Proposed Gold Hill Whitewater Course

Draft Biological Assessment

Action Agency: U.S. Army Corps of Engineers

Prepared for:

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1 Introduction

1.1 Background and Consultation History

This Draft Biological Assessment (Draft BA) addresses the development of the Gold Hill Whitewater Course on the Rogue River a short distance upstream of the city of Gold Hill, in Jackson County, Oregon (Figure 1). Gold Hill Whitewater Center, Inc. is a non-profit corporation promoting the development of this project. The Project consists of modification to a 950-foot-long bedrock side channel of the Rogue River at Ti'lomikh Falls, and includes adding four hydraulic grade control structures to create standing waves to provide for whitewater rafting and kayaking recreational features; selective rock removal to create eddies; and removal of mid-stream rocks to improve safety and navigability of the side channel. The completed project would decrease boating hazards, increase recreational value for rafting and kayaking, and provide conditions for an Olympic-style whitewater slalom course. Project funding thus far has been provided by a variety of public and private sources. It is anticipated that federal funding will not be used to construct the project. However, federal permits from the U.S. Army Corps of Engineers (COE) will be required to construct the project.

Section 7 of the Endangered Species Act (ESA) of 1973 (as amended) directs federal departments and agencies to ensure that actions authorized, funded, and/or conducted by them are not likely to jeopardize the continued existence of any federally proposed or listed species, or result in destruction or adverse modification of critical habitat for such species. Section 7(c) of the ESA requires that federal agencies contact the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) (the USFWS and NMFS are subsequently referred to as the Services) before beginning any construction activity to determine if federally listed threatened or endangered (T&E) species or designated critical habitat may be present in the vicinity of a proposed project. A Biological Evaluation/Assessment (BE/BA) must be prepared if actions by a federal agency or permits issued by a federal agency will result in construction and if the Services determine that T&E species may occur in the vicinity of a proposed project. With respect to the proposed action, the COE would be the lead federal agency for ESA Section 7 consultation due to their Clean Water Act Section 404 permit authority for placement of dredged or fill materials in waters of the United States.

The only T&E species present in the project area is the Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*) Evolutionarily Significant Unit (ESU), which is listed as threatened under the ESA. The Rogue River at the project site is also designated as coho critical habitat. As ESA listed species and critical habitat are present in the action area of the proposed project, this BA is required to ensure that implementation will not jeopardize the continued existence or recovery of this listed species.

In addition, this draft BA also addresses potential effects on essential fish habitat (EFH) as required under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1966. Biological Assessments and EFH evaluations can be integrated together per guidance provided by NMFS (2001). The MSA established procedures designed to identify, conserve, and enhance EFH for those species regulated under a federal fisheries management plan. Federal agencies must consult with NMFS on all actions or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect

EFH. Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon (PFMC 1999). Chinook salmon (*Oncorhynchus tshawytscha*) and coho EFH is designated in the Rogue River at the project site. This draft BA addresses Chinook and coho EFH to facilitate the COE consultation requirements due to their Clean Water Act permitting authority related to the proposed project.

2 Proposed Action

2.1 Action Area

The action area includes all areas to be affected directly or indirectly by the proposed federal action and not merely the immediate area involved in the action (50 CFR 402-02). It includes the bank line, riparian area, and aquatic habitat affected by the proposed action.

For specific construction-related impacts, the action area is defined as a 0.5-mile reach upstream and downstream of the project construction site, located between river miles 120 and 121 of the Rogue River near Gold Hill, Oregon (Figure 1). It is anticipated that the action area is more than sufficient to encompass any small and temporary short- or long-term impacts caused by project construction.

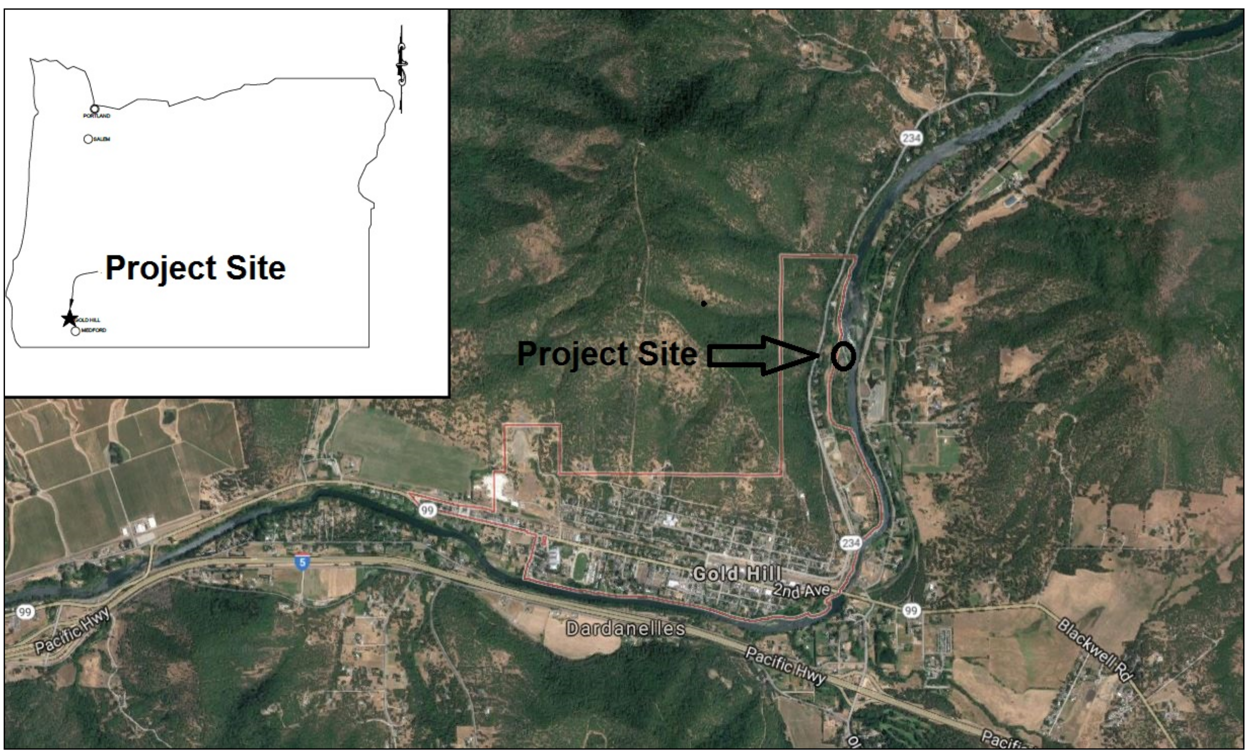


Figure 1. Gold Hill Whitewater Course project vicinity map.

2.2 Project Background

The Gold Hill Whitewater Park currently hosts the annual King of the Rogue race, which won the Medford Mayor’s Award for enhancing tourism in 2017. The park hosted the U.S. Rafting Association National Championships in 2016 and plans to host the World Rafting

Championships in 2022. Completing the proposed project whitewater enhancements could facilitate the World Cup slalom kayak competitions, freestyle kayak competitions, and the 2028 Los Angeles Olympic whitewater events.

Funding to complete the preliminary design of the proposed project was provided by the Regional Solutions Team funding from Oregon Senate Bill 5525, the Oregon Community Foundation, the City of Gold Hill, Olsrund Family Fund, the Rogue River Greenway Foundation, the Dishman Family Foundation, and Northwest Rafting Association. Gold Hill Whitewater, Inc. commissioned River Design Group to collect physical data at the site (topography, depth and velocity) and McLaughlin Whitewater Design Group, a division of Merrick & Co., to prepare the preliminary design.

The project was conceived in 2006 during the initial studies for removal of the Gold Hill hydroelectric dam, one mile north of the town of Gold Hill, Oregon. The 2006 whitewater plan envisioned extensive river bed modifications, re-watering the former power canal, a bridge across the river, and other access improvements. The dam was removed in 2008, and this preliminary effort was initiated in late 2015. The current plan is reduced in scale, being limited to the westernmost bedrock channel of Ti'lomikh Falls, primarily due to economics and to avoid and minimize environmental effects.

In addition to the proposed channel enhancements to improve safety and recreational whitewater boating value, a monument honoring Native American Tribes would occupy a prominent point on the west bank overlooking the project site. The two channels to the east are not proposed to be modified, as they have significant cultural importance to Tribes and also contain the "line" for a commercial rafting run. Representative from the Cow Creek Tribe of Umpqua Band of Indians, Confederated Tribes of Grand Ronde, and Confederated Tribes of Siletz Indians, have been informed of the project, such as through site visits by tribal leaders; at a legislative committee meeting in Salem, Oregon; at a group tour of the site where all the agencies and tribes were invited; and during visits to tribal offices.

2.3 Purpose and Need

Gold Hill Whitewater, Inc. desires that there be benefits and objectives of the project including:

1. Safety: remove the "mugging rock" at the upstream end of the side channel entrance, which is a dangerous mid-stream pinning boulder, in order to increase the navigability and safety of Mugger's Alley (the name given to this side channel by local boaters). This would also provide a safer alternate route for raft trips, which typically use the middle channel of the river, termed "Powerhouse Falls."

2. Olympic whitewater slalom competition and training requires continuous technical rapids with adequate vertical fall and length (typically 12+ feet over 600 to 1200 feet in length), with reliable water flow. The site possesses all of these characteristics.

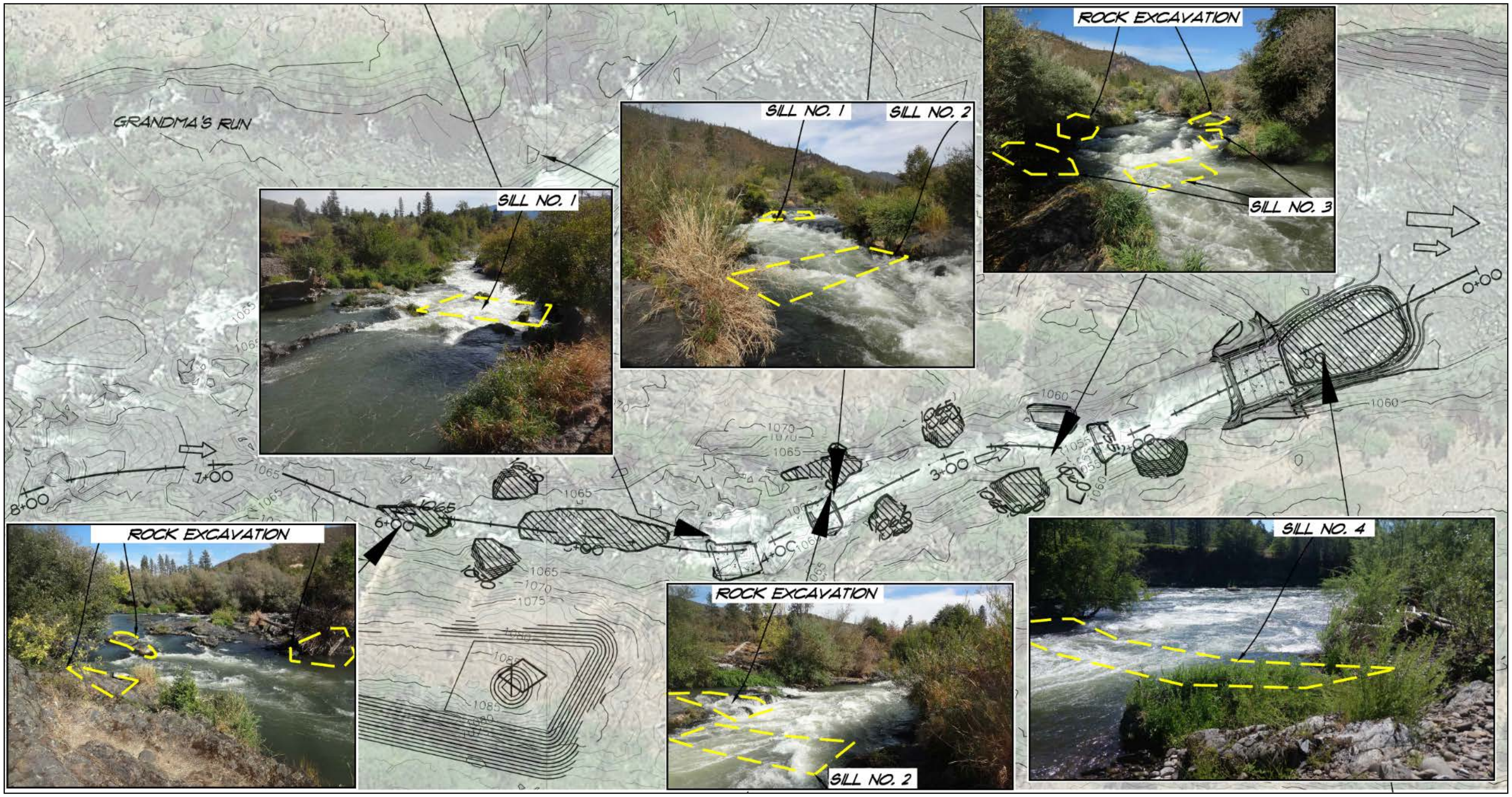
3. Economic development and quality of life for the City of Gold Hill stimulating tourism and enhancing the City's image as an outdoor destination with an outdoors and fitness lifestyle. Proximity of the project site to the central business district is a key metric.

4. Recreational Boating/Surfing: Whitewater park and play boating dominates recreational river use by private (self-equipped) river users. The project would create a reliable hydraulic wave/hole formation that would hold a boat or surfboard. It is anticipated these features would attract users from a several hour driving radius. This is known as “park and play” and is the chief motivation for building whitewater parks in the US.

2.4 Proposed Whitewater Course Description

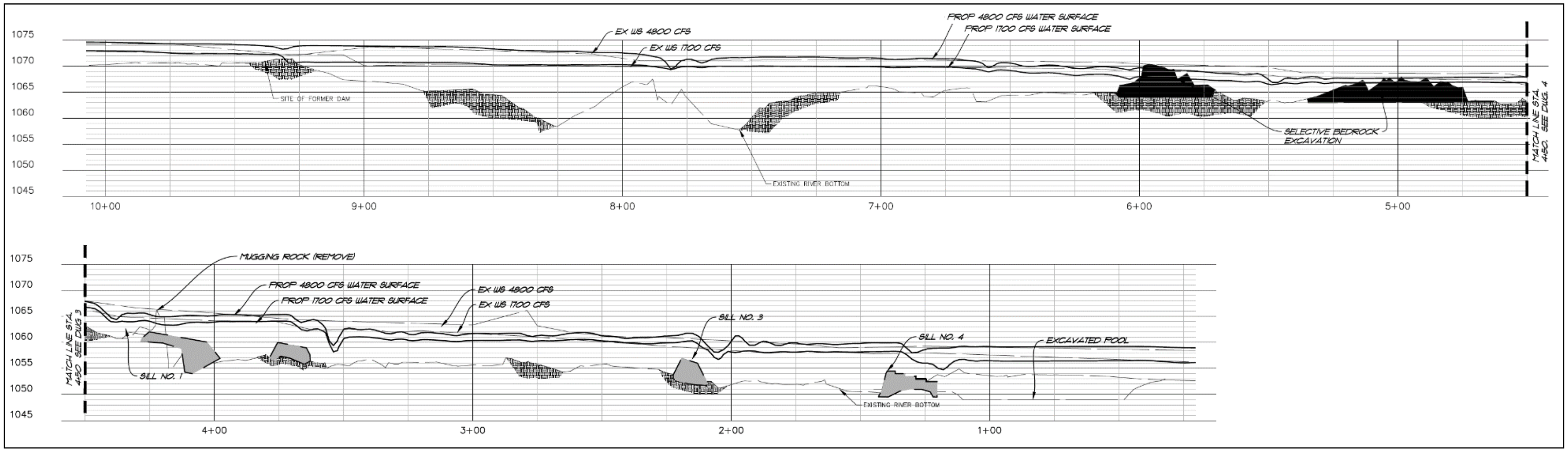
2.4.1 Project Design

The proposed project design layout and profile are depicted in figures 2 and 3 (respectively). A total of four sills would be added with a total surface area of about 2,750 square feet. A total of seven side eddies would be enhanced or created, covering about 3,000 square feet and result in the removal of 300 cubic yards of material (primarily bedrock). One pool would be created below the most downstream sill covering about 2,600 square feet and result in the removal of 600 cubic yards of material. Selective rock removal to improve safety and navigation would cover about 2,600 square feet and result in the removal of about 100 cubic yards of material. In total, to implement the proposed project, about 31,000 square feet of channel would be altered, involving the total removal of 1,100 cubic yards of material and the addition of 200 cubic yards of concrete (180 cubic yards poured on site and 20 cubic yards of pre-cast sill blocks). Taken together, these modifications seek to balance recreation and fish passage needs. Project design elements are described below.



Source: McLaughlin Whitewater Design Group

Figure 2. Project design layout.



Source: McLaughlin Whitewater Design Group

Figure 3. Proposed design profile.

1. Addition of a whitewater sill at the downstream-most end of the Project (Figure 4) would create surfing waves that are popular "park and play" features used by kayakers.

Figure 4. Park and play wave location (Gold Hill project site).

2. Addition of three more concrete and rock sills (hydraulic grade controls) to create localized standing waves - hydraulic formations that increase the recreational value of the river reach (Figure 5).

Source: McLaughlin Whitewater Design Group

Figure 5. Sills 1 and 2 locations (Gold Hill project site).

3. Selective removal of mid-stream rocks to improve safety and navigability (water depth) as well as to distribute the hydraulic energy (Figure 6).

Source: McLaughlin Whitewater Design Group

Figure 6. Selective rock removal to improve navigation and safety (Gill Hill project site).

4. Selective rock excavation along both banks to create eddies for the Olympic whitewater slalom discipline and resting areas for upstream migrating fish (Figure 7). These also allow recreational boaters to "eddy hop" down the reach, a common way to navigate steep rapids.

Source: McLaughlin Whitewater Design Group

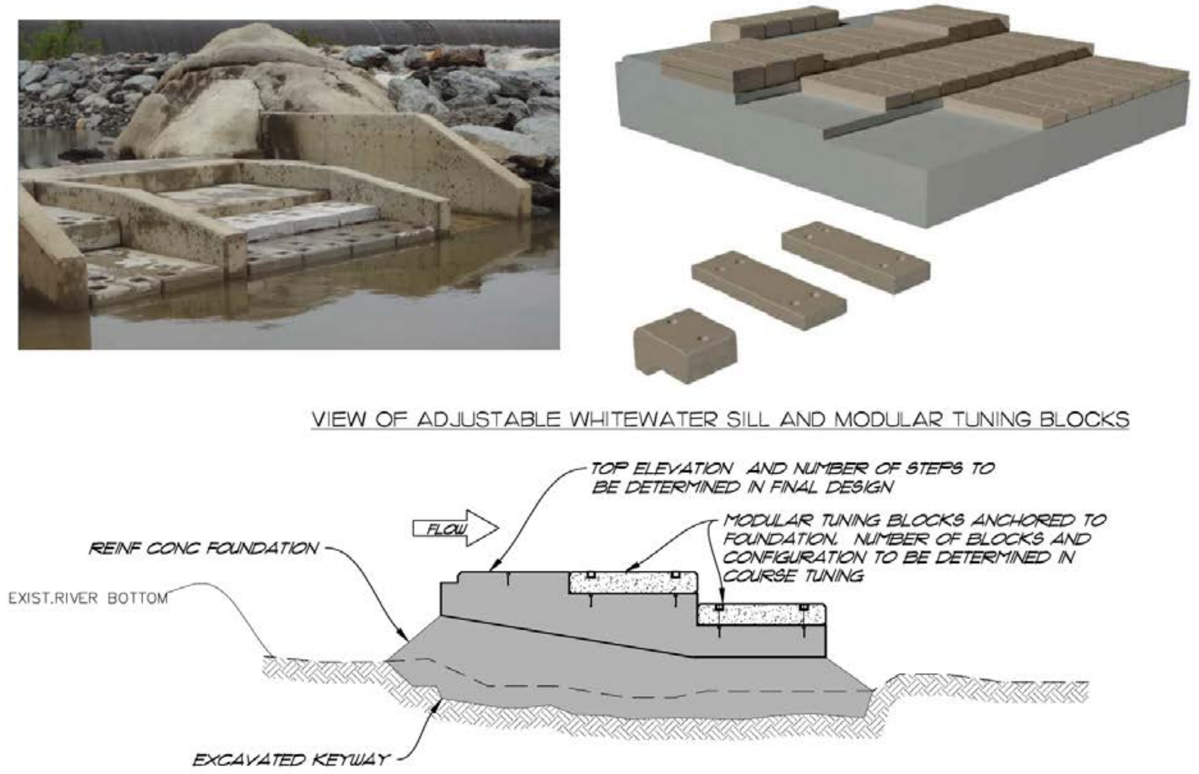
Figure 7. Eddy creation example sites (Gold Hill project site).

The proposed sills are relatively low volume (less than 200 cubic yards of rock and concrete total) and have a structural height of between one and five feet. In larger rivers the sills are typically made of multiple layers of grouted rock. Because of the small size of the sills in this project, the proposal is to make them of concrete with a surface treatment of faux rock for the portions that are visible or just under the surface of the water. An added benefit of faux rock is the ability to control the geometry and elevations to a much higher degree than rock structures. Properly reinforced and constructed faux rock withstands water and weathering. The image below of the faux rock used at the Ocoee River (Tennessee) is over twenty years old and has no surface degradation (Figure 8).

Source: McLaughlin Whitewater Design Group

Figure 8. Faux rock treatment example (Ocoee Park).

A novel aspect of this project is the use of modular concrete blocks for tuning the whitewater features in order to achieve the desired hydraulic performance (Figure 9). Tuning is generally required at whitewater drops to adjust the hydraulic formation to meet specific performance criteria, in this case, recreation and fish passage. The modular system of movable blocks reduces the reliance on post-construction poured concrete and the attendant water control/site isolation. The modular block system is used only in the deepest, central portion of the channel and would not be visible when the water is running. They are attached to a poured concrete foundation which is firmly anchored to the bedrock river bottom. The chief advantage of this system is the ability to make post construction modifications relatively quickly and without extensive dewatering, or placing fresh concrete in the river



Source: McLaughlin Whitewater Design Group

Figure 9. Concrete sill/tuning block example.

2.4.2 Construction Timing and Sequencing

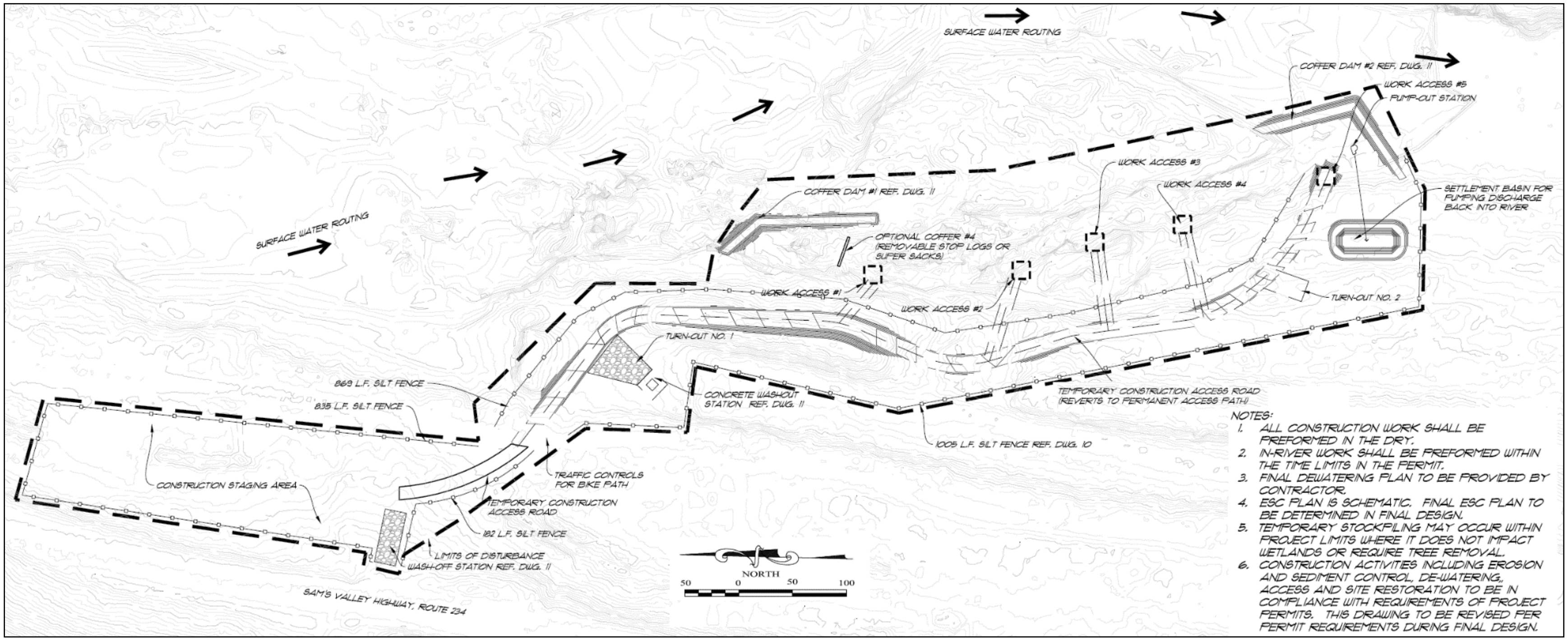
The standard Oregon Department of Fish and Wildlife (ODFW) recommended in-water work period for the Rogue River at the project site is June 15 through August 31. Work on the shore such as mobilization, demobilization, access roads improvements, etc. can occur before and after this time. The in-channel work would be sequenced from upstream to downstream. The overall construction sequencing includes:

1. Mobilize equipment
2. Establish staging areas and construct site access improvements
3. Implement conservation measures
4. Deliver and stage materials
5. Conduct upland grading and earthwork
6. Conduct stream channel isolation, fish salvage and dewatering
7. Conduct in-channel work
8. Re-water and tune sill blocks
9. Reclaim the site and seed disturbed areas
10. Demobilize equipment

2.4.3 Site Access and Staging

Temporary construction access would be facilitated by a gravel road along the west shore (Figure 10). Due to the narrow width of the channel, it is not practical or advisable to build haul roads along the length of the river. Accordingly, the proposal is to build the in-river features from work pads built out into the channel from the main haul road along the west shore. This allows unencumbered access to five discrete work zones in the river channel while allowing freedom of access along the road for other, concurrent construction activities. When the work in one zone is complete, the temporary earth-fill work pads would be removed and recycled to the next work area downstream. For economy, the work pads would be built of excess material cut from the haul roads and borrow from selected areas on site. At the close of construction, the haul road would be reconfigured as a permanent site access trail with the following modifications:

- Gravel topping would be removed and replaced with wood chips
- Fill slopes would be reduced from a 1:1 slope to a 3:1 slope or greater
- Width would be reduced to between 10 to 12 feet, wide enough for a light maintenance vehicle
- Cut and fill slopes would be re-vegetated with native grasses and trees



Source: McLaughlin Whitewater Design Group

Figure 10. Access and staging plan.

2.4.4 Isolation and Dewatering

Isolation and dewatering of the construction site is proposed to complete the in-channel work. Followed by a semi-dry tuning and adjustment phase where water is alternately admitted to the course and then turned off for the purpose of tuning and adjustments with the modular concrete sill block system. During the dry construction phase, the site would be coffered and isolated from flowing water in the adjacent river channel likely using bulk bags. Turbid water from construction activities and leakage from the coffers would be collected in low points within the work zone and pumped to settling ponds outside the river, from where water would be returned to the river downstream after settling. All poured concrete work and excavation would be done in the dry with water control and pump-out measures in place.

The tuning phase is to be done with precast modular blocks, placed by hand or with assistance of light construction equipment. During this activity, it is not necessary to eliminate all leakage since there are no concrete pours or disturbances to the river bottom. In past projects using this system, a small amount of flowing water did not prevent installation of the blocks. In the event that supplemental concrete pours need to occur in tuning, then full isolation would be restored. However, it is the intent of the design to do all tuning with the modular system to the full extent possible.

After placement of the coffers, fish would be removed using electrofishing and seining by qualified fish biologists. Captured fish would be quickly transported downstream in aerated containers as captured and released back to the river. Fish removed and relocated would be enumerated by species, size class and condition. Any subsequent dewatering, after initial re-watering, would require additional fish salvage efforts.

2.4.5 Construction Equipment

Heavy tracked equipment would conduct excavation and material placement. Concrete would be poured using a pumper truck. Coffers and water control gates may be placed using tracked equipment as well as light cranes. Materials would be delivered in road-rated dump trucks and moved about the site with rubber tire loaders. Of these, the concrete pumper and crane govern the design of access roads.

2.4.6 Post-Construction Site Restoration

Temporarily disturbed areas would be re-contoured and stabilized with native vegetation per an approved site restoration plan, which would be developed through the permitting process.

2.4.7 Long-term Maintenance

Maintenance of the Gold Hill Whitewater facility is expected to be typical for parks in riverine settings.

1. Ground maintenance, mowing and trimming
2. Invasive species control
3. Trash removal, litter pick up

4. Removal of debris after flood events
5. Trail grooming and replenishment of topping materials as needed

Maintenance of the whitewater features is not anticipated; the in-river features have a service life estimated to be similar to concrete dams and weirs (at least approximately 50 years). The pools and eddies would accumulate some sediment, but are expected to achieve a stabile equilibrium grade soon after construction. Maintenance dredging of pools is not anticipated. Adjustments to tuning blocks is not anticipated after initial course tuning and commissioning.

2.5 Proposed Conservation Measures

Conservation measures presented below are (1) components of the proposed action, and (2) requirements of contractors during construction. The following measures are intended to minimize potential impacts to listed species and designated critical habitat at the project site.

2.5.1 Preconstruction Activities

Before work commences, the following actions must be completed:

- Grading and offset stakes will be placed according to construction documents to identify the limits of construction areas.

- Staging areas and clearing/disturbance limits will be visibly marked in the field with orange plastic fencing or similar methods.

- The contractor will ensure that the following materials for emergency erosion control are on site: (1) a supply of sediment control materials (e.g., silt fence, straw bales), and (2) oil absorbing floating booms and spill containment kits at each work site.

- Temporary erosion controls identified on project drawings must be in place until completion of construction activities and site restoration.

2.5.2 Construction and Dewatering BMPs

Construction specifications will refine conservation measures for the following work components:

- Mobilization & Demobilization
- Pollution Control
- Clearing and Grubbing
- Stripping
- Removal of Water
- Water Pumping
- Revegetation of Construction Sites
- Fencing of Construction Sites
- Drainage Filters
- Erosion Control Blankets
- Construction Fabrics

2.5.2.1 Staging Areas

- Staging areas will be the minimum size necessary to practically conduct the work.
- Staging area limits will be clearly marked on the ground with orange plastic fencing or similar methods prior to construction.
- Staging areas will be chosen to minimize disturbance to perennial vegetation (based on logistical constraints).

2.5.2.2 Pollution Control Measures

Prior to initiating each of the construction elements, a project-specific Pollution Control Plan for construction activities will be prepared and implemented by the contractor to prevent construction-related pollution from reaching flowing waters or contaminating upland areas. This plan will include the following:

- Practices will be identified to prevent pollution from equipment and material storage sites, fueling operations and staging areas.
- Hydraulic fluids certified as non-toxic to aquatic organisms will be used in equipment used for in-water work.
- Sanitary facilities such as chemical toilets will be located at least 150 feet from water bodies to prevent contamination of surface or subsurface water.
- A spill containment and control plan will be prepared that includes notification procedures, specific clean-up and disposal instructions, quick response containment and clean up materials that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.
- Spill containment kits will be stored at each work site and the construction crews will be trained in proper use.
- A spill response plan will describe the chain of command, incident response procedures, agency notification protocols, and disposal protocols following all applicable local, state, and federal regulations.
- If a spill of chemical pollutants such as fuel or hydraulic fluid should occur, the plan will require that the contractor attempt to contain the spilled material. The following procedures will be followed:

  (a) Notify the project inspector immediately.

  (b) For spillage on land, construct earthen berms or use other suitable barricade material of sufficient size to contain the spill and keep it from spreading.

(c) For spillage on water, attempt to isolate and contain the spilled material. Commercial booms or other suitable materials shall be kept on site during construction to contain fuel and oil spills on water.

2.5.2.3 Equipment Maintenance and Refueling

- Prior to mobilizing to the project site, all equipment will be washed to minimize the introduction of foreign materials and fluids. All equipment will be free of oil, hydraulic fluid, and diesel fuel leaks.
- Vehicle staging, cleaning, maintenance, refueling, and fuel storage must take place in a designated area at least 150 feet from any stream or wetland.
- All vehicles operated within 150 feet of any stream or wetland must be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected must be repaired in the vehicle staging area before the vehicle resumes operation. Inspections must be documented in a record that is available for review on request.
- All equipment operated instream must be cleaned before beginning operations below the bankfull elevation to remove all external oil, grease and dirt.
- All other power equipment within 150 feet of the water will be inspected daily for fluid leaks and repaired. The contractor must prepare daily inspection reports.
- If a fluid leak does occur, the project inspector shall be notified immediately, and all work ceased at that specific location until the leak has been rectified. At all times during construction, fluid spill containment equipment will be present on-site and ready for deployment should an accidental spill occur. The project inspector reserves the right to refuse equipment that does not meet criteria.
- Stationary power equipment (e.g., generators) operated within 150 feet of any stream, water body or wetland must be diapered to prevent leaks.
- All fuel and lubricants will be stored in containers and areas that conform to applicable local, state and federal regulations.
- If a spill of fuel or hydraulic fluid occurs, the contractor will immediately attempt to contain the spilled material and notify the appropriate regulatory agency following the spill response plan and all applicable local, state, federal regulations.
- Petroleum contaminated soils resulting from contractor fueling, greasing, and cleaning, or due to fluid leaks will be removed and disposed of following all applicable local, state, and federal regulations.

2.5.2.4 Erosion Control and Construction Stormwater Management

An Erosion Control Plan and a Stormwater Pollution Prevention Plan will be prepared and will identify BMPs to minimize erosion and sedimentation associated access roads, water crossings, construction site, equipment and material storage site, and staging areas. Typical measures will include:

- To prevent sediment from entering stream and wetland habitats, erosion control measures will be implemented such as filter bags, sediment traps or catch basins, vegetative strips, berms, jersey barriers, fiber blankets, bonded fiber matrices, geotextiles, mulches or compost, wattles and silt fences, and covering exposed soils with plastic sheeting.
- Disturbance to riparian vegetation will be the minimum necessary to achieve construction objectives so as to minimize habitat alteration and the effects of erosion and sedimentation.
- During construction, all erosion controls will be examined daily by the project inspector to ensure they are working adequately.
- If inspection shows that the erosion controls are ineffective, work crews will be mobilized immediately to make repairs, install replacements, or install additional controls as necessary.
- Sediment will be removed from control devices once it has reached 1/3 of the exposed height of the control.
- Measures will be implemented to prevent stockpile erosion during rain events or when the stockpile site is not moved or reshaped for more than 48 hours. These may include surrounding piles with compost berms, covering piles with impervious materials or other equally effective methods.
- Measures will be implemented to prevent construction vehicles from tracking sediment offsite or onto roadways where it may wash into storm drains, waterways, or wetlands; including gravel access pads, wheel wash stations, or other equally effective methods.

2.5.2.5 In-water Work, Dewatering and Water Treatment

- The work areas will be isolated using cofferdams.
- In-channel work will be completed during the ODFW in-water work period of June 15 through August 31.
- The cofferdams will remain in place for the duration of work. After the work in the specific area is complete, these measures will be removed to introduce free flowing water into the area in a controlled manner.
- Any pumps used to dewater areas potentially used by fish will be screened to prevent fish entrainment. Pump screens will meet National Marine Fisheries Service salmonid fry criteria.
- As work areas are dewatered, fish will be removed by seining and/or electrofishing. Fish will be transported safely downstream of the work zone and released as soon as possible

after collection. A summary report of any fish salvage effort will be prepared that, at a minimum, includes a summary of methods, enumeration by species of fish and size class encountered, and description of their ultimate disposition.

2.5.3 Restoration of Temporary Construction Impacts

Temporary construction impacts outside the treatment areas will be restored as follows.

- All staging areas will be restored to pre-construction condition, or as specified in the approved restoration site plan.
- Temporary erosion control measures will remain on site and operational until the site is stabilized, at which time the devices will be removed.
- Implement any mitigation measures for impacts to waters of the United States that are specified in permit(s) issued by the Army Corps of Engineers, Oregon Department of State Lands, and Oregon Department of Environmental Quality.

3 Listed Species and Critical Habitat

3.1 Listed Species and Critical Habitat Occurrence in the Action Area

A list of federally endangered, threatened and proposed species, and critical habitat that may occur in the action area was compiled using the NMFS and USFWS websites regarding listed species and critical habitat designations, and reviewing recent Biological Opinions issued by NMFS in the Rogue River Basin. The only ESA listed species that is known or maybe present at the project site is the SONCC coho salmon. The Rogue River is also designated as coho critical habitat under the ESA.

3.2 Coho Status and Occurrence at Project Sites

3.2.1 Status

The NMFS reaffirmed the SONCC coho as threatened under the ESA on June 28, 2005. It was originally listed on May 6, 1997 (62 FR 24588). The SONCC coho inhabit coastal rivers and streams between Cape Blanco in southern Oregon to Punta Gorda in northern California (Weitkamp et al. 1995). Most of the remaining natural production in this ESU occurs in the Rogue, Klamath, Trinity, and Eel River basins.

Williams et al. (2006) suggested that coho inhabiting the Rogue River are composed of three distinct populations separated in the upper Rogue River, middle Rogue/Applegate River, and Illinois River watersheds. Further, the authors concluded that the upper Rogue River watershed, which encompasses the project area, supports the second largest independent population of the entire SONCC coho ESU.

3.2.2 Critical Habitat

Critical habitat was designated on May 5, 1999, and includes all river reaches accessible to the coho between the Mattole River in California and the Elk River in Oregon inclusive. The Rogue River in the project area falls within this critical habitat designation. Critical habitat includes all waterways, substrate, and adjacent riparian zones below longstanding, naturally-impassable barriers. The adjacent riparian zone is defined based on key riparian functions, which include shade, sediment, nutrient/chemical regulation, streambank stability, and input of large woody debris/organic matter. These features provide physical and biological features essential to the conservation of the species. These include spawning sites, food resources, water quality and quantity, and riparian vegetation.

3.2.3 Life History and Ecology

The following information is summarized from NMFS (2012) unless cited otherwise. Adult coho typically begin their freshwater spawning migration as 3-year-olds in the late summer and fall, spawn by mid-winter, and then die. The run and spawning times vary between and within populations. Life stages likely to occur within the action area include adult upstream migration and juvenile downstream migration. Based on the steep gradient, high velocity, and confined bedrock nature of the project site, juvenile rearing and adult spawning is not expected in the project side channel reach. Peak coho salmon smolt outmigration occurs in late April. Adult coho salmon begin entering at the mouth of the Rogue River in late September to mid-October. The majority of coho salmon adults migrate past the former Gold Ray Dam location between mid-October and mid-November. Historically, nearly 90% of the adults passed the Gold Ray Dam site before December each year. Spawning is generally in tributary streams, not the mainstem Rogue River channel.

Juvenile coho typically rear in freshwater for up to 1.5 years, then migrate to the ocean as smolts in the spring, from about mid-February through June. ODFW conducted smolt trapping in tributary streams above Gold Ray Dam from 1999 to 2004 and observed that the peak migration of coho salmon smolts ranged from late March to late May. Juveniles rear in tributary streams before smolting and migrating to salt water during spring or possibly fall of the year following emergence. Juvenile coho prefer low gradient habitat with slow current and complex habitat features, such as backwater pools, beaver ponds, dam pools, sloughs and low gradient side channels.

4 Environmental Baseline

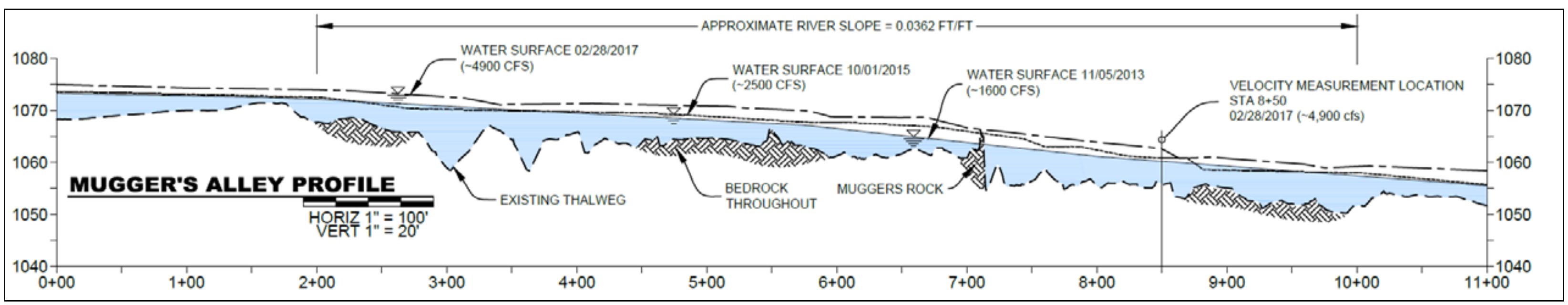
The environmental baseline includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process 50 CFR § 402.02(d). The baseline provides a reference for NMFS and the USFWS to evaluate the species' current status in relationship to the proposed action. NMFS (2012) recently summarized the status of the Rogue River environmental baseline in the action area in relation to listed SONCC coho, which remains accurate and is incorporated in this BA by reference. In summary, while historic land use has degraded aquatic and riparian habitat through the Rogue River Basin, such as urban and rural development, hydroelectric power generation, mining, flood control, forest and agricultural practices, in recent years, many relatively large fish passage obstructions have been removed, such as Savage Rapids (2009) and Gold Ray (2010) dams. In 2008, the Gold Hill Dam (Figure 11) was removed just upstream of the proposed project site. Gold Hill Dam was an 8-foot high concrete dam spanning the Rogue River a mile upstream of Gold Hill, Oregon. The dam was the second greatest barrier to fish passage in the Rogue River Basin. Removal of these mainstem Rogue River dams have improved passage for all salmonids including SONCC coho. Existing environmental baseline conditions in the vicinity of the project site are described below.

The hydrology of the project site is highly influenced by discharges from the COE's Lost Creek Lake Reservoir. Completed by the COE in 1977, the Lost Creek Project is a multipurpose flood control dam. Water quality in the Rogue River mainstem and in its tributaries has been degraded by historic and current land uses. Under Section 303(d) of the Clean Water Act, the mainstem Rogue River within the action area does not meet water quality standards for the following: alkalinity, ammonia, chlorophyll-a, dissolved oxygen, E. coli, fecal coliform, pH, phosphorus, and water temperature. Most important to fish habitat, warm water temperatures and low dissolved oxygen concentrations can adversely affect all life stages of anadromous fish present in the mainstem.

There are multiple channels in the project vicinity, and the project site is the western most bedrock channel. Figure 12 depicts the current conditions of the proposed project site, Figure 13 depicts the project site bedrock channel profile, and Figure 14 shows the approximate locations of proposed project elements. Substrate within the project area side channel is composed of nearly entirely bedrock, because SONCC coho salmon typically spawn in tributaries to the mainstem and because the project site is nearly entirely bedrock, no coho spawning habitat is present. The riparian vegetation at the site is composed of oak savannah, willow shrubs along the bank, and Himalayan blackberry and is relatively sparse.

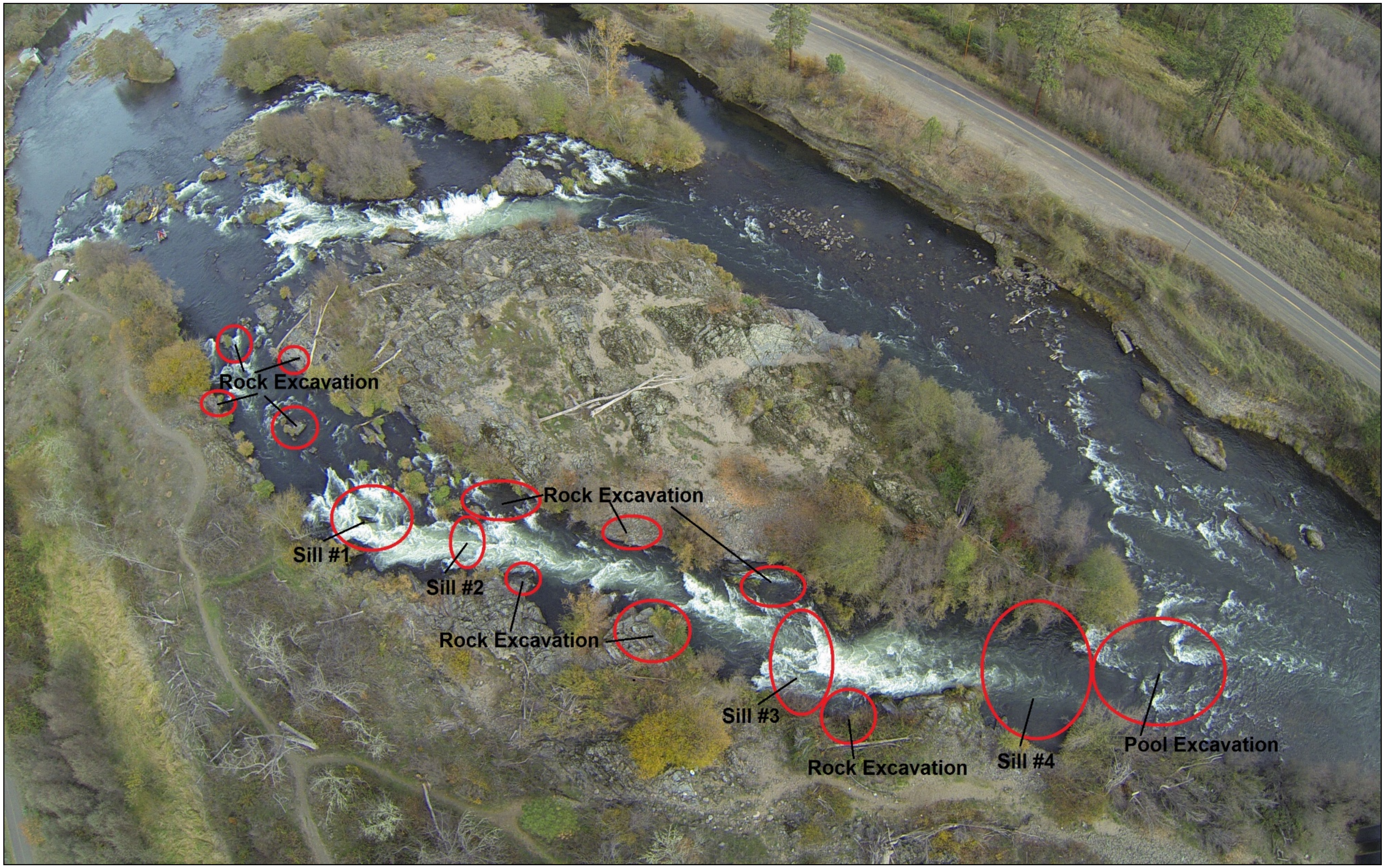
Figure 11. Project vicinity pre-Gold Hill Dam removal.

Figure 12. Existing conditions (Google Earth aerial photo July 2017).



Source: River Design Group

Figure 13. Existing proposed project bedrock side channel profile.



Source: River Design Group

Figure 14. Existing site conditions with proposed project design element approximate locations (drone flight, 11/2013).

5 Analysis of Effects of the Proposed Action

The proposed project would result in alterations to critical habitat for ESA listed species and essential fish habitat for Pacific Coast salmon. When considering effects on critical habitat and EFH, there are several habitat elements to consider, including water quality, water quantity, floodplain connectivity, passage conditions, riparian vegetation, substrate, cover, and water temperature. In addition, analyses must consider not only project construction, but also operation, and maintenance over the long-term.

5.1 Direct Effects on Listed Fish

In this section, direct effects of the proposed project are analyzed. The proposed project has three distinct direct effect avenues: those caused during construction, the existence of the project after construction, and from any long-term maintenance activities. During construction, there are several ways that fish could be directly affected. Direct construction effects include: capture and handling during fish salvage in de-watered areas; harassment or actual mortality through contact with the in-water construction equipment; and effects on water quality, such as increased turbidity during construction, which may displace individual fish. Direct effects on critical habitat during in-water construction are discussed in Section 5.2 (Effects on Salmonid Designated Critical Habitat). Direct effects from project existence after construction are primarily related to fish passage conditions. Long-term maintenance effects relate to the stability of the project over time are not anticipated

5.1.1 Construction Effects

Capture, Handling, and Mortality during Fish Salvage of In-Water Work Areas

Temporary construction effects on juvenile and adult listed fish include potential capture and handling during salvage operations in dewatered work areas. In-water work would disturb about 31,000 square feet of river habitat, which would primarily result from temporary de-watering (Table 1). In-water work would occur during the ODFW in-water work period, from June 15 through August 31. After the coffer dams are installed and operational, any fish trapped between the coffer dams would be safely removed and relocated out of the work zone using a combination of seining and electrofishing by trained fish biologists following methods stipulated in a scientific collection permit issued by ODFW and approved by NMFS. Use of electrofishing for fish salvage would comply with NMFS electrofishing guidelines (NMFS 2000) which are expected to adequately minimize the levels of stress, mortality, and competitive effects related to electrofishing.

The project side channel is bedrock dominated, with high gradient, fast water velocity, and little riparian or instream cover. This is not a habitat type preferred by juvenile coho. Juvenile coho typically prefer side/off-channel rearing habitat with low gradient, high habitat complexity and complex cover. Therefore, abundance of juvenile coho in the work zone is anticipated to be low. The isolation and dewatering would occur in June when adult coho would not be present. Based on species life history and expected occurrence by life stage, the habitat type, and average density values by habitat type for coho, we conservatively overestimate effects on listed coho as follows.

About 310 juvenile coho, may be harassed during in-water work, either through displacement or capture and handling when the work area is dewatered (Table 1). These values are based on average juvenile density by habitat type for productive salmonid systems (as reported in the scientific literature). We conservatively over-estimate that up to 5 percent of fish within the work isolation area would not be captured due to expected capture gear efficiency. These fish would not survive as the work area is dewatered. Of the fish captured and transferred, we conservatively over-estimate that up to 5 percent of fish captured and transported out of the work area may not survive due to stress and/or injury. NMFS (2004) suggests that during fish salvage, about 98 percent of fish are expected to survive with no long-term effects, and 2 percent are expected to be injured or killed (including delayed mortality). For this project, a more conservative higher mortality rate of 5 percent was assumed to account for the relatively large area to be dewatered and allow for variations in site conditions. Therefore, in total, we estimate about 30 juvenile coho would not survive the isolation, dewatering and relocation. This very small level of mortality would not be considered a population level effect as it would not result in measureable effects to adult returns.

Although not ESA-listed, the number of juveniles of other species is also estimated and presented in Table 1 to inform future fish salvage planning efforts. Density of other salmonids such juvenile Chinook, rainbow trout, and cutthroat trout are expected to be within a similar density range as coho and steelhead because salmonids do not prefer bedrock rapid habitat.

Table 1. Estimate of salmonids within proposed work isolation and dewatering area.

	Juvenile Coho	Juvenile Steelhead
ODFW In-Water Recommended Work Time	June 15 - August 31	
Total Isolation/ Dewatering Area	31,000 square feet	
Predominant Habitat Type in Isolation/ Dewatering Area	Rapid over bedrock	
Life Stage Potentially Present	Juvenile	
Average Density Reported in Literature (Fish/SF)	0.01	0.01
No. of Fish in Isolation/ Dewatering Area	310	310
No. of Fish to Avoid Capture and Perish (5%)	15	5
No. of Fish Captured and Relocated Downstream	295	295
Capture / Handling Mortality (5%)	15	15
Total Mortality Estimate	**30**	**30**

[a]Nickelson (1998)
[b]Cramer and Ackerman (2008)

Harassment and Migration Delay from In-water Work

Adult coho migrate in the fall; therefore, upstream migrants are not expected to be present during in-water work. Furthermore, other migratory fish species can use the center channel or the eastern-most side channel to move through this reach of the Rogue River during the construction period (either upstream or downstream). Therefore, migration past the construction site is expected to be unencumbered for all fish species during construction.

Water Quality Alteration and Fish Displacement

Adverse water quality effects on listed fish and their critical habitat potentially could occur during in-water or near stream work. For example, turbidity could increase during in-water activities or uncured concrete slurry could be introduced during construction of the weir sills. However, several measures will be implemented to reduce or eliminate the potential for erosion or the discharge of concrete to the river (see Section 2.5 Conservation Measures).

Even with best management practices (BMPs) and monitoring, a short-term decrease in water quality through inadvertent releases of sediment, green concrete, or petroleum products may occur to the river. Rain events increase the risk of water quality degradation due to soil erosion and introduction of stormwater runoff containing fuel and oil from construction equipment. The risk would be greater if water treatment and containment facilities are overwhelmed during an unusually large rain event. Because of the scale of project activities, a large spill is unlikely to occur and the intensity and duration of small leaks would be so mild that the effect could not be meaningfully measured, detected, or evaluated in the environment, any resulting effect to SONCC coho salmon would also be immeasurable or undetectable. Furthermore, fish would be removed from the isolated work zone prior to starting work. Therefore, it is unlikely that SONCC coho would be injured or killed by chemical contaminants.

Installing and removing coffer dams are reasonably certain to cause some increase in turbidity; however, most of the substrate is bedrock and therefore any increase in turbidity is expected to be minor and for short duration (few hours). NMFS (2012) provides a detailed analysis of elevated suspended sediment related to SONCC coho effects, which is applicable to the proposed project and is summarized below in relation to the proposed project.

Chronic exposure to elevated suspended sediment levels can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Lloyd 1987, Servizi and Martens 1991). Suspended sediment at a concentration of 53.5 mg/L for a 12-hour period can cause physiological stress and changes in behavior in coho salmon (Berg 1983). An increase in suspended sediment concentrations as low as 17 mg/L can cause gill inflammation and respiratory stress in juvenile coho for durations as short as 4 hours (Berg and Northcote 1985). However, it is unlikely that suspended sediment concentrations generated from cofferdam installation and removal would exceed the 53.5 mg/L threshold for physiological stress and changes in behavior. It is extremely unlikely that a sediment plume would exist for 12 hours because in-stream construction activities are unlikely to last longer than eight hours. Furthermore, salmonids have been observed to move laterally and downstream to avoid sediment plumes (Sigler et al. 1984, Lloyd 1987, Servizi and Martens 1991). As the project side channel represents a small portion of the overall habitat available in the Rogue River adjacent to the project site, any coho present could easily move to unaffected habitat nearby.

Therefore, while some SONCC coho salmon juveniles may be exposed to increased turbidity and suspended sediment during cofferdam installation and removal, the intensity, duration, and extent of suspended sediment plumes would likely be so small that any resulting effect would be nonexistent or so mild that it could not be meaningfully measured, detected, or evaluated. Therefore, suspended sediment plumes are not likely to injure or kill juvenile SONCC coho salmon.

5.1.2 Long-term Effects from the Existence and Use of the Project

Habitat Type and Distribution

Over the long-term, habitat types favorable to juvenile salmonids would be improved by the proposed project. The project side channel is currently dominated by rapids over bedrock with limited pool and eddy features. This type of habitat is not preferred by any salmonid species for foraging or rearing. Under the proposed project, several side eddy features would be constructed, which would increase resting and foraging habitat for all juvenile salmonid species, including SONCC coho compared to existing conditions. Under current conditions, riparian vegetation is sparse along the bedrock-dominated side channel and would continue to remain so under the proposed project.

Fish Passage

At least three channels are present in the vicinity of the project site (in relation to the total cross section of the Rogue River) to pass upstream and downstream migrant fish: the western channel, which is the project side channel, the center channel, and the eastern side channel (see Figure 12). Fish passage through the project side channel would be improved overall with the addition of side eddies and pool features, which would provide more resting habitat for fish, such as adult SONCC coho, if they so choose to migrate upstream through the project side channel instead of selecting the larger center channel, or the eastern side channel.

The side eddy creation elements of the proposed project are primarily designed for boaters to use when proceeding downstream to “eddy hop”, where boaters can eddy out after passing over a hydraulic drop (rapid), they can rest and setup to run the next drop. These same eddies can also be used by upstream migrating fish to rest after passing each hydraulic drop. Under existing conditions, side eddies upstream of hydraulic drops are relatively sparse at all modeled flows when compared to proposed conditions (figures 15, 16, and 17). In particular, the proposed project would create multiple relatively large eddies between sills 2 and 3 under the two lower modeled flows. These sills are located about midway along the length of the entire side channel (figures 15 and 16). At the highest modeled flow, results show a slow water channel developing between sills 2 and 3 that is much larger than under current conditions (Figure 17). Of note, monthly median flows (50% exceedence; see Table 2) during the adult coho upstream migration season (September through December) range from about 1200 to 1800 cfs (approximated by the modeled flows of 1100 and 1700 depicted in figures 15 and 16).

Table 2. Monthly flow exceedence (Rogue River near the project site).

								In-water Work					
	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1% Exceedance	11400	19638	14620	9578	8815	8545	6657	3920	3434	2720	2111	8838	22000
10% Exceedance	4730	7644	5534	5910	5808	5390	3810	2980	2580	2359	1600	2920	6948
20% Exceedance	3390	5326	3726	4604	4790	4456	3378	2686	2390	2168	1510	2308	4586
30% Exceedance	2810	3922	2980	3914	4000	3800	3140	2410	2280	1990	1450	1840	3208
40% Exceedance	2420	2992	2546	3270	3396	3422	2996	2230	2210	1890	1380	1610	2492
50% Exceedance	2150	2480	2180	2850	2875	3140	2840	2050	2120	1740	1310	1500	2070
60% Exceedance	1900	2130	1910	2360	2530	2888	2620	1920	2010	1600	1260	1400	1830
70% Exceedance	1660	1900	1700	1970	2303	2600	2420	1780	1920	1483	1180	1340	1686
80% Exceedance	1470	1610	1512	1590	1880	2314	2152	1610	1840	1370	1084	1180	1520
90% Exceedance	1260	1430	1320	1202	1421	2030	1880	1512	1720	1211	1000	1100	1390
99% Exceedance	984	1192	1060	1060	1003	1300	1366	1046	1060	1006	890	919	1040
Min	874	1070	1030	1010	946	1190	1340	1030	1030	927	874	909	1010
Max	53900	53900	22400	16200	18400	11100	11700	4170	3840	3230	4170	19100	31800

Source: McLaughlin Whitewater Design Group

Under existing condition there are generally three high velocity zones containing hydraulic drops. With the proposed project, four high velocity zones would contain hydraulic drops for upstream migrating salmon and steelhead to navigate at each of the sill installations. Sill zones 1, 2 and 3 correspond to the high velocity/hydraulic drop zones under existing and proposed conditions. Sill zone 4 currently is not a high velocity/hydraulic drop, but under the proposed action, this site would be developed with a hydraulic drop and pool to form a "park and play" wave feature.

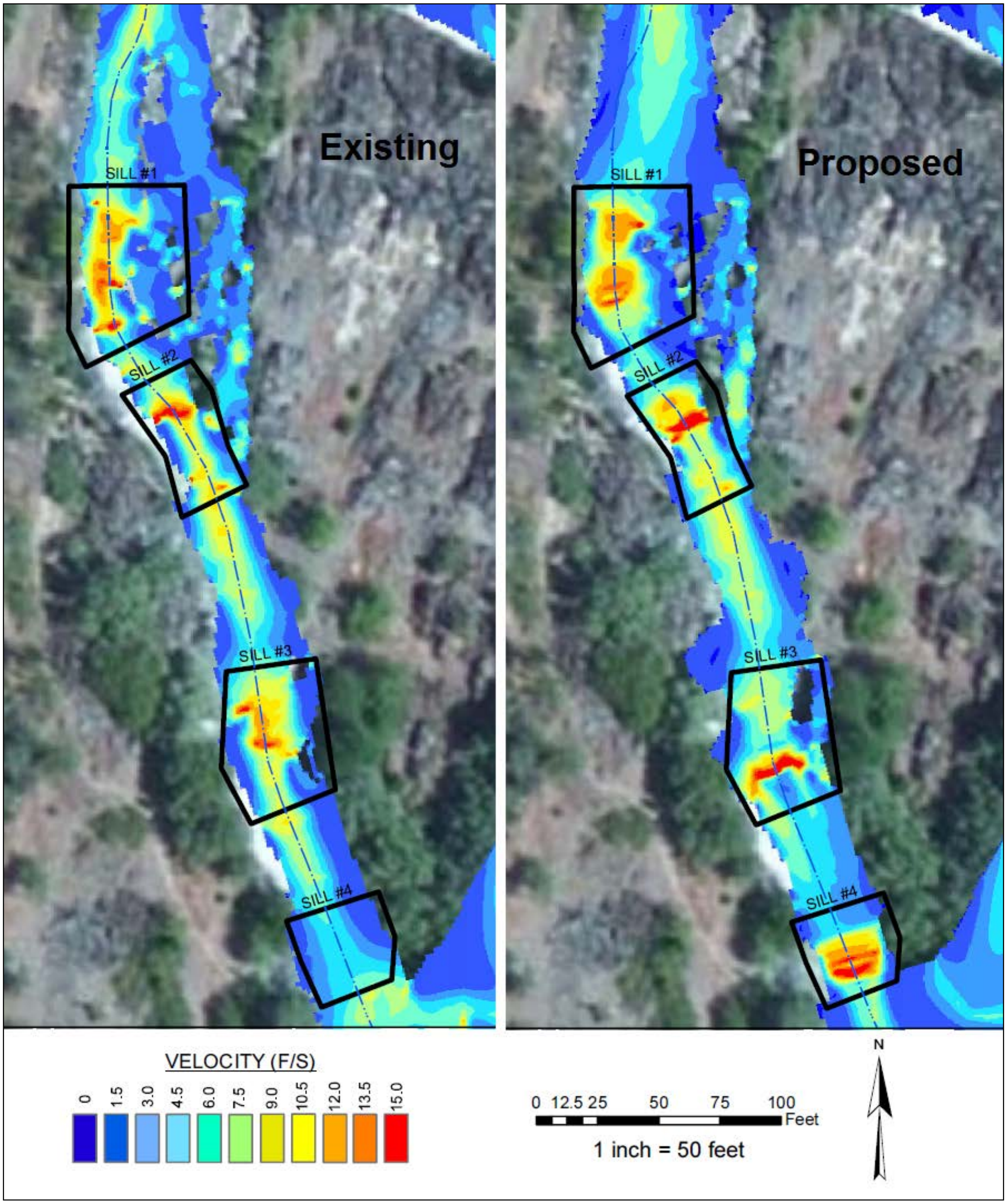
Figure 18 shows the average relative change in velocity (increase, decrease, or no change) at each sill zone at the three modeled flows (1,100, 1,700 and 4,800 cfs). Results show that at sill zone 1, while velocity would somewhat increase, the velocity over most of the zone would not change and a substantial portion of the zone's velocity would decrease. Sill zone 2 exhibits a similar pattern, but the area of increased velocity is greater. The largest area where velocities are expected to decrease is at sill zone 3. Whereas, sill zone 4 would have the greatest area of increased velocity. This is expected as Sill Sone 4 would be placed where no hydraulic drop currently exists. It is important to note that at all sill zones, a significant portion of the total area is expected to experience a drop in average velocity over all modeled flows (Figure 18) and areas with low velocities, 0 to 2 feet per second (fps]), appear to be more prevalent and larger along the margins of the project side channel at all modeled flows compared to existing conditions, except immediately upstream of sill zone 4 (figures 15, 16, and 17).

While installing the "park and play" wave feature at sill 4 would result in one extra high velocity obstacle for upstream migrating fish to pass through in the project side channel, the increase in relatively large slower water side eddies through this channel (particularly between sills 2 and 3 midway through the channel) would provide a resting spot for upstream migrating fish to recovery (if necessary) before ascending the remainder of the side channel. Under both existing and proposed modeled conditions (figures 15, 16 and 17), small areas of high velocity (15 fps) occur at all hydraulic drops under current and proposed modeled conditions. These modeled conditions are well within the burst swimming speeds reported for adult salmon and steelhead, including coho (Table 3). Velocities within the prolonged and sustained swimming speed range (for salmon and steelhead, including coho) are prevalent throughout the project side channel under both existing and modeled flows (Table 3; figures 15, 16, and 17). Therefore, it is expected that upstream migration for SONCC coho would not be hindered through the project side channel under the proposed action. In addition, SONCC coho have two other routes to pass upstream through the Rogue River adjacent to the project site; neither would be influenced by this project (the larger middle channel and eastern channel).

Table 3. Adults salmon and steelhead swimming speeds (fps).

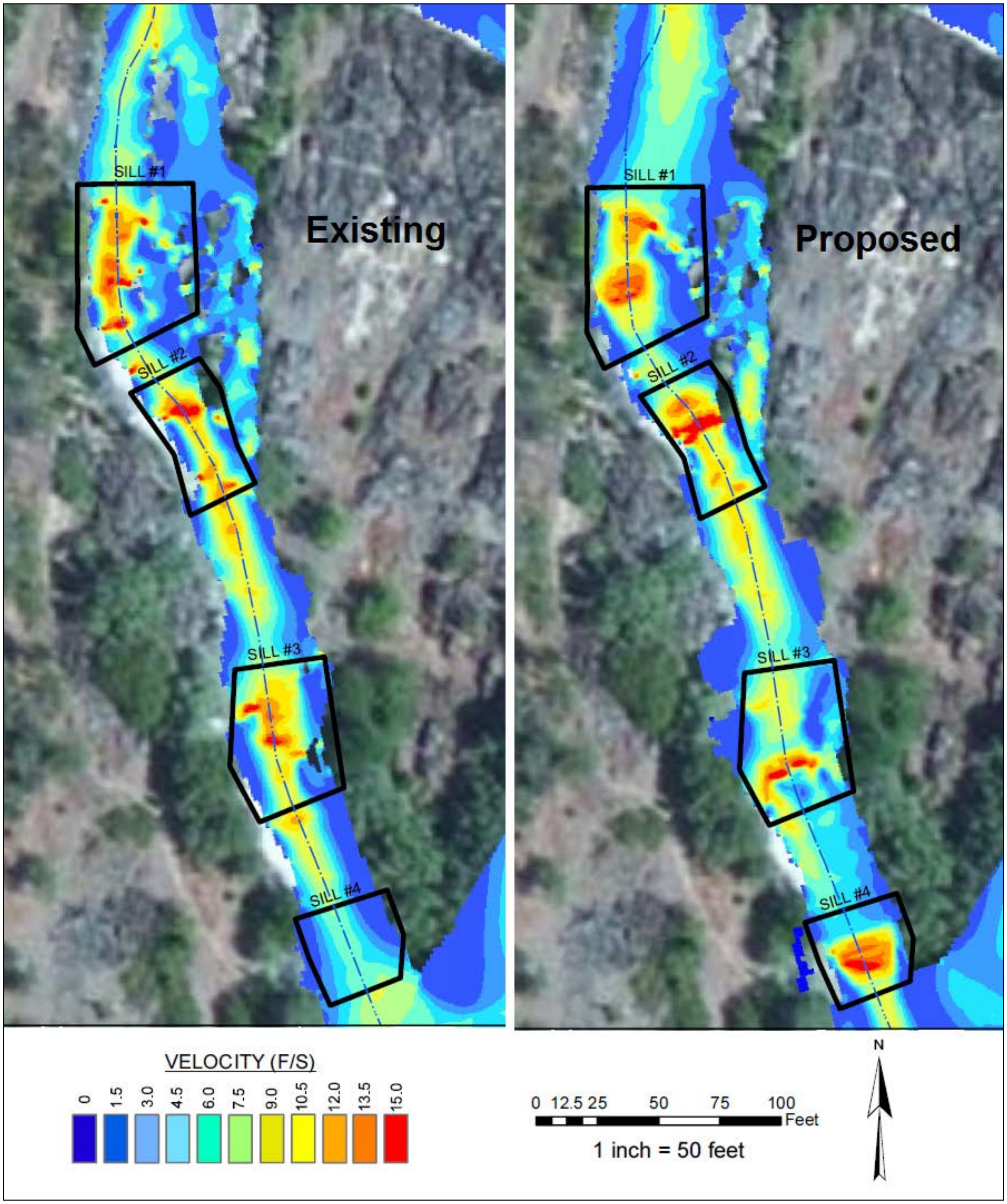
	Sustained	Prolonged	Burst
Steelhead	0 - 4.6	4.6 - 13.7	13.7 - 26.5
Chinook	0 - 3.4	3.4 - 10.8	10.8 - 22.4
Coho	0 - 3.4	3.4 - 10.6	10.6 - 21.5

Source: Orsborn (1983), Aaserude and Orsborn (1985)



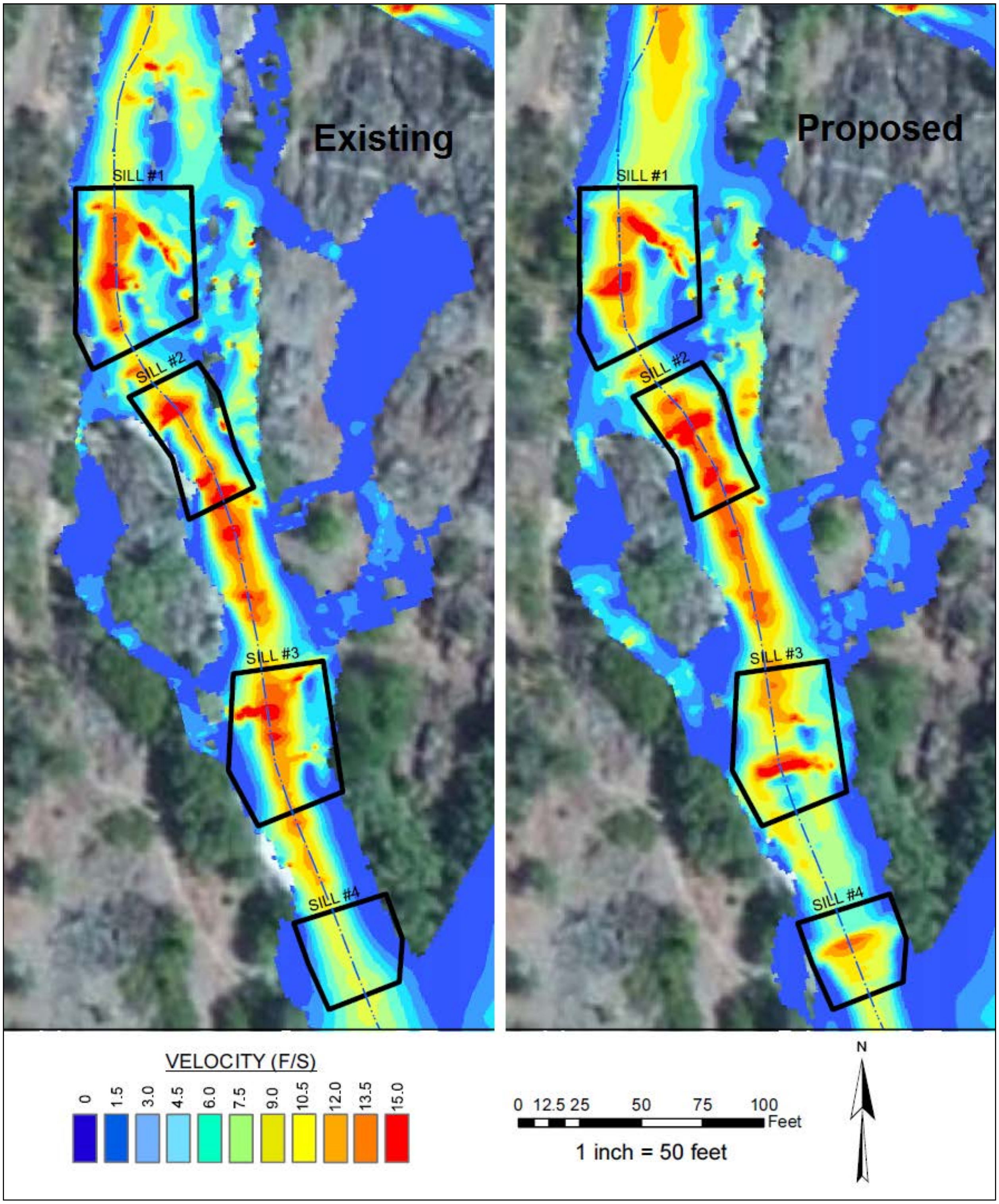
Source: McLaughlin Whitewater Design Group

Figure 15. Existing and proposed velocities modeled at 1100 cfs.



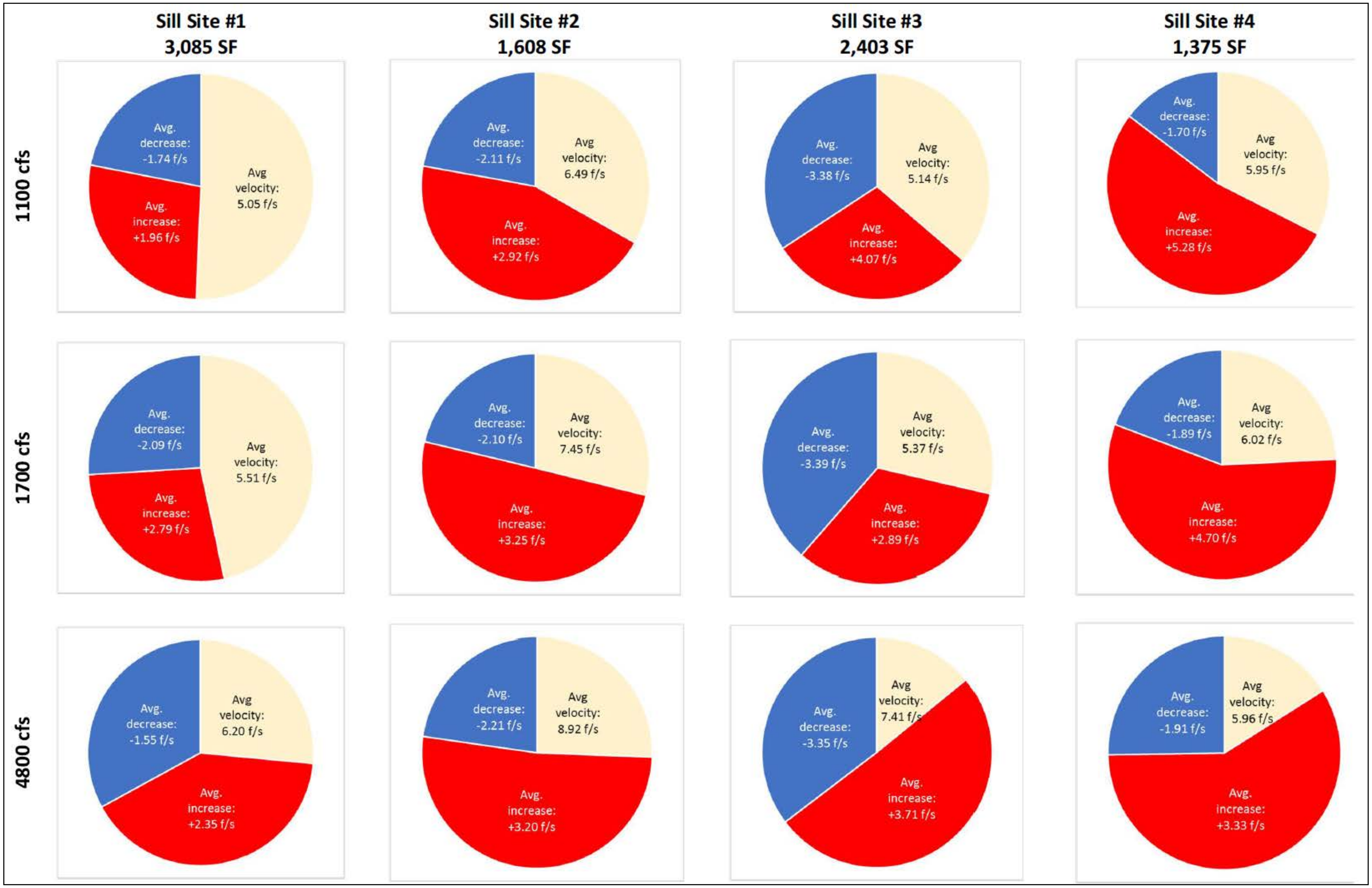
Source: McLaughlin Whitewater Design Group

Figure 16. Existing and proposed velocities modeled at 1700 cfs.



Source: McLaughlin Whitewater Design Group

Figure 17. Existing and proposed velocities modeled at 4800 cfs.



Source: McLaughlin Whitewater Design Group

Figure 18. Sill site velocity evaluation (2D).

5.1.3 Long-term Maintenance

Maintenance of the whitewater features is not anticipated; the in-river features have a service life estimated to be at least 50 years. Dredging of pools is not anticipated. Adjustments to tuning blocks is not anticipated after initial course tuning and commissioning. Therefore, no long-term effects are expected from maintenance actions.

5.2 Effects on Designated Salmonid Critical Habitat

Critical habitat for SONCC coho contains several essential features including:

- Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development;
- Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks;
- Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

The proposed project would affect a side channel characterized as a rapid with substrate dominated by bedrock. This type of habitat does not support potential spawning for salmonids due to lack of gravel. High velocity habitat with little cover and bedrock substrate is not a preferred habitat for juvenile coho or any salmonid species. As previously discussed, the habitat function of the project side channel is primarily a migration corridor.

During the short construction phase, fish passage would not be available through the project side channel, but passage through the middle and eastern side channels would be unaffected. There is some chance for water quality degradation during construction, but BMPs would minimize this risk. Regardless, these effects are temporary.

Over the long-term, passage conditions through the project side channel would be about the same as under existing conditions. Although an additional hydraulic obstacle would be added (Sill 4), the additional side eddies would provide more resting habitat for upstream migrating SONCC coho compared to existing conditions. Limited riparian vegetation through this rocky reach provides little cover and shade; therefore, construction effects would be minor. In the long-term, riparian conditions are expected to be similar to current conditions.

Overall, the function and value of the project side channel habitat would be essentially about the same under the proposed action as compared to existing conditions. Therefore, the proposed project would not destroy or adversely modify designated SONCC coho critical habitat.

5.3 Indirect Effects on Salmonids

Increased boating use could potentially increase harassment of adult coho, and potentially cause upstream migration delayed for coho and any other fish that may choose to use the project side channel. However, coho salmon are commonly observed to migrate upstream through obstacles primarily in the early morning and evening when recreational boaters would not be present (Meridian and NCH 2016). Therefore, increased fish harassment caused by increased recreational use is not expected.

5.4 Effects from Interdependent or Interrelated Actions on Salmonids

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification (50 CFR 402.02). Interdependent actions are those that have no independent utility apart from the action under consideration (50 C.F.R. 402.02). No interrelated or interdependent actions have been identified as part of the proposed action.

5.5 Cumulative Effects

Cumulative effects are defined in 50 CFR § 402.02 as "those effects of future state, tribal, local or private actions, not involving Federal activities, that are reasonably certain to occur in the action area." Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA; actions that will undergo their own ESA consultation are not to be considered as cumulative effects (USFWS and NMFS 1998). At this time, we are not aware of any specific future non-federal activities within the action area that will not undergo ESA Section 7 consultation.

6 Incidental Take Estimate for SONCC Coho

As described in Section 5.1.1 (Construction Effects), we estimate about 310 juvenile coho may be present within the project side channel during construction area isolation and dewatering. Of those, we estimate that 295 would be captured and safely relocated away from the work zone, but that a total of 30 may be killed due to non-capture or injured and killed during capture. This small level of incidental mortality would not be considered a population level effect, as it would not result in measureable effects to adult returns. Adult coho are not expected to be present during construction activities.

7 EFFECTS DETERMINATION (ESA LISTED SPECIES AND CRITICAL HABITAT)

The primary objective of this BA is to determine the effects that the proposed project will have on ESA listed species and critical habitat in the action area. To facilitate and standardize the determination of effects for ESA consultations, the Services use the following definitions for listed species (USFWS and NMFS 1998):

No effect: This determination is only appropriate "if the proposed project will literally have no effect whatsoever on the species and/or critical habitat, not a small effect or an effect that is unlikely to occur." Furthermore, actions that result in a "beneficial effect" do not qualify as a no-effect determination.

May affect, not likely to adversely affect: The appropriate conclusion when effects on the species or critical habitat are expected to be beneficial, discountable, or insignificant. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat.

May affect, likely to adversely affect: This is the appropriate conclusion when there is "more than a negligible potential to have adverse effects on the species or critical habitat." If incidental take is anticipated to occur as a result of the proposed action, a "likely to adversely affect" determination should be made. In the event the overall effect of the proposed project is beneficial to the listed species or critical habitat, but may also cause some adverse effects to individuals of the listed species or segments of the critical habitat, then the proposed project is "likely to adversely affect" the listed species or critical habitat.

Adult coho are expected to be able to navigate upstream through the project side channel with about the same effectiveness as current conditions, and no long-term take of SONCC coho is anticipated. However, incidental take of SONCC coho in the form of capture and a low level of expected mortality (non-capture and handling mortality) would occur during fish salvage in the construction isolation and dewatering zone. As there could be a small amount of incidental take during construction, the appropriate effects determination should be "may affect, likely to adversely affect" for listed SONCC coho salmon. As overall function of the designated critical habitat would be about the same under the proposed action (compared to existing conditions), the proposed project would not destroy or adversely modify designated SONCC coho critical habitat.

Based on these determinations, formal ESA Section 7 consultation between the COE and NMFS is indicated to ensure the proposed project does not jeopardize the continued existence of the SONCC coho salmon ESU.

8 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a federal fisheries management plan. Pursuant to the MSA, federal agencies must consult with NMFS on all actions or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (Section 305(b)(2)).

EFH means those waters and substrate necessary for fish to spawn, breed, feed, or grow to maturity. For the purpose of interpreting this definition of EFH, waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas of historical use; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact that reduces quality and/or quantity of

EFH and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

Consultation with NMFS is required for any federal action that may adversely affect EFH, including actions that occur outside designated EFH, such as certain upstream and upslope activities that could have an effect. The objectives of this consultation are to determine whether the proposed project would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

8.1 Description of the Proposed Action

The proposed project is described in Section 2 of this BA.

8.2 Identification of EFH

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: Chinook, coho, and Puget Sound pink salmon (PFMC 1999). Freshwater EFH for Pacific salmon includes all streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers, and longstanding, naturally impassable barriers (PFMC 1999). Detailed descriptions and identification of EFH for salmon are found in Appendix A to Amendment 14 of the Pacific Coast Salmon Plan (PFMC 1999). EFH is designated at the project site for Chinook and coho salmon.

8.2.1 Coho Salmon

Coho salmon habitat and use of the project area is the same as discussed in Section 3 of this BA.

8.2.2 Chinook Salmon

The following is summarized from NMFS (2012) unless otherwise cited. The Chinook salmon population in the Rogue River is composed of distinct spring and fall runs. Adult spring Chinook enter the Rogue River from the ocean from late winter through early summer and their distribution extends upstream of the project site. After migration, spring Chinook then hold in deep pools on the mainstem Rogue River for up to 5 months before spawning in the mainstem or tributaries in September through October. Fall Chinook have also been observed spawning in the Rogue River near the former Gold Ray Dam site. Fall Chinook typically enter the Rogue River in the late-summer/fall and migrate immediately to spawning areas to spawn. Before spawning, adult Chinook hold in pools, preferring deep pools with cool water, abundant large wood, and undercut banks for cover. Spawning typically occurs in riffles high dissolved oxygen levels, and clean gravels and cobble. Juveniles emerge during the winter and spring and rear in tributaries until the summer when they migrate towards the ocean as smolts. Abundance of spring Chinook in the Rogue River has declined owing to limited spawning habitat, variable ocean conditions, and changes in water temperature due to the operations of the Lost Creek Dam. Unlike spring Chinook, there is abundant spawning of fall Chinook in the lower Rogue River. Populations of fall Chinook have generally increased over the past decade.

8.3 Effects of the Proposed Action

Though some differences exist between coho and Chinook life history and habitat requirements, the effects of the proposed project to Chinook and coho salmon habitat are similar because the project side channel is a migration corridor for both species, and rapid habitat with bedrock substrate are not a preferred juvenile rearing habitat type or adult spawning habitat type. Thus, the effects on designated Chinook and coho salmon EFH are the same as those described for SONCC coho salmon ESA designated critical habitat.

8.4 Proposed Conservation Measures

Proposed conservation measures to minimize impacts to designated Chinook and coho salmon EFH are the same measures described previously under ESA consultation (Section 2.5, Proposed Conservation Measures).

8.5 Conclusion

Proposed construction activities could temporarily affect Chinook and coho salmon EFH, although negative effects are expected to be negligible by implementation of construction BMPs. As overall function of the designated EFH would be about the same under the proposed action (compared to existing conditions), the proposed project would have no meaningful effect on EFH quantity and quality. Overall, the proposed project would not adversely affect Chinook and coho salmon EFH to the extent that a reduction in harvestable adults would be expected. Therefore, the proposed project would not hinder a sustainable fishery for either species.

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APPENDIX A. WHITEWATER COURSE PROJECT DRAWINGS