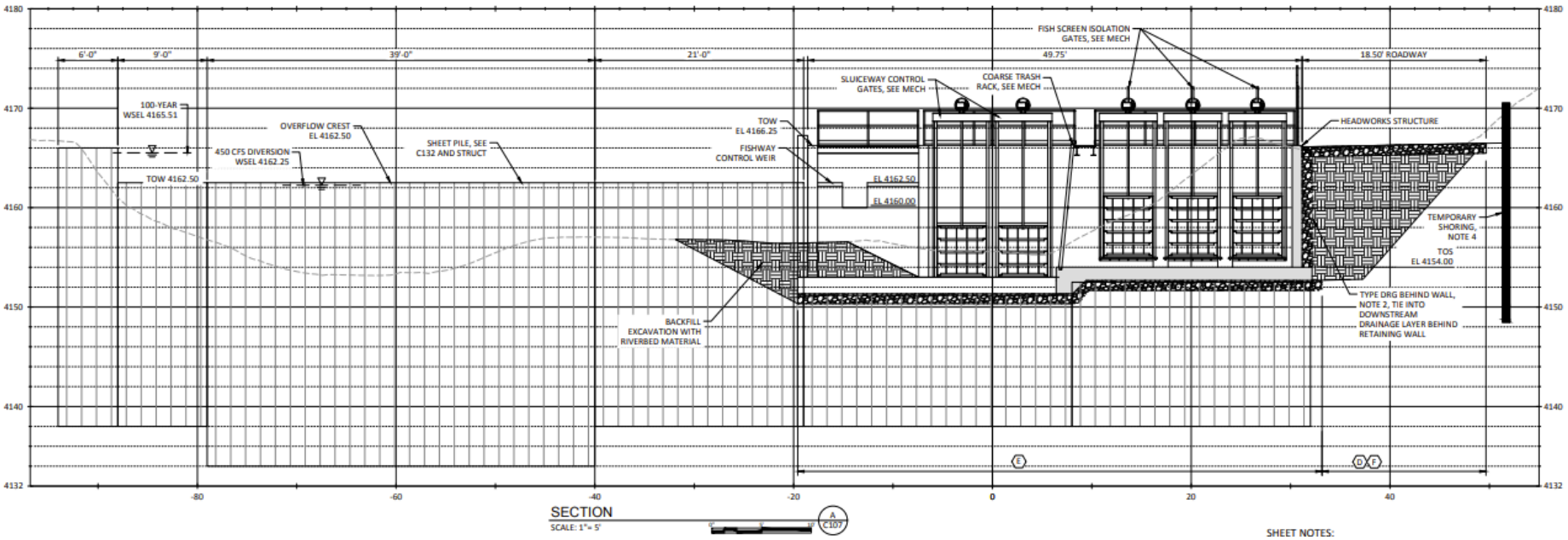

Figure 5: Details of diversion and headworks structures from river left to river right at the upstream end of the project area.

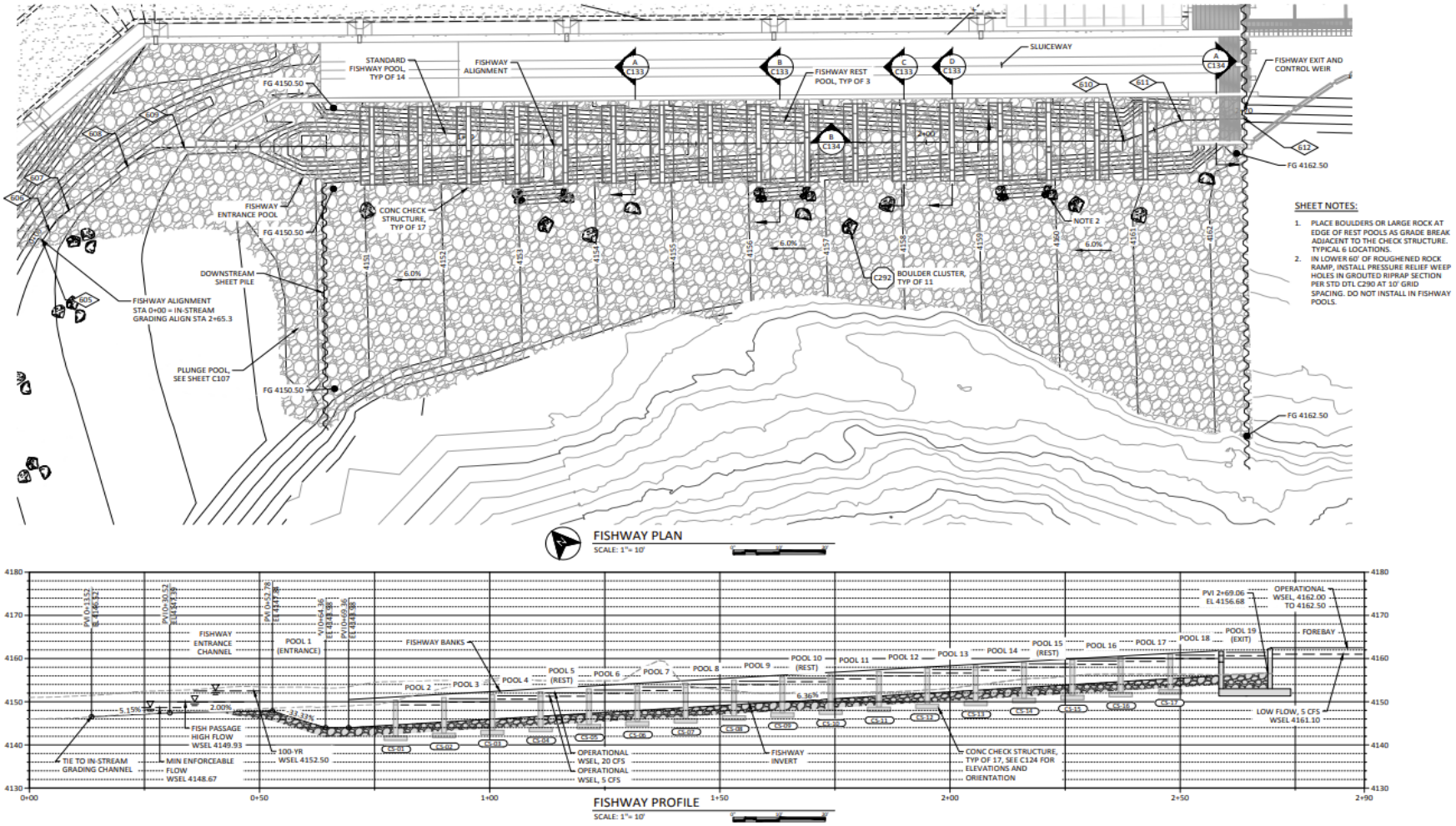

Figure 6: Overview of grouted rock ramp, fishway, and sluiceway

3.2.2.1 **Sheet Pile Cutoff Wall**

The diversion structure starts at the upstream end as a 120-foot-wide sheet pile wall installed to a depth of 20 feet below grade (Figure 4, Design Sheet C130). This wall serves as the upstream crest for the grouted rock ramp and provides structural stability for the rock ramp and a stable elevation for flood flow passage.

The method for sheet pile installation would be completed in one of two ways: sheet pile would be driven or excavated. The contractor-preferred method is to drive sheet pile, but large boulders can lead to refusal, or inability to continue driving. The alternate method is to excavate and place sheet piles. The final placement approach would need to be field-directed due to uncertain subsurface conditions. The top edge of the sheet pile would be finished smooth.

Sheet-pile driving would follow the conservation measures presented in Section 3.6.2.1, Bull Trout Project-specific measures to avoid injury to fish.

3.2.2.2 **Rock Ramp and Fishway**

Downstream of the sheet pile cutoff wall a 200-foot-long, six percent grade rock ramp would be constructed (Figure 6, Design Sheets C131-C134) using specified materials ranging from gravel-size up to twelve-inch plus rock for stability. Flowable concrete (grout) would be placed in the interstices between coarse materials.

A low-flow fishway would be placed adjacent to the rock ramp constructed of 19 pre-cast structures intended to form a step and pool fishway. The pre-cast structures would be placed in grouted rock. Three larger resting pools would be integrated into the fishway. The fishway design is adapted to meet flow criteria for the North fork and the swimming performance for the target fish species. Downstream of the rock ramp and fishway another sheet pile cutoff wall would be installed to approximately eight feet below grade to provide structural stability and preclude undercutting.

3.2.2.3 **Sluiceway**

The sluiceway is intended to pass sediment and fine debris up to a discharge of 600 cfs. The sluiceway intake is set at the lowest elevation in the diversion forebay and would draw the channel thalweg to river right. The sluiceway itself is a 200-foot-long concrete rectangle with an inset low-flow channel to allow downstream fish passage over a range of flows down to very low flows. Two slide gates at the sluiceway entrance would maintain upstream pool levels to keep the fishway active and meet irrigation diversion requirements.

3.2.2.4 **Headworks and Box Culvert**

Adjacent to and upstream of the sluiceway, a 50-foot-wide concrete headworks structure would be located to divert flows into the Tabor Feeder Canal through a 16-foot-wide by seven-foot-tall buried box culvert (Figure 4, Design Sheet C142). The box culvert would be installed under the existing road alignment and would be buried approximately two feet below grade then backfilled and topped with gravel road surfacing to match the existing grade. The culvert intake would be controlled with

three sluice gates with a combined capacity of 510 cfs. Debris screens would be placed before the intake gates and a log boom would be placed to route large floating debris down the rock ramp.

3.2.3 Fish Screening and Bypass and Plunge Pool

In the Tabor Feeder Canal below the box culvert, a new 330-foot-long concrete fish screening and bypass structure would be constructed that meets National Marine Fisheries Service (NMFS) criteria and screens canal flows of all fish, sediment, and small debris (Figure 7, Design Sheets S201-S214). The structure would host four horizontal screens, training channels, and control gates that would supply screened flows into the canal. Each screen would discharge a bypass flow to a series of buried pipes, which would return fish back into the river.

The 300-foot long bypass pipes would follow an existing, but vegetated irrigation access road to a release point in the NF Jocko downstream of the current Facility (Design Sheets C143-C146). The pipes would terminate at a concrete headwall structure constructed above the 100-year flood surface level and discharge into a rip rap-lined, engineered plunge pool constructed along river right. On the upgradient side of the headwall a buried concrete vault would house three micro-hydro turbine generators that would supply backup power for the Project. Water for the micro-hydro units would be supplied through a separate buried pipe from the fish bypass structure following the same alignment as the others. The plunge-pool work area would be isolated from the river channel by a temporary structure such as super sacks filled with large-diameter cleaned gravel in order to ensure work occurs in the dry.

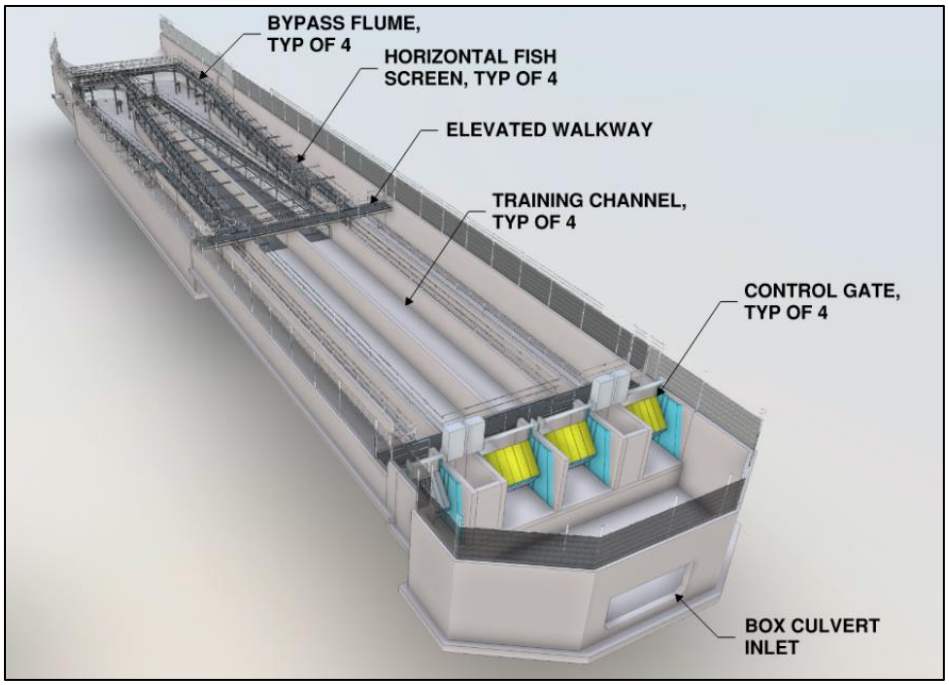

Figure 7: Fish screening and bypass structure.

The CSKT worked closely with the fish screen manufacterer in the design of the fish screen array to maximize successful fish passage while avoiding and minimizing fish injury and mortality from stranding. Operation of the fish screens would follow the manufacterer's guidance document that would be tailored to the Project to optimize fish screen performance. Fish stranding during operation would be avoided by only shutting down the diversion and fish screens when staff are present to ensure any fish remaining on the screens would be hazed downstream into the bypass pipes, or rescued and relocated (i.e., by hand with a net and bucket). The fish screens would be compliant with NOAA screening criteria

3.2.4 Demolition of Existing Structures

The current Facility would be removed by demolition as detailed in Design Sheets D100 – D103. Demolition would include removal of 1) the Road 5400 bridge across the Tabor Feeder Canal headworks; 2) the concrete diversion structure and concrete slabs, 3) the radial gate and concrete sluiceway and appurtenances, 4) the concrete abutments on both sides of the river, and 5) the canal headworks and radial canal gate. The channel near the demolition area would be regraded to a naturalized channel in native bed materials and lined with riprap locally where areas of high shear stress are expected to occur. The removal of the existing Facility would be performed by heavy equipment such as excavators and hydrodrills. The use of explosives would not be permitted. The construction contractor would develop a Demolition Plan at least one month prior to the start of construction to include anticipated methods for demolition equipment to be used, stockpiling locations for salvage materials and for off-hauling, and stream protection measures.

3.2.5 Power and Associated Infrastructure

Primary power for the Project would be supplied by two solar arrays comprising 5.2 kW of power. The solar arrays and other appurtenant electrical and control infrastructure would be housed in two control buildings on concrete pads adjacent to the fish screening and bypass structure and immediately west of the headworks structure (Design Sheets E101 – E104).

A small-scale hydropower system ("micro-hydro") would be constructed within a buried concrete vault downstream of the current Facility. The vault would house three micro-hydro turbine generators that would supply backup power for the Project (Design Sheet M530). Water for the micro-hydro units would be supplied through a separate buried pipe from the fish bypass structure following the same alignment as the fish bypass pipes.

3.2.6 Stream Gauge Relocation

An existing stream measurement gage is located approximately 650 feet downstream of the current Facility. The gage control pool is prone to fine-sediment infilling and requires recurrent field measurement to maintain rating curve accuracy. A new gage would be placed approximately 125 feet downstream of the proposed plunge pool and fish return bypass pipes. The new design would include placement of a constructed gage and control stream section and a gage pool with a hardened riffle crest to improve measurement accuracy. Output from the new gage would be incorporated into

the overall Project automation, eliminating the need to trench over 800 feet of conduit from the existing gage to the automation control house. The existing gage would be discontinued and manually removed (would not require equipment or in-channel work).

3.3 Additional Project Features

3.3.1 Project Area Access and Road Improvements

The project would be accessed from the town of Arlee, MT, via road P-1000, and by then turning north on road P-5450, which after its intersection with P-5200 continues north as P-5400 (Figure 1, Figure 3). Road repairs and dust abatement required to accommodate and mitigate project traffic would occur as necessary.

The Project would use the following roads:

- **Jocko Road** would be used between the lower staging areas (Theresa Adams Pit and FIIP Camp), and the mouth of Jocko Canyon where it turns into the P 1000 road to Seeley Lake.
- **Road P-1000** (Jocko Canyon Road) would be used as primary access.
- **Road P-5200** (Jammer Road) would be used as an access route for light duty vehicles.
- **Road P-5450** would be widened only where necessary within the existing right of way (which is approximately 20 feet in each direction from the road's center), where tight turns may preclude equipment access or risk impacts to sensitive resources. Vegetation removal associated with this road widening would be limited to the minimum necessary to accommodate access. Road widening would be limited to the east side of the road, avoiding any impacts to wetlands, the Tabor Feeder Canal, or other sensitive resources. Disturbed areas would be reclaimed and revegetated as closely as possible to their original condition.
- **Road 5400** (Canal Road) would be used to access the Project area. Wider pullout areas along the road would be utilized for staging materials and equipment from the north end of the NF Jocko Bridge (Figure 3) to the Falls Creek Diversion approximately two miles downstream.
- In addition, a short segment (~ 89') of road would be built on the east end of the Main Project Area, connecting road P-5400 with a temporary staging area within the NF Jocko channel ("TFC Access Road" in Design Sheet G105.) Select large diameter vegetation removal and earthwork would occur during road construction, and all applicable water quality standards and construction BMPs would be followed (See Section 3.3.3.3, Below OHWM Staging Area, and Section 3.5) The short-term purpose of this road would be to provide access during construction. Post-project, the road would be gated and limited to administrative use only for the purposes of maintenance to headworks, sluiceway and fishway.

3.3.2 Concrete Batch Plant and Pumping

A concrete batch plant would be mobilized at the developed staging area near the intersection of road P-1000 and road P-5450 (Figure 3). The batch plant would remain in use during construction as necessary for constructing concrete structures for the Project. Water for the concrete batch plant would be trucked from a well at the FIIP camp to meet the potable water requirements for the batch plant.

The batch plant staging area is identified as approximately 7.8 acres. The location is a former clear cut with a pole-size lodgepole plantation and interspersed larger trees. The site has a logging road down the axis of the area. Clearing and grubbing would occur on approximately four acres with the remainder of the staging area available for storage between tree stands. This area would serve as a potential campsite for construction crews. Post-construction, the area would be reclaimed and restored as needed following the guidelines in Design Sheet G104.

3.3.3 Construction Staging Areas

3.3.3.1 Lower Staging Areas

Two staging areas located on the Jocko Road several miles below the main project area would be used for material storage- the Theresa Adams Pit and the FIIP Jocko Camp (Figure 1, Design Sheet G103). These two areas are existing material storage areas or active material borrow sites for ongoing FIIP activities.

3.3.3.2 Upper Staging Areas

Several small staging areas would be established near the main project area (Figure 3, Design Sheets G104 and 105). Staging activities would predominantly occur on existing disturbed ground with some grading and small brush clearing at limited locations. The Jobsite Staging Area would be used to host job trailers, equipment and material storage, and other project needs. Vegetation would be cleared and ground leveled as necessary to accommodate these activities. All staging areas would be used to store Project equipment and materials. Post-construction, staging areas would be restored as needed following the guidelines in Design Sheet G104.

3.3.3.3 Below OHWM Staging Areas

Given the extremely limited space for staging near the main project area, staging may be permitted to occur below the OHWM (in the dry) in two locations, if absolutely necessary: within the bottom of the Tabor Canal from the current Facility to the Falls Creek Diversion, and on a mid-channel gravel bar upstream of the current Facility (Figure 3, Design Sheet 105). Staging in these locations would only occur when the channels are dry, outside of the irrigation season.

All materials would be removed from these staging areas when not in use or in the event of inclement weather or potential rises in flow. The NF Jocko mid-channel bar staging area would be accessed by road from Road P-5400 extending down to the NF Jocko channel, as described in Section 3.3.1, Project Area Access and Road Improvements.

Vegetation removal and earthwork would not occur in these staging areas. Material staged below the OHWM would be limited to that which can be promptly and fully removed in the case of rising flows or inclement weather. This would not include materials that could pose a risk to water quality, including but not limited to, fuels, oils, or other pollutants. Construction equipment would be required to be moved from the area daily. All applicable water quality standards and BMPs would be followed (See Section 3.5) and the areas would be restored as needed following the guidelines in Design Sheet G105.

3.3.4 Work Camps

If camping is needed for project activities, construction workers may be permitted to camp at the batch plant location or other approved locations in the action area upon consultation with CSKT. Any type of camping would be limited and would require hard-sided camping facilities such as a truck camper or small trailer RV. It is unlikely that camping protocols would be able to fully adhere to the BMPs listed in Section 3.6.2.4, Grizzly Bear Project-Specific Conservation Measures, to avoid adverse impacts to grizzly bears. Camping for project-related activities will likely occur outside of a developed campground for more than 5 days. It is also possible that >20 individual workers may camp at a single point in time, although smaller crews are much more likely.

3.4 Restoration

All areas of ground disturbance that are not permanently impacted by the Project would be restored after construction is complete. Given the extent of grading required for the Project within and adjacent to the NF Jocko channel, and the current altered geomorphic condition of the NF Jocko channel, the NF Jocko channel and streambanks would not be restored to pre-construction conditions. Rather, the goal would be to restore the NF Jocko channel and streambanks to a more natural geomorphic condition for the site, while protecting the newly constructed Project features from erosion at high flows or during storm events. In addition to restoration of plant communities and floodplain/slope features described below, habitat connectivity would be restored by removing a diversion structure that currently functions as a fish barrier. This diversion would be replaced by a fish-passable rock ramp, and fish screens would be installed to eliminate fish entrainment into the canal.

Restoration design specifications can be found in Design sheets C150 to C155. Design sheets C150-C151 present an overview of the restoration treatments for areas of ground disturbance between the NF Jocko bridge and the current Tabor Diversion. Wherever possible, designs for streambank armoring include natural materials such as live native willow cuttings, native brush and logs. Restoration treatments are also intended to promote point bar and slope vegetation development on surfaces downstream of the Project. Restoration treatments for the upland staging areas are not presented in the design sheets but are described below.

Design sheet C152 presents a typical cross section with restoration treatments and references specific design sheets for each treatment. Point bar restoration would consist of floodplain roughness and willow trenches on the left bank, where a depositional surface has been incorporated into the grading design. Partially buried logs and brush, in addition to willow trenches, would create

microtopography for surface diversity and native seed capture, trap sediments, and support revegetation of the site through natural processes. A vegetated brush bank would be constructed along the right bank. In conjunction with the riprap, the brush bank would dissipate streamflow energy, provide habitat complexity in the form of overhanging cover, and promote native vegetation establishment through the incorporation of live willow cuttings. Slope roughness treatments (partially embedded logs and brush) would be applied to tie-in slopes along both banks to limit erosion and sediment runoff.

3.4.1 Floodplain and Slope Treatments

Floodplain and slope treatments are presented in Design Sheet C153. Floodplain treatments include the installation of micro-topography roughness and woody material within the floodplain. The surface would be roughened to create an irregular surface that varies +/- 0.5 ft from grade while decompacting the surface soils. Approximately half of the length of each piece of wood would be buried. This treatment creates areas within the floodplain to trap seed, provides protection to seedlings, slows and spreads surface water, and recruits nutrients and organic matter to support re-establishment of riparian vegetation.

In steeper areas, slope treatments include partially buried logs in the slope to prevent erosion, slow and spread runoff water, and support revegetation by creating micro-sites where seedlings can establish. Logs would be placed on slopes at a rate of 150 pieces per acre. Approximately half of the length of the wood would be buried in the slope surface.

3.4.2 Brush Bank Treatments

Brush bank treatments are presented in Design Sheet C154. Brush bank treatments in the upstream section would be offset from the channel behind a riprap toe and backfilled with native substrate on top of the logs and brush. In the lower section, the brush banks would be adjacent to the channel with a riprap toe that is filled with native substrate to seal voids and backfilled with riprap on top of the logs and brush.

3.4.3 Willow Brush Trenches

Willow brush trench treatments are presented in Design Sheet C155. Willow brush trenches would be constructed within the floodplain to support rapid establishment of riparian vegetation, trap sediment, and provide habitat. Trenches would be dug up to four feet deep and would extend across the floodplain according to design, generally perpendicular to flow direction. Assorted native willow cuttings and brush would be placed vertically in the trench which would then be backfilled to match the existing floodplain elevation.

3.4.4 Revegetation Seeding

The upland staging areas, and two areas within the project area adjacent to the NF Jocko channel (Design Sheets C150-151) would be revegetated using hydroseeding methods, using a native seed mix approved by CSKT.

3.5 Project Operation

Many aspects of Project operation are described in the relevant Project feature section above. This section presents an overview of Project operation.

Following commissioning, the facility would be operated following the Standard Operating Procedures plan. The order of precedence would be to meet instream flows and then diversion into the Tabor Feeder Canal. The PLC would incorporate this logic. Day-to-day visitation would remain similar for a period of one to three years and would likely diminish over time as confidence in the gate operations increases.

Fine sediment accumulation and management, a substantive ecological problem with the existing facility, would be eliminated since the sluiceway would pass sediment during high flows. As with all irrigation facilities, periodic maintenance would be required to clean screens and ensure gates are operating.

The period of operation (from April into early July) is not anticipated to change since this timing is related to water availability.

3.6 Conservation Measures and Best Management Practices

Project construction effects on the environment would be avoided and minimized to the greatest extent practicable through the following conservation measures and construction BMPs.

3.6.1 Construction Water Management

Water management in the NF Jocko during construction was carefully considered in an effort to minimize impacts to Bull Trout and critical habitat. The construction contractor shall develop a Water Control Plan for the Project for review and approval by the Engineer at least 40 days prior to construction. The plan would also be transmitted to the Project team for review and concurrence prior to the Engineer approval step. The Water Control Plan would include cofferdam design and methods for diversion and dewatering of the river; would address care of the stream and water management during construction, and would include measures taken to meet permit requirements, methods for control and prevention of aquatic invasive species within the work area, and protection measures aimed at guarding against spills or leaks of oils or other lubricants, and other BMPs to ensure protection of the aquatic environment. The milestones in the forthcoming Water Control Plan are known and communicated below. Details related to means and methods for implementation of the plan are pending the Water control Plan contract submittal.

Two primary approaches would be implemented for construction water management: rerouting a reach of the North Fork Jocko River away from the construction area, and groundwater management in construction excavations.

Re-routing of the river from upstream of the fishway exit and box culvert forebay to downstream of the sluiceway would be completed using a permanent sheet pile wall that is integrated into the final design in combination with a temporary sheet pile wall intended solely for the cofferdam. The plan

view layout of the sheet-pile installation is attached as Figures 8, 9, 10, and 11, which indicate both temporary and permanent sheet pile segments. This figure is taken from Technical Memorandum – 011, Coffer Dam Hydraulic Analysis (McMillen 5/24/2024). This TM also summarizes hydraulic modeling to refine coffer dam details, including finish wall height and width of channel after re-routing. The coffer dam is designed to pass a 100-year flood without overtopping. The accessible width of the rerouted channel would also maintain river stability, measured by maximum velocity and shear stress, and the grain size that would be mobilized at various flow levels up to the 100-year flood. The coffer dam hydraulic analysis indicates that it would provide complete surface-water separation between the re-routed channel and the combined river-right fishway/sluiceway during construction. Modeling additionally indicated that bed material would remain mobile while maintaining overall channel stability.

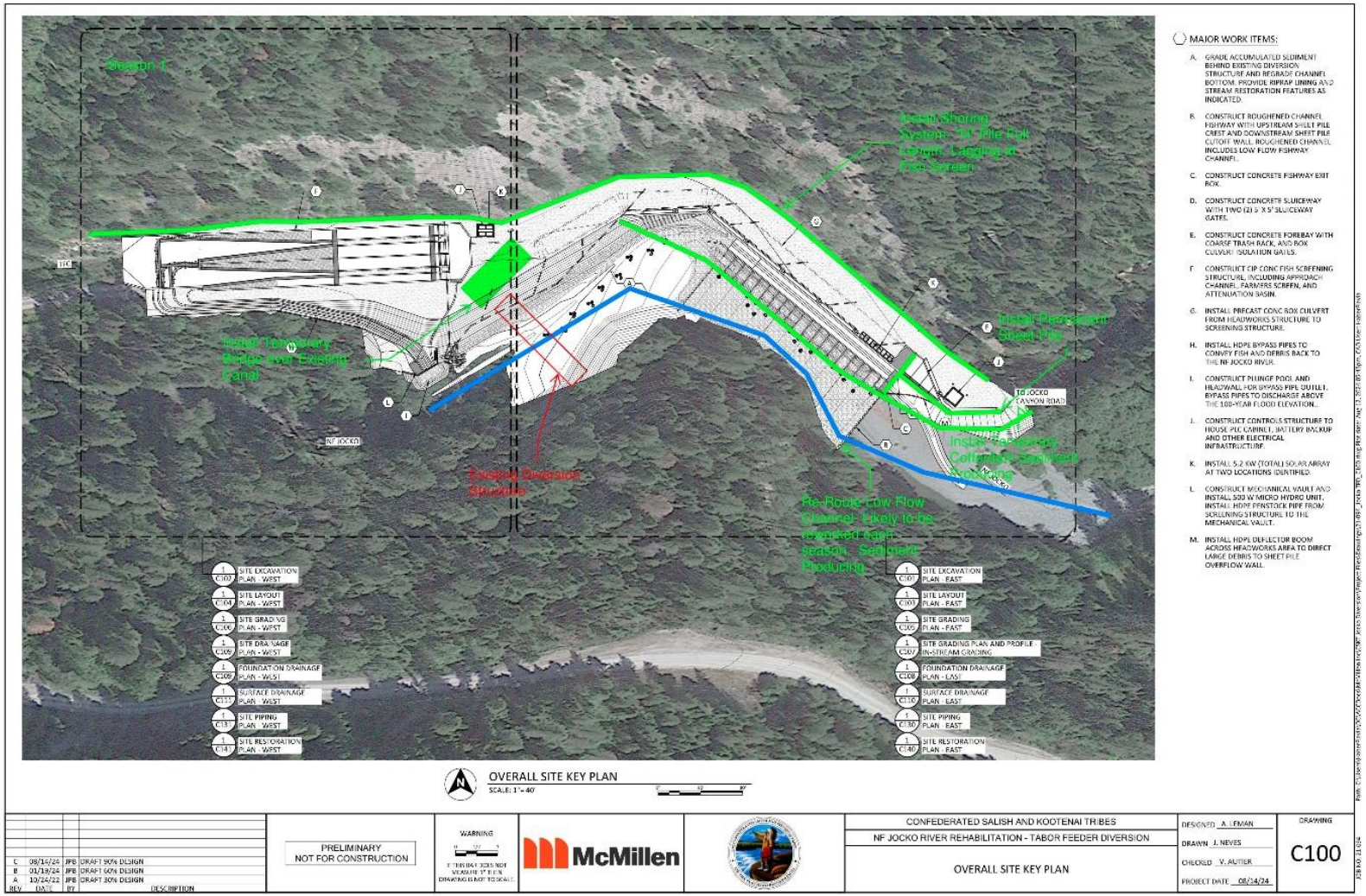

Figure 8: Year 1 Construction water management for the NF Jocko Tabor Diversion Project.

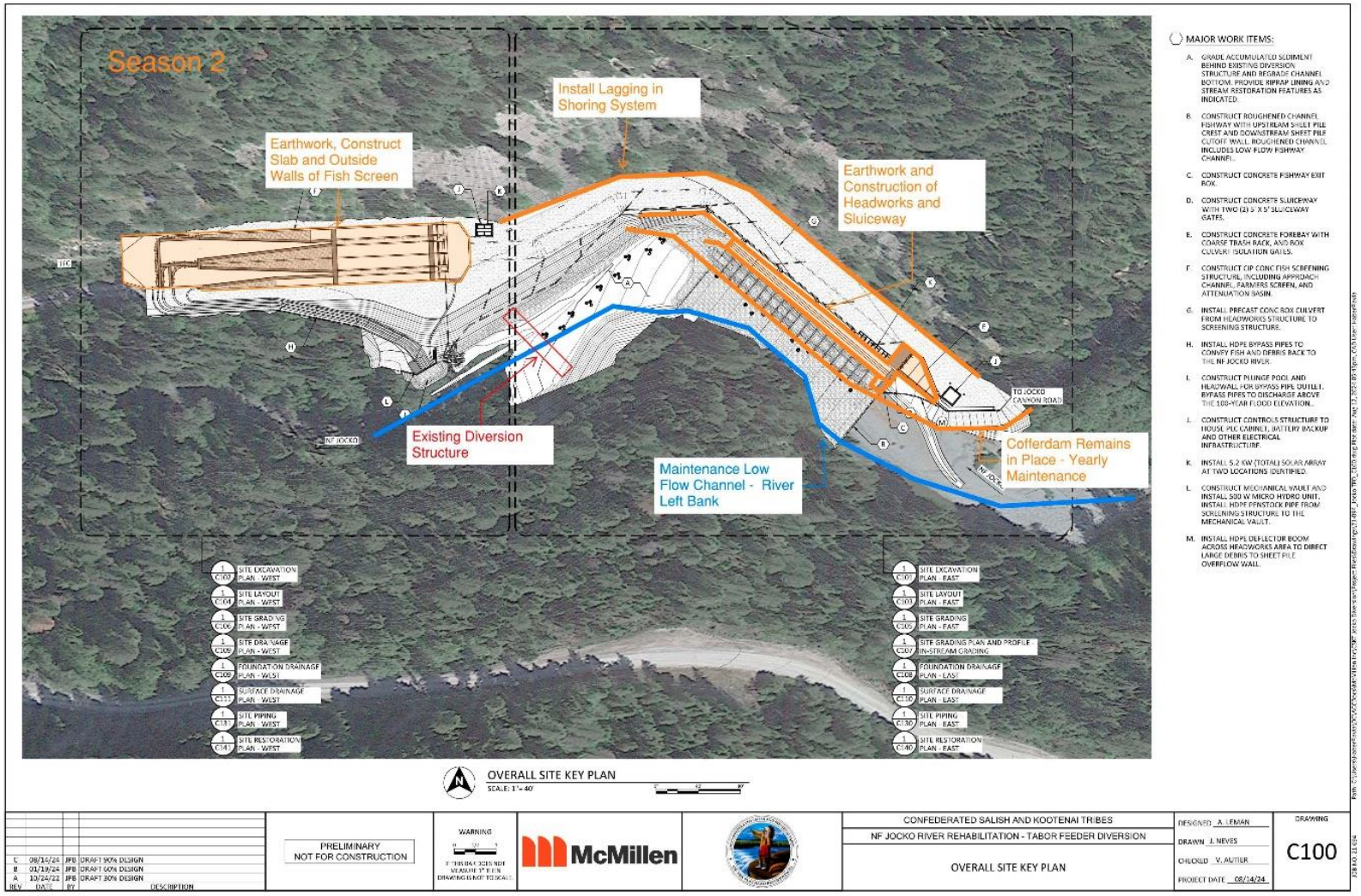

Figure 9: Year 2 construction water management for the Project.

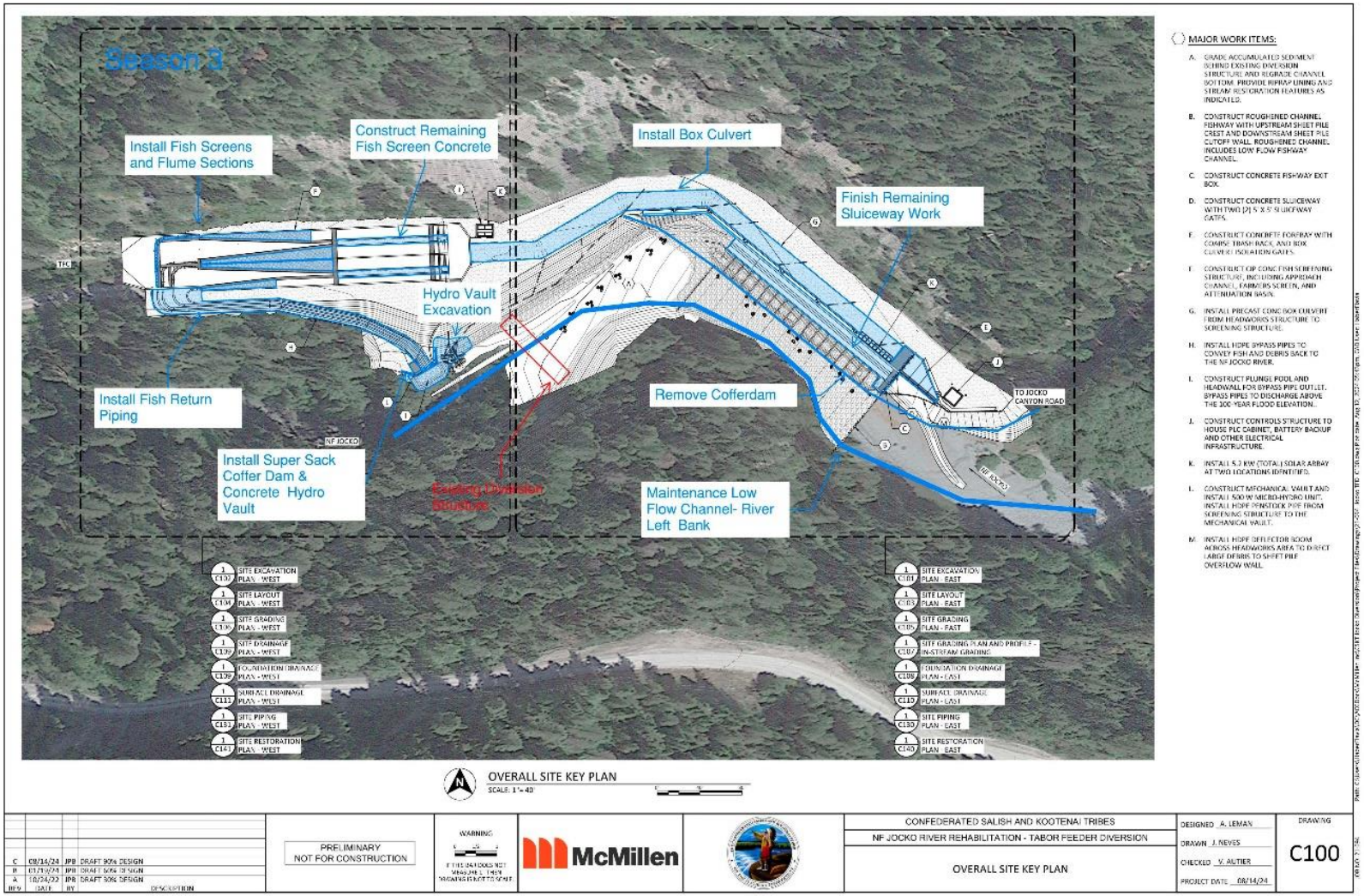

Figure 10: Year 3 construction water management for the Project.

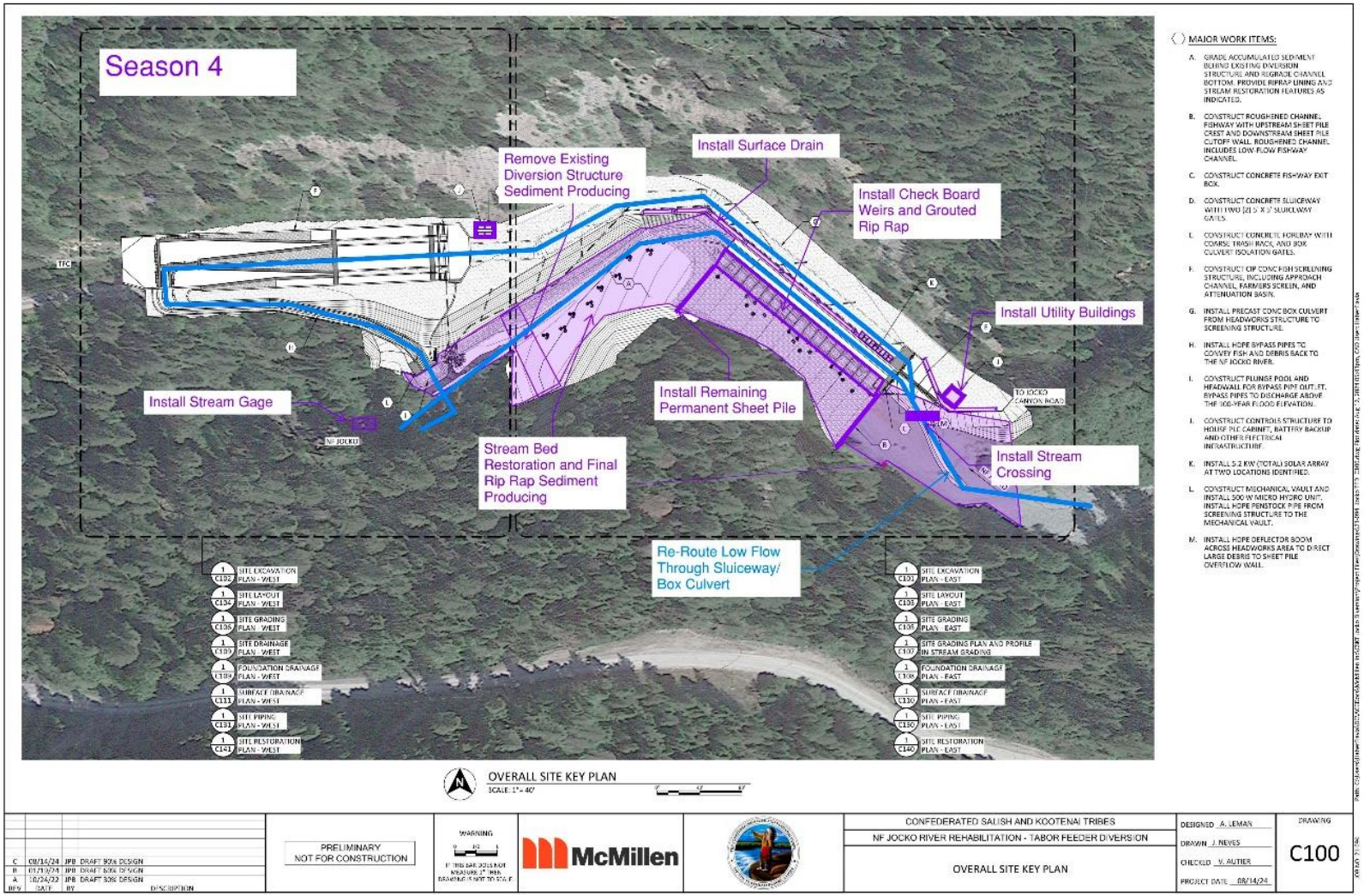

Figure 11: Year 4 construction water management for the Project.

Groundwater dewatering would need to occur in excavations through the life of the project. Geotechnical investigations (McMillen, 12/2021, Technical Memorandum 003 Geotechnical Investigations) indicate groundwater levels correspond approximately to the river water surface elevation – higher during irrigation operational periods when the forebay is full and lower in the off-irrigation season. Groundwater would be pumped from excavations as required and would be managed using one of three approaches. Groundwater would be routed into the Tabor Feeder Canal as a first option. This water would pond and infiltrate into the canal. Groundwater would be routed into vegetated buffers to allow infiltration and sediment filtration. With this approach, temporary features would be placed to preclude concentrated or channelized flow and direct discharge to the active channel. The third option would be best management practices adapted to site conditions. These include filtration basins, sediment barriers including bioengineering materials and rock check structures, and technical solutions such as flocculation logs.

Groundwater dewatering requirements are difficult to completely anticipate due to subsurface variability. Water management methods are identified and would be detailed in the Water Control Plan submittal, contractor personnel would be assigned to install and maintain dewatering features, and the construction contract would have allowances to address variable subsurface conditions.

Channel re-routing with the coffer dam would occur over years one through three. The channel is over-widened upstream of the diversion dam due to sediment deposition. The active wetted width of the channel in the non-irrigation period is much less that the alluvial fill bordering the channel. Throughout the project life, channel re-routing would occur during non-irrigation periods and the contractor would be instructed to shape the re-routed channel during low flow and potentially dry periods. Key water management activities are presented in Table 2 and summarized below.

- Year 1 (Figure 8)
    - *Streambed grading to reroute channel to river- left.* Prior to construction at low flows, the bypass river channel would be shaped and flow would be trained to river-left. The new channel would be excavated in the dry before breaching for the activation of the new channel.
    - *Sheet pile cutoff wall and coffer dam installation*. Sections of the permanent sheet pile cutoff wall would be partially constructed on the right bank and would connect with the temporary cofferdam to isolate the work zone for the fishway, sluiceway, headworks intake, box culvert, and river-right slope treatment.
- Year 2 (Figure 9)
    - *Channel maintenance.* During low flows the re-routed channel would be reshaped as needed to ensure flows remain along the left bank. Work associated with channel reshaping is anticipated to be minimal and short in duration.
    - *Cofferdam.* This would be evaluated for performance.

- *Groundwater management in excavations would be ongoing with installation and maintenance of treatment techniques noted above.*

- Year 3 (Figure 10)
  - *Channel maintenance.* During low flows the re-routed channel would be reshaped as needed to ensure flows remain on river left. Work associated with channel reshaping is anticipated to be minimal and short in duration.
  - *Remove upstream cofferdam*. The temporary segments of sheet pile would be removed during low flows, once all of the Project infrastructure on the right bank is complete (i.e., fish screens and bypass, box culvert, sluiceway).
  - *Cofferdam for micro-hydro vault.* A small temporary cofferdam (likely built from supersacks containing cleaned gravels) would be installed to isolate the work zone for construction of the micro-hydro vault and fish screen return pipe outfalls.
  - *Removal of cofferdam for micro-hydro vault.*
- Year 4 (Figure 11)
  - *Channel re-route to right bank*. Once the upper coffer dam is removed during low flows, the channel would be shaped and trained to flow to river right and down the sluiceway. The sluiceway invert is the lowest elevation feature in the headworks area and this would facilitate the shift in flow to river right.
  - *Equipment access bridge:* a temporary crossing would be utilized to allow equipment to cross the active channel during construction, eliminating the need for equipment to enter the active channel. This crossing would be utilized for all work occurring on the left bank.
  - *Demolition of existing structures*
    - *Alternative 1*: Demolition would occur from river left to river right. After an opening is created, the river would be routed down its left bank to complete demolition on the right bank. The temporary river crossing would be used to keep equipment out of the active channel. In water (wet) work would be largely associated with the activation of the channel on the left bank.
    - *Alternative 2:* Flows may be routed entirely down the fish bypass structure during demolition. Water would return to the NF Jocko via the fish bypass pipes. Some flows would be conveyed through the fish bypass structure and down the Tabor Feeder Canal. The bypass pipes would be utilized up to their max capacity of 60 cfs, ensuring that return flows to the NF Jocko meet or exceed instream flow requirements.

- *Alternative 3:* Flows in the NF Jocko would be captured and conveyed downstream via pipe and would be moved as necessary to complete work items in dry conditions.

- *Stream bed re-grading.* After all Project features are constructed the stream bed would be re-graded to allow the natural flow pattern.
  - Work would be sediment-producing unless flows were routed entirely down the bypass structure as stated in Alternative 2 of Structure Demolition.

Protection measures to avoid and minimize impacts of water management activities are presented in Section 3.6.1.1, Bull Trout Project-specific measures. Gradual unwatering of the stream channel would occur in stages to allow fish to move out of the reach or congregate in deeper portions of the channel where they could be captured. Biologists would be prepared to rescue any fish that become stranded as the channel is unwatered. BMPs such as silt fences and turbidity curtains would be installed downstream of the Project site, and to isolate other work items such as the bypass pipe headwall as necessary to reduce impacts to water quality. Close coordination with CSKT Fisheries, Shoreline Protection, and Water Quality programs would occur during the placement and removal of the cofferdam and other water management-related activities to minimize impacts and ensure all applicable permits and regulations would be followed. Yearly spring water management meetings would be held between the contractor and CSKT project managers and fish biologists to ensure early coordination and adaptive management to reduce sedimentation or other adverse impacts to the NF Jocko.

3.6.2 Fish and Wildlife Conservation Measures

3.6.2.1 Bull Trout Project-specific measures

1. Construction- in-water work (below OHWM)

   a. In-water work is defined by the USFWS as any work below the OHWM (dry or wetted channel), or on the stream banks abutting the OHWM that could subsequently produce sediment into the channel below the OHWM.

   b. July 15-August 31 is the preferred in-water work window for protection of spawning and rearing Bull Trout. In-water work outside this period would occur only if there were no other practicable alternative, and as negotiated during the regulatory permitting process.

   c. To prevent introduction and spread of terrestrial and aquatic invasive species (AIS), clean mud and plants (preferably by power washing) and dry all equipment to be used for in-water work prior to mobilizing onsite

   d. Perform daily visual checks on vehicles, equipment, and heavy machinery to minimize the chances of introduction of petroleum products to waterways. External grease and

oil would be removed off vehicles, equipment, and machinery offsite prior to operating in project area.

e. Have and maintain a spill kit and backup spill materials onsite.

f. Fuel equipment away from the stream, preferably at least 150'.

g. If machinery is to be stored below OHWM, secondary containment measures would be installed.

h. Clear water diversions would be used to route surface water from or around the Project area. Specifically, constructed channels and cofferdams would be used for diversion.

i. A fish rescue would be conducted to remove fish from the construction area during dewatering or rerouting of the channel.

j. Cofferdam sacks would be filled with washed material. Cofferdam heights would be elevated above modeled flood elevations to preclude overtopping.

k. Water pump lines would be screened at the inlets with minimum 3/32-inch mesh to preclude fish entrapment.

l. All imported materials would consist of clean, granular material free of contaminants and all other deleterious material.

2. Construction- sheet pile driving

a. To minimize impacts to overwintering and migrating bull trout, impact pile driving that has not been attenuated for noise can occur between February 1 and March 31 and between July 1 and September 30. According to past correspondence with USFWS for projects on bull trout-occupied waters and bull trout critical habitat, these periods coincide with periods of no overwintering, no juvenile downstream migration, and no adult upstream migration. These work windows include dry land and in-water impact pile driving.

b. Should piles be driven or other in-stream construction conducted outside of the above time periods, one of the following measures would be employed:

i. Use a vibratory hammer or initiate impact hammer pile-driving of each pile with lower hammer strokes than are required for the initial six strikes to encourage fish to vacate the surrounding area. If driving pile with an impact hammer over consecutive days, do not drive piling between the hours of 9:00 pm and 6:00 am.

ii. Use MDT-approved noise reduction methods (i.e. bubble curtains, cofferdams [Leslie and Schwertner 2013]), and conduct hydroacoustic monitoring.

1. Through hydroacoustic monitoring, should it be determined that either of the following physical harm thresholds have been attained or exceeded, impact pile driving must be stopped for the day, with impact pile driving permitted to commence the next morning.
    a. A peak sound pressure level of 206 dB (re: 1 µPa).
    b. A cumulative sound exposure level of 187 dB (re: 1 µPa) for fish >2 g, or 183 dB (re: 1 µPa) for fish <2 g.

3. Fish Rescue Procedure
    a. During channel rerouting trained personnel would be prepared to rescue any fish that become stranded in pools as the channel is dewatered. The fish rescue would be led by an experienced crew from the Tribes' Fisheries Program, with assistance from additional CSKT staff if needed.
    b. As flows diminish there should be relatively little holding water in the abandoned channel. Crews would walk the entire reach, attempting to drive remaining fish towards the downstream channel confluence. As flows become more isolating, the crew would search and net fish from any remaining pocket water within the entire reach, making a concerted effort to search for smaller size classes of fish that might seek refuge under larger rocks and within interstitial spaces.
    c. Captured fish would be bucketed, transported, and released either upstream or downstream of the dewatered reach.
    d. The final step in the rescue would be to electrofish pools and pocket water that would likely temporarily persist within the dewatered portion of the channel. Electrofishing would be done using the minimum electricity settings needed to initiate galvanotaxis and allow for capture of fish. Particular care would be taken if larger fish are observed. Fish captured by electrofishing would be netted, bucketed, transported to live cars, and allowed to fully recover before release upstream or downstream of the abandoned channel.

4. Operations- flow management and fish screen operation
    a. Flow management – flow management would be driven by the instream flows – MEF's and TIF's in wet and normal years. Also, the BO for Operation and Maintenance of FIIP has a bankfull discharge schedule. These are the drivers for flow management
    b. Fish screen operation
        i. Fish screens would be operated per the manufacturer's guidelines to avoid fish stranding.

ii. Fish screens would be shut down only when personnel are present to ensure that fish are not stranded on the screens (either by hazing fish down flow, or by capturing with a net and bucket to relocate downstream).

3.6.2.2 Wolverine Project-specific measures

1. When activities occur in wolverine denning habitat, project activities would occur in summer/fall to avoid construction during the spring denning season for wolverine.
2. If a wolverine is observed in the project area, a CSKT wildlife biologist would be notified immediately.
3. Many BMPs applicable in lynx habitat are also applicable in wolverine habitat, primarily regarding habitat connectivity, road density, improved access, and concentration of development in high-use or pre-disturbed areas.

3.6.2.3 Lynx Project-specific measures

1. Activities would adhere to all Canada lynx-related requirements in Tribal Forest Management Plans and Resource Management Plans (i.e., Northern Rockies Lynx Management Direction (NRLMD, USDA Forest Service 2007), Canada Lynx Conservation Assessment and Strategy (LCAS, Interagency Lynx Biology Team 2013)), Terms and Conditions in past and future consultation, and other management plans and relevant literature.
2. Activities would not affect snowshoe hare habitats (i.e., sapling, multistoried as defined in NRLMD) that are inside important lynx habitat.
3. Activities would not create a barrier or impede lynx movement between patches of foraging habitat or between foraging and denning habitat within a potential home range.
4. If an active denning site used by Canada lynx is found within 0.25 miles of any activity, operations would cease until a wildlife biologist is notified, and activities would be modified as necessary.
5. Activities should conserve riparian areas, forest stringers, unburned inclusions, or forested ridges to provide habitat connectivity within and between patches of lynx habitat. Consult local biologists to determine critical linkage areas that promote lynx dispersal.
6. Upgrading unpaved roads should be avoided in lynx habitat. Activities should not result in permanent increased road density, traffic speeds, traffic volume, or associated human activity/development within lynx habitat.
7. Restrict public access on roads designed for project area access.
8. To minimize habitat loss, concentrate activities, access, and staging areas within existing developed and high-use areas, rather than developing new areas in lynx habitat. Locate new development outside of lynx habitat when possible, and minimize the footprint of developments within lynx habitat.

3.6.2.4 Grizzly Bear Project-specific measures

1. Anyone working in grizzly bear habitat (i.e., contractors, partners, and tribal employees) would be briefed on bear-country safety, including use of bear spray and measures to avoid providing attractants and minimizing potential for conflicts and disturbance to bears.
2. All workers would be equipped with and carry bear spray.
3. Promptly clean up any project related spills, litter, garbage, debris, etc.
4. Store all food, food related items, petroleum products, antifreeze, garbage, and personal hygiene products inside a closed, hard-sided vehicle or commercially manufactured IGBC Certified bear resistant container.
5. Remove garbage from project sites daily and dispose of it in accordance with applicable regulations. Anyone working in grizzly bear habitat (i.e., contractors, partners, and Tribal employees) would comply with applicable attractant storage orders (https://igbconline.org/be-bear-aware/food-storage/). If no specific rule exists for the area, a review and adaptation of the available food storage orders would be considered adequate.
6. Activities would adhere to all grizzly bear-related requirements in Tribal Forest Management Plans and Resource Management Plans, Terms and Conditions in past and future consultations, and other management plans. This includes consistency with any Forest-specific bear safety plans.
7. Between April 1 and June 1, all activities would avoid high-quality spring habitats wherever feasible. If not feasible to avoid these areas, projects in quality spring habitats during the spring season would be completed in 5 or fewer days. These areas are defined as snow-free forested and open habitats that afford fresh green-up of grasses, roots, and bulbs, as well as foraging opportunities for small rodents, and may include riparian areas, meadows, open grassy parklands, and avalanche chutes.
8. No new openings would be created in riparian management zones where the distance to cover would exceed 350 feet.
9. The project cannot contribute to motorized access conditions that result in potentially significant effects to grizzly bears. In areas where existing motorized access conditions may affect grizzly bears, motorized use would only occur during daylight hours, and no motorized access for project activities would occur further than 300 feet from any open road.
10. The project cannot include actions that result in a net increase in the amount of motorized or non-motorized access routes or route density and/or a net decrease in the amount of core or secure habitat, as assessed by a wildlife biologist.
11. Any motorized access (on bermed roads or cross country) that is further than 500 meters from any open or gated road would need to be reviewed and approved by a wildlife biologist. Such access would be consistent with all plan-level direction and Section 7 Terms and Conditions.
12. No seeding or planting of species palatable for grizzly bears (i.e., clovers) would occur. Projects that involve seeding or planting of grasses, forbs, or shrubs must do so in a manner that would tend not to attract bears into areas where increased mortality risk or

interaction between bears and people is likely, such as adjacent to roads or in or near developed or designated recreation and/or camping sites.

13. Camping for project-related activities would occur at developed campgrounds or if at dispersed sites, would consist of ≤20 individuals for up to 5 days per campsite.
14. Grizzly bear sightings and/or incidents would be reported to the CSKT Wildlife Management office within 48 hours.
15. Notify the CSKT Wildlife Management Program of any animal carcasses found in the area.

***Grizzly Bear Conservation Measures Specific to the PCA:**

16. In the Mission Mountains Tribal Wilderness and within the Primary Conservation Area (PCA), there will be no permanent increases in open or total road densities, and no permanent decreases in secure core habitat.
17. All sites temporarily disturbed for construction, including staging and camping areas, will be restored to natural conditions within one year of project completion.
18. Projects occurring within the PCA that result in temporary removal of secure core habitat will NOT exceed 5 years in duration.
19. Any temporary, dispersed sites used for camping will be restored upon project completion, and care will be taken to exclude the public from establishing permanent camping sites at these locations. This may include fencing or signage to discourage public recreational use of new camping locations within the PCA.

3.6.3 Construction Best Management Practices

1. Permit compliance:
    a. The Project would follow all requirements and conditions included in permit authorizations and clearances (e.g., Section 401 Certification, Section 404 authorization, CSKT Aquatic Lands Conservation Ordinance (ALCO) 87A permit, CSKT cultural resources clearance).
    b. The construction manager would review permit provisions with the contractor, and copies of Project permits would be posted on-site.
2. Water Control Plan
    a. The construction contractor would develop a Water Control Plan at least 40 days prior to construction start. This plan would include the following:
        i. Cofferdam design, and methods for diversion and unwatering of the river.
        ii. Care of the stream during construction and measures taken to meet permit requirements.

iii. Methods for control and prevention of aquatic invasive species within the work area.

iv. Protection measures against spills or leaks of oils or other lubricants.

v. Other BMPs to ensure protection of the aquatic environment.

3. Demolition Plan

    a. The construction contractor would develop a Demolition Plan at least 1 month prior to construction start to include anticipated methods for demolition; equipment to be used; stockpiling locations for salvage materials and for off-hauling; and stream protection measures.

4. Vegetation management

    a. Limits of disturbance would be clearly staked to avoid ground disturbance in wetlands where disturbance is not authorized by permit (Design Sheet G106.)

    b. All vehicles would follow designated access routes to minimize disturbance.

    c. Excavated materials shall be stockpiled outside of existing wetlands, other areas noted for preservation, or cultural resource buffer zones.

    d. All areas of ground disturbance would be seeded and revegetated as soon as reasonably possible after construction. Revegetation activities are presented in Design Sheets C150-151.

5. Erosion and sediment control

    a. The construction contractor would follow the Montana State Department (MDT) of transportation Erosion and Sediment Control Best Management Practices Manual (MDT 2016).

    b. In addition to following the MDT plan referenced above, the contractor would develop a Project-specific Erosion and Sediment Control Plan indicating erosion and sediment control measures and products, as well as installation, maintenance, repair, and removal processes.

    c. The construction contractor would develop a Stormwater Pollution Prevention Plan prior to the start of Project construction.

    d. Fugitive dust would be controlled per the Fugitive Dust Plan to be developed for the Project, to include wetting soil and access roads with water during dry periods.

    e. Disturbance to channel banks shall be minimized.

    f. Site grading would promote drainage by diverting surface runoff from excavations.

g. Prior to construction, install and maintain erosion and sediment control measures, such as swales, grade stabilization structures, berms, dikes, waterways, filter fabric fences, and sediment basins.

h. Turbidity filtration devices such as silt curtains, gravel berms, bulk bags or other filtration devices would be used to reduce or eliminate instream turbidity.

i. Erosion and sediment control plans within the Main Project Area are detailed in Design Sheet EC100.

4.0 Action Area

The Project action area includes all areas to be directly or indirectly affected by the proposed action (50 CFR §402.02). The action area is presented in Figure 1 and Figure 3, and consists of 1) the footprint of the main project area (surrounding the Facility where active construction would occur), access roads, and ancillary facilities (i.e., staging areas, batch plant, and batch plant pumping site), and 2) a buffer associated with each of these project footprints based on the extent of anticipated direct or indirect effects.

The following areas of effect were combined to make up the Project action area:

1. **Main project area (between NF Jocko bridge and current Facility) buffered to 0.5 mile,** for the effects of construction noise, and the in- and out-of-water effects of sheet-pile driving and demolition.
2. **NF Jocko channel below OHWM within the main project area and 1 mile downstream**, for the effects of construction-generated suspended sediment.
3. **All other ancillary facilities buffered to 0.25 mile**, for the effects of Project vehicles and construction equipment noise and dust.

Conditions in the action area are presented in the sections below; the narrative outlines conditions within the three major drainages of the upper Jocko and for the Tabor Canal. Elevations within the action area extend from approximately 3,300 feet at the Theresa Adams pit, to 4,200 feet at the main project area, and up to 5,300 feet on higher ridgetops. Vegetation is similar across drainages and is therefore described collectively. A description of the current Facility is presented in Section 1.1, Background and Need, and is not repeated here.

4.1 Jocko River Drainage

Land status in the lower main-stem Jocko River drainage is composed primarily of fee and allotted lands, with a small amount of Tribal lands. Fee lands continue upriver, but land status converts to primarily Tribal lands northeast of Pistol Creek. Terrain in the main-stem Jocko drainage is generally gently sloped, with forested foothills rising on either side of the valley. Precipitation in the lower main stem averages 14-16 inches per year, and averages 18-20 inches per year in the upper main stem. Snow depths in the Jocko drainage (and in the MF Jocko and NF Jocko) are typically deep and can

persist well into April or May. Due to the residential and agricultural land use of the land surrounding the mainstem Jocko, road densities are generally very high.

The Jocko River is a fourth-order tributary to the Flathead River, and the second largest tributary watershed of the lower Flathead River in the Clark Fork River basin. At the Jocko River below K Canal average annual flow is 134.4 cubic feet per second (cfs), average peak flow is 1.3 cfs, and average base flow is 0.2 cfs. The Jocko River within the action area has the characteristics of a mountain stream, with moderate gradients and minimal sinuosity. Forest and shrub vegetation dominate the upper portion of the action area with some areas of agricultural lands present in the lower portion of the action area.

Historically, the only salmonids in the Jocko River were Mountain Whitefish (*Prosopium wouldiamsoni*), Bull Trout, and Westslope Cutthroat Trout (*Oncorhynchus lewisi*). Extant introduced salmonids in the Jocko River include Rainbow Trout (*O. mykiss*), Brown Trout (*Salmo trutta*), and Brook Trout (*Salvelinus fontinalis*).

4.2 Middle Fork Jocko River Drainage

The MF Jocko drainage is exclusively Tribal lands, with the southern side of the drainage encompassing a portion of the South Fork Jocko Primitive Area and the northern side encompassing a portion of the Mission Mountains Tribal Wilderness. Terrain in the MF Jocko is moderately steep with many small, incised tributaries feeding the river. Precipitation in much of the drainage averages 30-40 inches per year, with the upper northern side of the drainage averaging 50-60 inches per year. Due to topography and land protections, road density in the drainage is low to moderate, with one main road running up the valley to a series of lakes and reservoirs in the upper drainage.

Below the Tabor Feeder Canal (Figure 3), average annual flow is 31.6 cfs, average peak flow is 0.2 cfs, and average base flow is 0,0 cfs. Within the action area the MF Jocko has a moderate gradient, is highly confined, with dense forest and shrub vegetation along its banks.

4.3 North Fork Jocko River Drainage

The NF Jocko drainage is primarily Tribal lands, with a few parcels of Fee, State, and Allotted land. Approximately two-thirds of the upper NF Jocko drainage encompasses a large portion of the Mission Mountains Tribal Wilderness. Terrain in the NF Jocko drainage is variable, with the lower end gently rolling and the upper end climbing into the craggy Mission Mountains. Elevation at the NF Jocko bridge is approximately 4,200 feet. Precipitation in the lower NF Jocko drainage averages 20 inches per year, whereas upper portions of the drainage average 30 – 70 inches per year. Road density in the lower NF Jocko drainage is moderate to high, while the upper NF Jocko drainage is roadless due to topography and land protections.

Below the Tabor Feeder Canal, average annual flow is 31.3 cfs, average peak flow is 0.5 cfs, and average base flow is 0.0 cfs. These flows are estimated to be approximately one-half of natural flows in the absence of irrigation diversion (CSKT 2010). Within the action area the NF Jocko has a moderate gradient, is highly confined, with dense forest and shrub vegetation along its banks.

Aquatic habitat conditions in the NF Jocko are described in greater detail in Section 5.2, Bull Trout Critical Habitat.

4.4 Tabor Feeder Canal

The Tabor Feeder Canal starts at the diversion on the MF Jocko just upstream of the intersection of the P-5450 and P-1000 roads (Figure 3). It flows along Road P-5450 for approximately 1 mile before entering the NF Jocko downstream of the NF Jocko bridge. It exits the NF Jocko again at the current Facility and flows to the northwest for several miles, crossing into the Mission Creek drainage before flowing into Tabor Reservoir.

The peak diversion capacity at the Facility is 450 cfs, with diversion typically occurring from April to early July. The Tabor Feeder Canal trans-basin diversion is an important water supply for the FIIP irrigation system in the Mission Valley, on average supplying 34.5 to 38.6 cfs of water per year.

Within the action area the canal bottom consists of an earthen bed of gravel and fine substrate for some of the segments, while other segments are concrete-lined. The canal is dry outside of the irrigation season, except where shallow water persists where seeps or small tributaries enter the canal (within the action area this occurs almost exclusively directly upstream of Falls Creek). In turn, wetlands are present along the edge of the canal channel only in the areas where water persists outside of the irrigation season. The canal sides are very steep throughout the action area.

4.5 General Vegetation

The vegetation types occurring within the action area are listed below (Geum 2023).

Emergent (herbaceous) wetland: American mannagrass (*Glyceria grandis*), arrow-leaf ragwort (*Senecio triangularis*), creeping bentgrass (*Agrostis stolonifera),* Canada-aster (*Canadanthus modestus),* Northwest Territory sedge (*Carex utriculata*), water sedge (*Carex aquatilis),* bluejoint (*Calamagrostis canadensis),* blue wildrye (*Elymus glaucus),* water smartweed (*Persicaria amphibia).* This cover type exists throughout the main project area and within its surrounding 0.5-mile buffer, primarily along the upstream riparian corridor. Emergent wetlands also exist along the mainstem Jocko, MF Jocko, and NF Jocko riparian corridors, on mid-channel river bars, along downslope canal channel fringes, and on some areas of water saturated low gradient topography within 0.25-mile ancillary feature buffers.

Shrub wetland: Red-osier dogwood (*Cornus alba*), Drummond's willow (*Salix drummondiana*), sandbar willow (*S. exigua*), speckled alder (*Alnus incana*), hawthorn (*Crataegus gaylussacia*), field horsetail (*Equisetum arvense)*, bearded fescue (*Festuca subulata*), tall buttercup (*Ranunculus acris*), violet (*Viola species*), sidebells wintergreen (*Orthilia secunda*), Kentucky bluegrass (*Poa pratensis*), blue wildrye, and sticky-wouldy (*Galium aparine)*. This cover type is dominant within the main project area, and exists within its 0.5-mile buffer, primarily along the upstream riparian corridor. Shrub wetlands also exist along the mainstem, MF Jocko, and NF Jocko riparian corridors, on mid-channel river bars, along downslope canal channel fringes, and on some areas of low gradient topography within 0.25-mile ancillary feature buffers.

Forested wetland: black cottonwood (*Populus balsamifera*), Engelmann spruce (*Picea engelmannii),* speckled alder, red osier dogwood, American mannagrass, field horsetail, Northwest Territory sedge, water sedge, pink wintergreen (*Pyrola asarifolia),* common lady fern (*Athyrium filix-femina)*, starry false-Solomon's seal (*Maianthemum stellatum*). This cover type is the least abundant of wetland cover types in the main project area and its 0.5-mile buffer. Forested wetlands also exist along the mainstem Jocko, MF Jocko, and NF Jocko riparian corridors and smaller tributary streams and seeps, and along upslope canal channel fringes within 0.25-mile ancillary feature buffers.

Shrub upland: western snowberry (*Symphoricarpos occidentalis*), Rocky Mountain maple (*Acer glabrum*), Saskatoon service-berry *(Amelanchier alnifolia)*, sticky-wouldy, bearded fescue, spotted knapweed (*Centaurea stoebe),* small-wing sedge (*Carex microptera*), curly blue grass (*Poa secunda*), Douglas-fir (*Pseudotsuga menziesii)*. This cover type is the least abundant in the action area, existing along steeper, drier slopes encompassed by 0.25-mile ancillary feature buffers, specifically along the P-1000 corridor.

Forested upland: Douglas-fir, Engelmann spruce, lodgepole pine (*Pinus contorta*), subalpine fir (*Abies lasiocarpa*). This cover type is the most abundant in the action area, existing throughout the 0.5-mile main project area buffer and 0.25-mile ancillary feature buffers. Upland forest topography surrounding ancillary features in the river valley bottoms is generally gently sloping with southeastern/northwestern aspects.

Agricultural land: This cover type exists within the 0.25-mile buffers around the lower staging areas on the mainstem Jocko River. Primary agricultural production within this portion of the action area includes hay and pasture lands. Where there are agricultural lands that are no longer in production, they are dominated by cultivar grasses including meadow fescue (*Festuca pratensis*) and creeping bentgrass; weeds such as cheatgrass (*Bromus tectorum*), spotted knapweed, and houndstongue (*Cynoglossum officinale*).

4.6 Environmental Baseline

Previous Consultations with USFWS Within Action Area:

Table 3 summarizes all known past Section 7 consultations that occurred within or have been associated with the Action Area for this project.

Table 3. Previous consultations conducted in the project vicinity.

Project	Type of Project	Species Addressed	Status[1]	Determination[2]	Date
Operation and Maintenance of the FIIP (*Reservation wide*)	Facility construction and maintenance	Grizzly bear Canada lynx Gray wolf Bull trout Bald eagle Water howellia Spalding's campion	T T T T T T T	NLAA NLAA NLAA LAA NLAA NLAA NLAA	2008
Eva-Paul Delaware Timber Sale	Timber harvest	Grizzly bear Canada lynx N.A. wolverine Bull trout Canada lynx CH Bull trout CH	T T P T - -	NLAA NLAA NLJ NLAA NLAA NLAA	2019
North Fork Jocko Bridge Replacement	Infrastructure upgrades	Grizzly bear Canada lynx N.A. wolverine Whitebark pine Bull trout Y.B. cuckoo Melt. Led. stonefly Spalding's catchfly Canada lynx CH Bull trout CH	T T P P T T T T - -	NLAA NLAA NLJ NLJ LAA NE NE NE NE LAA	2022
Jocko K Canal Headworks Rehabilitation	Infrastructure upgrades, fish passage improvements	Grizzly bear Canada lynx Whitebark pine Bull trout Y.B. cuckoo Melt. Led. stonefly Spalding's catchfly Canada lynx CH Bull trout CH	T T P T T T T - -	NLAA NE NLJ LAA NE NE NE NE LAA	2022
Falls Creek Diversion Replacement	Infrastructure upgrades	Grizzly bear Canada lynx N.A. wolverine Whitebark pine Bull trout Y.B. cuckoo Monarch butterfly Canada lynx CH Bull trout CH	T T P P T T C - -	NLAA NLAA NLJ NE NLAA NE NE NE NLAA	2023

[1] **E** = Endangered; **T** = Threatened; **P** = Proposed; **C** = Candidate

[2] **NE** = No Effect; **NLAA** = May affect, not likely to adversely affect; **LAA** = May affect, likely to adversely affect; **NLJ** = Not likely to jeopardize the continued existence of the species.

Past and Current Activities Within the Action Area:

Substantial changes to the hydrology and ecology of the FIR have occurred since implementation of the Flathead Indian Irrigation Project (FIIP) in 1911. Construction of FIIP infrastructure resulted in approximately 1,100 miles of open earth ditches, 10,000 irrigation structures, and 16 irrigation reservoirs. The FIIP stores and delivers water to approximately 128,000 acres of irrigated land in parts of Lake, Sanders, and Missoula Counties, Montana. The infrastructure encompasses three transbasin diversions and diverts and delivers water from almost every stream within the FIR. When the FIIP is operating, in-stream diversion structures divert a portion of water into canals via canal headgates. Most bull trout streams have interim minimum instream flow requirements downstream of diversion structures. Implementation of the FIIP led to highly degraded baseline conditions for bull trout (i.e., actions affecting stream flows, reservoir pool levels, water quality, and fish passage facilities). Diversion of vast amounts of water from natural systems, along with channelization and straightening of streams via canal systems, have led to degraded baseline conditions for terrestrial wildlife species as well, particularly those that use riparian and wetland habitats. However, recent infrastructure improvement projects have allowed for easier fish passage through these structures and have improved fish habitat. Recent riparian and wetland restoration projects have improved terrestrial wildlife habitat in some locations.

The construction of irrigation infrastructure within the FIIP (e.g., dams, diversion structures, canals) has drastically altered natural hydrological flows, sediment loads, and the physical habitat of streams, riparian corridors, and wetlands. Dams and reservoirs significantly alter natural water flows and provide habitat in which it is easier for invasive plant and fish species to establish. While much of the valley once contained native grassland, much of this habitat has been converted to irrigated agricultural land. Increased human development in the valley has altered the landscape so drastically that many terrestrial species, including the grizzly bear, are forced to utilize mountainous habitat more frequently and no longer occur at historical levels in the Plains region of the valley.

5.0 Affected Habitats and Species

Table 4 presents the ESA-listed species identified by the USFWS IPaC as potentially occurring in the action area, along with brief assessments of population and habitat occurrence known by Tribal wildlife and fisheries specialists, and a review of the Montana Natural Heritage Program (MNHP) species and habitat information (MNHP 2024).

Affected species (species further evaluated in this BA) are grizzly bear, Canada lynx, North American wolverine, Bull Trout, and Bull Trout Critical Habitat. Yellow-billed cuckoo, Spalding's catchfly, and whitebark pine were not evaluated further as they are unlikely to occur in or near the action area and there is no potential suitable habitat for these species within the action area.

Table 4. Screening of ESA listed species for the proposed project.

Species	ESA Status	Potential Occurrence in Action Area[a]	Potential Suitable Habitat in Action Area[b]	Affected Species?
Bull Trout *Salvelinus confluentus* Bull Trout critical habitat	Threatened	**Yes.** Incidental, found in very low numbers downstream of the project (see 5.1.3 Status within the Action area). **Designated critical habitat**	**Yes.** Found in coldwater rivers, streams and lakes with clean spawning gravels and sufficient cover. **Yes.** Designated critical habitat	Yes
North American Wolverine *Gulo gulo luscus*	Threatened	**Yes.** Wolverine are known to occur in the vicinity of the main Project area (MNHP 2024a).	**Yes.** Primarily found in alpine tundra, mountain forests, often in larger wilderness areas. Known to disperse through other habitats.	Yes
Grizzly Bear *Ursus arctos horribilis*	Threatened	**Yes.** Grizzly Bears are documented to occur within the action area. This is also an important corridor for grizzlies moving between the Flathead and Swan valleys.	**Yes.** Found in diverse habitats, including meadows, grasslands, riparian, woodlands, forests, and alpine.	Yes
Canada Lynx *Lynx canadensis*	Threatened	**Yes.** Lynx are known to occur in the Mission Mountains (MNHP 2024a) and have been documented <3 miles from the main Project area.	**Yes.** Primarily found in dense conifer forest in mountains and subalpine at elevations ~4,000-7000 ft (west of Continental Divide in MT). Known to disperse through other habitats.	Yes
Yellow-billed Cuckoo *Coccyzus americanus*	Threatened	**Unlikely.** Most recent MNHP occurrence documented near Polson Bay, ~35 miles from action area, in 1959. CSKT does not monitor this species on the Reservation.	**No.** Found in low elevation deciduous and riparian woodlands with heavy understory shrub cover and large cottonwood trees. Typically require intact sections of riparian woodland (>25 ac).	No
Spalding's catchfly *Silene spaldingii*	Threatened	**Unlikely.** Nearest MNHP occurrence and predicted habitat is 50 miles from action area. Not documented during recent wetland delineations and weed mapping in action area.	**No.** Found in open mesic grasslands in valleys and foothills along draws and swales.	No

Whitebark pine *Pinus albicaulis*	Threatened	**Unlikely.** Known to occur at higher elevations near the action area. Although MNHP has documented occurrences at similar elevations and environments adjacent to the Reservation (MNHP 2024a), the Tribal Forestry department has determined that occurrence is unlikely because the action area is <4200 feet and there are no subalpine habitat types within the analysis area.	**No.** Found in mid to high elevation conifer forests in the mountains. Most are found at elevations higher than the main project area (6000-7500 feet) and within subalpine habitat types (MNHP 2024b).	No

[a] *Montana Natural Heritage Program Occurrence Data (MNHP 2024a)*

[b] *Montana Natural Heritage Program Field Guide (MNHP 2024b). This includes any type of habitat known to be used by the species, including low quality habitat used primarily for migration and dispersal.*

5.1 Bull Trout

The action area is located within the Columbia Headwaters Recovery Unit for Bull Trout (USFWS 2015). The USFWS recognizes 35 Bull Trout core areas (USFWS 2015) within this Recovery Unit. The proposed action area is located within Lake Pend Oreille (LPO) core area, subsection A, which has 15 distinct Bull Trout populations. Within the action area, Bull Trout occur in both residential and migratory forms. The following is a brief summary of what is known about the Jocko River and NF Jocko Bull Trout populations (Bull Trout are not present in the MF Jocko).

5.1.1 Ecology

Bull Trout are native salmonids of western North America, with populations that have been fragmented and have undergone declines throughout much of their range. Bull Trout are long-lived fish that generally do not reach maturity until at least five years of age. Sub-adult and adult Bull Trout feed primarily on other fish. Bull Trout spawn in the autumn in cold, low-gradient streams with clean gravel and cobble substrates. Their eggs remain up to six inches deep in spawning gravels until late winter or spring when the fry emerge. Young Bull Trout remain in the stream for 1 to 4 years, huddled among stream substrate and other cover (Carnefix 2002). Bull Trout exhibit a variety of migratory and nonmigratory life histories. Stream-resident Bull Trout complete their entire life cycle in their natal tributary streams. Most Bull Trout are migratory, spawning in tributary streams, where juvenile fish usually mature from one to four years before migrating to either a larger river (fluvial) or lake (adfluvial) where they spend their adult lives. Adult Bull Trout return to the tributary streams to spawn (Fraley and Shepard 1989).

Resident and migratory forms may be found together, and either form can produce resident or migratory offspring (Rieman and McIntyre 1993). In addition to displaying complex life histories, Bull Trout appear to have some of the most specific habitat requirements of the North American salmonids (Reiman and McItyre 1993). For example, Bull Trout are widely recognized as being among the most coldwater adapted of the salmonids. Consistent with this, Fraley and Sheppard (1989) rarely observed juvenile Bull Trout in streams having summer maximum temperatures above 15º C. This and other specific habitat requirements (e.g., strong association with undisturbed complex stream habitats) make Bull Trout particularly sensitive to habitat alterations. Bull Trout appear to be sensitive to changes in thermal regimes, migratory corridors, sediment levels, and habitat complexity, among others (Reiman and McItyre 1993). Land uses that change these parameters can fragment, reduce, or eliminate Bull Trout populations. For example, Baxter et al. (1999) found a negative relationship between Bull Trout redd counts (an index of adult abundance) and road densities in spawning tributaries of the Swan River.

In Montana, Bull Trout are distributed in waters of the Clark Fork and Saint Mary's River drainages (USFWS 2015). On the Flathead Indian Reservation, Bull Trout occur in Flathead Lake and its tributaries above Seli'š Ksanka Qlispe' (SKQ) Dam, in the Jocko River, and in two glacial lakes that have been modified for use as irrigation storage reservoirs (St. Mary's and McDonald); a third Bull Trout population that existed in another irrigation storage reservoir (Mission) is extinct. Rare occurrences of Bull Trout have also been documented in the Flathead River below SKQ Dam, and

in Post and Mission creeks downstream of McDonald and Mission reservoirs, respectively; however, the Jocko River Bull Trout population is likely the only viable riverine population remaining on the Reservation.

5.1.2 Baseline Population and Habitat Condition- Matrix of Pathways and Indicators

The baseline conditions of the Bull Trout population and critical habitat within the NF Jocko were evaluated using the USFWS matrix of pathways and indicators (matrix; USFWS 1998) as part of the 2017 Flathead Indian Irrigation Project Biological Assessment (BIA 2017) and updated here. Pathways of effect are divided between species pathways and habitat pathways. Pathways are further divided into indicators for each pathway. There is one species pathway with four indicators and six habitat pathways, each with one to six indicators. The condition of each indicator is designated as functioning appropriately (FA), functioning at risk (FAR), or functioning at unacceptable risk (FUR) (see USFWS 1998 for definitions of FA, FAR, and FUR). Only three NF Jocko baseline habitat indicators were designated FA, all others were designated FAR or FUR.

5.1.2.1 Subpopulation Characteristics - Functioning at Unacceptable Risk

The NF Jocko Bull Trout population as indexed by monitoring of juvenile fish, has been in long-term decline, albeit with some annual variability and occasional years of higher abundances. More recently, however, the population has undergone a precipitous decline. There is evidence that the migratory form once dominated this population, which may explain some of the annual variability in juveniles, but redds from migratory fish have not recently been detected, and this has corresponded with declines in juvenile Bull Trout abundances throughout the drainage. Contemporary, extensive electrofishing surveys at both long-term and systematic random sites have either failed to detect Bull Trout, or detections have been rare, and of presumed resident adults or older juveniles.

The CSKT Fisheries Program began monitoring this population in the mid-1980s with sampling of juvenile abundances at several sites in both the North and South Forks of the Jocko River. In the early 2000s, CSKT also began conducting systematic random sampling at other sites in the drainage. Extensive sampling done along the stream gradient in 2023 failed to detect any Bull Trout. In 2024, one Bull Trout was captured at the long-term monitoring site located immediately downstream of the Facility. This is first Bull Trout observed at that site since 2019. An additional fish was sampled in 2024 at another monitoring site located three miles downstream of the Facility. Both individuals were small, and likely resident forms at least three years old, which does not indicate recent recruitment in this reach. Spawning by a radio-tagged migratory Bull Trout, as well as large redds characteristic of migratory fish, have been documented in the past downstream of the Facility (namely approximately one mile downstream of the Facility between Falls Creek and the Road P-5000 bridge; Figure 3). Resident Bull Trout redds are difficult to detect and cannot be distinguished from Brook Trout redds, so redd counts are an ineffective means of monitoring resident forms. Rearing also occurs below the Facility, as indicated by the presence of low numbers of smaller size classes of Bull Trout sampled by electrofishing at the long-term monitoring site just below the Facility (Site #10).

Some spawning by migratory fish has also been documented in the upper main-stem Jocko River in close proximity to the confluence of the NF Jocko. Limited sampling has additionally indicated comparatively high numbers of juvenile fish at some main-stem locations in this general area.

Upstream of the Facility on the NF Jocko, long-term monitoring by the CSKT has documented Bull Trout in typically low numbers within the approximately two miles of high-quality habitat upstream of the Facility, which is bounded by a natural barrier falls on the upper end of the reach. But sampling with electrofishing has not indicated Bull Trout in this reach since 2018.

5.1.2.2 **Water Quality**

Temperature- Functioning at Risk

Maximum temperatures in the lower segments of the North Fork Jocko River occasionally exceed 15ºC during the warmest summers. Maximum temperatures in upper segments, within and near the Action Area, are modified by groundwater inputs and a heavy riparian canopy of coniferous forest, and are thus generally below 15ºC.

Sediment- Functioning at Risk

Relatively few data are available for this stream reach. Surface pebble counts at two transects in upstream areas below the Tabor feeder canal showed that fines made up greater than 20 percent of the surface gravels. However, this site is likely not representative of the entire stream length since it is in an area subject to disturbance caused by a nearby road and the operation of the Tabor Feeder Diversion. During fall 2002, CSKT used a McNeil Corer to sample substrate composition in a low-gradient (Rosgen C channel type) area of the North Fork Jocko River. This area once supported relatively high densities of juvenile Bull Trout and is potential spawning habitat. To sample substrate composition, three replicate samples were collected across a transect. An examination of the median particle size distributions in those samples suggested that fine sediment (less than 6.35 millimeters) levels in potential spawning habitat in this area were relatively high. The percentage of fine sediments in the North Fork Jocko River sample area was 39.6, which suggests that spawning and emergence success for Bull Trout in this area might be impaired. This information, however, should be interpreted cautiously because it was based on limited sampling at only one presumed spawning location. Finally, fines averaged 10.5% in an assessment of 21 glides along the entire stream gradient.

Chemical Contaminants - Functioning Appropriately

There are no known sources of agricultural or industrial contaminants in the drainage.

5.1.2.3 **Habitat Access**

Physical Barriers- Functioning at Risk

The primary barrier to fish movement between downstream FMO habitats and the North Fork Jocko River was rectified by the installation of a new ladder at the K canal diversion structure. This ladder's effectiveness would need to be evaluated but a record number of Bull Trout were handled at the

facility during 2024, the first complete year of operation. The new ladder is outfitted with PIT-tag antennas and readers at both the entrance and at the upstream trapbox, which would allow for evaluation of ladder effectiveness once more PIT-tagged fish are in the system. The final barrier to passage in the system is the Tabor Diversion, which this project proposes to address. This would allow access to roughly 2 miles of high-quality habitat that once supported some of the highest densities of Bull Trout observed in the last two decades. This was presumably an isolated resident population, with fish subject to entrainment down the Tabor Feeder canal. However, despite regular monitoring, no Bull Trout have been observed upstream of the diversion since 2018.

5.1.2.4 **Habitat Elements**

Substrate Embeddedness- Functioning at Risk

Data are unavailable for this parameter (but see discussion under sediment baseline). In the past, unmanaged, intensive, season-long livestock grazing resulted in unstable and poorly vegetated streambanks, physical damage (i.e., pugging, trampling, and hoof shear), and over-widened channels. This, in combination with a highly modified hydrograph (from water withdrawals and FIIP operations at the Tabor Diversion), undoubtedly resulted in elevated sediment levels and embeddedness in the North Fork Jocko River. However, livestock were removed from the entire upper drainage, and this resulted in a rapid and dramatic recovery of stream and riparian conditions. Recent timber sales have had much improved BMPs, including 300-foot buffers on either side of the Jocko and its major tributaries. Nonetheless, very high levels of embeddedness have been observed during some years, especially in the reach of stream extending 1-2 km downstream of the Tabor Diversion. These conditions can largely be attributed to high sediment inputs from a natural landslide upstream of the Tabor Diversion in combination with a greatly modified spring hydrograph, a lack of sediment sluicing, and the sometimes erratic and abrupt (leading to rapidly changing downstream flows that abruptly change stream competence and sediment transport and deposition) operations at the diversion structure.

Large Woody Debris- Functioning at Risk

This parameter was measured in an extensive habitat survey of the Jocko River drainage conducted during 2003. The survey showed that large woody debris in the North Fork Jocko River was 45 pieces/mile in the lower one-half of the stream occupied by Bull Trout and 12 pieces/mile in the upper stream section, which ended at the Tabor Diversion. Historical road building and timber harvest practices in portions of this stream have likely contributed to a reduction in woody debris accumulations. However, riparian logging or roading has not occurred in decades, and some riparian roads have been re-contoured. Observations made during the 2003 survey suggested that potential woody debris levels in the North Fork Jocko River are sufficient to maintain and improve upon current levels.

Pool Frequency and Quality, Large Pools- Functioning at Risk

The dominant macrohabitats in the North Fork Jocko River are fast-water habitats (i.e., runs and riffles). Pool frequency is naturally low along much of the stream gradient because of the channel

type, which is primarily a Rosgen B. However, past land-use activities such as road building and riparian tree harvest likely contributed to reduced pool frequency in the lower-gradient stream reaches. In a 2003 survey we found that there was an average of 19 primary pools per mile in the North Fork Jocko River. We rated this parameter as functioning at risk because past actions (e.g., timber harvest, roading) and ongoing practices (operation of the Tabor Diversion) have compromised large woody debris levels and contributed to increased fine sediment levels.

Off-Channel Habitat Baseline—Functioning at Risk.

For most of the North Fork Jocko River, this is an inherently restricted feature because of the stream channel type (Rosgen B channel), which is predominantly high-gradient. However, off-channel habitats are likely reduced from the historic condition in lower gradient portions of this stream segment. This reduction is likely a result of channel simplification from loss of large woody debris and from diminishment of overbank high-flow events resulting from the FIIP operation of the Tabor Diversion.

Refugia- Functioning at Risk

The upper Jocko River drainage provides refugia for the Jocko River subpopulation because portions of it retain appropriate thermal regimes and high-quality habitat relative to lower river reaches. However, the size and quality of available habitats may not be sufficient over the long term to “support strong and significant populations” of Bull Trout, particularly in the North Fork Jocko River.

5.1.2.5 **Channel Condition and Dynamics**

Width:Depth Ratio- Functioning at Risk

Although much of the channel length in the North Fork Jocko River is a Rosgen B type which is relatively resilient to changes in channel dimension, water withdrawals at the Tabor Feeder Civersion and historical unrestricted cattle access to Rosgen C channel types have modified this parameter. The effects of the diversion on channel form have not been quantified, but FIIP water withdrawals substantially modify the North Fork Jocko River hydrograph. A 2002 assessment showed moderate to heavy grazing impacts to riparian habitats on some stream segments of the North Fork Jocko River, but a cessation of livestock grazing in the drainage led to rapid recovery of streambank condition and riparian vegetation.

Streambank Condition- Functioning Appropriately

The North Fork Jocko River outside of the Wilderness Boundary was nearly wholly contained within Tribal Range Unit 22. A survey conducted during 2002 suggested that ongoing livestock grazing coupled with an altered hydrograph resulted in bank damage and modification of riparian plant communities in low gradient (Rosgen C channel types) stream reaches. Exceptions were in areas where topography or fencing restricted cattle use. Also, in some areas with Rosgen B channel types, cattle use was very heavy, but bank integrity remained relatively good due to the nature of this stream channel type. During the 2003 fish habitat survey, average bank stability values for the two North Fork Jocko River survey reaches were 77 percent and 80 percent. Some isolated C channel reaches,

however, had much lower stability values. In the mid-2000s the CSKT ceased cattle grazing in the upper Jocko River drainage, including the North Fork Jocko River. This management decision was fully implemented in 2011 and streambank conditions have dramatically improved with most reaches demonstrating high stability.

Floodplain Connectivity- Functioning at Risk

This is an inherently restricted feature of this stream type, which is predominantly high-gradient. However, lower gradient reaches exist in downstream areas, and these would have historically had overbank flows. This parameter is classified as functioning at risk because of highly altered stream flows. The Tabor diversion diverts a substantial portion of peak flows and is therefore considered a disturbance agent that decreases floodplain connectivity.

5.1.2.6 **Flow and Hydrology**

Change in Peak and Base Flows- Functioning at Unacceptable Risk

Operation of the Tabor Diversion substantially alters peak flows and the shape of the hydrograph in this drainage. An average of approximately 24,000 acre-feet of water is diverted annually from the North Fork Jocko River. Depending on the water year, this greatly alters the magnitude of flows along the length of the North Fork Jocko River outside of the wilderness boundary, which corresponds with the area of stream accessible to Bull Trout.

Drainage Network Increase- Functioning Appropriately

There are no direct measurements of this indicator, but there are no observed large-scale increases in active channel length relative to the historic condition.

5.1.2.7 **Watershed Condition**

Road Density and Location Baseline—Functioning at Risk

The upper portions of the drainage are in Tribal Wilderness. However, much of the lower NF Jocko River drainage area has more than 2.1 miles of road per section, and some of the drainage has more than 4 miles of road per section. In addition, there are valley bottom roads and some of these are unmaintained, primitive two-tracks.

Disturbance History Baseline—Functioning Appropriately

Less than two percent of the area has been clear-cut, and nearly all equivalent clear-cut areas (ECA) have revegetated, at least to some degree.

Riparian Conservation Areas Baseline—Functioning at Risk

There is evidence that some riparian areas were historically logged, thus, large woody debris recruitment has likely been limited. In addition, season-long grazing has only been curtailed for a little more than a decade. There are also localized segments where roads encroach upon the riparian area. This habitat indicator is showing improvement over time both because grazing has been eliminated and because riparian timber harvest has not occurred for decades. Most riparian areas

now have a recovering shrub component, and existing coniferous cover would provide for future recruitment of large woody debris.

Disturbance Regime Baseline—Functioning at Risk

Flow alterations caused by irrigation diversion introduce unnatural variability in the NF Jocko River. This unnatural variability, acting in concert with naturally high sediment inputs (i.e., from active landslides and outwash surfaces) in the upper drainage, creates instability in critical habitat.

5.1.2.8 Integration of Species and Habitat Conditions- Functioning at Unacceptable Risk

Greatly reduced Bull Trout population levels, past and possibly ongoing problems with connectivity, irrigation impacts, and high abundances of introduced Brook Trout (a condition that may be interactive with habitat and flow modifications) limit the population's ability to grow.

5.2 Bull Trout Critical Habitat

The USFWS designated critical Bull Trout habitat in 2010 (75 FR 63898). The action area is located within the Lower Clark Fork River subunit of the Clark Fork River Basin Critical Habitat Unit 31. Within the action area the NF Jocko is designated as spawning and rearing critical habitat, and the Jocko River is designated as foraging, migrating, and overwintering habitat. Critical habitat is also designated for the South Fork Jocko River but that is outside of the action area. The MF Jocko is located within the action area but does not support a Bull Trout population and is not designated as critical habitat and is therefore not included in this discussion.

As part of the designation of critical habitat, the USFWS defined nine physical and biological features required for Bull Trout habitat, referred to as "primary constituent elements" (PCEs). The nine Bull Trout PCEs integrate the habitat pathways and indicators (USFWS 1998) described for the action area in Section 5.1.2, Baseline Population and Habitat Conditions. Table 5 presents a crosswalk between the habitat pathways and indicators, and the associated PCEs (based on an evaluation completed in Krupka, Halupka, and De La Vergne [2011]). A summary of the habitat conditions in the context of each of the nine PCEs is also presented below.

Table 5. Crosswalk of habitat pathways and indicators to Bull Trout critical habitat PCEs.

	Associated Primary Constituent Elements								
***Habitat Pathways* and Indicators[a]**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Water Quality									
Temperature	X	X			X			X	X
Sediment	X	X	X	X		X			
Chemical contamination and nutrients	X	X	X					X	
Habitat access									
Physical barriers		X							
Habitat elements									
Substrate embeddedness	X	X			X			X	X
Large woody debris			X	X					
Pool frequency and quality			X	X					
Large pools				X	X				
Off-channel habitat	X		X	X	X				
Refugia	X	X	X	X	X	X	X	X	X
Channel condition and dynamics									
Width:depth ratio		X		X	X			X	
Streambank condition	X		X	X	X	X	X	X	
Floodplain connectivity	X		X	X	X	X	X	X	
Flow and hydrology									
Change in peak or base flows	X	X			X		X	X	
Increase in drainage network	X				X	X	X	X	
Watershed condition									
Road density and location	X			X	X	X	X	X	
Disturbance history	X				X		X		
Riparian conservation areas	X		X	X	X	X	X	X	
Disturbance regime				X		X		X	
Integration of species and habitat condition	X	X	X	X	X	X	X	X	X

[a] *USFWS 1998*

[b] *As evaluated in the Amended FIIP Biological Assessment (BIA 2017)*

1. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

NF Jocko: The North Fork Jocko River has a laterally wide floodplain starting at the confluence with Falls Creek. Floodplain surface features become evident at and downstream of the confluence and continue intermittently downstream to the confluence with the main stem. The North Fork is interconnected and gains groundwater downstream of Falls Creek. These features provide seasonal floodplain habitats and moderate stream temperatures both in summer and winter periods. The

stream begins losing flow to groundwater not far downstream of the P-5000 Road, and this corresponds with warming stream temperatures along the stream gradient and, in some years, areas of intermittent flow.

Jocko River: The Jocko River downstream of the confluence with the North Fork has extensive surface and ground-water interactions. The extent of gaining and losing reaches may vary through the year, but gaining reaches occur in the Jocko Canyon downstream of Gold Creek in the vicinity of the Arlee hatchery, and downstream of the confluence with Finley Creek to the confluence with the Flathead River. The interaction with groundwater forms floodplain springbrooks, provides flow augmentation, moderates stream temperatures, and provides thermal refugia for fish.

2. Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.

The Tabor Diversion on the NF Jocko is a migration barrier to fish, impeding travel between upstream spawning and rearing habitat in the NF Jocko and foraging, migration, and overwintering habitat downstream in the Jocko River. There are no biological or water quality impediments within the action area that limit or prevent migration between spawning, rearing, overwintering, and foraging habitats.

Bull Trout distribution and abundance in the NF Jocko is undoubtedly influenced by habitat and thermal conditions present along the stream gradient. Field observations by CSKT staff, and a 2004 – 2005 systematic habitat survey of the NF Jocko, suggested habitat is available for all life stages of Bull Trout; however, habitat is limited in the lower 3 miles of the river, which is a losing reach with warmer summer water temperatures, occasional intermittency, or highly depleted flow, and a lack of habitat complexity.

The Jocko River metapopulation is threatened by a suite of factors in spawning and rearing habitats and in foraging, migration, and overwinter habitats. Habitat fragmentation and population isolation historically occurred as a result of barriers (i.e., diversions and dams) and a transportation network of legacy and in-use logging roads throughout the Jocko River drainage. Projects have been undertaken throughout the drainage and in downstream habitats to reduce these threats, including construction of fish ladders on irrigation diversions in the Jocko River drainage and on main-stem dams of the Clark Fork River, along with road removal and BMP upgrades. In the Jocko River drainage, the remaining barrier is in the NF Jocko at the unscreened Facility, which is used to divert a majority of flow during spring runoff, leaving as little as 18 cfs, and causing fish entrainment and stranding.

3. An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

There is an adequate food base for Bull Trout within the action area (macroinvertebrates and fish) and in downstream FMO habitats. In upper stream reaches prey fishes include Westslope Cutthroat Trout, Mountain Whitefish, sculpins (*Cottus* spp.) and introduced Brook Trout. These same species are present in downstream areas, but several species of cyprinids and castostomids are added to

the assemblage. Macroinvertebrate data are not available for the action area, but sampling done in the early 2000s upstream of the action area (outside of the influence of the diversion) and at another location near the mouth of the NF Jocko indicated a non-impaired assemblage indicative of cold and clean conditions (Bollman 2007). Given aggradation and sedimentation observed in the field, some impairment and a modified assemblage both above and below the diversion structure in the action area (i.e., in the area influenced by the structure and FIIP operations) can be anticipated.

4. **Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.**

The Tabor Diversion blocks sediment transport in the NF Jocko, resulting in sediment deposition behind the diversion and an altered sediment transport regime downstream of the diversion. Otherwise, habitat in the action area within the NF Jocko and Jocko River is considered to be of average complexity and compromised by substrate embeddedness, limited off-channel habitat, reduced channel forming and maintaining flows, and low to moderate amounts of large wood.

5. **Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range would depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.**

Maximum temperatures in the lower segments of the North Fork Jocko River occasionally exceed 15ºC during the warmest summers. Maximum temperatures in upper segments within and near the Action Area are modified by groundwater inputs and a heavy riparian canopy of coniferous forest, and are thus generally below 15ºC. Main-stem water temperatures are influenced by groundwater inputs and are functioning appropriately.

6. **In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout would likely vary from system to system.**

NF Jocko: The CSKT Fisheries Program has never detected spawning in the NF Jocko reach between the upstream NF bridge and the Tabor diversion, but spawning and rearing are undoubtedly limited by poor habitat conditions (e.g., high embeddedness, an abundance of fines, intermittency during low-flow periods). The CSKT Fisheries Program has documented spawning and rearing downstream of the Tabor diversion between Falls Creek and the P-5000 Road bridge (Figure 3). The Tabor diversion does not allow natural sediment transport, therefore there is an increased amount of fines in the NF Jocko directly above the Tabor diversion. These accumulated fines are then released as the canal gates are closed and the radial gate to the stream is opened at the end of the

irrigation season. This results in a large sediment pulse on downstream areas during the egg incubation period for Westslope Cutthroat Trout (a co-evolved prey species) and prior to Bull Trout spawning. Spawning by migratory Bull Trout has been detected in a reach of stream between the P-5000 road crossing and the Falls Creek confluence.

Jocko River: Some spawning by migratory fish has been documented in the main-stem Jocko River at a few distinct locations near the confluence of the NF Jocko and the main steam (Craig Barfoot, personal communication). We conjecture that the NF Jocko may have been the natal stream for these fish, but that occasional periods of low or intermittent flow prevented them from reaching upstream spawning habitats in the NF Jocko.

7. **A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.**

Flow monitoring conducted by the CSKT Department of Engineering and Water Resources concluded that hydrologic regimes in the NF Jocko and Jocko River are altered as a result of irrigation diversions, including at the Tabor Diversion. The NF Jocko and Jocko River have reduced annual flow volumes compared to natural conditions. In particular, peak flows in the NF Jocko are much lower in magnitude and duration than natural conditions, while in the Jocko River peak flows are lower than natural conditions, and base flows are reduced in the summer but slightly increased in winter.

The MT-CSKT Water Compact stipulates the implementation of minimum and target instream flows for the NF Jocko and the Jocko River. These flows were developed to be protective of native fish species and would support restoration of a natural hydrograph in the NF Jocko and Jocko Rivers but would not be in place prior to implementation of the proposed action. The proposed project, however, would allow for better management and implementation of compact flows and of the bankfull flow schedule in the FIIP BO (USFWS 2018).

8. **Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.**

The CSKT Surface Water Quality Standards classifies the NF Jocko as a B-1 waterbody which must be suitable for "…drinking and culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; wildlife…[and] salmonid fishes and associated aquatic life; and agricultural and industrial water supply purposes" (CSKT 2024a). Water quality is sufficient in the NF Jocko and Jocko River within the action area such that normal Bull Trout growth, and survival are not inhibited.

9. **Sufficiently low levels of occurrence of nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.**

Brook Trout are a key threat in in the NF Jocko and Jocko River within the action area where they sometimes dominate the assemblage at a given location (this dominance may be mediated by habitat and flow modifications). Brook Trout hybridize with Bull Trout and likely compete for resources with Bull Trout and native Westslope Cutthroat Trout (a co-evoloved prey species). Brook x Bull trout hybrids have been observed in low numbers in the NF Jocko. Introduced Rainbow trout and Rainbow x Westslope Cutthroat trout hybrids are also present in the main-stem Jocko River upstream of the K Canal Diversion. Brown Trout are added to the assemblage in FMO habitat downstream of K.

5.3 Grizzly Bear

5.3.1 Ecology

The contiguous United States grizzly bear Distinct Population Segment (DPS) was listed as threatened under the ESA on July 28, 1975. Grizzly bears historically occurred on the Plains and in mountainous regions of the American West, and populations are recovering in protected habitats and remote areas in western Montana. Grizzly bears existed on the FIR long before its designation. Grizzly bears on the reservation hibernate mostly in the Mission Mountain Range during late October – mid March, and move into the valley and other areas in March – April to forage for food. Grizzlies use waterways to travel through the valley and prefer thick, wooded areas for cover. However, it is not uncommon for grizzlies to be out in the open while traveling or foraging. In Montana, grizzly bears use a wide variety of habitats including meadows, seeps, riparian zones, mixed shrub fields, closed timber, open timber, side-hill parks, snow chutes, and alpine slab-rock habitats (MTNHP 2024). Habitat use is highly variable between seasons, and movement of grizzlies within their home range is primarily dependent on riparian habitats and the availability of food sources. During spring, grizzly bears feed primarily on winter-killed ungulates and early-greening herbaceous vegetation at low elevations, while during summer bears move higher in elevation to feed on roots, berries, herbaceous vegetation, and army cutworm moths (Martinka 1972). In the fall, bears often broaden their search to build fat reserves prior to winter denning. Grizzly bears exhibit discrete elevational movements from spring to fall and require large corridors of contiguous forested land for movement within their home range. Den sites typically occur at higher elevations above 6,400 feet that have a slope of 28 to 35 degrees, with an aspect that maintains deep snow (USFWS 2021). A solitary grizzly bear can have a large home range (146-588 mi^2), dependent upon the availability of food resources. Sows with cubs tend to have smaller, often overlapping home ranges (26-94 mi^2), but for all grizzly bears, uninhabited, undisturbed, large tracts of land are preferred (MTNHP 2024).

5.3.2 Status and Baseline Conditions

The Action Area lies within the Northern Continental Divide Ecosystem (NCDE), an important recovery zone for grizzly bears. The NCDE is approximately 5,716,783 acres and includes all of Glacier National Park, as well as portions of the Flathead, Helena-Lewis and Clark, Kootenai, and Lolo National Forests (including 4 Wilderness Areas), and the Flathead and Blackfeet Indian Reservations (USFWS 2022). To monitor grizzly bear demographics within the NCDE, a Primary Conservation Area (PCA) was established along with a buffer of approximately 4,804,717 acres surrounding the PCA, for a total monitored area of approximately 10,521,500 acres (USFWS 2022).

The FIR is part of the Demographic Monitoring Area (e.g., population size and mortality limits are monitored; NCDE Subcommittee 2019). Portions of the Action Area fall within the PCA. The most rigorous habitat protections apply to the PCA, as the PCA was established to achieve the goal of continual occupancy by a source population of grizzly bears.

Grizzly bears are known to heavily use the Action Area from spring-fall. Because the area along Jocko Canyon Road is a low-lying pass between mountainous areas, it is an important travel corridor for grizzlies moving between the Flathead Valley and the Swan Valley/Bob Marshall Wilderness Area. The Tribes have observed numerous GPS-collared bears moving directly through the Project Area while traversing this corridor. Bears also forage near the Action Area, and the remote aspect of this habitat offers some protection from human disturbance.

Previous and on-going federal actions within the Project vicinity include operation and maintenance of FIIP infrastructure since the early 1900s, as well as several infrastructure improvement projects occurring since 2019 (Table 3). One timber sale has also been conducted in the project vicinity in the last few years. Grizzly bears are using remote mountainous areas more frequently as human activity increases in the valley, and the North Fork Jocko area is relatively remote but sees regular human activity along established roads. Each disturbance action in this area has potential to cause stress and/or elicit an avoidance response in individual grizzly bears. The Falls Creek Diversion Project is the only project currently still in progress and is located approximately 1.75 miles from the project area.

5.4 Canada Lynx

5.4.1 Ecology

In April 2000, the Canada lynx was listed as a threatened species in the conterminous United States. This includes the Distinct Population Segment (DPS) occurring south of the Canadian border. The USFWS concluded that the population was threatened by human alteration of forests, low numbers as a result of past overexploitation, expansion of the range of competitors, and elevated levels of human access into lynx habitat. Critical habitat was designated in 2006 and revised in 2014, but critical habitat is no longer assessed for projects occurring on Tribal Lands because Tribes have individual management plans for lynx within Reservation boundaries.

In Montana, west of the Continental Divide, lynx generally occur in subalpine forests between approximately 3,900 and 7,050 feet in elevation in stands composed of pure lodgepole pine (*Pinus contorta*) but also mixed stands of subalpine fir (*Abies lasiocarpa*), lodgepole pine, Douglas-fir, grand fir (*Abies grandis*), western larch (*Larix occidentalis*) and hardwoods. Secondary habitat is intermixed Engelmann spruce (*Picea engelmannii*) and Douglas-fir habitat types where lodgepole pine is a major seral species (USFWS 2017). Throughout their range, shrub-steppe habitats may provide important linkage habitat between primary habitat types (Interagency Lynx Biology Team 2013). Within these habitat types, disturbances that create early successional stages such as fire, insect infestations, and timber harvest provide additional foraging habitat for lynx through creation of snowshoe hare foraging habitat/cover. However, older forests provide long-term habitat for

snowshoe hares and Canada Lynx whereas disturbance-created early successional habitat is relatively short-lived (Interagency Lynx Biology Team 2013).

Canada lynx avoid large openings but often hunt along edges in areas of dense cover (Interagency Lynx Biology Team 2013). This species requires cover for stalking and security, and usually does not cross openings wider than approximately 330 feet (Koehler and Brittell 1990). Natal and maternal dens are typically located in hollow trees, under stumps, or in thick brush. Den sites typically occur in mature or old-growth stands with a high density of logs and horizontal cover (Koehler and Brittell 1990). Denning habitat must occur near or adjacent to appropriate foraging habitat as the female roams within a restricted range while kits are in the den (Interagency Lynx Biology Team 2013).

5.4.2 Status and Baseline Conditions

The proposed Action Area falls within portions of two LAUs and cuts through tribally-mapped lynx habitat. Lynx have been observed <3 miles from the project area, and snowshoe hare habitat is present along the access roads to the project site as well as directly adjacent to the main project area and staging areas. The Action Area is within the typical elevation band for Canada lynx denning, foraging, and dispersal activities. However, all project activities would occur along or adjacent to existing roads, which see regular use by the public.

Previous and on-going federal actions within the Project vicinity include operation and maintenance of FIIP infrastructure since the early 1900s, as well as several infrastructure improvement projects occurring since 2019 (Table 3). One timber sale was conducted in the Pistol Creek LAU in 2019. In order for habitat within the LAU to remain below the 15% unsuitable threshold described in the LCAS (2013), since the Eva Paul Delaware timber sale, no more than 245 acres of habitat may be made unsuitable by other activities within this LAU. The total amount of habitat potentially removed for this project would likely be <15 acres and habitat disturbance would occur along roadsides or near already disturbed areas. Lynx habitat near the project area is patchy, and existing roads already see regular human use. Lynx are likely to move through this area regularly, using existing habitat patches near the Action Area to connect between larger habitat patches deeper into the Mission Mountains. Each disturbance action in this region has potential to cause stress and/or elicit an avoidance response in individual lynx. The Falls Creek Diversion Project is the only project currently still in progress and is located approximately 1.75 miles from the project area.

5.5 North American Wolverine

5.5.1 Ecology

The North American wolverine was listed as a threatened species under the ESA on January 2, 2024. Wolverine habitat consists of alpine tundra and high elevation boreal forest, typically between 5,906–11,483 feet in elevation in Montana. Wolverines require large tracts of undisturbed, roadless wilderness and are vulnerable to human disturbance. They are known to use features such as cirque basins, avalanche chutes, and alpine areas just above tree line (Copeland et al. 2007; Ruggiero et al. 2007). Research suggests that wolverines select habitat based on balancing avoidance of

disturbance and food availability by season (Scrafford et al. 2018; Kortello et al. 2019). They hold large territories in rugged, high elevation terrain that offers topographic variation and maintains persistent spring snowpack (Aubry et al. 2007). Deep, persistent, and reliable spring snow cover is a key feature of wolverine habitat and is especially important during the denning period (Ruggiero et al. 2007). Wolverines have large home ranges, low reproductive rates, intrinsically low population resilience, and are vulnerable to climate change-induced habitat loss (Inman et al. 2012).

According to the Species Status Assessment for North American wolverine (USFWS 2018), the primary physical and ecological needs of wolverine in the contiguous U.S. include:

1. Large territories in relatively inaccessible landscapes
2. Access to a variety of food resources that vary with the seasons
3. Physical/structural features (e.g., talus slopes, avalanche chutes, rugged terrain, persistent spring snowpack) that are linked to reproductive behavioral patterns

5.5.2 Status and Baseline Conditions

Wolverines are known to occur in the action area, although no in-depth studies have documented wolverine use of the region. Wolverines have been detected via remote cameras and bait stations in the Mission mountains north of the project area, as well as within the Jocko area south of the project area. The action area is below the typical elevation band for wolverine denning and foraging activities, but individuals likely disperse through the area regularly. Wolverines are more likely to use the area during the winter months as they move to lower elevations in search of prey. Wolverines are more likely to use remote areas and may avoid habitat near busy roads with regular human disturbance. Because all project activities would occur along or adjacent to existing roads, wolverines are less likely to use the immediate action area than they are to use surrounding habitat.

Previous and on-going federal actions within the Project vicinity include operation and maintenance of FIIP infrastructure since the early 1900s, as well as several infrastructure improvement projects occurring since 2019 (Table 3). Each disturbance action in this region has potential to cause stress and/or elicit an avoidance response in individual wolverines. The Falls Creek Diversion Project is the only project currently still in progress and is located approximately 1.75 miles from the project area.

6.0 Effects of Proposed Action

6.1 Bull Trout

This section discusses the adverse and beneficial effects of Project construction and operation on Bull Trout and Bull Trout critical habitat.

Bull Trout are present in two streams in the action area (Figure 1) -- the NF Jocko, and the main-stem Jocko River. Project activities would only impact the NF Jocko, therefore this section focuses on effects to Bull Trout in the NF Jocko.

The primary factors by which Bull Trout and Bull Trout critical habitat have the potential to be adversely affected by the proposed action are sediment increases due to in-water disturbance, possible barotrauma due to impact pile driving, fish stranding during channel re-routing and

dewatering, and possible chemical contaminants associated with construction activities. The Project would result in a permanent beneficial impact to fish passage due to reconstruction of the Tabor Diversion to allow for fish passage, in turn providing access to high-quality habitat upstream, while also incorporating fish screens that would eliminate entrainment of downstream migrating fish into the Tabor Canal.

Effects of the proposed action on Bull Trout were analyzed using the USFWS matrix of pathways and indicators (matrix; USFWS 1998) (Table 6) which integrates species and habitat conditions to determine the potential Project effects on Bull Trout. For each indicator both major (i.e., changes in an indicator function for the drainage) and minor effects were analyzed, recognizing that for several indicators the Project would result in temporary adverse effects, with permanent beneficial effects. Table 6 also presents a crosswalk of the pathways and indicators to the Bull Trout critical habitat PCEs (Krupka, Halupka, and La Vergne 2011), as many of the physical, biological, and chemical features of the PCEs correspond to the matrix parameters.

Although CSKT sampling indicates that Bull Trout numbers are very low in the NF Jocko within the action area, this analysis of Project impacts to Bull Trout assumed that Bull Trout could be present in the NF Jocko within the action area during construction. Thus, the proposed action effect determination is **May Affect, is Likely to Adversely Affect Bull Trout**.

Table 6. Determination of effects to species and habitat parameters for Bull Trout. Major effects - change the level of the baseline condition (e.g., FA to FAR). Minor effects - Indicates action may result in an incremental or cumulative effect, but does not result in a functional change to the system (no change in functional level); M = maintain, D = degrade, R = Restore. Where applicable, minor effects are further classified for both temporary and longer-term effects (e.g., sediment = short-term degrade, long-term restore).

***Pathways* and Indicators**	**Baseline in NF Jocko**	**Major effects**	**Minor effects**
SPECIES PATHWAYS			
Subpopulation Characteristics			
Subpopulation (local population) size	FUR	M	D/R
Growth and survival	FUR	M	D/R
Life history diversity and isolation	FUR	M	R
Persistence and genetic integrity	FUR	M	R
HABITAT PATHWAYS			
Water Quality			
Temperature	FAR	M	M
Sediment	FAR	M	D/R
Chemical contamination and nutrients	FA	M	D
Habitat access			
Physical barriers	FAR	M	R

Habitat elements			
Substrate embeddedness	FAR	M	D/R
Large woody debris	FAR	M	D/R
Pool frequency and quality	FAR	M	R
Large pools	FAR	M	R
Off-channel habitat	FAR	M	R
Refugia	FAR	M	R
Channel condition and dynamics			
Width:depth ratio	FAR	M	D/M
Streambank condition	FA	M	D/R
Floodplain connectivity	FAR	M	M/R
Flow and hydrology			
Change in peak or base flows	FUR	M	R
Increase in drainage network	FA	M	D
Watershed condition			
Road density and location	FAR	M	D
Disturbance history	FA	M	M
Riparian conservation areas	FAR	M	M
Disturbance regime	FAR	M	M
Integration of species and habitat condition	FUR	Maintain	D/R

6.1.1 Subpopulation Characteristics (Species Pathways)

6.1.1.1 Subpopulation (local population) size

Project construction could temporarily reduce the local population size due to potential Bull Trout mortality during the fish rescue, given that the population is already very small (if present at all), within the Project reach. The Jocko River Bull Trout metapopulation appears to be in decline, particularly the NF Jocko subpopulation. Bull Trout are found in the NF Jocko below the Tabor Diversion in select areas at very low densities, and these are both fluvial migratory and resident fish. In the past, one radio-tagged migratory Bull Trout was documented spawning in the mid- to lower reaches of the NF Jocko, several miles downstream of Tabor Diversion, near the P-5000 road crossing in a reach of stream where occasional redds from migratory fish have been observed. The Tabor Diversion is considered a complete barrier to fish passage and Bull Trout have not been documented upstream of Tabor Diversion in recent sampling. Bull Trout were historically documented in a reach of stream extending two miles upstream of the diversion (below a natural barrier falls), and these were assumed to be resident fish.

In the long-term, the local Bull Trout population could benefit from the Project and expand into newly accessible high-quality habitat upstream of the Tabor diversion after removal of the existing diversion, which is a barrier. Replacement of the Tabor Diversion with a fish protection and passage system would ensure that fish would not continue to be entrained in the Tabor Canal.

6.1.1.2 Growth and survival

In-water work would occur between mid-July and August 31 wherever practicable to avoid adverse impacts to Bull Trout; however, certain construction activities would need to occur outside of the in-water work window. The timeframe of in-water work activities is presented in the construction schedule (Table 2). During Project construction the following in-water activities could temporarily adversely affect Bull Trout growth and survival by causing stress, injury, or mortality, if Bull Trout are present:

- Increased suspended sediment associated with in-water work activities could cause gill trauma, reduced feeding effectiveness, or degraded spawning and rearing habitat. Sediment effects are described in the Water Quality section below.
- Re-routing and dewatering of the channel could result in fish stranding and mortality. Biologists would be prepared to conduct fish rescues during re-routing and dewatering activities to avoid and minimize fish stress and mortality. The fish rescue procedure is described in Section 3.6.2.1, Bull Trout Project-specific measures.
- Sheet pile driving can result in underwater sound pressure waves that cause barotrauma injury or mortality. Conservation measures for limiting the effects of sheet pile driving are presented in Section 3.6.2, Construction Best Management Practices.

Based on the CSKT monitoring, rearing Bull Trout could be present in very low numbers (only one has been detected since 2018) within 0.5 miles of the main project area where these in-water construction activities would occur, therefore Project construction is unlikely to affect many, if any, rearing Bull Trout. No spawning has been detected within 0.5 miles of the main project area. Overall, the Project would improve Bull Trout growth and survival due to habitat improvements described below, including access to high-quality habitat, elimination of entrainment, restoration of a natural sediment regime, and increased genetic exchange.

6.1.1.3 Life history diversity and isolation

The Project would restore full fish passage, which in turn could allow both resident and migratory life history forms to occupy the Project reach.

6.1.1.4 Persistence and genetic integrity

The Project would restore full fish passage, connecting Bull Trout populations upstream and downstream of the diversion and improving genetic exchange.

6.1.2 Water Quality

The Project would not affect temperature within the action area. Adverse and beneficial effects on the remaining indicators are described below.

6.1.2.1 **Sediment**

The Project would cause temporary increases in suspended sediment in the NF Jocko downstream of where in-water work is proposed. In-water work would occur from July through August 31 when practicable to avoid sediment impacts to spawning Bull Trout. However certain construction activities would need to occur outside of the in-water work window and would therefore produce suspended sediment in the NF Jocko. Much of this work would be done at very low flows and would be short in duration and, in some instances such as the annual reworking of the low-flow channel, we do not anticipate the need for extensive in-channel work. The timeframe of in-water work activities is presented in the construction schedule (Table 2).

An estimate of the expected duration and downstream extent of suspended sediment that could result from in-channel work was made based on observational monitoring studies conducted by the USFS (Foltz, Yanosek, and Brown 2008) for culvert removal projects, and CSKT (CSKT 2024b) as part of the NF Jocko Bridge Replacement Project. It was estimated that sediment would likely be elevated for a few hours after in-water disturbance activities but could remain elevated for up to 1 day. Increased suspended sediment would likely extend downstream at least 300-500 feet, but would be expected to dissipate to background levels within 2,500 feet, or nearly 0.5 mile. The longer/farther estimates would only be expected in the case where rain events and higher water unexpectedly occur during or immediately after the in-channel disturbance. Increased sediment would be minimized by using forecasting to avoid or restrict in-channel work during these periods and through implementation of erosion and sediment control BMPs presented in Section 3.6.2, Construction Best Management Practices.

Based on the CSKT monitoring, only very low numbers of rearing Bull Trout would be expected to be present within 0.5 miles downstream of the in-water construction activities (at the main project area), therefore negative effects from Project construction would likely be very limited.

Implementing the Project would result in a permanent beneficial effect on sediment transport in the NF Jocko. The Project would contribute to restoration of a more natural sediment regime, as the existence and operation of the current structure greatly alters sediment transport and negatively impacts critical habitat above and below the diversion, causing embeddedness, pool filling, and extreme turbidity during canal shutdown. Additionally, the modernized structure would allow for better water management and compliance with instream flows and bankfull flow scheduling.

6.1.2.2 **Chemical contamination and nutrients**

The Project could temporarily introduce contaminants into the river during construction due to the presence of construction equipment and vehicles in or near the channel. The construction contractor would be required to develop a spill prevention plan and follow standard BMPs related to equipment to avoid spills and contamination into the river. There are no sources of nutrients associated with the Project.

6.1.3 Habitat Access

6.1.3.1 Physical barriers

Fish passage would remain blocked by the existing diversion during Project construction, therefore this would not represent a change from current conditions, as the Tabor diversion acts as a fish barrier. The noise and vibration associated with sheet-pile driving and demolition of the current diversion may cause Bull Trout to avoid the area, temporarily blocking access to habitat, but again, this would be upstream of the existing diversion and no Bull Trout have been documented during annual sampling in upstream areas since 2018. Additionally, the area within the influence of the existing diversion has poor quality habitat as a result of sediment accumulation behind the structure, and we therefore do not anticipate Bull Trout presence at the construction site.

The Project would have a permanent beneficial effect on fish passage as removal of the Tabor diversion and construction of a comprehensive fish passage system would allow for safe upstream and downstream fish passage for all life stages, improving fish passage in the NF Jocko.

6.1.4 Habitat Elements

6.1.4.1 Substrate embeddedness

Constructing the Project would result in short-term increases in suspended sediment that may temporarily increase embeddedness. However, suspended sediments resulting from construction activities is anticipated to be comprised largely of fines and not in volumes that would contribute to pool filling or measurable increases in embeddedness. Sedimentation would be temporary and superficial.

6.1.4.2 Large woody debris

The Project would temporarily remove large woody debris in the NF Jocko, if present, during channel grading and shaping. Removal of the Tabor Diversion would restore natural large woody debris transport in the NF Jocko. Large woody debris currently accumulates behind the existing diversion gates and is frequently removed as needed.

6.1.4.3 Pool frequency and quality; large pools

Implementing the Project would allow woody debris transport through the reach, possibly contributing to an increase in channel complexity, including pool frequency and large pools immediately below the new diversion. The Project would also allow fish access to ~2 miles of high-quality, cold habitat upstream that is currently blocked by the Facility, including habitat with quality pools.

6.1.4.4 Off-channel habitat

The Project would not have any adverse effects on the limited off-channel habitat within the action area. Over time it could contribute to an increase in off-channel habitats in less-constricted portions of the NF Jocko due to the restoration of large woody debris transport and accumulation after removal of the Tabor Diversion.

6.1.4.5 Refugia

The Project would allow fish to access ~2 miles of high-quality rearing and resident adult habitat upstream that is currently blocked by the Facility, including complex habitat that may serve as a small refugium.

6.1.5 Channel condition and dynamics

6.1.5.1 Width:depth ratio

To construct as much of the Project as possible in the dry, the NF Jocko channel would be confined to the left bank for the first 1-3 years of Project construction. After construction of the sluiceway, the channel would be re-routed through the sluiceway on right bank. This re-routing of the channel would temporarily reduce the width: depth ratio of the NF Jocko. After all in-channel features are constructed (i.e., within year 4), the full NF Jocko channel would be re-activated.

6.1.5.2 Streambank condition

The Project would temporarily disturb NF Jocko streambanks during construction as the rip-rap along armored banks would be replaced with a more natural bank stabilization treatment (such as brush banks). Replacement of rip-rapped streambanks with more natural armoring would result in better functioning streambanks over the long-term.

6.1.5.3 Floodplain Connectivity

The Project would allow for more precise and responsive flow management, which in turn would facilitate more effective implementation of bankfull discharge schedules and water compact flows. The Project could also enhance floodplain connectivity in the lower-gradient areas downstream of the Facility by restoring more natural regimes of sediment and large woody debris inputs, thereby resulting in a more natural channel form and connection with the adjacent floodplain.

6.1.6 Flow and hydrology

Adverse and beneficial effects on these indicators are described below.

6.1.6.1 Change in peak or base flows

The Project would not change peak or base flows in the NF Jocko. The Facility would continue to operate as it did prior to Project construction. The Project would, however, allow for more effective flow management, which would facilitate implementation of minimum instream and peak flow schedules.

6.1.6.2 Increase in drainage network

The Project would contribute to a very small increase in the drainage network which is discussed under the Road density and location indicator.

6.1.7 Watershed condition

The Project would not cause beneficial or adverse effects to disturbance history, riparian conservation areas, or disturbance regime, but there would be a limited adverse effect to the road density and location indicator, which is discussed below.

6.1.7.1 Road density and location

The Project would add a short length (89 feet in length, approximately 1,077 square feet in area) of permanent valley bottom road adjacent to the new Facility. The road would provide access to the site during construction and would remain after the Project is completed. Post-project, the road would be gated and access limited to administrative use only for maintenance (e.g., cleaning of trash racks, etc.,) to the headworks, sluiceway and fishway.

6.1.8 Integration of Species and Habitat Condition

Overall the Project would result in permanent benefits to species and habitat condition in the NF Jocko within the action area. Restoration of upstream and downstream fish passage would have the following beneficial effects: Bull Trout access to ~2 miles of high-quality habitat upstream of the existing diversion; reconnection of Bull Trout subpopulations, improving genetic exchange; restoration of a more natural sediment regime downstream of the diversion; and, more effective implementation and management of bankfull discharge prescriptions and instream flows

6.2 Bull Trout Critical Habitat

Project effects to physical and biological habitat features (pathways and indicators) are presented in Section 6.1, Bull Trout. These effects to habitat are summarized below in the context of the nine PCEs for Bull Trout critical habitat. A crosswalk between the pathways and indicators and PCEs, is presented in Table 5, and the baseline condition of the PCEs within the action area is presented in Section 5.2, Bull Trout Critical Habitat. The proposed project would maintain the existing status of the PCEs. The proposed action effect determination is **May Affect, is Likely to Adversely Affect** Critical Bull Trout Habitat. Over the long-term the Project would have beneficial effect resulting from more effective flow management and compliance with instream flow scheduling, from a more normative sediment transport regime, which would benefit many parameters, from removal of a passage barrier, and from fish screening.

1. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

The Project could temporarily shift NF Jocko hyporheic flows when the coffer dam is in place and the river is routed to river left (years 1-3), and when the river is routed down the sluiceway on river right (year 4), as part of the channel would be dewatered which could alter groundwater-surface water interactions. This change would not be expected to alter water quantity, quality, or thermal refugia in the NF Jocko within the action area, as flows would be maintained through the re-routed channel, and the alteration would be confined to the area upstream of the existing diversion.

2. Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.

Fish passage would remain blocked at the existing diversion during Project construction, therefore this would not present a change from current conditions as the Tabor diversion acts as a fish barrier. The noise and vibration associated with sheet-pile driving and demolition of the current diversion may cause Bull Trout to avoid the area, temporarily blocking access to habitat. The Project would have a permanent beneficial effect on fish passage, as removal of the Tabor diversion and construction of a comprehensive fish passage system would allow for safe upstream and downstream fish passage.

The Project would temporarily increase suspended sediment during and after work within the wetted channel. Increased suspended sediment would likely extend downstream at least 300-500 feet, but would be expected to dissipate to background levels within 2,500 feet, or nearly 0.5 mile. The longer/farther estimates would only be expected in the case where rain events and higher water unexpectedly occur during or immediately after the in-channel disturbance. Increased sediment would be minimized through the implementation of the erosion and sediment control BMPs presented in Section 3.6.2, Construction Best Management Practices.

3. An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

The NF Jocko within the Project area has a sufficient food base for Bull Trout, including aquatic macroinvertebrates and forage fish. The Project would temporarily reduce aquatic macroinvertebrate populations in the immediate Project area when the channel is re-routed and dewatered for in-channel work. After the channel is re-wetted in year 4, macroinvertebrates would be expected to recolonize via downstream drift within a few months. The Project would also allow fish, including forage fish, to travel upstream from lower reaches in the NF Jocko and elsewhere in the Jocko River system. Beneficial effects are anticipated from the project to the food base over the long-term. Beneficial effects would primarily result from restoration of a more normative sediment transport regime.

4. Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.

The Project would temporarily degrade Bull Trout habitat within the direct footprint of construction, as the area between the bridge and the current diversion would be partially dewatered, the channel would be graded and re-shaped, and large woody debris and substrates would be moved or removed as part of grading and reshaping the channel. However, habitat quality in this area is highly degraded from sedimentation resulting from the existing structure, so use is likely nearly non-existent, especially given that the structure is a barrier to upstream movement and given that monitoring has failed to detect Bull Trout in upstream areas since 2018. Post-construction the NF Jocko channel

outside of the rock ramp area would be regraded, and substrate embeddedness would be similar to prior to construction. Substrate within the rock ramp would be replaced with larger diameter material than was present prior to construction. Substrate would be grouted in place to ensure integrity of the rock ramp feature. Over time the substrate overlying the grouted material would be expected to naturally transition to a substrate similar to the areas outside of the rock ramp.

In the long term, removal and replacement of the Tabor Diversion would restore complex habitat to this area, including restoration of natural large woody debris transport and accumulation in the NF Jocko, as well as natural sediment transport. Woody debris currently accumulates behind the Tabor Diversion and is removed as needed.

5. **Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range would depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.**

The Project would not affect water temperature in the action area during construction or operations.

6. **In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout would likely vary from system to system.**

The NF Jocko is spawning and rearing habitat, although CSKT monitoring has only documented spawning by migratory fish in a limited reach of stream between Falls Creek and the Road P-5000 bridge (Figure 3). The Project would cause a temporary increase in suspended sediment downstream of proposed in-water work (i.e., downstream of the current diversion), which could result in an increase in fine sediments. The increased suspended sediment would likely extend downstream at least 300-500 feet from the diversion, but would be expected to dissipate to background levels within 2,500 feet, or approximately 0.5 mile. Given the stream length over which the suspended sediment would accumulate on the channel bottom, the increase in fine sediment in the channel substrate would be expected to be very minimal. In addition, the Project would restore the natural sediment transport regime in the NF Jocko (by removing the existing diversion which partially blocks sediment transport), thereby facilitating natural sediment recruitment downstream in the NF Jocko system. Increased sedimentation during construction would also be minimized through the implementation of the erosion and sediment control BMPs presented in Section 3.6.2, Construction Best Management Practices.

There would be a permanent beneficial effect on sediment transport in the NF Jocko. The Project would contribute to restoration of a natural sediment regime in the NF Jocko as the Tabor Diversion currently does not allow sediment to pass.

7. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

The Project could temporarily shift NF Jocko hyporheic flows when the coffer dam is in place and the river is routed to river left (years 1-3), and when the river is routed down the sluiceway on river right (year 4), as part of the channel would be dewatered which could alter the groundwater-surface water interaction. This change would not be expected to alter water quantity, quality, or thermal refugia in the NF Jocko within the action area. Flows would be maintained through the re-routed channel, and the alteration would be confined to the area immediately upstream of the existing diversion.

8. Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.

Fish passage would remain blocked during Project construction; therefore, this would not present a change from current conditions as the Tabor diversion acts as a fish barrier. The noise and vibration associated with sheet-pile driving and demolition of the current diversion may cause Bull Trout to avoid the area, temporarily blocking access to habitat, but only one Bull Trout has been documented downstream of the existing diversion in the last several years. None have been documented upstream of the existing diversion since 2018.The Project would have a permanent beneficial effect on fish passage, as removal of the Tabor diversion and construction of a comprehensive fish passage system would allow for safe upstream and downstream fish passage.

The Project would temporarily increase suspended sediment which would likely extend downstream at least 300-500 feet, but would be expected to dissipate to background levels within 2,500 feet, or nearly 0.5 mile. The longer/farther estimates would only be expected in the case where rain events and higher water unexpectedly occur during or immediately after the in-channel disturbance. Increased sediment would be minimized through the implementation of the erosion and sediment control BMPs presented in Section 3.6.2, Construction Best Management Practices.

9. An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

The NF Jocko within the Project area has a sufficient food base for Bull Trout, including aquatic macroinvertebrates and forage fish. The Project would temporarily reduce aquatic macroinvertebrate populations when the channel is re-routed and dewatered for in-channel work. Increases in suspended sediment could also cause an increase in macroinvertebrate drift and a decrease in habitat suitability and production. After the channel is re-wetted in year 4 macroinvertebrates would be expected to recolonize via downstream drift within a few months. The Project would also allow fish, including forage fish, to travel upstream from lower reaches in the NF Jocko and elsewhere in the Jocko River system.

10. Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes that establish and maintain these aquatic environments, with features such as

large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.

The Project would temporarily degrade Bull Trout habitat within the direct footprint of construction, as the area between the bridge and the current diversion would be partially dewatered, the channel would be graded and re-shaped, and large woody debris and substrates would be moved or removed as part of grading and reshaping the channel. Post-construction the NF Jocko channel outside of the rock ramp area would be regraded and substrate embeddedness would be similar to prior to construction. Substrate within the rock ramp would be replaced with larger diameter material than was present prior to construction. Substrate would be grouted in place to ensure integrity of the rock ramp feature. Over time the substrate overlying the grouted material would be expected to naturally transition to a substrate similar to the areas outside of the rock ramp.

In the long term, removal of the Tabor Diversion would restore complex habitat to this area, including restoration of natural large woody debris accumulation and transport in the NF Jocko, and natural sediment transport. Large woody debris currently accumulates behind the Tabor Diversion and is removed as needed.

11. **Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range would depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.**

The Project would not affect water temperature in the action area during construction or operations.

12. **In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout would likely vary from system to system.**

The NF Jocko is spawning and rearing habitat, although CSKT sampling indicates that spawning by migratory fish is limited, and has only been documented in a reach between Falls Creek and the Road P-5000 bridge (Figure 3). The Project would cause a temporary increase in suspended sediment downstream of proposed in-water work (i.e., downstream of the current diversion), which could result in an increase in fine sediments. The increased suspended sediment would likely extend downstream at least 300-500 feet from the diversion, but would be expected to dissipate to background levels within 2,500 feet, or nearly 0.5 mile. Given the stream length over which the suspended sediment would accumulate on the channel bottom, the increase in fine sediment in the channel substrate would be expected to be very minimal. In addition, the Project would restore the natural sediment transport regime in the NF Jocko (by removing the existing diversion which partially blocks sediment transport during runoff but then pulses it at the end of the diversion season), thereby facilitating natural sediment recruitment downstream in the NF Jocko system. Increased sediment

during construction would also be minimized through the implementation of the erosion and sediment control BMPs presented in Section 3.6.2, Construction Best Management Practices.

There would be a permanent beneficial effect on sediment transport in the NF Jocko. The Project would contribute to restoration of a natural sediment regime in the NF Jocko as the Tabor Diversion currently impedes sediment transport during runoff and pulses great amounts of it downstream at or near baseflows when canal gates are closed.

13. A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.

The current hydrograph in the NF Jocko is highly altered (with lower annual, peak, and base flows) due to irrigation diversions such as the Tabor Feeder Canal at the MF Jocko and NF Jocko. Although the Project would continue to be operated for diversion of irrigation water, the new Facility would allow for more effective management of instream flow requirements and may result in a more normative hydrograph.

14. Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

See discussion above in PCE #1 (seeps and springs), PCE #6 (spawning substrate) and #7 (hydrology).

15. Sufficiently low levels of occurrence of nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

Brook Trout are present in the NF Jocko within the action area but the Project would not affect the presence of Brook Trout or the threats they pose to Bull Trout.

6.3 Grizzly Bear

The Project would be implemented over a 4 to 5-year time period, with construction occurring April-November each year. A project generating noise and increased human presence would have adverse effects on individual bears that attempt to pass through or utilize the Project Area, and this multi-year construction period would prolong these effects.

Noise disturbance would affect bears found outside the immediate project footprint. Anthropogenic noise is known to cause a stress response in many large mammal species, often leading to shifts in activity patterns or movement rates, which may have negative impacts on survival or reproduction (Ordiz et al. 2011; Zarzo-Arias et al. 2018). Noise may cause bears to alter their movement and behavior patterns by avoiding the area during construction hours. While there is available surrounding habitat into which bears may disperse, this habitat is likely occupied by other bears. The effects of crowding can lead to further stress on displaced individuals that may attempt to circumvent the disturbance by moving through another bear's territory. This is particularly dangerous for females

with cubs. Dispersal in response to anthropogenic activities may lead to increased stress and elevated mortality risk for individual bears, and also may push bears into closer proximity with other human use areas, leading to increased human-bear conflicts.

Grizzly bear/human interaction is a management concern that may threaten bears as well as human safety. When interactions are frequent, bears have the potential to become habituated to human presence. Habituated bears can become aggressive and food-conditioned, which often results in habituated bears being removed from the population (NCDE Subcommittee 2019). Following food storage guidelines to minimize any potential exposure to human attractants that could lead to habituation is important for all projects occurring in bear country.

Additionally, this is an important travel corridor and a higher number of bears may utilize this area than similar habitats outside of a major travel corridor. Vegetation would be removed along one access road, which may decrease cover for bears. Up to 7.8 acres would be cleared for the concrete batch plant, located along the access road to be widened. Staging areas and roadside acreages cleared would be restored to natural conditions post-construction. Therefore, these effects would all be temporary. However, a short road segment would be created for access to the new diversion structure. While this road would be restricted to administrative use only post-construction, it would be a new, permanent road 89 feet long (0.025 acres total).

In addition to this project occurring within the NCDE, portions of activities, including camping, would fall within the PCA. The most rigorous habitat protections apply to the PCA, as this area is intended to support a source population of grizzly bears over the long term (Figure 12). No decreases in secure core habitat are allowed within the PCA unless such decreases are temporary to accommodate projects. Habitat management in the PCA is focused on maintaining secure core habitat, for which primary threats include increases in motorized route density, developed recreation sites, vegetation management, livestock grazing, and mineral/energy development (NCDE Subcommittee 2019). Potential impacts from this project include increases in motorized route density and developed recreation sites. The new, permanent access road would be located just outside the PCA (approximately 400 meters from the PCA boundary). While the dispersed camping sites for workers during project construction would be located inside the PCA and may be used for up to 4-5 years, this project would not be creating any new developed recreation sites for public use. Sites used for camping would be restored to natural vegetative conditions after project completion. All disturbed areas will be restored within one year of project completion.

The conservation measures included in this document should be strictly adhered to; the only grizzly bear conservation measure for which it may not be possible to adhere is #13 regarding camping for project activities. Therefore, conservation measures #17 and #19 must be followed to avoid public recreational use and establishment of new, permanent, dispersed camping sites within the PCA.

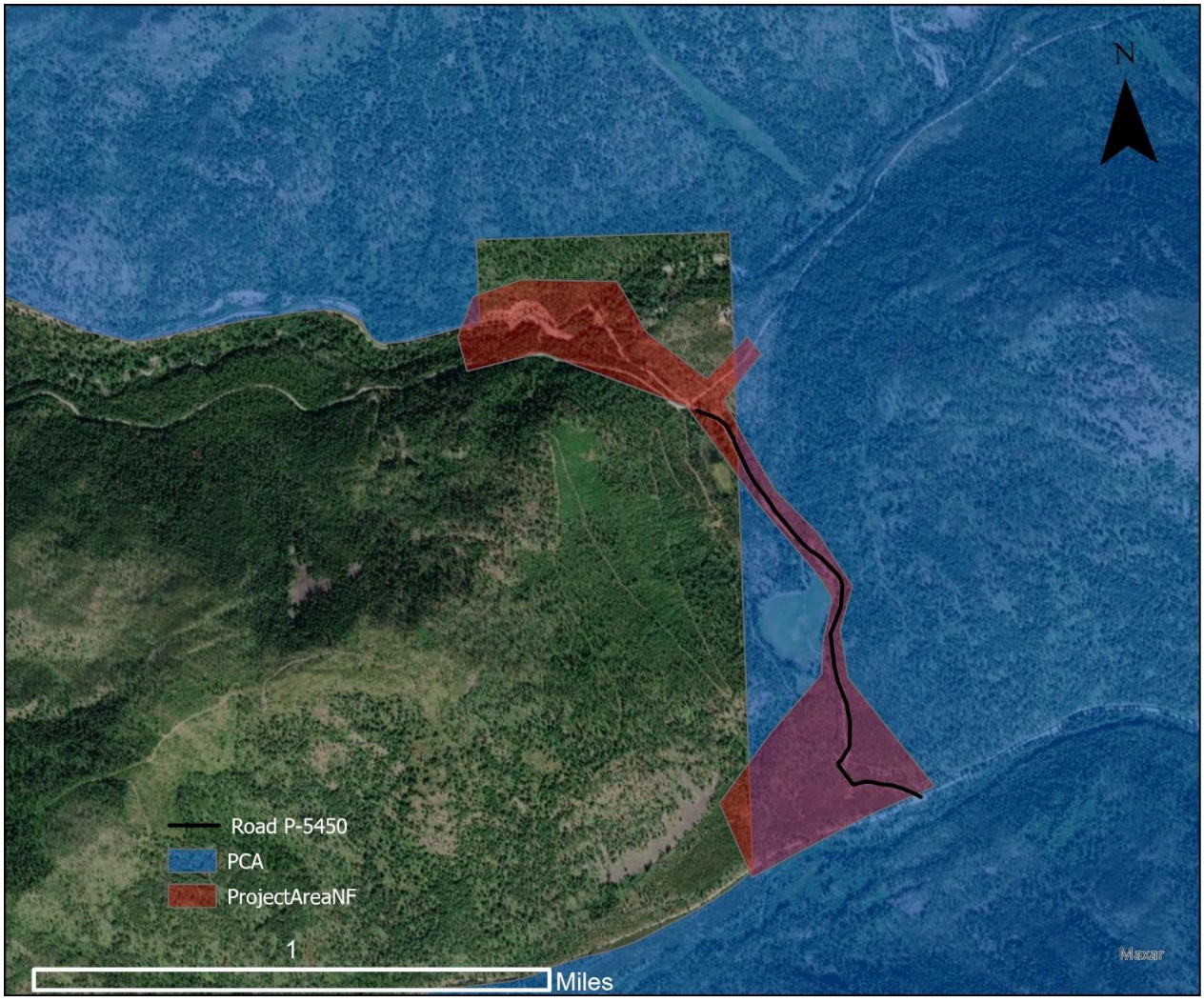

Figure 12: Overlap of project area and grizzly bear PCA. The main area disturbed by project activities is shown in red and the PCA is shown in blue. Road P-5450, the road to be widened as needed, is also indicated. The batch plant and potential camping area will occur within the large red portion to the south, where P-5450 branches off of Jocko Canyon Road. This area largely falls within the PCA.

Objectives relative to grizzly bear recovery in the NCDE include: 1) provide adequate space to meet the spatial requirements of a recovered grizzly bear population; 2) manage for an adequate distribution of bears across the landscape; 3) manage for an acceptable level of mortality risk; 4) maintain/improve habitat suitability with respect to bear food production; 5) meet the management direction outlined in the Interagency Grizzly Bear Guidelines (51 Federal Register 42863) for Management Situations 1, 2, and 3 (USFS 1986).

Objective 1. Provide adequate space to meet the spatial requirements of a recovered grizzly bear population.

The proposed action would infringe upon grizzly bear habitat that lies within the NCDE, and part of the construction footprint falls within the PCA. While this area sees some human activity and vehicle traffic already, human presence and noise levels would be elevated as a result of the proposed action. This would likely result in bears avoiding the project area, and individuals may move into territories occupied by other bears. While most disturbed areas would be re-vegetated upon project completion, the area cleared for the concrete batch plant would take several years to re-grow to the point that it provides cover for bears. The new road segment built to access the new structure would be a permanent impact, as the road would be maintained for future administrative use. The loss of any grizzly bear habitat is considered to have an adverse impact, especially given that significant losses of grizzly bear habitat have occurred on the Reservation since implementation of the FIIP.

Objective 2. Manage for an adequate distribution of bears across the landscape.

This project would cause disturbance to bears along an important travel corridor, for the duration of construction (4-5 years). This project would occur within important spring, summer, and fall habitat for grizzly bears within the PCA. Individual bears would likely be able to avoid the action area by going around the disturbance, but noise impacts would continue for multiple years. However, these effects would not be permanent, and the only permanent removal of habitat involves the new access road. The surrounding mountainous and wilderness areas would continue to provide year-round habitat for grizzly bears.

Objective 3. Manage for an acceptable level of mortality risk.

Bears are regularly observed in the action area, and there is some chance of mortality risk to grizzly bears if mitigation measures are not followed carefully or if human attractants draw bears to the project area. However, if appropriate mitigation measures are strictly adhered to, this would greatly reduce the likelihood of habituation and dangerous human-bear encounters. Construction activities themselves pose no direct threat to grizzly bears or their habitat. Pushing bears into surrounding habitat as a result of project activities may lead to increased human-bear conflicts or conflicts with other bears competing for food resources. The project area is small enough that it is unlikely to result in displacement of a large number of individual bears, but it is unknown how heavily this area is used as a travel corridor throughout the year. Camping is likely to occur for >5 days with possibly >20 individuals. Even if hard-sided campers are used, the potential for attractants is greatly increased with workers camping on-site.

Objective 4. Maintain/improve habitat suitability with respect to bear food production. Known grizzly bear foraging habitat is present in the Action Area. This project would result in a slight reduction of habitat because of the new access road leading to the new structure. All other impacts to habitat would be temporary, but some staging areas would take several years to recover from disturbance. Noise from construction activity would adversely affect the ability of bears to forage or travel through the area. Bears would be temporarily displaced from the project area during construction activities that occur over multiple years, and this level of disturbance would adversely affect grizzly bears using this area as foraging or corridor habitat.

Objective 5. Meet the management direction outlined in the Interagency Grizzly Bear Guidelines (51 Federal Register 42863) for Management Situations 1, 2, and 3 (USFS 1986).

The proposed action would meet the management direction outlined in the CSKT Grizzly Bear Management Plan and NCDE Conservation Strategy only if the above listed conservation measures were strictly followed within the PCA. Because conservation measure #13 would likely not be met, it is imperative that conservation measures #17 and #19 are followed to avoid permanent, public use of the dispersed campsites. Additionally, project activities within the PCA should be limited to 5 years duration. The newly established permanent road, built to access the new infrastructure, will be located outside of the PCA. Workers camping at dispersed sites should follow all precautions to avoid attracting bears to campsites and to reduce the potential for human-bear conflict. If these measures here are followed, the project should remain within the bounds of the management direction.

Effects Determination:

The Proposed Action **May Affect, and Is Likely to Adversely Affect** grizzly bear based on:

- The duration and location of noise disturbance associated with the proposed project would adversely affect grizzly bear foraging in nearby habitat and bear movement through an important corridor area.
- The timing of the activity, as work would occur during spring, summer, and fall when grizzly bears are known to frequent the action area, possibly including females with cubs. This may result in adverse effects to individual bears who would likely be displaced from foraging or corridor habitat.
- Camping at dispersed sites would likely occur for longer than 5 days with maybe >20 workers present. Camping would increase the potential for human-bear conflict.
- Mortality risk would be expected to slightly increase as a result of the action
- Conservation measures would be strictly followed and attractants would be minimized, but attractants are likely to increase with long-term camping in the action area, resulting in an adverse effect to grizzly bears.
- The new access road would permanently remove 0.025 acres of habitat, but most effects would be temporary and would end once the project concludes.
- The project would not result in increased long-term human use of or access to the project area.

6.4 Canada Lynx

The Canada Lynx Conservation Assessment and Strategy (2013) identified the main factors affecting lynx and lynx habitat under two tiers: 1) climate change, vegetation management, wildland fire, and habitat fragmentation; 2) incidental trapping, recreation, mineral/energy exploration and development, illegal shooting, forest/backcountry roads and trails, and domestic livestock grazing.

The primary risk factors to lynx in this region of the FIR include climate change, vegetation management, wildland fire, habitat fragmentation, and forest roads and trails. The effects of climate change are outside the scope of this analysis and would not be affected by this action. The proposed action would not include any vegetation management activities, nor would it result in any changes to wildland fire management on the FIR. The actions from this project may contribute to habitat fragmentation and forest roads/trails, given that a new section of road would be constructed. Vegetation removal would occur along established roads, and would include clearing of a 7.8 acre staging area for the concrete batch plant as well as other, smaller staging areas near the project site. Any other staging areas would be smaller than the area cleared for the batch plant. No new, permanent openings >330 feet would be created. Workers may camp on-site, as needed, within the boundary cleared for the concrete batch plant. One new road, approximately 89' in length, would be created to access the new diversion structure. Only one road, P-5450, cuts through a section of mapped lynx habitat and road widening would remove vegetation within this habitat patch (Figure 13). The road would be widened only as needed, up to 20 feet on either side of the road center. The green area in Figure 13 represents the area in which vegetation removal may occur (total of 1.15 acres), but removal would not occur within the entire area. Vegetation removal would primarily occur only on the east side of the road, to avoid damage to the existing canal. Removal would occur in narrow areas or near sharp turns to facilitate large equipment access. Vegetation removal in all other areas may occur adjacent to, but not within, mapped lynx habitat. Therefore, the proposed action would not result in substantial increased fragmentation of existing lynx habitat, as all disturbance would occur along existing roads that experience regular human use. Degradation of snowshoe hare and lynx habitat along these roads is expected to be insignificant.

Implementation of the project would not result in increased road use or increased accessibility after project completion. Use of the new access road would be limited to administrative use only. Project construction would occur from spring-fall, and no snow compaction for winter access would occur. The proposed action would not alter any recreational trails in the action area. All disturbed areas (with the exception of the new access road) would be restored/rehabilitated after project completion. The effects of such disturbance would not be long-term and would not permanently degrade or fragment lynx habitat.

No den sites or evidence of denning activity have been observed in the immediate action area, but no studies have been done to document lynx denning on the FIR. Lynx likely use the action area for dispersal, and may forage in suitable patches of snowshoe hare habitat surrounding the project area. Lynx may be temporarily displaced by human activity and construction noise, and this would occur over a 4-5 year time period during project construction (spring-fall). Studies have not examined the effects of noise disturbance on lynx behavior, but anthropogenic noise, such as construction noise, is known to cause a stress response in many large mammal species. This may lead to shifts in activity patterns or movement rates, which may have negative impacts on survival or reproduction (Ordiz et al. 2011; Zarzo-Arias et al. 2018). The level of noise disturbance associated with construction activities would be elevated in comparison to existing impacts. If lynx are temporarily

displaced from the action area, there is adequate surrounding habitat into which individuals may disperse.

Figure 13: Area of potential vegetation removal in mapped lynx habitat along road P-5450. The purple patches delineate mapped lynx habitat and the green shows the area of possible vegetation removal along the access road that intersects with lynx habitat.

Alteration of vegetation associated with project activities would not be expected to influence snowshoe hare population trends or distribution. However, it should be noted that if trees/logs that were removed from roadsides and staging areas were left in the woods near the Action Area instead of being hauled from the site, this could provide increased structural complexity which may improve habitat for snowshoe hare foraging activities. This would result in a beneficial impact to both snowshoe hare and lynx. Construction activities would occur during daylight hours when lynx are less active, and the likelihood of these impacts increasing the risk of lynx mortality or negatively

impacting lynx populations is low. The proposed action may affect individual lynx hunting or traveling near the action area by temporarily displacing or disturbing these individuals. Such effects would be insignificant and discountable due to the limited scale, duration, and placement (near established roads) of the proposed action. Even when considered alongside effects from the Falls Creek Project, located 1.75 miles from the action area, effects are expected to be insignificant and discountable due to the limited scale, duration, and placement of activities for both projects.

Effects Determination:

The Proposed Action **May Affect, but is Not Likely to Adversely Affect** Canada lynx based on:

- The limited area affected by project activities and the availability of displacement habitat
- Mortality risk to Canada lynx is not expected to increase as a result of the action
- Snowshoe hare populations would not be measurably affected by the action
- The project would not result in an expansion of the range of competitors/predators
- No alteration of critical habitat would occur
- Conservation measures would be strictly adhered to
- The proposed action would not be expected to measurably affect lynx at the population level
- Project activities may act as a barrier to lynx movement through the area, but these effects would be temporary (except for the 89' access road) and would not result in permanent adverse modification of lynx habitat
- The new access road would disturb 0.025 acres total and would not result in significant loss of lynx habitat or increased accessibility into lynx habitat
- Camping would only occur in areas already disturbed for equipment staging and work site use
- Human activity levels in the area would not be increased over the long term as a result of this action

6.5 North American Wolverine

The main factors affecting wolverine populations include habitat loss from decreased snowpack in late spring, human disturbance, dispersed recreational activities, infrastructure development, transportation corridors, and habitat fragmentation. The primary risk factors in this region of the FIR include climate change, human disturbance, infrastructure development, and habitat fragmentation via increased roads and other human development. Direct and indirect effects of the proposed action include human disturbance and habitat fragmentation via increased roads and human development. As with lynx and grizzly bear, construction noise and human presence are likely to elicit an avoidance response in wolverines attempting to move through the action area. Widening of roads, clearing of

vegetation, and creation of new, permanent roads would reduce the suitability of habitat within the action area for wolverine. Human use of the area would increase for the 4-5 year duration of construction. However, effects from this action would be temporary and lost habitat would be restored after project completion, with the exception of the new access road. The new access road covers a small area and access would be restricted to administrative use in the future. This road would occur below the typical elevation band for wolverine and would not increase access into wolverine habitat or wilderness areas.

Noise disturbance would likely negatively affect the quality of habitat surrounding the action area for use by wolverine during project activities. This may result in temporal and spatial displacement of individual wolverines attempting to move through the action area. However, this displacement is not expected to have measurable population-level effects due to the large home ranges typically occupied by wolverines as well as the amount of suitable habitat surrounding the project area. The proposed action is not anticipated to have any adverse effects on natal den sites or wolverine denning activities given the location of the action area. Although activities would occur during the denning season (February-May), the action area falls below the typical elevation band for wolverine denning. Project activities would likely result in temporary avoidance of the action area during periods of active construction.

Effects Determination:

The Proposed Action **May Affect, but is Not Likely to Adversely Affect** the North American wolverine based on:

- The limited area affected by project activities and the availability of displacement habitat
- No effect to wolverine range, abundance, or distribution
- Mortality risk to wolverine is not expected to increase as a result of the action
- Conservation measures would be strictly adhered to
- No den sites are known to occur in the action area and are unlikely due to the low elevation of the project site
- The proposed action would not be expected to measurably affect wolverine at the population level
- Effects would be temporary (except for the 89’ access road) and would not result in permanent adverse modification of wolverine habitat or increased human use of the area

7.0 Cumulative Effects

Cumulative effects encompass effects of future state or private activities reasonably certain to occur within the Action Area. Federal actions unrelated to this project are not considered in this analysis because they require separate analyses and consultation pursuant to Section 7 of the ESA.

Future state or private activities reasonably certain to occur within the disturbance area include continued road use by the public and some recreation access. These disturbance levels would not be elevated from existing conditions, and the Project would not lead to permanent increased motorized access. When combined with effects from the Proposed Action, an insignificant additional increase in adverse effects is expected to occur for all species and critical habitats assessed herein.

8.0 Summary of Effects

The following effects determinations have been made for the ESA listed species and critical habitat analyzed in this BA:

- Bull Trout (*Salvelinus confluentus*) [Threatened]: **May Affect, is Likely to Adversely Affect**
- Bull Trout Critical Habitat: **May Affect, is Likely to Adversely Affect**
- Grizzly Bear (*Ursus arctos horribilis*) [Threatened]: **May Affect, is Likely to Adversely Affect**
- Canada Lynx (*Lynx canadensis*) [Threatened]: **May Affect, Not Likely to Adversely Affect**
- North American Wolverine (*Gulo gulo luscus*) [Threatened]: **May Affect, Not Likely to Adversely Affect**
- Yellow-billed Cuckoo (*Coccyzus americanus*) [Threatened]: **No Effect**
- Spalding's catchfly (*Silene spaldingii*) [Threatened]: **No Effect**
- Whitebark Pine (*Pinus albicaulis*) [Threatened]: **No Effect**

9.0 Need for Re-assessment Based on Changed Conditions

The CSKT has prepared this BA to comply with Section 7 of the ESA for the North Fork Jocko Tabor Diversion Project, with construction commencing in 2025. The USFWS has regulatory jurisdiction over any activities that may harm ESA-listed species or their critical habitat. This BA and associated findings are based on the most current scientific information available. A new analysis and revised BA must be prepared if one or more of the following occurs: (1) new species information (i.e., newly discovered presence, activity area, species requirements/needs) reveals effects to threatened, endangered, proposed species, or designated/proposed critical habitat in a manner or extent not considered in this assessment; (2) the action is subsequently modified or is not fully implemented as described herein, which may cause an effect that was not considered in this assessment; or (3) a new species is listed or critical habitat is designated that may be affected by the action not analyzed herein.

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ATTACHMENT A

IPaC REPORT

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

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

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

NOT FOR CONSULTATION

Location

Lake and Missoula counties, Montana

Local office

Montana Ecological Services Field Office

(406) 449-5225
(406) 449-5339

585 Shephard Way, Suite 1
Helena, MT 59601-6287

NOT FOR CONSULTATION

Endangered species

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

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

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

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

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

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

NOT FOR CONSULTATION

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

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

Mammals

NAME	STATUS
Canada Lynx Lynx canadensis There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3652	Threatened
Grizzly Bear Ursus arctos horribilis There is **proposed** critical habitat for this species. https://ecos.fws.gov/ecp/species/7642	Threatened
North American Wolverine Gulo gulo luscus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5123	Threatened

Birds

NAME	STATUS
Yellow-billed Cuckoo Coccyzus americanus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Bull Trout Salvelinus confluentus There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/8212	Threatened

Insects

NAME	STATUS

NOT FOR CONSULTATION

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Spalding's Catchfly Silene spaldingii Wherever found There is **proposed** critical habitat for this species. https://ecos.fws.gov/ecp/species/3681	Threatened

Conifers and Cycads

NAME	STATUS
Whitebark Pine Pinus albicaulis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1748	Threatened

Critical habitats

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

This location overlaps the critical habitat for the following species:

NAME	TYPE
Bull Trout Salvelinus confluentus https://ecos.fws.gov/ecp/species/8212#crithab	Final

NOT FOR CONSULTATION

Bald & Golden Eagles

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

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below.

Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

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

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

NOT FOR CONSULTATION

Probability of Presence Summary

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

"Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

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

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

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

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

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

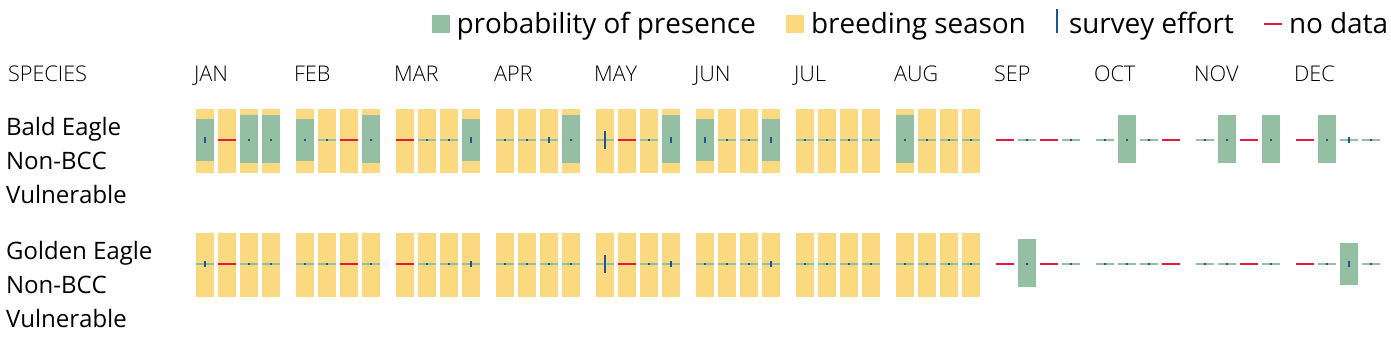
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

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

Survey Timeframe

NOT FOR CONSULTATION

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

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

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

NOT FOR CONSULTATION

Migratory birds

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

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

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

NAME	BREEDING SEASON

NOT FOR CONSULTATION

Bald Eagle Haliaeetus leucocephalus — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black Swift Cypseloides niger — Breeds Jun 15 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8878

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

California Gull Larus californicus — Breeds Mar 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Calliope Hummingbird Selasphorus calliope — Breeds May 1 to Aug 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9526

Cassin's Finch Haemorhous cassinii — Breeds May 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9462

Clark's Grebe Aechmophorus clarkii — Breeds Jun 1 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Evening Grosbeak Coccothraustes vespertinus — Breeds May 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Flammulated Owl Psiloscops flammeolus — Breeds May 10 to Aug 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/7728

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Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lewis's Woodpecker Melanerpes lewis — Breeds Apr 20 to Sep 30
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9408

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Rufous Hummingbird Selasphorus rufus — Breeds Apr 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Western Grebe aechmophorus occidentalis — Breeds Jun 1 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/6743

Williamson's Sapsucker Sphyrapicus thyroideus nataliae — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

NOT FOR CONSULTATION

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

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

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

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

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

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

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

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

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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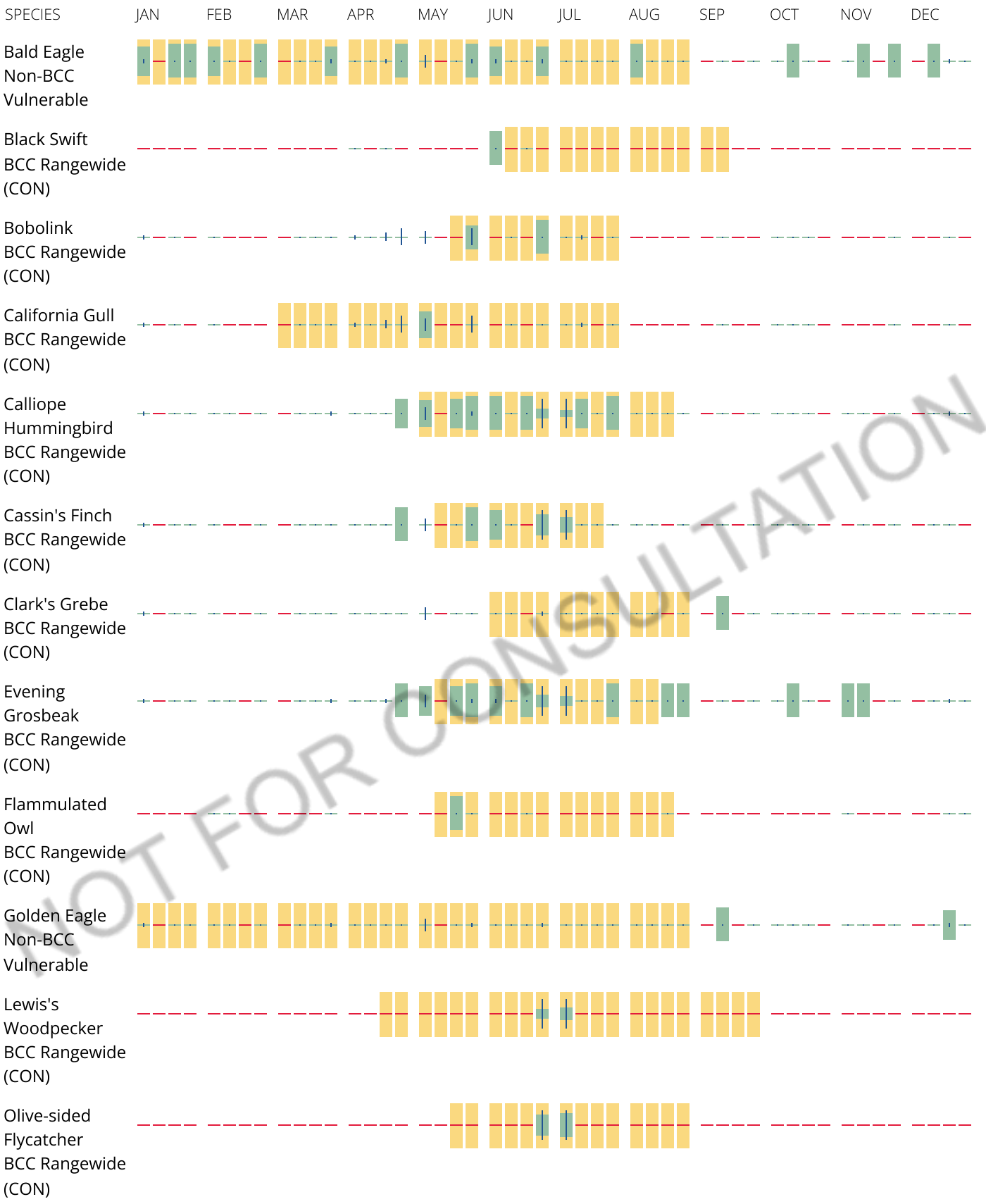
▪ probability of presence ▪ breeding season | survey effort – no data



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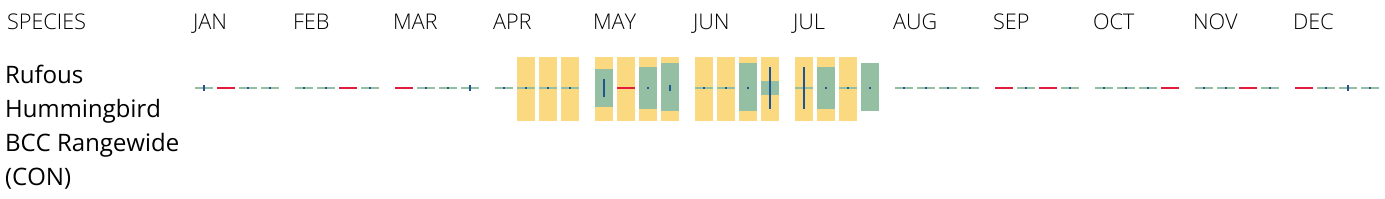

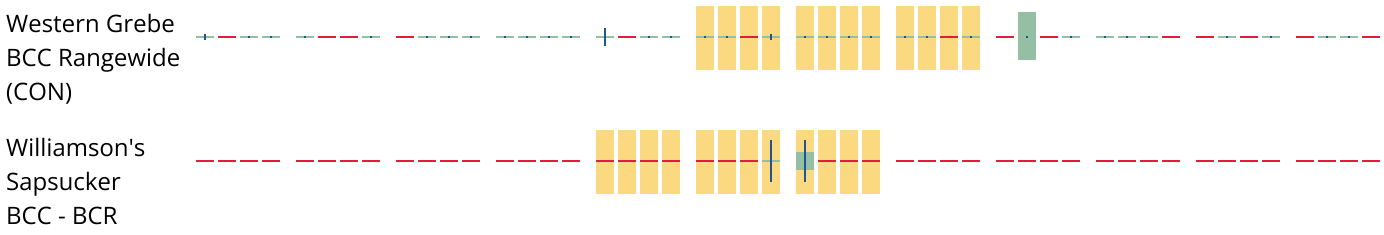

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

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

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

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

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

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

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

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

How do I know if a bird is breeding, wintering or migrating in my area?

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To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

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

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

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

Details about birds that are potentially affected by offshore projects

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

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of

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presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on Federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field Office or visit the CBRA Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

CBRA information is not available at this time

This can happen when the CBRS map service is unavailable, or for very large projects that intersect many coastal areas. Try again, or visit the CBRS map to view coastal barriers at this location.

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Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be

subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

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

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

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

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

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

NOT FOR CONSULTATION

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

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

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

Data exclusions

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

Data precautions

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

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