UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Blvd., Suite 1100
PORTLAND, OREGON 97232-1274

Refer to NMFS No.: WCRO-2021-03436

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February 18, 2022

Lt. Col. Richard T. Childers
U.S. Army Corps of Engineers
Idaho Falls Regulatory Office
900 North Skyline Drive, Suite A
Idaho Falls, Idaho 83402

Science Kilner
Federal Emergency Management Agency
Regional Environmental Officer
1300200 28th Street South West
Bothell, Washington 98021

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Salmon Whitewater Park and City of Salmon Waterline and Bank Stabilization Actions, Middle Salmon-Panther, HUC 17060203, Lemhi County, Idaho (Three Projects)

Dear Lt. Col. Childers and Ms. Kilner:

Thank you for the U.S. Army Corps of Engineers (COE) email dated November 22, 2021, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Salmon Whitewater Park and City of Salmon Waterline and Bank Stabilization Actions project. Your letter provided an amendment to a previously submitted biological assessment (BA) originally submitted on May 18, 2021, and which was withdrawn due to newly identified conditions in the action area. Collectively, the two documents you submitted identified three projects that were batched together for analysis given their proximity and the timing of proposed work: (1) construction of the Salmon Whitewater Park; (2) City of Salmon's installation of two waterline casings; and (3) City of Salmon bank stabilization.

Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson–Stevens Fishery Conservation and Management Act [16 U.S.C. 1855(b)] for these actions. However, after reviewing the proposed action, we agree with your determination that there are no adverse effects on EFH. Therefore, we are hereby concluding EFH consultation.

In this biological opinion (opinion), NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of Snake River spring/summer Chinook salmon and Snake

River Basin steelhead. NMFS also concurs with the COE determination that the proposed actions may affect, but are not likely to adversely affect designated critical habitats for Snake River Basin steelhead, Snake River spring/summer Chinook salmon, and Snake River sockeye salmon.

The COE determined the proposed actions would have no effect on Snake River sockeye salmon. "No effect" determinations under section 7 of the ESA are the province of action agencies, which may make such findings without seeking the agreement of NMFS. It is NMFS procedure to not provide any written concurrence with a federal action agency's determination that its action will have "no effect" on any ESA-listed species or designated critical habitat. Therefore, effects to sockeye salmon will not be considered in the attached opinion.

As required by section 7 of the ESA, NMFS provides an incidental take statement (ITS) with the opinion. The ITS describes reasonable and prudent measures (RPM) NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The ITS establishes terms and conditions, including reporting requirements, that the COE, including any permittees who performs or oversees the implementation of any portion of the action, in order to be exempt from the prohibitions of section 9 of the ESA.

If you have questions regarding this consultation, please contact Chad Fealko, Southern Snake Branch Office, at (208) 768-7707, or chad.fealko@noaa.gov.

Sincerely,

Michael P. Tehan
Assistant Regional Administrator
Interior Columbia Basin Office

Enclosure

cc: S. Fisher – USFWS
Kelly Urbanek – COE
Tracy Peak - COE
C. Colter – SBT
J. Richards - IDFG
J. Joyner - COE
B. Green – SWPA
E. Penner – City of Salmon

Endangered Species Act Section 7(a)(2) Biological Opinion

Salmon Whitewater Park and City of Salmon Waterline and Bank Stabilization Actions, Middle Salmon-Panther, HUC 17060203, Lemhi County, Idaho (Three Projects)

NMFS Consultation Number: WCRO-2021-03436

Action Agencies: U.S. Army Corps of Engineers and Federal Emergency Management Agency

Affected Species and Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Snake River Basin steelhead (*Oncorhynchus mykiss*)	Threatened	Yes	No	No	NA
Snake River spring/summer Chinook salmon (*Oncorhynchus tshawytscha)*	Threatened	Yes	No	No	NA
Snake River sockeye salmon (*Oncorhynchus nerka*)	Endangered	No	NA	No	NA

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	No	No

Consultation Conducted by: National Marine Fisheries Service, West Coast Region

Issued By:

Assistant Regional Administrator

Date: *February 18, 2022*

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ACRONYMS

BA	Biological Assessment
BMP	Best Management Practice
CFS	Cubic Feet Per Second
CITY	City of Salmon
COE	U.S Army Corps of Engineers
CWA	Clean Water Act
CY	Cubic Yards
DBH	Diameter at Breast Height
DPS	Distinct Population Segment
DQA	Data Quality Act
EPA	Environmental Protection Agency
ESA	Endangered Species Act
EFH	Essential Fish Habitat
ESU	Evolutionarily Significant Unit
FEMA	Federal Emergency Management Agency
HDPE	High Density Polyethylene
IDEG	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
ITS	Incidental Take Statement
LOMR	Letter of Map Relocation
MPG	Major Population Groups
MSA	Magnuson–Stevens Fishery Conservation and Management Act
NLAA	Not Likely To Adversely Affect
NMFS	National Marine Fisheries Service
NTU	Nephelometric Turbidity Units
OHWM	Ordinary High Water Mark
opinion	Biological Opinion
PBF	Physical and Biological Features
PCE	Primary Constituent Element
PEM1A	Hardened Recreational Trail
PSI	Per Square Inch
RPM	Reasonable and Prudent Measures
SPL	Sound Pressure Level
SR Chinook	Snake River spring/summer Chinook Salmon
SR sockeye	Snake River Sockeye Salmon
SR steelhead	Snake River Basin Steelhead
SWPA	Salmon Whitewater Park Association
TMDL	Total Maximum Dailey Loads
USBWP	Upper Salmon Basin Watershed Project
VSP	Viable Salmonid Population

1. INTRODUCTION

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3 below.

1.1 Background

National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), as amended, and implementing regulations at 50 CFR 402.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within 2 weeks at the NOAA Library Institutional Repository (https://repository.library.noaa.gov/welcome). A complete record of this consultation is on file at the Snake Basin Office, in Boise, Idaho.

The Salmon Whitewater Park Association (SWPA) began initial planning for the project in 2010. Planning for the project accelerated in 2014. The SWPA is a 501(c)3 non-profit group that has held numerous public meetings and community fundraising events for the whitewater park.

The SWPA is actively involved in promoting and hosting river skills, safety, stewardship, education, and kayaking classes to youth and other community members. The Salmon Whitewater Park is designed to provide a safer river experience, improve access to the river, and encourage education, recreation, and stewardship of the river.

The park will provide three-season opportunities for wave surfing, swimming, and river skills training by constructing a consistent wave and providing access and viewing opportunities for the community and visitors. The proposed park will include a life jacket station, a scow replica-viewing platform for spectators, as well as historical, educational, and interpretive signs and improved city park facilities. There will be an outdoor classroom potentially developed in coordination with the City of Salmon (City) with tables and shade/cover for use when conducting field trips, classes, events, and competitions. The existing U.S. Army Corps of Engineers (COE) levee adjacent to the wave will be terraced with grouted-in boulders to accommodate spectators, large events, and all user groups. Bank modifications will also improve river access on the east and west sides of the east river channel.

The park will be located on City property. The City has two additional projects that are also included in this consultation due to their proximity to the whitewater park and to gain efficiencies in permitting. Pursuing the projects simultaneously also allows the work to occur while the east channel is dewatered to construct the Whitewater Park, which reduces impacts to ESA-listed resources and costs less.

1.2 Consultation History

NMFS first became aware of the proposed whitewater park during the spring of 2016, when the SWPA shared draft 60 percent designs. Original designs included whitewater features in both the east and west channels of the Salmon River within the City of Salmon's Island Park. NMFS participated in multiple public meetings and design reviews shortly thereafter, stressing the need to maintain unimpaired fish passage at the site. Through evaluating jump height and modeled velocity estimates for the original designs, we identified potential upstream fish passage concerns, particularly for juvenile fish. Through 2016, engineers reviewed designs and provided suggested modifications necessary to provide upstream passage. NMFS' biologists augmented the engineering input by providing SWPA and their engineers swim speed and jump capacity information for the fish of concern. The SWPA used this information, along with input provided through local public meetings, to refine their designs. For ESA consultation purposes, the project essentially sat dormant until mid-September 2020.

NMFS received a revised design package on September 1, 2020, and a revised fish passage evaluation on December 2, 2020. NMFS biologists and engineers reviewed the material, ultimately concluding the revised design, which now includes just one wave feature in the east channel, and a modified side channel, will allow upstream passage of all anadromous life stages that may be present.

A draft biological assessment (BA) was received from SWPA on March 11, 2021. NMFS reviewed the BA and provided comments to the SWPA on April 8, 2021. The parties discussed the comments by phone on April 11, 2021. NMFS received a final BA and request for formal ESA consultation on May 18, 2021. The consultation initiation package also included the SWPA's application for a COE Clean Water Act (CWA) permit, final design drawings, and fish passage modeling results – all of which was reviewed in the completion of this opinion. The final BA included design plans for and an assessment of two City projects proposed to occur in the action area at the same time as whitewater park construction. The City owns the property adjacent to the whitewater park and they desire to replace two water lines and stabilize an eroding streambank coincident with whitewater park construction. The SWPA agreed to assess the actions and batched all three projects into one BA. NMFS notified the COE and SWPA that ESA consultation had been initiated on May 18, 2021, via a letter signed May 24, 2021.

In July 2021, during a site walkthrough with contractors, SWPA staff realized the description of the proposed action in the March 11, 2021 BA had overlooked a small tributary confluence (i.e., Kids Creek) within the project area. Progress on NMFS' opinion halted at this time. After considering this omission with NMFS during an August 31, 2021 call, the parties agreed to formally amend the original BA with a revised dewatering plan to properly address Kids Creek and fish that may be present. The parties also informally agreed to modify the project start date to begin as early as August 1, because of low water levels, high water temperatures, and a desire to complete work before winter icing occurs. The City also agreed to allow planting 20 containerized black cottonwood (*Populus balsamifera*) trees and use a drip water system to mitigate for trees removed during bank armoring. After minor delays tied to development of the BA amendment, NMFS recognized we would be unlikely to meet our regulatory deadline to produce the opinion and we formally withdrew the consultation on November 16, 2021. We

notified the COE and SWPA by email on the same date. NMFS received the BA amendment from SWPA by email on November 22, 2021, and formal consultation was officially initiated on that date. Both the March 11, 2021, and November 22, 2021, BAs were used to describe the complete proposed action described and analyzed in this opinion.

Because this action has the potential to affect tribal trust resources, NMFS provided copies of the draft proposed action description and terms and conditions to the Shoshone-Bannock Tribe on January 24, 2021, requesting comments. The Shoshone-Bannock Tribe did not respond. The same draft material was provided to the COE, SWPA, and the City of Salmon on January 24, 2021. The COE responded on January 25, 2022, indicating the City and the COE did not have any comment. The SWPA responded on January 26, 2022, indicating they also had no further comment.

1.3 Proposed Action

Under the ESA, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02).

The Federal actions triggering ESA consultation are: (1) CWA Section 404 and River and Harbors Act Section 408 permit permits by the COE; and (2) a National Floodplain Insurance Program Letter of Map Revision (LOMR) by Federal Emergency Management Agency (FEMA) (51 FR 30315). The LOMR process will allow FEMA to update the floodway map for the action area. The FEMA approval is not expected to cause any effects different than the actual construction, as the project will not cause a rise in floodway water elevations. For this reason, the COE is the lead action agency, and FEMA is a secondary action agency. The permits will officially authorize the following primary activities (see Figure 2):

1. Construction of a whitewater park on the Salmon River. The park will include a wave structure, terraced viewing area, a kid's play area to provide public recreation opportunities, and placement of ecological education signs and a life jacket station (locations to be determined);

2. Installation of two new City waterline casings buried beneath the Salmon River's east channel; and

3. Removal of depositional material in the east channel of the Salmon River and installation of bank armoring along Island Park's east shore, both below the Highway 93 bridge.

The City's two projects are being done in conjunction with the whitewater park construction to eliminate the need for additional site dewatering, fish salvage, and turbidity control. All the actions will occur entirely in the east channel. Although just one play wave structure will be built, the action also includes: (1) a buried grade control structure built with large rock (min 4.5-foot diameter) near the east channel's inlet; (2) a grouted rock deflector upstream of the play wave, projecting off the east bank; (3) various boulder clusters; (4) a kids' wading/play area; (5) modification of the existing side channel to serve as low water fish passage channel; and (6) approximately 300 feet of boulder terracing on the east bank, a small amount of terracing on the

west bank, and boulder terracing on both banks of the side channel below the pedestrian bridge. Work involves substantial excavation and fill in the channel and will require dump trucks, excavators, loaders, pumps and other standard construction equipment. Grouting of the wave structure and terracing requires concrete placement within the channel cross section. Design drawings for each element were provided in the May 18, 2021 BA, and they are incorporated by reference into this opinion. Where useful, this opinion uses copies of designs sheets from the complete package, but the reader is encouraged to review the actual designs (available from NMFS's Salmon Field Office or from Breann Green, SWPA, Salmon, Idaho), which allow for better legibility, clarity, and completeness. Figure 1 displays an artist's illustration of the proposed wave structure. The wave structure will be completed during the first four to six weeks of construction to facilitate concrete drying. In-water work will be limited to a maximum of 12 hours per day and the entire construction and demobilization are expected to be completed in 8 to 12 weeks. The City waterline casings, substrate removal, and bank protection will be done during the same window, but will be authorized, paid for, and overseen by the City.

We considered, under the ESA, whether or not the proposed action would cause any other activities and determined that it would cause a minor increase in recreational use in the Salmon River's east channel for approximately 30 years, the expected lifespan of the wave structure. Additional boating use would likely not occur but for the new wave structure and associated maintenance. The effects of increased use are addressed in our opinion.

All actions are subject to the same design criteria outlined in Section 1.3.1 below. These project components and the associated design criteria, conservation measures, best management practices (BMPs) and the general construction sequencing are described below. Following mobilization, dewatering, fish salvage, and construction of the wave structure, the contractor has leeway to complete construction in a different order with approval of the project engineer and or the SWPA project manager.

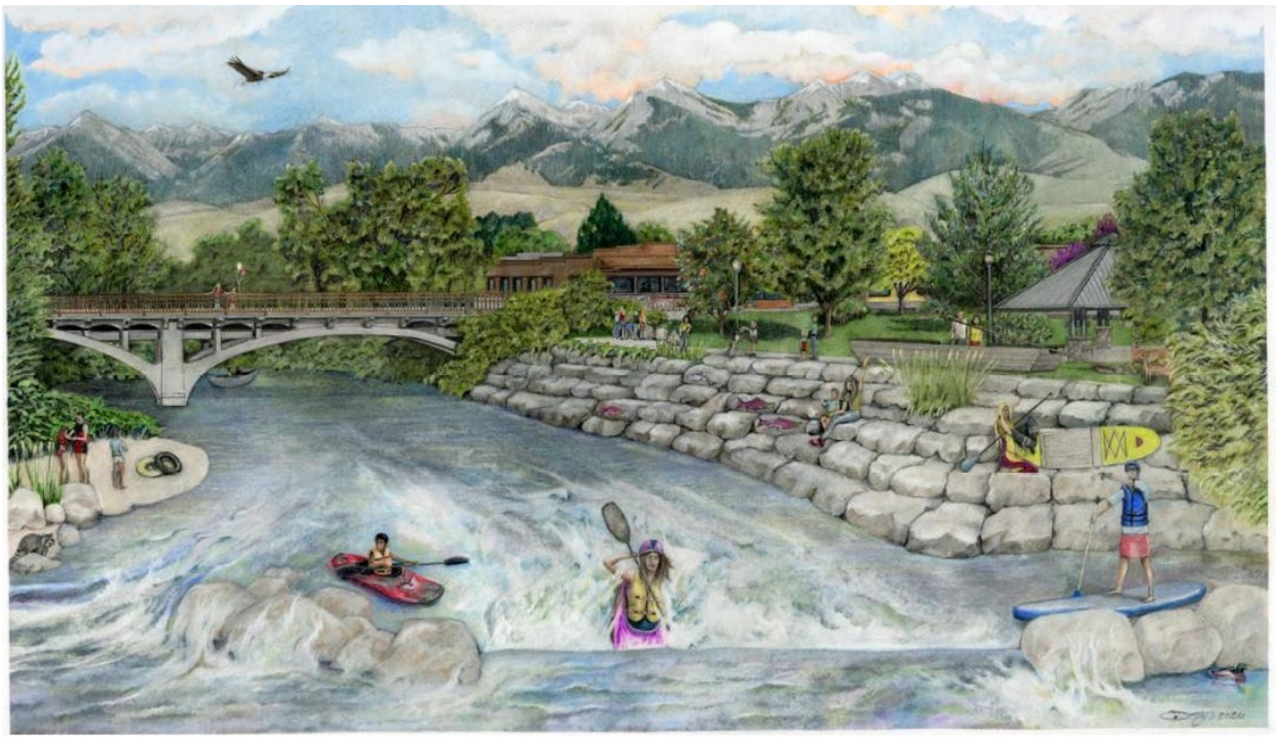
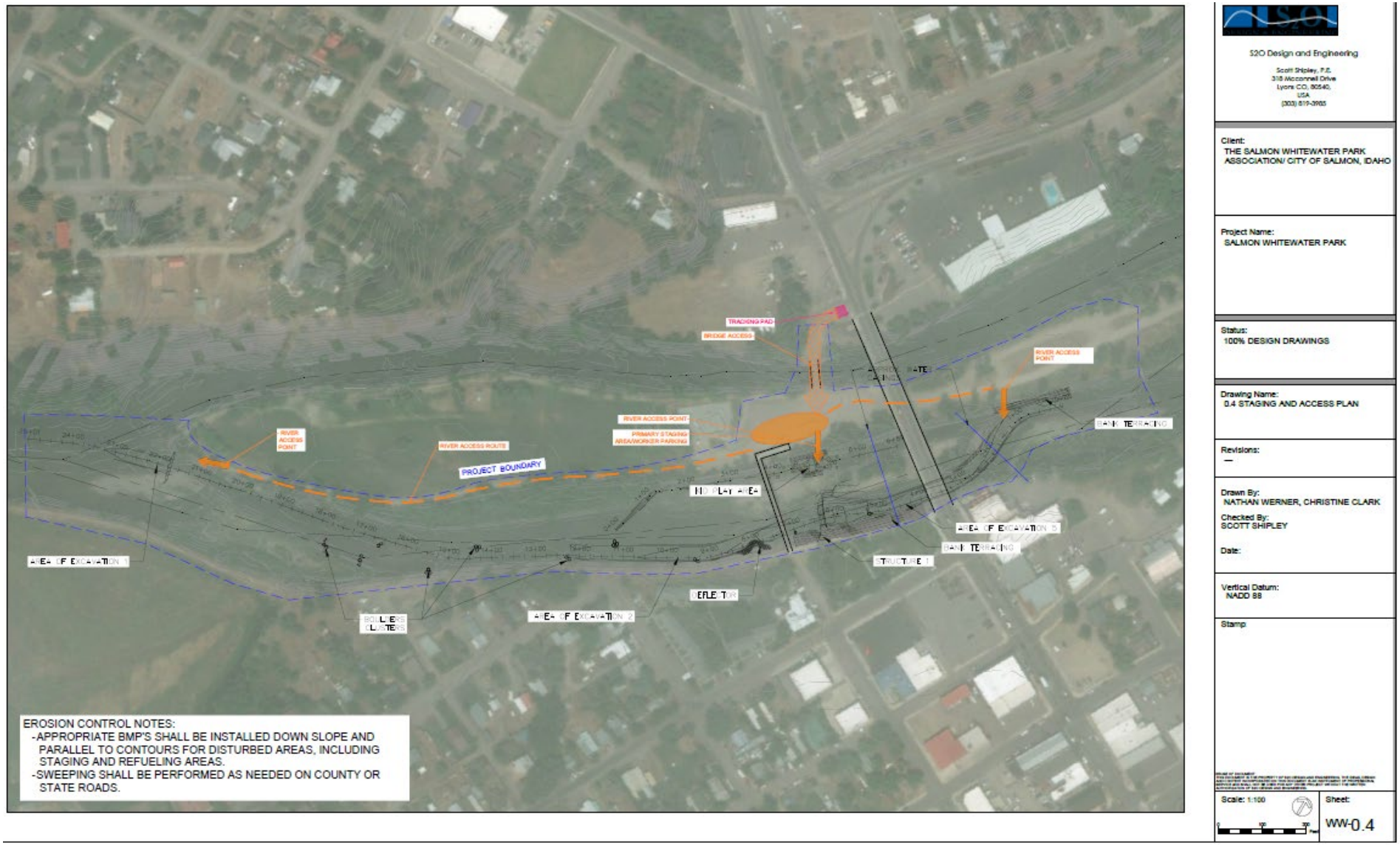


Figure 1. Artist illustration of the proposed Salmon Whitewater Park's Wave Structure, by Don Stamp, DGStamp Architects, Salmon, Idaho.



S2O Design and Engineering

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318 Mcconnell Drive
Lyons CO, 80540,
USA
(303) 819-3965

Client:
THE SALMON WHITEWATER PARK ASSOCIATION/ CITY OF SALMON, IDAHO

Project Name:
SALMON WHITEWATER PARK

Status:
100% DESIGN DRAWINGS

Drawing Name:
0.4 STAGING AND ACCESS PLAN

Revisions:
—

Drawn By:
NATHAN WERNER, CHRISTINE CLARK

Checked By:
SCOTT SHIPLEY

Date:

Vertical Datum:
NADD 88

Stamp

Scale: 1:100

Sheet:
WW-0.4

Figure 2. Plan view of the proposed Salmon Whitewater Park, City waterlines, and City bank stabilization

1.3.1 Project Design Criteria

In addition to the measures described above in construction sequencing, the following measures are proposed by the SWPA, and thus by the COE, to avoid and or minimize effects to ESA-listed species and their habitats, protect the natural environment, and ensure a quality end product.[1]

- Prior to commencing work, the contractor will prepare and submit a Maintenance Inspections and Procedures Plan that outlines required maintenance schedules and required daily inspections.
-
- Prior to arriving on-site, all vehicles and equipment will be power washed to remove weed seeds, plant material, aquatic contaminant deposits (e.g., concrete in tracks, oil leak stains, etc.).

- All equipment will be power-washed and free of weeds prior to its delivery to the project area to minimize the spread of invasive species.

- If equipment was previously used in another stream, river, lake, pond or wetland within 10 days of initiating work, one of the following decontamination practices should be employed to minimize the spread of Didymo (*didymosphenia geminate)*, New Zealand mud snails (*Potamopyrgus antipodarum*), whirling disease, zebra mussels (*Dreissena polymorpha*), and other aquatic invasive species.

    - Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.) and keep the equipment dry for 10 days; or,

    - Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.) and spray/soak equipment with either a 1:1 solution of formula 409 household cleaner and water, or other approved chemical solution. Treated equipment must be kept moist for at least 10 minutes; or,

    - Remove all mud and debris from (tracks, turrets, buckets, drags, teeth, etc.) and spray/ soak equipment with water greater than 120°F for at least 10 minutes.

- All equipment will be inspected for fluid leaks or fuel/chemicals, vegetation, mud, debris, and invasive species on equipment and approved for use by the Project Manager prior to crossing the vehicle bridge onto the island.

- A vehicle-tracking pad made of geotextile and 2- to 3-inch diameter rock will be installed where vehicles and equipment exit the project area onto the highway pavement to keep the roadway clean of mud, rocks, and other debris. If track-out does occur, the roadway should be swept immediately.

[1] Only measures relevant to aquatic habitat or ESA-listed fish are listed. A complete list of all measures is available in the original BA (COE 2021).

- All access routes, river access points, staging areas, refueling areas, and disturbance limits will be flagged on the ground prior to beginning construction to prevent unanticipated disturbance of areas not designated for construction activities.

- There will be four designated river access ramps (shown in COE 2021, Appendix A: WW-0.4). Random or multiple channel access points will not be permitted unless otherwise approved by the Project Engineer or Project Manager. The four designated access ramps are:

    - The road and recreational trail on the east side of Island Park from the staging area to the upstream end of the island to dewater the channel with a cofferdam, excavate the pilot channel, and install the boulder clusters and the wave deflector structure.

    - The east bank of Island Park downstream of the pedestrian bridge to construct the wave structure, boulder-viewing terrace on the COE levee, and play area. This access point will also be used by boaters and the public to access the wave and the play area following construction.

    - The park road on the east side of the island from the staging area downstream to below the highway bridge to construct a boulder and riprap revetment on the east bank of the island/west bank of the east channel.

    - On the east bank of the river, downstream of the Highway 93 bridge, directly below City Hall.

- Gravel berms will be installed at the top of the river access ramps to prevent concentrated surface flows from running onto exposed ramps. Silt barriers will be erected along the toe of these disturbed banks to prevent runoff from machinery operating within the wet channel from flowing back into the channel untreated.

- Erosion control fabric, silt fences, and sediment control logs will also be installed to design specifications parallel to the river at all areas of potential run-off prior to disturbance. The contractor must remove the accumulated sediment as needed to maintain effectiveness to prevent sediment from entering the river. Additional erosion controls may be added as needed.

- Equipment and vehicles will be stored in the designated staging area with proper containment so they will not deliver fuel, oil, and other contaminants to the river. The designated equipment staging area is part of the Island Park road system and was used as the staging area for the Island Park vehicle bridge replacement in 2016.

- The contractor will follow the provided Storm Water Pollution Prevention Plan, which will be posted in all work areas prior to the performance of any construction activities. The plan will include information for coordination with local emergency response agencies.

- Vegetation will only be grubbed from areas where permanent ground alteration occurs.

- Vegetation will be cut at ground level and rootwads will be retained where trees are cut down or temporary clearing occurs.

1.3.2 Construction Sequence

Schedule. Construction is scheduled to occur from August 1 through December 20, during seasonal low flows, likely in 2022. This timeframe is within locally recognized in-stream work windows (July 15 through March 15) (USBWP 2005). Total construction time is expected to be between 8 and 12 weeks. Following staging of materials and equipment and establishment of sediment and pollution control measures, the east channel will be dewatered first. Dewatering will retain a live channel to convey Kids Creek through the action area. Specific methods are described in additional detail below.

Channel Dewatering and Fish Salvage. Salmon River flow into the east channel will be diverted into the west channel prior to construction. Sheet pile cofferdams will be installed with vibratory hammers to dewater the channel. The main cofferdam will be at the top of the island and will direct all surface flow to the main, west channel. The exact placement of the dams will be determined during low water at the start of construction. The current conditions of the east channel, below the pedestrian bridge down to the Highway 93 bridge is shown in (Figure 3). East channel dewatering will occur over approximately 48-hours, allowing for gradual reduction in flow in the east channel and facilitating fish emigration.

An excavator, and materials for the water diversion, will be stationed at the south end of the island (upstream) and on the road below the highway bridge. The emergent wetland at the end of the island will be flagged to prevent equipment entry. The excavator will walk down the rocky bar at the south end of the island to avoid disturbance to the emergent wetland.

Dewatering of the east channel will be done slowly and in stages. In the first 24-hours, the flow will be reduced by 1/3 to encourage fish to emigrate volitionally. Over the next 24-hours, the remaining flow will be diverted to the west channel. Pumps, with NFMS criteria screens (NMFS 2011), will be used pump excess groundwater and turbid water from the dewatered channel to settling basins on the island. Settling basin outflow will be filtered through established vegetation where available and practical. When vegetation is not available, straw bales, wattles, or similar will be used to filter outflow water before it enters the river to ensure compliance with Idaho Department of Environmental Quality (IDEQ) water quality standards. After 24-hours, additional cofferdams will be installed across the top of the east channel to reduce flow to 1/4 of original flow for 10-12 hours. Then, additional sheetpile will be extended until only 10% of the original flow volume remains. After 12-hours, the cofferdam will be finished and surface flow will be cut off from the east channel.

A second smaller temporary cofferdam will be installed to direct Kids Creek water to flow along the east bank next to the levee while the initial live water channel is lightly excavated to carry Kids Creek's flow and fish across the dewatered east channel and through the side channel/kids play area (Figure 4). This live water channel will have a trapezoidal 6-foot wide bottom, 2:1

sideslopes, 0.7% gradient – the same dimensions originally designed for the wave park side channel/kids play area construction (COE 2021). A 200-foot long smooth or corrugated pipe will then be installed below the highway bridge to convey Kids Creek water and fish past the City's bank armoring site. The pipe will be as straight as possible to prevent pooling and sized for flows that may be between 10-40 cubic feet per second (cfs) in August and September. Water will spill from the pipe directly into the east channel below the bank-armoring site. No excavation will be needed downstream of the live water channel. Temporary culverts will be installed in the Kids Creek bypass channel as needed to allow equipment crossings to the work area. No live water crossings will be allowed. A gravel and tarp berm cofferdam installed diagonally across east channel will then direct Kids Creek flow into the newly excavated live water side channel bypass. The bypass will be rewatered slowly over a 12- to 24-hour period to reduce turbidity. During rewatering the bypass channel may be pre-washed, and pumps and/or settling basins may be used to remove suspended sediments prior to water re-entering the Salmon River. Instantaneous turbidity monitoring and visual observations will be used to trigger temporary work stoppage if turbidity exceeds 50 nephelometric turbidity units (NTUs) to protect water quality and ESA-listed fishes.

At this time, sheet pile cofferdams will be installed at the bottom of the east channel, below the highway bridge, to prevent backwatering of the work area. Culverts will discharge the bypass water and any fish moving through the system over/through the cofferdam. The culverts will have the same capacity as the upstream temporary pipe (i.e., 10-40 cfs). Additionally, to protect fish the pipe will not have any sharp edges, have an outlet fall less than 18-inches but high enough to prevent fish from re-entering the work area, and discharge to a deeper area (not necessarily a pool) so fish will not fall on rocks and be injured.

The total dewatered area will be approximately 5.2 acres (2,550 feet long by variable width). Idaho Department of Fish and Game (IDFG) personnel will salvage fish during the dewatering process as the water recedes, following NMFS' electrofishing guidelines (NMS 2000). IDFG will be given a minimum 48-hour notice to be on-site for fish salvage prior to and during dewatering and cofferdam construction.

IDFG will complete a minimum of two upstream passes and two downstream passes with 2-4 electroshocking units and at least 6-8 netters and bucket handlers. Construction work will cease if IDFG is not available to perform fish salvage operations.

Only after the east channel is dewatered and fish salvage is complete will an excavator walk down the designated river access ramps and access the east channel. While completing construction, the excavator will operate within the dewatered channel from the upstream cofferdam to the end of the construction-site, including the existing side channel, where the child play area is proposed. The east end of the wave structure and levee terracing will be done first. Then, once concrete has cured, the Kids Creek bypass flow will be redirected to the low flow pilot channel on the east side to allow the west side of the wave structure to be completed in the dry. Switching the Kids Creek water will require an additional fish salvage event of the bypass channel. The 5.2 acre salvaged area includes the bypass channel's footprint.

Sump pumps and the described settling basin system will be used as needed to maintain a dry work environment when working below groundwater (e.g., wave and bottom row of the levee terracing).

Figure 3. Salmon River's east channel, downstream of pedestrian bridge to the Highway 93 bridge. Island Park to the left, the COE levee and Veterans' Park to right. The existing side channel is located to the left of the vegetated gravel bar on left of photo (date 10/21/2020).

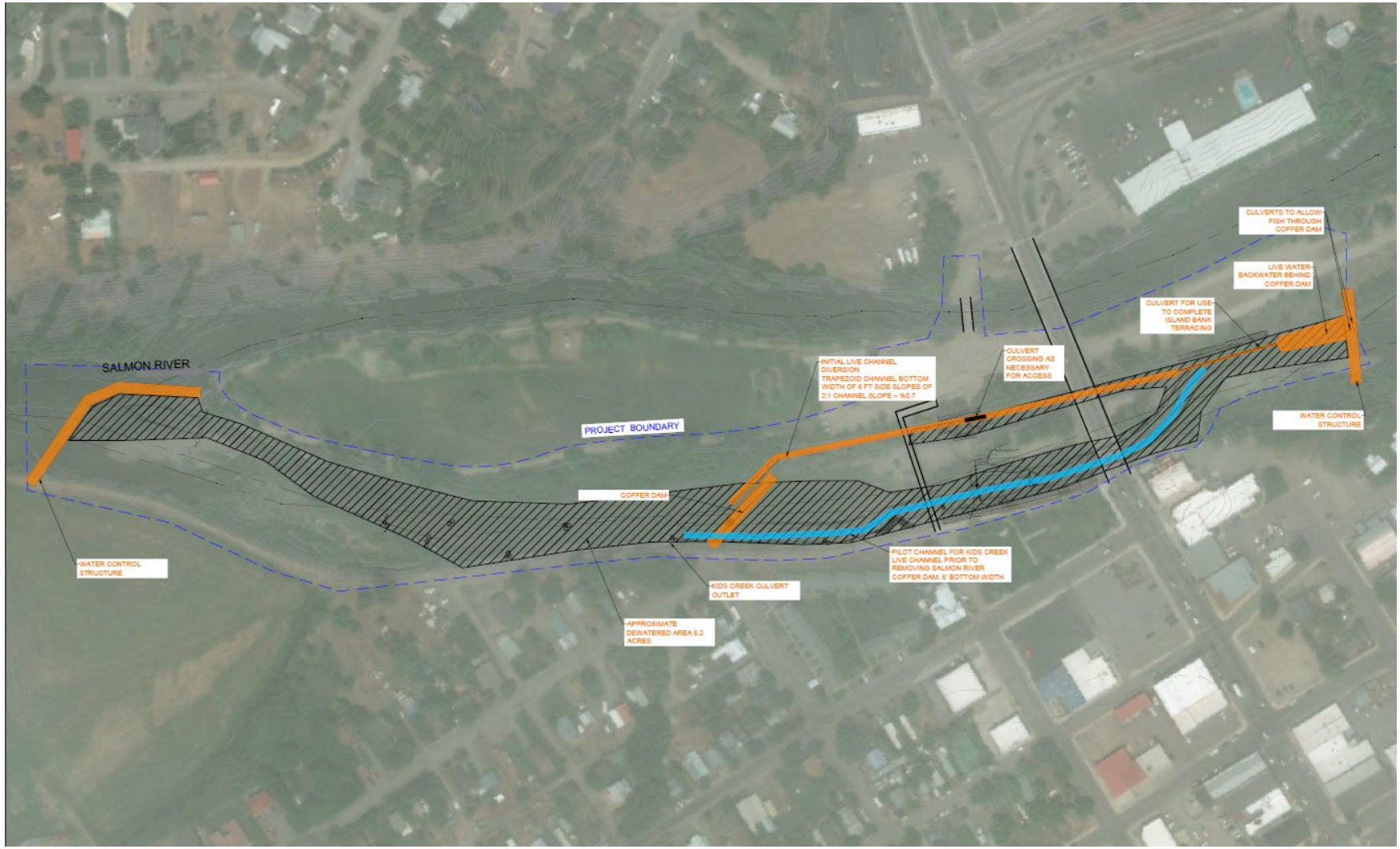

Figure 4. Proposed dewatering plan for Salmon Whitewater Park, inclusive of Kids Creek water management.

Channel Rewatering. Rewatering of the east channel may occur as early as mid to late-October and as late as mid-December, beginning on or prior to December 15. Rewatering will be completed prior to December 20. Clean water from a tank truck, or water from the adjacent west channel, will be used to wash fines out of the construction areas prior to rewatering the channel. If water is drafted from the west channel, the pump intake screens will comply with NMFS' screen criteria (NMFS 2011).

Pumps, in combination with settling basins and appropriate discharge filtering, will be used to seal the east channel and remove suspended sediments prior to water reentering the Salmon River below the downstream cofferdam. Where available and practical, settling basin outflow will be filtered through established vegetation. When vegetation is not available, straw bales, wattles, or similar will be used to filter outflow water before it enters the river to ensure compliance with IDEQ water quality standards. Alternatively, turbid water can be pumped through a "Rain-for-Rent" system and discharged back to the west channel or downstream of the project.

The cofferdam below the highway bridge will be removed when visual monitoring and the instantaneous turbidity monitoring indicates the washing has met the IDEQ water quality standard of no more than 50 NTUs over background levels.

Removal of the cofferdam at the top of the east channel will be staged over a 48-hour period, in the reverse sequence of the dewatering process described earlier. This will allow additional fine sediment to settle out and disperse without exceeding IDEQ water quality standards. Instantaneous turbidity readings and visual observations will continue to be taken in 15-minute increments 600-feet downstream of the lower cofferdam site during the 48- hour rewatering process. If the average readings exceed 50 NTUs over background levels during a 1-hour period, or visual observations indicate an exceedance, work will stop until levels are below this threshold. The instantaneous turbidity monitoring and visual observations will also be used to indicate when it is appropriate to allow additional flow into the newly constructed area.

Site Reclamation. The contractor is responsible for restoring all disturbed areas to pre-project conditions or better. This includes but is not limited to existing utilities, infrastructure, vegetation, staging areas, Island Park and Veterans' Park roads and trails used for equipment access, construction access, and any general disturbance created during construction activities. Excess rock and soil that is not needed for site reclamation will be made available to local businesses.

Excess woody debris including cottonwood trees that cannot be used in site reclamation will be used to add complexity in the kids' play area or hauled to a storage location until they can be used for other area river restoration projects. The SWPA will notify the Upper Salmon Basin Watershed Project (USBWP) about these trees and their availability.

Clumps of coyote willow will be planted on the east bank of the island downstream of the highway bridge to replace the trees and other woody vegetation removed during the bank armoring proposed by the City. In addition, 20 containerized cottonwood trees will be planted on the east bank of Island Park to mitigate for the tree removal (i.e., 13 cottonwood trees 5- to 28-

inches diameter-at-breast height (DBH) and ~29 cottonwood saplings ≤3 to 4-inches DBH) that will occur during bank armoring. The trees will be planted between the park road and the top of the armored bank. If possible, the roots will be planted in the water table, a depth of 6 feet or more. The City will install and maintain an automatic drip watering system to increase the chance of survival during the first 2 years post planting.

Retained clumps of woody vegetation will be replanted in the temporarily disturbed sites so that the rootwads reach the permanent water table, where possible. Damaged branches and roots will be pruned.

No instream large wood will be removed. If instream wood needs to be moved during construction, it will be moved so that it remains instream where it will provide fish habitat.

The SWPA will maintain the silt fencing, straw wattles, barriers, and other erosion controls until site revegetation is complete (approximately one year).

Demobilization. All equipment and unused materials will be removed as soon as the site reclamation is completed.

Excess stockpiled riverbed material and woody debris will be moved to an appropriate off-site disposal facility and made available to local contractors, unless otherwise directed by the engineer or SWPA Representative. Trash will be disposed of at an approved facility.

Turbidity Monitoring. Calibrated, continuous monitoring turbidity meters will be set up upstream of the project site and 600-feet downstream of the project boundary (about 50 feet upstream of the confluence of the east and west channels). Background levels both upstream and downstream of the project boundaries will be recorded prior to any construction or mobilization at the site. No more than 50 NTUs over background levels will be exceeded during all mobilization and construction activities, as recorded in 15-minute intervals and averaged for each 1-hour period, or visual observations (T. Saffle, IDEQ and B. Green, SWPA pers. comm. 1/4/2021). The frequency of the turbidity readings will decrease as the values consistently fall below 50 NTUs over background, unless the visual observations or a change in activity (e.g., removal of cofferdams and rewatering the channel) indicate a spike in the turbidity has occurred or is likely to occur.

1.3.3 Individual Project Element Descriptions

1.3.3.1 Boulder Wave Structure.

The grouted boulder wave structure and the play area will be constructed first to facilitate the concrete curing. The east channel streambed will be excavated for the wave structure and a downstream grouted pool. The upper 1.5 feet of riverbed material excavated during construction will be stored separately from other excavated materials to be tracked into voids and interstitial spaces in the bed armoring during the cleanup and removal from river phase. Sediment barriers will be used to contain this stockpiled material. The structure will consist of 3-foot-plus diameter, rounded boulders bedded with clean gravel and cobble and grouted in with 3,500

pounds per square inch (psi) concrete mix. Prior to the placing boulders, and to prevent tearing or ripping of filter fabric, a 12-inch deep layer of bedding material be placed. Bedding material will be well-graded 3- to 4-inch clean cobble or approved native alluvium. The fill types and volumes below the ordinary high water mark (OHWM) are shown in Table 1[2].

The concrete will cure in the dewatered channel; no uncured concrete will contact flowing water. The concrete will be non-caustic when the surface is "dry" and stiff, usually within a couple hours depending on air temperature (N. Werner, S2O project engineer). However, concrete will be kept dry for at least 24 hours to protect water quality. Concrete takes a long time to cure; it is assumed to be full strength at 28 days. Ideal conditions occur when the concrete is hydrated or submerged. The following conservation measures apply to concrete pours:

- Concrete pours will not be conducted during or before anticipated storm events.
- All excess concrete and concrete washout slurries from the concrete mixer trucks and chutes will be discharged off-site, or temporarily stored in a washout area designated in an upland area without vegetation and completely isolated from stormwater and drainage.
- A concrete washout basin lined with plastic sheeting (greater than 10 mm thick) or geomembrane is required to store excess concrete.
- All concrete residues will be hauled off-site and disposed of where it will not contact flowing or standing water.

1.3.3.2 Kids' Play Area and Fish By-Pass Channel.

A 375-foot-long section of the side channel will be excavated for a play area and low flow fish passage channel. The fish passage channel will be approximately 1-foot deep by 10-feet wide at the top, down to 4-feet deep at the outlet. The excavation will temporarily clear a 10-foot-wide swath through the woody riparian vegetation. Two 3- to 4-foot-deep pools will be excavated in the play area: one above and one below the wave structure. Approximately 37 cubic yards (CY) of clean, coarse sand (¼-inch-minus) will be added to the pool areas to provide soft footing for children.

The play area side slopes will be terraced with 2- to 3-foot diameter, rounded or angular boulders to provide easy access to the play area pools. Between the play area and the east channel, a depositional bar will be over-excavated to create an eddy off the play wave. The excavated area will be about 1,500 square feet. The eddy will provide lower velocity access to the river. It will also encourage sediment deposition to create a natural beach area downstream of the wave. The deposition will be a dynamic process. In some years, sand will be deposited, at other times it will wash out and the beach will have more cobble.

1.3.3.3 Levee Boulder Terracing.

[2] Table 1 includes fill and excavation volumes for all project elements being proposed.

A terraced public viewing area 310-feet long and 14- to 15-feet high (matching the levee height) will be built on the face of the existing COE levee. The terracing will be located between the pedestrian bridge on the upstream end and the highway bridge below. Terracing will be completed with 3-foot diameter angular or square boulders. The viewing area will be accessible to the public through the City's Veterans' Memorial Park. The current east channel width will be maintained.

Figure 5. Site of proposed terraced bank on the COE levee, downstream of the pedestrian bridge visible in background (photo date 10/21/2020).

1.3.3.4 Boulder Deflector.

A deflector of 3-foot-plus diameter, rounded boulders will be built into the COE levee, upstream of the pedestrian bridge and upstream of the wave structure. The deflector will direct east channel flow to maintain the pilot channel depth to the crest of the wave structure. The deflector will be built while the channel is dewatered.

1.3.3.5 Inlet Channel Grading and Grade Control.

An excavator will be used to remove a portion of the depositional bar at the top of the east channel that has continued to aggrade since the Salmon River flooded in 2017. Approximately

165 CY of cobble and gravel substrate will be removed. Native large cobble and small boulders will be placed on the riverward side of the remaining bar to narrow and deepen the channel necessary to maintain the flows needed for the whitewater park.

A buried grade control structure consisting of 3-foot diameter, rounded or angular boulders or 2-foot diameter riprap will be built downstream of the excavated inlet to prevent the channel headcutting in the future. The structure will be perpendicular to flow. Approximately 200 CY of boulders will be required and they will be placed on a bed of native alluvium and 3- to 4-inch cobble.

1.3.3.6 Pilot Channel.

An excavator will dredge a 1,500-foot-long pilot channel in the east channel from the top of the island downstream to just below the Highway 93 bridge. Work will be done with a track excavator from the dewatered channel.

The bottom of the pilot channel will be 30-feet-wide; the top will be 42-feet-wide. The depth will be 1-2 feet as it grades into the existing channel. This pilot channel will direct flow to increase depth and velocity over the wave structure. The bed will remain native substrate and size of material will be consistent with current substrate size.

The pilot channel is designed to transport sediment through the east channel and minimize aggradation during normal flows. Some deposition will still occur, and routine excavation will be needed to maintain the inlet to the east channel, the inlet to the play area side channel, the channel depth above the wave, and the pool below the wave (see *Routine Maintenance,* below).

The pilot channel excavation downstream of the highway bridge will remove some of the depositional bar material, per the City's proposal. The pilot channel will redirect flow away from the island to reduce erosion on Island Park's east bank. Additional excavation of the pilot channel below the bridge will not be done as routine maintenance and is not covered by this consultation.

1.3.3.7 Random Boulder Installation.

Large, partially buried boulder clusters will be used to provide play opportunities for boaters and kids from the upper end of the east channel to just below the proposed wave structure. Approximately thirty 6-foot-plus diameter, rounded boulders will be placed in the east channel above the wave. The play area will have ten 5- to 6-foot diameter, rounded boulders. Ten more 3-foot diameter rounded or angular feature boulders will be installed as directed by the project engineer and project manager. Native alluvium and 3 to 4-inch diameter cobbles will be used to key in the boulders.

Table 1.Excavation and Fill Volumes below OHWM Excavation and Fill Volumes below OHWM.

Structure/Activity	Material	Excavation Below OHWM (CY)	Fill Below OHWM (CY)
Excavation	existing alluvial material	2,975	
Grout/Concrete	3,500 psi concrete mix		125
Wave Feature Boulders	6-foot plus in-channel, rounded		50
Play Area Feature Boulders	5- 6-foot diameter rounded boulders		32
Additional Feature Boulders	3-foot diameter rounded or angular boulders		32
Wave Structure	≥3-foot diameter rounded boulders; in-channel		700
Boulder Deflector	≥3-foot diameter rounded boulders; in-channel		150
Buried Grade Control	3-foot diameter boulders - any kind OR 24-inch plus riprap		45
Levee Terracing	3-foot diameter boulders, on bank, can be angular/square		1,450
Play Area Terracing	2- 3-foot diameter boulders, rounded or angular		145
Island East Bank Armoring	3-foot diameter boulders, on bank, can be angular/square		200
Type H Riprap	18-inch riprap		115
Bedding Material	Clean 3- 4-inch cobble and native alluvium		705
Surface Substrate Material (Play area)	Clean coarse sand ¼-inch minus		37
Two Waterline Casings	High density polyethylene pipe; 2-foot diameter		38
Totals		2,975	3,824

1.3.3.8 Routine Whitewater Park Maintenance

During the 30-year design life of the wave feature, routine maintenance will be required to maintain its optimal function and longevity. The SWPA will be responsible for routine maintenance after it is approved by the City. All maintenance will be coordinated with IDFG and all permitting agencies.

In the first 1-2 years after construction, SWPA expects to have to remove sediment at the inlet of the east channel, above the wave structure, from the pool below the wave structure, and from the inlet of the play area. Based on the project engineer's experience with similar structures, routine sediment removal from the same areas is expected to occur two to three times between 5- and 10-years post construction and two to three more times between 10- and 30-years post construction (Table 2). The boulder clusters may also need to be repositioned during routine maintenance.

An excavator and dump truck will be used to perform all maintenance and in-water work will only occur between July 7 and August 21, after spring fish migrations, before the fall fish migrations, and when the water temperatures are typically above IDEQ criteria for cold water aquatic life. The excavator and dump truck will use the same construction access points utilized during the original construction. The excavator will work from the bank at the two river access sites above the highway bridge or will walk out on the depositional bar at the east channel inlet. Equipment will not enter the active channel. The frequency of expected maintenance events and quantity of fill removed are displayed in Table 2. Each maintenance event is conservatively estimated to remove approximately 500 CY.

Turbidity monitoring will follow the same protocols described for construction to protect water quality. With the exception of dewatering the channel, all of the design criteria, BMPs, and conservation measures described previously will also be implemented during routine maintenance. Dewatering is not proposed as the work is expected to take just one day and dewatering the entire east channel would take several days to complete and could be more harmful than in-water excavation.

Prior to the first two in-water maintenance events, IDFG fish biologists will snorkel the wave pool to determine ESA-listed fish presence or absence (P. Murphy, IDFG pers. comm. As cited in COE 2021). The pool is believed to be the most likely location to find ESA-listed fish if they are present. The SWPA project manager and the project engineer will report the results to NMFS for any additional direction prior to the start of in-water work. Snorkel results, and future coordination between NMFS and the SWPA, will also determine any changes in future routine maintenance protocols.

The excavator may also need to clean silt out of the play area pools. Silt removal from the play area pools will be completed in conjunction with the wave maintenance, using the same access point. Additional sand will not be added to the play area pools as routine maintenance and is not covered by this consultation.

The following activities are not covered under routine maintenance; regrouting, dewatering, fish salvage, pilot channel excavation downstream of the highway bridge, and maintenance of the armoring on the east bank of Island Park will not be done as routine maintenance and are not covered by this consultation.

Table 2. Estimated post-construction routine sediment removal (COE 2021).

Years Post-Construction	Number Removal Events	Estimated Sediment Removal
1	1	≤ 500 CY
2	1	≤ 500 CY
5-10	2 to 3	≤ 500-1500 CY
10-30	2 to 3	≤ 500-1500 CY

In the event of a large flood event that results in major channel changes such as occurred in 2017, the wave park may need reconstruction and in-channel work that exceeds the routine

maintenance actions described. If these conditions occur, SWPA and the COE will initiate consultation with NMFS.

1.3.3.9 City's Bank Armoring.

A 180-foot long by 6-foot-high section of the island's east bank, below the Highway 93 bridge, will be armored with 4-tiers of 3-foot diameter, about 200 CY of angular or square boulders and approximately 115 CY of 18-inch diameter riprap to protect the bank from erosion (Figure 6).

Excavation and rock armoring will remove most of the woody vegetation, including most of the cottonwood trees currently present. The project engineer and project manager will work with the contractor to avoid damaging or removing cottonwood trees whenever possible. The remaining trees are expected to maintain a source for cottonwood recolonization to suitable depositional areas upstream and downstream.

The cottonwood trees that need to be removed will be used to create complexity in the play area or hauled to a location for storage until they can be used in other area river restoration projects. The SWPA will notify the USBWP about these trees and their availability.

Twenty containerized cottonwood trees will be planted on the east bank of Island Park, in the same general vicinity as the trees being removed. The trees will be planted between the park road and the top of the rock-armored bank. If possible, the roots will be planted in the water table, a depth of 6 feet or more. The City will install and maintain an automatic drip watering system to increase the chance of survival during the first 2 years post planting. SWPA volunteers will plant 200 coyote willow cuttings collected on-site within the rock terrace. The cuttings will be planted in clumps near the base of the armored bank, in the water table to increase their chance of survival.

Some clumps of coyote willow and red osier dogwood that are permanently removed to build the wave structure and access points to the wave and play areas will be planted above the armored bank to replace lost vegetation. The roots will be planted in the water table, a depth of 6 feet or more, to increase the chance of survival.

Figure 6. City of Salmon's proposed bank armoring treatment area downstream of Highway 93 bridge on Island Park.

1.3.3.10 City of Salmon Water Pipeline Casings

Two City of Salmon water pipelines run perpendicular to and beneath the Salmon River's east channel. One pipeline is upstream of the highway bridge, the other is about 20 feet below the bridge. While the channel is dewatered for whitewater park construction, two new 24-inch diameter, and high-density polyethylene (HDPE) casings will be buried 5-feet below the east channel's bed elevation (to ensure they remain below the scour level). One casing will be 150-feet long; the other will be 175-feet long.

The City will feed new pipes through the casings in about two years when they are completing their waterline replacement project. No in channel work or other actions are tied to the waterline replacements. The old pipelines will not be removed.

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each Federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, Federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provide an opinion stating how the agency's actions would affect listed species and their critical habitats. If

incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

The COE determined the proposed actions are likely to adversely affect Snake River spring/summer Chinook (SR Chinook) and Snake River Basin steelhead (SR steelhead). They also determined the actions are not likely to adversely affect designated critical habitat for SR Chinook, SR Basin steelhead, and SR sockeye. Our concurrence is documented in the "Not Likely to Adversely Affect" (NLAA) Determinations section (Section 2.12). Table 3 provides the ESA listing status for these species and habitats.

Table 3. Federal Register notices for final rules that list threatened and endangered species, designated critical habitat, or apply protective regulations to listed species considered in this consultation.

Species	Listing Status	Critical Habitat	Protective Regulations
Chinook salmon (*Oncorhynchus tshawytscha*)			
Snake River spring/summer run	T 6/28/05; 70 FR 37160	12/28/93; 58 FR 68543 10/25/99; 64 FR 57399	6/28/05; 70 FR 37160
Sockeye salmon (*O. nerka*)			
Snake River	E 6/28/05; 70 FR 37160	12/28/93; 58 FR 68543	ESA Section 9 applies
Steelhead (*O. mykiss*)			
Snake River Basin	T 1/05/06; 71 FR 834	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160

Note: Listing status 'T' means listed as threatened under the ESA; 'E' means listed as endangered.

2.1 Analytical Approach

This biological opinion is limited to a jeopardy analysis, although Section 2.12 documents our concurrence with the COE's NLAA determinations for critical habitat. The jeopardy analysis relies upon the regulatory definition of "jeopardize the continued existence of" a listed species, which is "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

The ESA Section 7 implementing regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the final rule revising the definition and adding this term (84 FR 44976, 44977; August 27, 2019), that revision does not change the scope of our analysis, and in this opinion we use the terms "effects" and "consequences" interchangeably.

We use the following approach to determine whether a proposed action is likely to jeopardize listed species:

- Evaluate the rangewide status of the species expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species and critical habitat.

- Evaluate the effects of the proposed action on species using an exposure–response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat, analyze whether the proposed action is likely to directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.
- If necessary, suggest a reasonable and prudent alternative to the proposed action.

2.2 Rangewide Status of the Species

This opinion examines the status of each species that is likely to be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" for the jeopardy analysis.

This opinion considers the status of the SR Chinook evolutionarily significant unit (ESU) and the SR Steelhead distinct population segment (DPS). Both this ESU and this DPS are composed of multiple populations, which spawn and rear in different watersheds across the Snake River basin. Having multiple viable populations makes an ESU or DPS less likely to become extinct from a single catastrophic event (ICTRT 2010). NMFS expresses the status of an ESU or DPS in terms of the status and extinction risk of its individual populations, relying on McElhaney et al.'s (2000) description of a viable salmonid population (VSP). The four parameters of a VSP are abundance, productivity, spatial structure, and diversity. NMFS' recovery plan for SR Chinook salmon and SR steelhead (NMFS 2017) describe these four parameters in detail and the parameter values needed for persistence of individual populations and for recovery of the ESU and the DPS.

Table 4 summarizes the status and available information on both species, based on the detailed information on the status of individual populations, and the species as a whole provided by the *ESA Recovery Plan for Snake River Spring/Summer Chinook Salmon and Snake River Basin Steelhead* (NMFS 2017), *Status Review Update for Pacific Salmon and Steelhead Listed under the Endangered Species Act: Pacific Northwest* (NWFSC 2015), and *2016 5-year Review: Summary and Evaluation of Snake River Sockeye Salmon, Snake River Spring-summer Chinook, Snake River Fall-run Chinook, Snake River Basin Steelhead* (NMFS 2016). These three documents are incorporated by reference here. Additional information (e.g., abundance estimates) have become available since the latest status review (NMFS 2016) and its technical support document (NWFSC 2015). This latest information (NWFSC 2021) represents the best scientific and commercial data available and is summarized in the following sections. SR Chinook and SR steelhead remain threatened with extinction due to many individual populations not meeting recovery plan abundance and/or productivity targets.

Table 4. Most recent listing classification and date, status summary (including recovery plan reference and most recent status review), and limiting factors for species considered in this opinion.

Species	Listing Status	Status Summary	Limiting Factors
Snake River Spring/summer Chinook Salmon	Threatened 6/28/05	This ESU comprises 28 extant and four extirpated populations, organized into five major population groups (MPGs), none of which are meeting the viability goals laid out in the recovery plan (NMFS 2017). All except one extant population (Chamberlin Creek) are at high risk of extinction (NWFSC 2015). Most populations will need to see increases in abundance and productivity in order for the ESU to recover. Several populations have a high proportion of hatchery-origin spawners—particularly in the Grande Ronde, Lower Snake, and South Fork Salmon MPGs—and diversity risk will need to be lowered in multiple populations in order for the ESU to recover (NWFSC 2015). Overall, adult returns declined dramatically across the ESU between 2015 and 2019, compared to the five preceding return years (NWFSC 2021). Only three populations (Minam, Bear Valley, and Marsh Creek) exhibit an increasing abundance when evaluating returns over periods of 10 to 20-years and these are the only populations currently expected to be meeting VSP criteria for a maintained status (NWFSC 2021).	• Adverse effects related to the mainstem Columbia and Snake River hydropower system and modifications to the species' migration corridor. • Degraded freshwater habitat, including altered streamflows and degraded water quality. • Harvest-related effects. • Predation in the migration corridor. • Potential effects from high proportion of hatchery fish on natural spawning grounds.
Snake River Basin Steelhead	Threatened 1/5/06	This DPS includes 24 populations organized into five MPGs. In 2015, five populations were tentatively rated at high risk of extinction, 17 populations were rated at moderate risk of extinction, one population was viable, and one population was highly viable (NWFSC 2015). Four out of the five MPGs were not meeting the population viability goals laid out in the recovery plan (NMFS 2017). Since 2015, adult abundance has decreased for all populations except one (range -30 percent to -71 percent, NWFSC 2021). The Wallowa River population is an outlier, displaying a 72 percent abundance increase since 2015. Although decisions on current status are not yet complete, two of the five MPGs appear to meet recovery plan objectives but more populations and MPGs need to be viable for the DPS to recover. The relative proportion of hatchery fish spawning in natural spawning areas near major hatchery release sites remains uncertain and may need to be reduced (NWFSC 2015, NWFSC 2021).	• Adverse effects related to the mainstem Columbia and Snake River hydropower system and modifications to the species' migration corridor. • Genetic diversity effects from out-of-population hatchery releases. Potential effects from high proportion of hatchery fish on natural spawning grounds. • Degraded fresh water habitat. • Harvest-related effects, particularly B-run steelhead. • Predation in the migration corridor.

The actions are located in the mainstem Salmon River, just upstream of the Lemhi River confluence. This area falls within the boundaries for the Salmon River Lower Mainstem SR Chinook and Pahsimeroi River SR steelhead populations, which belong to the Upper Salmon River and Salmon River MPGs, respectively. The action area also serves as migratory adult and juvenile rearing/overwintering and migratory habitat for all upstream populations for both species (Table 5 and Table 6), all of which belong to the same two MPGs.

Current viability status, applying Interior Columbia Technical Recovery Team (ICTRT) (2007) criteria, for each SR Chinook and SR steelhead population affected by the actions is displayed in Table 5 and Table 6 along with the populations' life history type, population size class, and its role in NMFS' example recovery scenarios (NMFS 2017). It is important to note that all populations must meet criteria for a maintained status – less than 25 percent chance of extinction in 100 years – to maintain options for a viable major population group (MPG) and the species recovery (ICTRT 2007).

The Upper Salmon River SR Chinook MPG contains a total of eight extant populations and one functionally extirpated population (i.e., Panther Creek). Five populations must meet viable status with the appropriate representation of population size, life history, and spatial distribution to meet MPG viability criteria. The ICTRT example recovery scenario for this MPG includes the Pahsimeroi River (summer Chinook life history); the Lemhi River and Upper Salmon Mainstem (very large size category); East Fork Salmon River (large size category), and Valley Creek. The Lower Mainstem population, which primarily exhibits summer run timing and has lagged behind other populations in total abundance, is not currently identified in NMFS' example recovery scenario for this MPG (NWFSC 2021), but the population is one of two very large size populations in the MPG and could be used to satisfy viability criteria in lieu of other populations. Specific effects are discussed in section 2.4.

For SR Chinook, abundance and productivity have declined across the affected MPG and individual populations since our last status review (NMFS 2016 and NWFSC 2015) and are approaching levels reported when the species were first listed (NWFSC 2021). During this time, observations of coastal ocean conditions suggested that the 2015-2017 outmigrant year classes experienced below average ocean survival during a marine heatwave and its lingering effects. This led researchers to predict a corresponding drop in adult returns through 2019 (Werner et al. 2017). In fact, the best scientific and commercial data available with respect to the adult abundance of all populations in and upstream of the action area indicate a substantial downward trend in abundance and productivity when comparing returns from 2010-2014 to 2015-2019. Over this period, declines ranged from 9 percent in the Lemhi (where extensive habitat improvements targeting SR Chinook have been accruing) to 87 percent in the Yankee Fork population. Although NMFS has not yet completed our most recent status determination, declining abundance and productivity will likely continue to support the high-risk ratings for all populations.

For steelhead, all affected populations belong to the Upper Salmon River MPG, which includes a total of 12 populations. Six of those populations must be viable, with the appropriate representation of population size, life history, and spatial distribution to meet MPG viability criteria. The recovery plan's example recovery scenario for this MPG identifies two Middle Fork

populations, the South Fork Salmon River, Chamberlain Creek, Panther Creek, and the North Fork Salmon River populations. This scenario meets the ICTRT (2007) criteria. Although none of the populations affected by this action are included in the recovery scenario, all populations must improve to a maintained status for the MPG to be viable. Although the current status review is not yet complete, the available information suggests the affected populations may be meeting criteria for maintained status.

At the MPG scale, 5-year geometric mean SR steelhead natural adult abundance declined an average of 54 percent across the MPG (range 31 to 71 percent) when comparing return years 2010-2014 to 2015-2019. There is a great deal of uncertainty with individual population abundances in this MPG given estimates are generated from aggregate Lower Granite Dam returns and then parsed into similar genetic stock groupings. Data are still not available for individual populations and the values remain unconfirmed estimates and are applied with caution. The data are however, the best current information and represent an improvement from previous estimates, which were based solely on aggregate dam counts.

Table 5. Preliminary SR Chinook abundance (most recent 10 year geometric mean (range)) and viability ratings (NWFSC 2021) and recovery plan role (NMFS 2017) for populations potentially affected by the proposed actions considered in this opinion.

Population[a] ***(run timing)***	**Abundance/Productivity Metrics**				**Integrated Spatial Structure and Diversity Risk Rating**	**Overall Risk Rating**	**Identified for viable status in ICTRT Recovery Scenario?[d]**
	ICTRT Threshold[b]	***Natural Spawning***	***ICTRT Productivity***	***Integrated A/P Risk***			
Upper Salmon River MPG Populations Affected by the Proposed Actions							
Salmon Lower Main *(spring/summer)*	2,000[a]	71 (sd 87)	1.30 (0.23 20/20)	High	Low	High	No
Salmon Upper Main *(spring/summer)*	1,000[b]	326 (sd 270)	1.13 (0.31 18/20)	High	Low	High	Yes
Pahsimeroi River *(summer)*	1,000	218 (sd 168)	1.26 (0.20 20/20)	High	High	High	Yes
Lemhi River[c] *(spring/summer)*	2,000	250 (sd 159)	1.63 (0.28 19/20)	High	High	High	Yes
Valley Creek *(spring/summer)*	500[d]	113 (sd 100)	1.63 (0.26 17/20)	High	Moderate	High	Yes
Salmon East Fork *(spring/summer)*	1,000	288 (sd 291)	2.00 (0.28 17/20)	High	high	High	Yes
Yankee Fork *(spring/summer)*	500	62 (sd 139)	0.99 (0.51 17/20)	High	High	High	No

[a]The North Fork and Panther Creek populations are not displayed since they are located downstream of the action area and do not migrate through it.

[b] ICTRT threshold establish the population size class as follows: 2,000 = Very Large; 1,000 = Large; 750 = Intermediate; and 500 = Basic.

[c] The Lemhi population is downstream of the action area, but there is some limited potential for Lemhi River juveniles to migrate into the action area in the fall and potentially overwinter there.
[d] Populations marked 'yes' must be viable which is defined as having a 5% or less risk of extinction over 100 years. One of the five populations must by highly viable (i.e., less than 1% risk of extinction in 100 years). All populations in the MPG must meet criteria for maintained status for the MPG to be viable. Maintained populations have a less than 25 percent chance of extinction in 100 years.

Table 6. Preliminary estimated SR steelhead abundance (most recent 10 year geometric mean (range)) and viability ratings (NWFSC 2021) and recovery plan role (NMFS 2017) for populations potentially affected by the proposed actions considered in this opinion.

Population	**Abundance/Productivity Metrics** [a]				***Integrated Spatial Structure and Diversity Risk***	**Overall Risk Rating**	**Identified for viable status in ICTRT Recovery Scenario?**[d]
	ICTRT Minimum Threshold	***Natural Spawning Abundance***	***ICTRT Productivity***	***Integrated A/P Risk***			
Salmon River MPG Populations Affected by Proposed Actions							
Lemhi R.	1,000	3,502 (sd 2,562)	1.88 (0.17 16/20)	Moderate	Moderate	Maintained	No
Pahsimeroi R.	1,000			Moderate	Moderate	Maintained	No
East Fork Salmon R.	1,000			Moderate	Moderate	Maintained	No
Up Main. Salmon R.	1,000			Moderate	Moderate	Maintained	No

[a] Abundance and productivity values are generated from aggregate steelhead counts at Lower Granite Dam that are subsequently partitioned into four subgroups based on genetic stock identification. The Upper Salmon River stock group includes six populations. The displayed abundance and productivity values are for the entire subgroup, not just the four populations shown.
[d] Populations marked 'yes' must be viable which is defined as having a 5% or less risk of extinction over 100 years. All populations in the MPG must meet criteria for maintained status for the MPG to be viable. Maintained populations have a less than 25 percent chance of extinction in 100 years.

2.2.1 Climate Change Implications for ESA-listed Species

One factor affecting the rangewide status of SR Chinook and steelhead, and aquatic habitat at large, is climate change. The 2018 U.S. Global Change Research Program (USGCRP 2018) reports average warming in the Pacific Northwest of about 1.3ºF from 1895 to 2011, and projects an increase in average annual temperature of 3.3ºF to 9.7ºF by 2070 to 2099 (compared to the period 1970 to 1999), depending largely on total global emissions of heat-trapping gases (predictions based on a variety of emission scenarios including B1, RCP4.5, A1B, A2, A1FI, and RCP8.5 scenarios). The increases are projected to be largest in summer (Melillo et al. 2014, USGCRP 2018). The 5 warmest years in the 1880 to 2019 record have all occurred since 2015, while 9 of the 10 warmest years have occurred since 2005 (Lindsey and Dahlman 2020).

Several studies have revealed that climate change has the potential to affect ecosystems in nearly all tributaries throughout the Snake River (Battin et al. 2007; ISAB 2007). While the intensity of effects will vary by region (ISAB 2007), climate change is generally expected to alter aquatic habitat (water yield, peak flows, and stream temperature). As climate change alters the structure and distribution of rainfall, snowpack, and glaciations, each factor will in turn alter riverine hydrographs. Given the increasing certainty that climate change is occurring and is accelerating (Battin et al. 2007), NMFS anticipates salmonid habitats will be affected. Climate and hydrology models project significant reductions in both total snow pack and low-elevation snow pack in the Pacific Northwest over the next 50 years (Mote and Salathé 2009). These changes will shrink the extent of the snowmelt-dominated habitat available to salmon and may restrict our ability to conserve diverse salmon life histories.

In the Pacific Northwest, most models project warmer air temperatures, increases in winter precipitation, and decreases in summer precipitation. Average temperatures in the Pacific Northwest are predicted to increase by 0.1 to 0.6°C (0.2°F to 1.0°F) per decade (Mote and Salathé 2009). Warmer air temperatures will lead to more precipitation falling as rain rather than snow. As the snow pack diminishes, seasonal hydrology will shift to more frequent and severe early large storms, changing stream flow timing, which may limit salmon survival (Mantua et al. 2009). The largest driver of climate-induced decline in salmon populations is projected to be the impact of increased winter peak flows, which scour the streambed and destroy salmon eggs (Battin et al. 2007).

Higher water temperatures and lower spawning flows, together with increased magnitude of winter peak flows are all likely to increase salmon mortality. The Independent Scientific Advisory Board (ISAB) (2007) found that higher ambient air temperatures will likely cause water temperatures to rise. Salmon and steelhead require cold water for spawning and incubation. As climate change progresses and stream temperatures warm, thermal refugia will be essential to persistence of many salmonid populations. Thermal refugia are important for providing salmon and steelhead with patches of suitable habitat while allowing them to undertake migrations through or to make foraging forays into areas with greater than optimal temperatures. To avoid waters above summer maximum temperatures, juvenile rearing may be increasingly found only in the confluence of colder tributaries or other areas of cold-water refugia (Mantua et al. 2009).

Likely changes in temperature, precipitation, wind patterns, and sea-level height have implications for survival of SR Chinook and SR steelhead in both its freshwater and marine habitats. Climate change is expected to make recovery targets for salmon more difficult to achieve (Crozier et al 2019). Climate change is expected to alter critical habitat by generally increasing temperature and peak flows and decreasing baseflows. Although changes will not be spatially homogenous, effects of climate change are expected to decrease the capacity of critical habitat to support successful spawning, rearing, and migration. Habitat improvement actions can help address the adverse impacts of climate change on salmon. Examples include restoring connections to historical floodplains and freshwater and estuarine habitats to provide fish refugia and areas to store excess floodwaters, protecting and restoring riparian vegetation to ameliorate stream temperature increases, and purchasing or applying easements to lands that provide important cold water or refuge habitat (Battin et al. 2007; ISAB 2007).

2.3 Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The project area is within the city limits of Salmon on property owned by the City. As seen in Figure 7 and Figure 8, this area is highly developed. The two Salmon River channels (east and west) are separated by the 0.73-mile-long Island Park. The main channel (i.e., majority of flow) is on the west side of Island Park; the secondary channel is on the east side of the park. There is a small, high flow side-channel between the east channel and Island Park (visible in Figure 8).

The action area includes the west and east channels of the Salmon River, from the southern end of Island Park (upstream end) to the northern tip of the island (downstream end). This distance (approximately 0.73 miles) includes the projected extent of all project-generated turbidity, noise, future recreational use, and other anticipated effects of the action. The entire length of Island Park, and all of Veterans' Park, located on the east shore of the east channel, are also included in the action area since these sites will be used to access the new wave and related facilities, provide construction access for the wave and bank stabilization, and receive future recreational use.

Figure 7. Aerial view, looking north (i.e., downstream) and displaying Island Park, the Salmon River's west (viewer's left) and east (viewer's right) channels, and the existing pedestrian and Highway 93 bridges. This is the upstream extent of the action area.

Figure 8. Aerial view, looking north (i.e., downstream) and displaying the downstream half of Island Park. The proposed wave structure will be located between the two bridges on the east channel (on right in picture). Also visible is the existing vehicle access to the island, Veteran's Memorial Park (right bank between two bridges), and the existing City skate park and island parking areas.

2.4 Environmental Baseline

The environmental baseline refers to the condition of the listed species or its designated critical habitat in the action area without the consequences to listed species or designated critical habitat caused by the proposed action. 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 consultations, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02).

The descriptions provided below focus only on baseline conditions within the action area. The Salmon River is confined by the COE levee on the east bank of the east channel and topography and urban development on the west bank of the west channel. In winter, ice frequently inundates portions of the channel as it backs up from the Deadwater reach many miles farther downstream (Axelson et al. 1990). The dominant substrate is embedded large gravel and cobble. Habitat conditions in the action area are poor, with no pools, limited undercut banks, low levels of large woody debris, and no spawning habitat.

All proposed activities will occur in the east channel, including work within a small side channel just off the island's west shoreline (see Figure 8). The side channel holds groundwater and backwater but does not have a surface connection with the east channel during baseflows. At high flows, a complete surface connection exists. Groundwater contributes a large volume of water to the east channel below the Highway 93 bridge where the channel turns sharply to the west and then east. Prior to 2017, aggradation and low flow in the east channel during the summer and early fall provided poor quality habitat (Ecosystem Research Group 2016) (NMFS 2016). The channel was wide and shallow and lacked any pools or useable cover for fish. High flows in 2017 approached a 50-year flood event (BLM 2019) which mobilized previously deposited substrates. This flow opened up the east channel slightly such that it now carries approximately 1/3 of the Salmon River's discharge (S20 Design and Engineering 2021). Habitat conditions in both channels remain poor, mostly due to the long-term lack of large wood, historical channel and floodplain simplification associated with the urban setting, and unsuitable water temperatures for the majority of the year (e.g., hot in summer and frequent anchor ice in winter). Habitat conditions result in almost no juvenile salmonids rearing in the action area. Adult and juvenile fish do successfully migrate through the action area, likely using the east and west channel. More fish likely use the west channel for migration due to the larger volume of water, but there are no data to support this assumption.

Water Temperature. The importance of temperature in defining aquatic environments is arguably second only to the presence of water (Isaak et al. 2017). Temperature: (1) dictates metabolic rates, physiological processes, and life history events across taxa; (2) constrains the distribution and abundance of ectothermic species that constitute most aquatic communities; (3) is used to measure habitat impairment; and (4) serves as the basis for regulatory actions (multiple sources cited in Isaak et al. 2017).

The Salmon River, in the action area, is listed as an impaired water body by the IDEQ under section 303(d) of the CWA. Identified impairments are flow regime modification and temperature (IDEQ 2020). The U.S. Environmental Protection Agency (EPA) has not yet approved total maximum daily loads (TMDL) for the assessment units in this area.

Although salmon and steelhead migrate through the action area (juveniles in spring and adults spring, summer and fall), summer water temperatures are believed to be too warm to support juvenile salmonid rearing. There is surprisingly little current data on water temperatures here. U.S. Forest Service researchers (Isaak et al. 2017) compiled water temperature data from across the interior Columbia River basin and for this reach they reported a mean August temperature of 63.5°F for the 1993-2011 period. Using models and climate projections, they then estimated future water temperature after applying the effects of expected climate change scenarios. Estimates were made for years 2040 and 2080. For the action area, they estimated mean August water temperature in the action area will be 66.1°F by 2040 and about 68°F by 2080. Depending on life stage, salmonids can die at water temperatures ranging from 57.2-77°F (multiple citations in Crozier et al. 2019), but physiological and behavioral impacts can occur at lower temperatures in absence of appropriate refugia. For migration and rearing habitat, NMFS generally considers water temperatures greater than 64°F as not properly functioning (NMFS 1996). Current temperatures routinely exceed this value and future projections suggest temperatures will do so more frequently, potentially with lethal consequences for fish. In short, current summer thermal

conditions are poor for ESA-listed salmonids and the area primarily serves as a migration corridor with little value as summer rearing habitat. Jesse Creek, a small tributary, does enter the west channel just upstream of the Island Park vehicle bridge. Although severely dewatered in the summer by irrigation and municipal water withdrawals, the confluence area may provide thermal refugia on occasion.

Kids Creek is another tributary to the action area, joining the east channel from the southeast, approximately 500 feet upstream of the pedestrian bridge and below the upper extent of the island. Kids Creek is a small perennial stream that is heavily influenced by upstream irrigation practices, including return flows from Salmon River diversions much further upstream. As a result, summer flows are substantially higher and warmer in Kids Creek than they would be without irrigation. The influence is likely due to extensive upstream flood irrigation water returning to Kids Creek via an array of surface and groundwater pathways. In early fall, shortly after irrigation ceases, discharge drops dramatically and only about 5-10 cfs enters the Salmon River. Because it is primarily spring fed during winter, Kids Creek may serve as temporary refugia for fish seeking to avoid ice in the Salmon River. There are no data available to support fish using Kids Creek in this fashion, but it is believed to be possible.

Modified Flow Regime. The Salmon River is listed on IDEQs category 4(c) list for flow regime modification from Pollard/Jesse Creek, just upstream of the Island Park vehicle bridge, upstream several miles to Williams Creek (IDEQ 2020). The listing is based on the number of diversions and water rights in this area. The monthly mean discharge measured at USGS gage #13302500 located approximately 0.3 miles downstream of Island Park and the action area from 1912 through 2020 shows the lowest baseflows occur from August through the following March. Currently, about one third of the total flow measured by this gage flows through the east channel. Substantial water withdrawals occur upstream of this point. Based on the number of irrigated acres and assuming 0.02 cfs per acre, NMFS (2021) estimated the Salmon River upstream of the Middle Fork Salmon River may have summer baseflow of less than half the quantity of water present prior to irrigation development.

The City also operates an auxiliary water lift station consisting of an infiltration gallery and two large pumps to withdraw water from the west channel for municipal uses when tributary water is insufficient to fulfill the City's needs. The lift station is located on Island Park where two pumps can remove up to 8.15 cfs. The estimated mean monthly discharge in the east channel during September is 347 cfs (1/3 of total flow). This volume includes the small discharge contributed by Kids Creek. Summer baseflow reductions likely reduce fish access to the meager amounts of cover near the stream margins, reduces availability of forage, and contributes to increased water temperatures. Overall, flow regime in the action area is highly modified and has contributed to reduced habitat suitability within (and beyond) the action area.

Floodplain, Wetland, Riparian Habitat, and Bank Condition. The Tomanovich Levee (levee) makes up the entire east bank of the east channel through the action area. The levee is a federally constructed system and has been in place since 1955. It was damaged by ice-induced flooding in 1957 but immediately repaired (Larsen 2021).

As the sponsor of the 1,478-foot long section of levee through the action area, the City is responsible for its operation and maintenance. The levee is routinely cleared of riparian vegetation to meet COE standards necessary to qualify for continued participation in FEMA's National Flood Insurance Program. As a result, the levee is essentially devoid of woody vegetation absent a few non-native invasive Siberian elm (*Ulmus pumila*) and the noxious weed spotted knapweed (*Centaurea stoebe*). As per Section 14 of the Rivers and Harbors Act of 1899, alteration to a federally authorized project (i.e., levee) requires a COE Section 408 permit. The proposed project cannot pose a risk to the public interest or impair the usefulness of the federally authorized project including levees, dams, and federal navigation channels.

In general, the island's streambanks are sparsely vegetated, supporting a narrow band of coyote willow (*Salix exigua*), red-osier dogwood (*Cornus sericea*), and scattered black cottonwood trees, and other woody riparian dependent and facultative species such as Wood's rose (*Rosa woodsii*) and chokecherry (*Prunus virginiana*) (Ecosystem Research Group 2016) (NMFS 2016). Most of the native riparian vegetation has long been replaced by roads, parking areas, a constructed recreational trail, manicured lawn, an infiltration gallery, two boat ramps, and other park amenities. Large rock, likely imported for historical bank protection, makes up much of the bank substrate in both channels (NMFS 2016). River substrate throughout the reach is coarse, generally consisting of large cobble and small boulders in the west channel and small to large cobble in the east channel.

The COE wetland classification in the project area is predominantly Riverine (R3UBH) (https://www.fws.gov/wetlands/data/Mapper.html). The upstream end of the island (0.43 acre) is Freshwater Emergent Wetland (PEM1A). Much of the area classified as PEM1A is already developed as a hardened recreational trail that will be used for equipment access. The native, riparian vegetation is confined to the active bars and riverbanks and overall functionality has been severely altered.

Woody riparian vegetation has been recolonizing the depositional bars since the 2017 flood. The narrow band of riverine vegetation between the park road and the top of the island bank proposed for armoring below the Highway 93 bridge includes 13 cottonwood trees 5- to 28-inches diameter-at-breast height (DBH) and at least 29 cottonwood saplings ≤3- to 4-inches DBH. The bank has been previously rocked and the remaining vegetation provides a visual screen between Island Park, the highway bridge, and a restaurant deck on the other side of the river; some avian nesting habitat, root strength in the bank, and canopy cover.

In addition to the levee confinement that exists through the action area. Three bridges, two vehicle and one pedestrian, cross the Salmon River's two channels. The vehicle bridge accessing the island was replaced in 2016, increasing the span from 46 feet to 80 feet. Despite the improvement at the site scale, river water cannot regularly access the floodplain throughout the action area, and thus potentially valuable rearing habitat is absent. Also, the regeneration of nutrients and sediment important to maintain healthy ecological processes cannot occur when flows cannot regularly access the floodplain and banks are armored. This is magnified by the absence of robust riparian vegetation that has been mostly eliminated in this urban setting. The area is unlikely to function properly in the future given the level of development present in the center of the city.

2.4.1 Anadromous Fish Presence in the Action Area

No anadromous fish spawning is known to occur in the action area and the area lacks suitable gravels and other habitat conditions to support future spawning. Adult and juvenile SR Chinook and steelhead migrate through the action area, and juvenile Chinook and steelhead likely rear within the action area when water temperatures are suitable (i.e., spring, fall, and winter). No known fish density data for rearing or overwintering juvenile salmonids are available for the area but densities are expected to be low to very low given the poor habitat quality and lack of proximal natal habitat. Adult Chinook salmon migrate through the area between June and August and adult steelhead begin arriving in the area about mid-October with some overwintering in or near the action area when ice is not present.

NMFS completed the recovery plan for SR Chinook and steelhead in 2017 (NMFS 2017). The recovery plan discusses threats to the species, viability criteria, and actions recommended to achieve species recovery. Although the proposed actions do not implement any of the identified recovery actions, we did not identify any conflict with plans' specific recommendations.

2.5 Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

2.5.1 Effects to Species

We identified the following general categories of potential effects expected from the proposed actions:

1. Effects that may occur during the initial construction of the permanent wave park structures, water line casings, bank armoring, and substrate removal;

2. Effects of routine maintenance necessary to maintain a functioning wave and play area;

3. Effects caused by use of the wave structure and associated infrastructure; and,

4. Effects of the structure's presence for approximately 30 years, the estimated lifespan of the structure.

We considered, under the ESA, whether the proposed action would cause any other activities and determined that it would not.

2.5.1.1 Construction-related Effects

Construction is scheduled to occur as early as August 1 and could extend through December. This is within the locally recommended instream work period (USBWP 2005). During this period, adult SR Chinook could be migrating through the action area in August, but not during the later months of the construction period. Adult SR steelhead typically arrive in the vicinity of Salmon near mid-October. When holding near or in the project area, they are expected to be present in the limited areas of deeper habitat, typically with adequate cover, until they make their final push to natal spawning areas early the following spring. Small numbers of adult SR steelhead are expected to be present from mid-October until construction is complete near the end of December.

For juveniles, primary migrations to the sea occur in the spring, with limited numbers of SR Chinook and steelhead possibly overwintering in the action area. Winter typically brings heavy ice accumulations and the number of fish successfully overwintering in the action area likely depends on the severity of winter weather. Low numbers of juveniles are expected to be present during the proposed work window, and individuals of both species are likely to be present and exposed to construction activities.

Potential adverse effects of the action may include the following:

- Temporary displacement from habitat from construction noise/disturbances and fish salvage efforts. Effects may range from hazing, harassment, stranding, handling/capture, and electrofishing-related harm and/or death.

- Exposure to minor and temporary (i.e., minutes to hours long) turbidity increases.

- Exposure to potential chemical contaminants such as petroleum and concrete products.

- Exposure to increased sediment deposition and its related effects to cover, food, and escape cover.

Cofferdam Installation and Fish Salvage. As water is diverted from the east channel into the west channel, it is possible some adult Chinook salmon could be migrating through the action area. Because water levels will be approaching base flows and the west channel carries 2/3 of the water volume, most adults are likely to pass through the west channel during late summer. In the event any adults are present in the east channel when dewatering begins in early August, they are likely to quickly move out of the east channel, either upstream or downstream, and continue their migration with only minor behavioral modifications (i.e., unharmed). The east channel will be slowly dewatered over 48 hours, allowing ample opportunity for the fish to move out of the channel. As flows are incrementally reduced, there will also be less attractant flow in the east channel, further decreasing the potential use of new adults entering the east channel as dewatering progresses. There is also little to no available holding cover in the east channel that is reasonably expected to provide suitable cover for adult migrants as waters recede. Based on our experience with extensive dewatering events, there is very little potential for adults to become trapped in the east channel where they would be exposed to proposed fish salvage. Because adult

Chinook migrate very quickly and because there is low potential for adults to become stranded in the east channel as it is slowly dewatered, we do not expect any adult Chinook salmon will be subject to the proposes fish salvage efforts.

Under the proposed action, cofferdams (vibratory installed sheet-pile or gravel filled super sacks) will be installed to incrementally reduce flow in the east channel over approximately 48 hours until about 10 percent of the pre-project volume remains. This is expected to allow approximately 50 percent or more of the pre-project juvenile fish to emigrate out of the dewatered east channel area and into the side channel/Kids Creek flow on their own volition. The IDFG will then block the lower east channel's entrance to prevent fish from entering from downstream. IDFG will perform two upstream and two downstream passes with electrofishing gear in dewatered areas of the east channel to remove fish that do not volitionally move into the Kids Creek bypass channel or out of the work area. Salvaged fish will be released in the west channel at the closest safe release location and without delay. All electrofishing will follow NMFS' (2000) guidelines to minimize harm.
After salvage is complete, the downstream cofferdam will be installed at the bottom of the east channel, below the highway bridge, to prevent backwatering if Salmon River flows increase. Kids Creek water will remain in a single thread channel on the river left bank, utilizing the existing side channel, after which it will pass over the downstream cofferdam in a temporary pipe. This will allow the contractor to build about 80 percent of the wave structure before switching Kids Creek to the right bank to allow the remaining portion to be completed. Fish in the side channel/Kids Creek flow will remain and they could volitionally leave the project area, passing downstream through the culvert and over the lower cofferdam or upstream, into Kids Creek. The Kids Creek water will only need to be salvaged when moving the water from the west side bypass area to the east side pilot channel – which is necessary to complete work on the river left bank.

The east channel's dewatered area is estimated to be about 5.0 acres (2,550 feet long by variable width). The Kids Creek area, which will be salvaged after switching bypass channels, is estimated to be 0.23 acres (2,550 feet long by 4 feet wide). As discussed in the environmental baseline, the east channel's fish habitat is wide, shallow, very warm, and devoid of cover and is considered to be very low quality. No local fish sampling data are available. Salvage will not overlap with juvenile salmon and steelhead migration periods, which primarily occur during spring. Hall-Griswold and Petrosky (1996) documented parr densities for poor, fair, good, and high quality habitats. Their data were taken from tributary streams and sorted by channel type and level of apparent degradation. The action area is not natal habitat and is expected to have much lower densities of juvenile fish than tributary rearing areas. Because of the difference in fish use of the area and because the habitat condition in the action area is very poor and often too warm to support juvenile rearing , applying fish densities for poor habitat are likely to substantially overestimate the number of fish present during dewatering. There are no other data from past fish salvage actions or fish sampling in the area. For reasons described, we expect fish densities to be much lower than those suggested by Hall-Griswold and Petrosky (1996), even for poor habitat quality (0.56 steelhead and 1.1 Chinook salmon parr per 100 square feet). For this reason, we reduced their estimates by 50 percent to estimate the number of fish potentially present and thus exposed to fish salvage and the other impacts caused by this action. This equates to approximately 0.28 steelhead and 0.55 Chinook salmon parr per 100 square feet. This

is still expected to be an overestimate given the width of the channel and lack of preferred near-shore habitat juveniles typically depend on. Regardless, it is the best information available to inform our estimate.

Cofferdam construction and fish salvage may cause the following effects to juvenile SR Chinook and juvenile steelhead:

- Potential crushing of juveniles in stream substrate as equipment enters the channel to begin installing sheetpile or super sack cofferdams.

- Behavioral modification caused by exposure to elevated sound pressure levels (SPL) generated if sheet pile cofferdams are installed with a vibratory hammer.

- Harassment, handling, harm, and potentially death caused by fish salvage.

- Fish stranding could occur during dewatering.

Applying the above fish density estimates, NMFS calculated that up to 662 steelhead parr and 1,301 Chinook salmon parr may be present between all salvage areas. Although NMFS has historically applied a 50% volitional emigration rate from dewatered areas that typically applies to locations where the entire channel is being dewatered. In this situation, the initial dewatering will maintain flow along the river left bank in the Kids Creek bypass, providing a temporary refugia for fish to migrate into and where salvage is not initially required. Much higher fish emigration rates are expected for this reason and we applied an 80% value to account for site-specific conditions.

Applying the estimated emigration rates, we calculated that up to 141 steelhead parr and 260 Chinook salmon parr may be captured. Each of these fish would experience varying levels of elevated stress and potentially harm, with some fish dying from the exposure to electrofishing and handling. Applying a five percent mortality estimate associated with electrofishing (McMichael et al. 1998) NMFS estimates up to 7 steelhead parr and 13 Chinook salmon parr mortalities may result from the proposed electrofishing salvage.

Juvenile fish are known to seek refuge in stream substrate, with larger cobble more preferable than small gravel due to more useful interstitial space (Ligon et al. 2016; Thurow et al. 2020). As water levels drop, some juvenile fish could become stranded and lost in these dewatered interstitial spaces. We have no accurate way to measure or estimate the number of fish that could be stranded. However, stranding risk is expected to be relatively low here given the staged dewatering over 48-hours, and because the Kids Creek bypass channel will offer a refugia and escape route as water level drops. Electrofishing the channel margins will also be effective in capturing most fish during the proposed four passes. For these reasons, we do not expect any fish injury or stranding to occur during the dewatering process.

Assuming steelhead fry-to-smolt survival is approximately 13.5% (Quinn 2005), and smolt to adult survival is approximately 0.8% (USFWS 1998), we calculated that fewer than one adult steelhead equivalent (0.01) may be lost from the population as a result of this level of juvenile

mortality. For Chinook salmon, if fry-to-smolt survival is approximately 10.1% (Quinn 2005), and smolt to adult return is approximately 0.87%, fewer than one adult Chinook salmon equivalent (0.01) may be lost from the population from fish salvage.

Effects to Species from Noise. The noise from construction and routine maintenance is not expected to harm fish given: (1) impact hammers will not be used to install the cofferdams; (2) normal equipment noise levels are at least an order of magnitude lower than established underwater sound pressure thresholds (Fisheries Hydroacoustic Working Group 2008; Federal Highway Administration 2008); and (3) in-water work to build the cofferdams with vibratory hammers will occur for less than 12 hours a day for 6 days (NMFS 2016).

Juvenile Chinook salmon and steelhead occupancy is expected to be very low during the early August channel dewatering/vibratory pile driving. Adult SR Chinook salmon may be migrating during this time. Vibratory hammers produce sound pressure levels that cause minor behavioral impacts to exposed fish (FHWG 2008). Exposed fish are expected to temporarily move or seek out escape cover downstream in the west channel, upstream into the main Salmon River, or downstream in the east channel where they feel more secure. Movements could result in an unknown level of increased predation for juvenile fish. Predation risk is likely low due to the small number of ESA-listed fish present in late summer, small area affected, short periods of affect, anticipated short movement distances of exposed fish, and presence of adjacent similar habitat for escape cover nearby. Adult migrants are expected to flee the immediate area of elevated noise and continue upstream migrations unharmed by vibratory hammer use.

Similar displacements may occur from construction equipment operation and noise adjacent to rearing and migratory habitat in the west or east channel. Fish use of the west channel will not be meaningfully affected by noise given the only proximal work will be the vibratory pile driving at the top of the island (discussed above). Equipment will work in close proximity to potential rearing habitat in the east channel. In these cases, fish would be displaced for a few hours in any given day during construction staging, dewatering, and possibly within the Kids Creek bypass channel during construction. We do not anticipate short-term movements caused by the expected noise levels from construction equipment or cofferdam installations will result in effects substantially different than those typically experienced by fish in their natural environment or as influenced by the existing noise and visual stimuli from the highway, pedestrian bridge, and west channel recreation. For these reasons, the noise levels and the level of disturbance caused by construction equipment and the vibratory hammers used to install the cofferdams will be so minor that we consider them biologically irrelevant to exposed fish.

Turbidity Effects. The effects of increased suspended sediment on salmonids vary based on exposure time and concentration. These effects were reviewed by Newcombe and Jensen (1996) and range from avoidance response, to minor physiological stress from increased rate of coughing, to death. Salmonids are relatively tolerant of low to moderate levels of suspended sediment (Gregory and Northcote 1993) and they tend to avoid high levels of turbidity when possible (Servizi and Martens 1992; McLeay et al. 1987). Avoidance behavior can mitigate adverse effects when fish are capable of moving to an area with lower sediment concentrations. Researchers have reported thresholds for salmonid avoidance behavior at turbidities ranging from 30 to 70 NTU (Lloyd 1987; Servizi and Martens 1992; Berg and Northcote 1985).

The proposed action includes multiple conservation measures aimed at preventing sediment from entering the Salmon River during construction, thus minimizing potential increases in turbidity. Key measures include staged dewatering and rewatering of inchannel work areas, avoiding in-water excavations, use of pumps to settling basins for groundwater removal, pre-washing of work areas prior to rewatering, and appropriate sediment containment and prevention measures. Turbidity will also be continually monitored and construction activity modified when instream turbidity approaches or exceeds 50 NTUs – limiting effects to minor behavioral modifications for exposed fish immediately downstream.

Overall, fish are not expected to be exposed to turbidity plumes greater than 50 NTU over background. All turbidity pulses and plumes will be temporary, likely lasting less than an hour or two. All Chinook salmon and steelhead will likely respond to the short-term pulses or low intensity turbidity plumes by avoiding them and temporarily seeking nearby refuge. These effects are minor behavioral changes and are not expected to harm exposed individuals.

Effects from Chemical Contamination. Use of construction equipment and heavy machinery adjacent to stream channels poses the risk of an accidental spill of fuel, lubricants, hydraulic fluid, antifreeze, or similar contaminants into the riparian zone, or directly into the water. If these contaminants enter the water, the substances could adversely affect habitat, injure or kill aquatic food organisms, or directly impact ESA-listed species (e.g., Neff 1985; Staples et al. 2001). The proposed action includes multiple conservation measures aimed at minimizing the risk of fuel or oil leakage into the stream. Based on the past success of these types of conservation measures in other projects, negative impacts to ESA-listed fish from fuel spills or leaks, or exposure to uncured concrete, are unlikely to occur.

Effects of Sediment Deposition. Turbidity plumes from construction work will deposit a small amount of sediment on substrate within and downstream of the dewatered area in the east channel. Effects to individual fish could include reduction of available cover for juveniles or changes to primary and secondary productivity, affecting food supply for the fish rearing there. As described above in the turbidity section, only small amounts of sediment are expected to be mobilized, thus there will only be a small amount of sediment available for deposition. Because of the expected effectiveness of the proposed sediment control BMPs, NMFS does not expect that enough sediment deposition will take place to alter salmonid use of the habitat. Additionally, it is unlikely that primary or secondary production will be meaningfully affected. For these reasons, sediment deposition on action area substrates caused by construction will be too small to result in harm to fish using the habitat.

Summary of Construction-related Effects to Species. Due to the anticipated effectiveness of proposed BMPs and due to the limited use of the action area by ESA-listed species during the time of construction, adverse effects are expected to be limited to those caused by dewatering and associated fish salvage work. Our analysis estimated that up to 141 steelhead parr and 260 Chinook salmon parr may be captured. Each of these fish would experience varying levels of elevated stress and potentially harm, with some fish dying from the exposure to electrofishing and handling. Up to 7 steelhead parr and 13 Chinook salmon parr may be killed from injuries or directly during electrofishing. Stranding of fish could occur but is unlikely given the proposed

dewatering plan and fish salvage methods. Harmful effects from turbidity exposure, sediment deposition, noise, or chemical contamination are not anticipated.

2.5.1.2 Maintenance-related Effects

With routine maintenance, the wave structure has an anticipated lifespan of approximately 30 years. Regular maintenance of the structure, including manipulation of stream substrate in the east channel will occur to maintain the wave's functionality (see Section 1.3.3.8 for specific details). Principle maintenance activities will be removal of sand and gravel sediment that has aggraded at the east channel inlet, above the wave structure, from the pool below the wave structure, and from the play area's inlet. Each event will occur over one day. Table 2 displays the frequency and quantity of sediment expected to be removed, with two to three maintenance events within 10 years and two to three additional events between 10 and 30 years after construction. In total, maintenance will occur on 6-8 days over 30 years.

Maintenance will only occur during the mid- to late-summer work window (July 7-August 21). This period coincides with warm water temperatures and outside typical juvenile migration periods, suggesting juvenile SR Chinook and SR steelhead presence will be limited. Adult steelhead are not present during this time. Adult Chinook salmon do migrate through the action area with potential presence running from late May through August. There is limited potential for a small number of juvenile Chinook salmon and steelhead to be present in the action area during each maintenance event, with the highest potential expected in the pool immediately downstream of the proposed wave structure. This pool will have the highest value habitat and is the only location where maintenance work is reasonably expected to directly impact juvenile ESA-listed fish.

Maintenance activities could affect adult SR Chinook salmon and juvenile SR Chinook and SR steelhead via: (1) harm/harassment, or potential crushing as equipment excavates substrate from the east channel; (2) temporary displacement by equipment and personnel working near the channel; (3) temporary turbidity increases created during substrate removal; and (4) from exposure to chemical contaminants.

Any excavators and dump trucks used for maintenance will only access the east channel from the bank and by using access routes used during construction. To avoid crushing fish, equipment will not enter the active channel. With the exception of channel dewatering, all BMPs described in section 1.3.1 will also apply to future maintenance work to avoid and/or minimize potential effects to species. The BA also requires the SWPA to work with IDFG and NMFS prior to and during maintenance to ensure work areas are free from ESA-listed fish. Before maintenance events IDFG will snorkel the pool below the wave feature, where juvenile fish are most likely to be found, to determine if any ESA-listed fish are present. The SWPA project manager and the project engineer will report the results to NMFS for any additional direction prior to the start of in-water work.
In the event ESA-listed fish are not observed by snorkelers, maintenance will occur immediately. If ESA-listed fish are present and go unobserved during snorkeling they will likely simply move away from the maintenance activity as equipment and personnel approach and begin removing substrate. This type of impact will cause a one-day displacement, likely from pool habitat –

affecting very few individuals. Any adult SR Chinook present would likely move away from the disturbance and continue their upstream migration unharmed. There is a small chance that some juvenile fish could seek refuge in gravels and be excavated or crushed during maintenance. However, this risk is believed to be minor given the described precautions, the low quality of affected habitat, and low incidence of juvenile use of the habitat during summer due to characteristic high summer stream temperatures in this reach. Additionally, the impact from maintenance could occur just six to eight times over 30 years.

Regardless, we assumed that during routine maintenance there is a small potential for a few juvenile fish to be crushed during maintenance work occurring outside the pool area. Although this risk is likely very low due to timing work when fish are typically absent or at very low abundance, it could occur. We anticipate fewer fish would be subject to crushing from maintenance work outside the pool, but we used the same number of fish as we estimated for the pool area to be conservative in our evaluation (i.e., 10 crushed juvenile Chinook and five-crushed juvenile steelhead). Adding both sources of mortality together for each maintenance event we estimate up to 11 juvenile Chinook salmon and six juvenile steelhead could be killed at each of the six to eight maintenance events. When expanding these estimates to a number of adult equivalents, each event would be expected to result in a minor impact on overall adult returns (i.e., less than one in both cases). The death of up to 11 juvenile SR Chinook salmon and six juvenile SR steelhead every four to five years is too small to have an appreciable influence on any individual population's abundance or productivity. Further, affected fish will likely be from multiple upstream populations each time there is a maintenance event, further reducing the potential the action's effects would be focused on just one population any individual year or repeatedly over the 30-year duration of the action. Effects are expected to be distributed among a mix of populations over time, further reducing the potential that effects will be concentrated on one particular population of either species.

In the event ESA-listed fish are observed during pre-maintenance snorkeling, SWPA will work with IDFG to remove fish from the salvage areas with electrofishing, compliant with NMFS' guidelines (2000). Applying the fish densities used above to the wave pool area (1,875 feet^2), we estimate the pool could support up to 10 juvenile Chinook salmon and five juvenile steelhead. Assuming all fish are effectively captured and the same mortality rates used previously apply, each maintenance event will handle/harm/harass up to 10 juvenile Chinook salmon and five juvenile steelhead and up to one juvenile of each species may be killed. Future maintenance will only occur after additional coordination between NMFS and SWPA to determine if any changes in routine maintenance protocols are necessary. This allows for repeated conversations and evaluations of fish capture data and other monitoring results and is expected to effectively avoid and minimize additional harm to the species with each subsequent maintenance event.

In addition to implementing all proposed design criteria and BMPs, turbidity monitoring will follow the same protocols previously described for construction actions to protect water quality. The only exception is that channel maintenance areas will not be dewatered. Dewatering would likely extend the work period to multiple days; require significantly more channel, and fish disturbance. Assuming monitoring is effective in preventing turbidity from rising above 50 NTUs over background at each location, effects to any ESA-listed fish that happen to be exposed to turbidity plumes in the action area would be similar to those described above in Section

2.4.1.1. For this reason, fish exposed to the maintenance-related temporary turbidity increases will experience minor behavioral impacts that are unlikely to harm fish.

Fish are also not expected to be exposed to chemical contaminants during routine structure maintenance. All original design criteria (Section 1.3.1) will still be utilized. These measures and the brief nature of the work (i.e., less than one day every few years) make it unlikely that chemical spills or leaks will contaminate fish habitat and thus exposure to toxic chemicals is not expected, similar to our conclusion for the initial construction work. The following activities are not covered under routine maintenance; regrouting, dewatering, fish salvage, pilot channel excavation downstream of the highway bridge, and maintenance of the armoring on the east bank of Island Park. In addition, wave park reconstruction required due to structure failure or flood damage is also not covered. Future consultation will be required if the SWPA or City propose to undertake these activities in the future. That consultation will then consider the effects of extending the structures' lifespan on ESA-listed fish and their habitat.

2.5.1.3 Effects of Whitewater Park Use

Current recreational use is primarily confined to the west channel where there are two boat and paddle board launch/take-out sites. Kids regularly surf on boogey boards tied to the Island Park Bridge during summer and drift boats, rafts, and other watercraft regularly launch/take-out on the Island through spring, summer, and fall. Island Park's south half is used as a walking route and off-leash dog play area with access to both channels. Veteran's Park, on the east shore of the east channel receives regular use but provides limited access to the river.

After construction, recreational uses in the east channel will increase from current low levels. Uses will likely include surfing on the constructed wave with kayaks and other personal watercraft and wading and splashing kids in the constructed play area located off the current side channel. Currently there is very little angling in action area and little or no change in angler use is expected post-project as it is typically in conflict with the other uses, although angling may occur in the wave pool when boaters are not using the wave. All fishing is conducted pursuant to existing IDFG sportfishing regulations, which NMFS has previously considered under the ESA (NMFS 2011; NMFS 2019). For this reason, sportfishing effects are not further considered in this consultation.

Post-construction, the majority of upstream and downstream fish migration will continue to occur in the west channel as it carries twice the flow as the east channel. Fish may still migrate through the east channel. Smolts out-migrate during spring peak flows when recreation use is low; these species do not use the action area during the summer months when recreation use is high; and there is no recreation use in the winter months when Chinook salmon, steelhead, and bull trout may be over-wintering in the action area.

None of the anticipated changes in recreational use are expected to harm listed fishes. The new wave is expected to cause an increase in recreational use by experienced boaters during spring, commensurate with higher water. However, the increase in use will likely be minor given the small local human population, limited number of experienced boaters with appropriate cold-water gear, and availability of one wave feature. We assumed use may increase from zero boats

now to a potential maximum of three or four kayaks/stand up paddle boards simultaneously using the wave feature for a maximum about one hour each day. The majority of adult and juvenile fish migrate through the action area in the spring when flows are high. Migrating fish move quickly, and brief encounters with playboaters using the new wave or with children using the new kids wading area will be brief (i.e., seconds). Exposure to boats or waders during this time may cause some fish to startle and move away, but these interactions will be so minor they will not exceed a small temporary behavioral modification with little to no impact on their continued upstream or downstream migration.

Summer recreational use in the east channel will also likely increase as warmer water temperatures make the feature more appealing to less experienced boaters and lower wave conditions are also more approachable for these users. The kids wading area is also expected to get more use during summer due to increased accessibility. Although the actions will cause a summer increase of human use in the action area, including within the east channel, ESA-listed fish presence in the action area during this time is extremely low. Water temperatures are generally unsuitable for juvenile ESA-listed fish during this time and they will rarely be present in large numbers or for long periods of time. Increased summer recreation is expected to have a minor increase in exposure of a small number of juvenile ESA-listed fish (Chinook salmon and steelhead) each year. However, exposed fish are expected to experience temporary and minor behavioral modifications such as moving to adjacent habitat or continuing upstream migrations. For these reasons, the small increase in exposure to boaters and waders during summer is not expected to harm exposed fish.

Fall recreation use could potentially increase but cooler weather/water and low water conditions will likely make water play less attractive to most users and any increases are expected to be very small. For this reason, effects of increased recreational use in the fall will be similar to those described above for spring and summer seasons. Winter use of the action area is not expected to be increased by the proposed actions since the channel is typically iced up and water levels are at their lowest annual level.

2.6 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02 and 402.17(a)). 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.

No new State or private actions are expected to occur in the action area. For these reasons, habitat conditions, as influenced by State and private activities in the action area are not expected to materially change during the next 30 years, the expected life span of the whitewater park. For these reasons, no new future impacts to the populations' VSP parameters are anticipated or otherwise known at this time.

2.7 Integration and Synthesis

In this section, we add the effects of the action (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species (Section 2.2), to formulate the agency's opinion as to whether the proposed action is likely to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution.

Species. SR Chinook and steelhead abundance experienced population increases, relative to time of ESA listing, through the mid-2000s. During the past six years, abundance has dropped, with many populations nearing levels observed when the species were listed. Observed declines have been similar for all populations in the ESU and declines are believed to be tied to recent ocean conditions (NWFSC 2021). Action area conditions have not materially changed during this time and have likely had little influence on recent trends. In addition to abundance and productivity concerns for these species, climate factors will likely make it more challenging to increase abundance and recover the species (NMFS 2017; Crozier et al. 2019). All individual populations, including those affected by this action, are still at high risk of extinction and remain far below recovery plan abundance and productivity targets. As a result, both species remain threatened with extinction.

Due to the anticipated effectiveness of proposed BMPs and due to the limited use of the action area by ESA-listed species during the time of construction, adverse effects are expected to be limited to those caused by dewatering and associated fish salvage work. Our analysis estimated that up to 141 steelhead parr and 260 Chinook salmon parr may be captured. Each of these fish would experience varying levels of elevated stress and potentially harm, with some fish dying from the exposure to electrofishing and handling. Up to seven steelhead parr and 13 Chinook salmon parr may be killed from injuries or directly during electrofishing. Stranding of fish could occur but is unlikely given the proposed dewatering plan and fish salvage methods. Adverse effects from turbidity exposure, sediment deposition, or chemical contamination are not anticipated. Direct juvenile fish mortalities can be used to estimate the total number of adult equivalents potentially removed from the pool of affected populations. We estimated construction-related mortality would result in up to one less adult SR Chinook salmon and SR steelhead from the 2022 brood. Because the action area is principally a migratory corridor for upstream populations, fish affected by construction could belong to many different populations of SR Chinook salmon (up to seven populations) and SR steelhead (up to four populations) (see Table 5 and Table 6). For this reason, the minor salvage related harm caused by the action will be spread across multiple populations and the loss of one adult equivalent from one brood year is too small to have significant impacts on any population's abundance or productivity.

Routine maintenance may also have direct effects to juvenile SR Chinook salmon and SR steelhead. Principle effects identified above are minor behavioral modifications resulting from in-water and near water work, temporary exposure to low levels of turbidity, small levels of fish salvage, and minor potential for fish to be crushed outside the pool area. Adding both sources of mortality together for each maintenance event, up to 11 juvenile Chinook salmon and six juvenile steelhead could be killed at each of the six to eight maintenance events. Expanding this impact to adult equivalents results in an estimate of less than one adult equivalent being removed

from each event (i.e., 0.01 adult Chinook and 0.005 adult steelhead). Even if we assume each species will experience one less adult return due to maintenance-related mortality, this impact is too small to influence annual variability in abundance or productivity, it is spread out over multiple generations, and impacts will likely be distributed between different populations of each DPS/ESU each time maintenance occurs. For these reasons the actions' impact on fish are believed to be too small to have an appreciable influence on any individual population's abundance or productivity.

Long-term recreational use of the new whitewater park is expected to increase compared to baseline use levels. However, ESA-listed fish primarily use the action area as a migration corridor to and from the ocean as juveniles (spring) and adults (fall, spring, and summer), respectively. Kayakers and paddle boarders using the wave feature and people wading in the kids play area may scare migrating fish. Encounters will be brief (seconds) and are unlikely to result in harm to migrating fish. Migrations are expected to continue with little to no influence being apparent for fish that are exposed to boaters during the 30-year lifespan of the structure.

The action has been designed and timed to minimize the impacts of construction, future maintenance, and recreational use on ESA-listed fish. Fish killed by the action will be limited to less than one adult equivalent SR Chinook salmon and SR steelhead every four to five years, starting in 2022. This roughly coincides with one generation for each species considered. The loss of this small number of fish spread out over multiple generations is not expected to influence overall population, MPG, or ESU/DPS productivity or abundance. Each species' individual populations experience substantial annual variation in both metrics and the project-related impacts are not expected to be meaningful at any of these scales. Adding the projected impacts to the continued effects of State and private actions already occurring in the action area, as well as with existing environmental baseline conditions in the action area, does not result in additional risks for the affected populations. Considering climate change impacts on available habitat and SR Chinook salmon and SR steelhead over the next 30 years, future maintenance activities will likely cause even less impact than we anticipate now due to reduced habitat suitability related to warming Salmon River water temperatures. In the latter term of the structure's life span, the action will likely affect fewer fish than is currently projected and the action would likely have even less potential influence on population viability than the already low levels described. We conclude the effects are expected to be minor, occur infrequently, be distributed across multiple populations of each affected MPG when they do occur, and the magnitude of effects will likely become reduced over time. For these reasons, the action is not expected to appreciably reduce the abundance and productivity of any of the populations affected. Because we do not anticipate the action to cause a change in the viability at any population level, we also find that the action will not likely affect the survival of the affected MPGs, nor the affected ESU or DPS. Similarly, the minor severity of the described adverse effects should not affect the species' probability of recovery over the structure's 30-year life span.

2.8 Conclusion

After reviewing the current status of the listed species, the environmental baseline within the action area, the effects of the proposed action, and cumulative effects, it is NMFS' biological

opinion that the proposed action is not likely to jeopardize the continued existence of SR Chinook salmon and SR Basin steelhead.

2.9 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Harass" is further defined by interim guidance as to "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include but are not limited to, breeding, feeding, or sheltering." "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) of the ESA provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

2.9.1 Amount or Extent of Take

In the opinion, NMFS determined that incidental take is reasonably certain to occur as follows:

1. Juvenile SR Chinook salmon and SR steelhead will likely be harmed, harassed, handled, and or killed during salvage of dewatered areas during construction of the proposed whitewater park. Up to 141 steelhead parr and 260 Chinook salmon parr may be captured. Of these, up to seven steelhead and 13 Chinook salmon may be killed during construction. Exceeding either the total number of fish handled and/or the stated number of mortalities would exceed the amount of take identified in this consultation.

2. Juvenile fish may be harmed, harassed, handled, and or killed during salvage of the whitewater park's pool during future routine maintenance events. This effect is expected to occur six to eight times over the next 30 years. Each maintenance event may handle up to up to 10 juvenile Chinook salmon and five juvenile steelhead and up to one juvenile of each species may be killed. If any one maintenance handles or kills more fish than identified, the amount of take identified in this opinion will be exceeded.

3. A very small number of juvenile SR Chinook salmon and SR steelhead could potentially be stranded and/or crushed during construction-related dewatering in 2022 and/or during routine structure maintenance occurring at four- to five-year intervals (i.e., six to eight events) during the next 30 years. If fish are crushed, they will be buried in substrates and impossible to quantify or otherwise measure. In these instances, NMFS uses a surrogate to describe the extent of incidental take, pursuant to 50 CFR 402.14[I]. In this case, we use the number of maintenance events outside the park's wave pool area over 30 years as a surrogate for the amount of take. Although the number of events is somewhat

coextensive with the proposed action, with maintenance events tied to a specified frequency in the BA (also see Table 2), the number of maintenance events is directly related to this take pathway, they can be measured, and they serve as reasonable trigger to require reinitiation if exceeded. For this reason, no more than eight maintenance events are authorized and exceeding this limit will trigger the reinitiation provisions of this Opinion.

2.9.2 Effect of the Take

In the opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to jeopardize SR Chinook salmon or SR Basin steelhead.

2.9.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are measures to minimize the amount or extent of incidental take (50 CFR 402.02).

The COE shall:

1. Minimize the incidental take resulting from the anticipated six to eight whitewater park maintenance events over 30 years.

2. Ensure completion of a monitoring and reporting program to confirm that the terms and conditions in this ITS are effective in avoiding and minimizing incidental take from permitted activities and that the extent of take is not exceeded.

2.9.3 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the COE must comply (or must ensure that any applicant complies) with the following terms and conditions. The COE, as the lead Federal action agency, has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. To implement RPM #1 (minimizing incidental take from maintenance), the COE shall:

    a. Require SWPA snorkel all proposed in water maintenance sites (in addition to the wave pool area) prior to initiating substrate excavation.
    b. If snorkeling identifies ESA-listed anadromous fish in any of the identified maintenance sites, the SWPA will work with IDFG or other qualified staff to herd fish out of work areas with electrofishing equipment and adhering to NMFS guidelines (2000).

2. To implement RPM # 2 the COE shall require the SWPA to:
    a. Maintain records of the number, species, and size of fish handled during any electrofishing event in order to verify the extent of take authorized by this Opinion is not exceeded.
        i. If more than 141 steelhead parr or 260 Chinook salmon parr are captured during construction-related fish salvage or if more than seven steelhead or 13 Chinook salmon are killed during those activities, immediately stop work and contact NMFS to reinitiate ESA consultation.
        ii. If more than 10 juvenile Chinook salmon or five juvenile steelhead are handled during maintenance-related fish salvage of the whitewater park wave pool or if more than one juvenile of each species is killed, stop work and immediately contact NMFS to reinitiate ESA consultation.
    b. Document the results of all pre-maintenance snorkel events for the life of the structure.
    c. The SWPA, on behalf of the COE, shall submit a post-construction report to the Snake River Basin Office email (nmfswcr.srbo@noaa.gov) by February 28 the year after construction. The report will address the monitoring identified in the proposed action and terms and conditions relevant to construction.
    d. Following each maintenance event, the SWPA, on behalf of the COE, shall provide NMFS a report similar to 2.C documenting compliance with monitoring requirements identified in the proposed action and terms and conditions related to maintenance.

2.10 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

NMFS recommends the COE require all substrate removed during all future maintenance events be hauled to an off-site location where there is no potential for the material to erode into or otherwise affect ESA-listed species or their habitat.

2.11 Reinitiation of Consultation

This concludes formal consultation for the Salmon Whitewater Park and City of Salmon Waterline and Bank Stabilization Actions. As 50 CFR 402.16 states, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) the amount or extent of incidental taking specified in the ITS is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect on the

listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

2.12. "Not Likely to Adversely Affect" Determinations

The previous discussion focused on the actions' (see section 1.3) adverse effects to SR Chinook salmon and SR steelhead. The COE determined the proposed actions may affect, but are NLAA designated critical habitats for SR Chinook, Snake River Basin steelhead, and SR sockeye. Please refer to Table 3 for the ESA listing status information for each habitat.

2.12.1 NLAA Effects to Critical Habitat

The designations of critical habitat for SR Chinook, SR Basin steelhead, and SR sockeye use the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414) replace these terms with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting our analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this document, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat. Table 7 identifies the PBFs for designated critical habitats considered in this consultation.

Table 7. Types of sites, essential physical and biological features, and the species life stage each physical and biological feature supports.

Site	Essential Physical and Biological Features	Species Life Stage
Snake River Basin Steelhead[a]		
Freshwater spawning	Water quality, water quantity, and substrate	Spawning, incubation, and larval development
Freshwater rearing	Water quantity and floodplain connectivity to form and maintain physical habitat conditions	Juvenile growth and mobility
	Water quality and forage[b]	Juvenile development
	Natural cover[c]	Juvenile mobility and survival
Freshwater migration	Free of artificial obstructions, water quality and quantity, and natural cover[c]	Juvenile and adult mobility and survival
Snake River Spring/Summer Chinook Salmon and Sockeye Salmon		
Spawning & Juvenile Rearing	Spawning gravel, water quality and quantity, cover/shelter (Chinook only), food, riparian vegetation, space (Chinook only), water temperature and access (sockeye only)	Juvenile and adult
Migration	Substrate, water quality and quantity, water temperature, water velocity, cover/shelter, food[d], riparian vegetation, space, safe passage	Juvenile and adult

[a] Additional PBFs pertaining to estuarine and nearshore areas have also been described for Snake River Basin steelhead. These PBFs will not be affected by the proposed action and have therefore not been described in this opinion.
[b] Forage includes aquatic invertebrate and fish species that support growth and maturation.
[c] Natural cover includes shade, large wood, log jams, beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
[d] Food applies to juvenile migration only.

The COE's BA (March 11, 2021, and November 22, 2021 amendment), included an articulate and complete evaluation of effects the action may have on designated critical habitat and is incorporated into this Opinion by reference. The action as proposed has the potential to affect the

following PBFs: Water quality (e.g., turbidity); floodplain connectivity; cover/shelter; riparian vegetation; space; and safe passage. Modification of these PBFs may affect seasonal freshwater rearing or adult and juvenile migration in the action area. Proper function of these PBFs is necessary to support successful adult and juvenile migration, adult holding, and short-term rearing, growth, and development of juvenile fish. The remaining PBFs will not be affected by the proposed action.

Water Quality. Construction activities and six to eight maintenance events over 30 years will all produce temporary water quality effects. The SWPA proposes to monitor turbidity continuously during construction to meet State water quality standards. The objective is for turbidity to remain below 50 NTUs above background levels. An average of all readings taken within one hour will be used to track compliance. In the event average turbidity is higher than 50 NTU above background, work will be stopped and the turbidity producing activity modified to reduce turbidity prior to resuming. Other proposed design features include: pre-washing the construction area before rewatering and pumping sediment laden water out; controlled rewatering of the channel, operating equipment out of the channel (during maintenance); and proper installation and maintenance of standard sediment control BMPs. With these measures in place, particularly strict monitoring and adaptive construction practices, turbidity-related effects to water quality will be minor and temporary during construction and all future maintenance activities (i.e., normally less than 50 NTUs and lasting a few hours). The nature of these impacts will have insignificant effects on this PBF in this action area.

Floodplain Connectivity, Wetlands, and Riparian Vegetation. The regulatory floodplain will not be impacted by the whitewater park, associated terracing, the City's bank armoring, or the City's water line casings. The action area is an urban area and most banks are official COE-approved levees or heavily armored with riprap. Modeling conducted by the SWPA's engineer indicates post-project flood inundation levels will not be modified. For these reasons, floodplain connectivity impacts are expected to be insignificant.

A small area of emergent wetland at the top of the island will be avoided during construction and thus not be affected. No other wetland areas will be modified.

The existing levee is devoid of woody riparian vegetation and is routinely cleared to qualify for the National Flood Insurance Program. Terracing the levee for the whitewater park will not affect riparian vegetation in any time period. Construction will cause a temporary disturbance to approximately 0.25 acres of streamside riparian vegetation. However, vegetation in these areas is coyote willow and red osier dogwood and each species is expected to quickly recolonize the disturbed area from the retained root systems. Cottonwood trees will also quickly recolonize areas upstream of the highway bridge that are seasonally inundated and where natural sediment deposition occurs. Rapid revegetation of these areas should make construction effects temporary (two to three years) and the small area affected results in the effects being insignificant.

The City's water line casing installation and bank armoring will require removal of 13 cottonwood trees 5- to 28-inches DBH, about 29 cottonwood saplings (≤3- to 4-inches DBH), and some underbrush along about 180 linear feet of bank. Figure 9 and Figure 10 show the type and location of these tree removals as well as the overall lack of riparian vegetation present in

the treatment site. Design criteria also require engineers to mark individual trees and 'field fit' rock placement such that vegetation loss is avoided and minimized as much as possible. Collectively, the trees that will be removed provide very minor levels of benefit to the east channel's habitat. Removed trees are about 13 feet apart (on average) through the 180-foot long treatment area. While they do provide some shade at the site scale, their removal is not expected to influence site level, action area, or reach level water temperatures. The east channel is approximately 165 feet wide (bankfull width). Riparian cover, canopy angle, and tree height play a reduced role in regulating water temperatures as channel width and volume increase (Seixas et al. 2018; Durfee et al. 2021). The small number of trees removed, their wide spacing across 180 feet of channel, and the low influence of shade in this system suggest their initial removal will have insignificant effects on water temperature. The city will plant 20 containerized cottonwood trees and install a watering system, transplant willow and red osier dogwood clumps into the disturbed area (with roots in the perennial water table), and plant 200 willow poles within the rock bank armoring. Shrub and willow transplants will likely immediately replace the removed understory vegetation, providing similar (or more) cover, shade, forage, and other riparian functions that currently exist. Although cottonwood trees will take a decade or more to mature, they will ultimately provide more shade, leaf litter, and other riparian functions than the minor amount of these riparian functions provided by the 13 mature trees scheduled to be removed.

Streamside trees often fall into the adjacent river where they can provide useful cover for fish or where the wood, in conjunction with the river's energy, scours and sorts substrate and improves fish habitat. Gregory et al. (2003) and Roni et al. (2014) provide useful summaries of the functions and processes wood plays in river ecosystems which each draw on the robust literature available on this topic. The City routinely removes dead and dying trees from Island Park before they fall to enhance the safety of park users – essentially eliminating their potential recruitment to the channel. In the rare instances trees have fallen into the river in the action area, they have been removed by the City or Lemhi County to prevent material from jamming up on bridge piers, diversion dams, and other features where they are perceived to present a safety hazard for river users or infrastructure (C. Fealko, Personal Observations). Trees proposed for removal are immediately adjacent to a high volume parking and picnic area. As such, the trees are not expected to be naturally recruited to the east channel where they could potentially improve existing habitat conditions. A portion of the removed trees will be incorporated into the play area channel several hundred yards upstream. Although they will not be placed in the main channel, they will be located in the floodplain and oriented such that they have a low risk of mobilizing during future floods. Remaining trees will be made available to restoration project sponsors working in adjacent watersheds where there is a high likelihood they will be used to improve aquatic and riparian habitats. Trees placed in the play area will help improve riparian function and side channel habitat in that part of the action area, but the small area affected (approximately 0.25 acres) suggest such improvements are likely to be insignificant. For the reasons described, the loss of 13 cottonwoods greater than 5-inches DBH is expected to have an insignificant effect on fish habitat in the action area.

Figure 9. Riparian vegetation on the east bank of island park across from the restaurant deck and the highway bridge. The triple cottonwood clump (far right of photo) is the upstream end of the proposed bank armoring (Photo date 4/22/2021).

Figure 10. Riparian vegetation on the east bank of island park. The big cottonwood tree (left of photo) is the downstream end of the proposed bank armoring (Photo date 4/22/2021).

Cover/Shelter. The new wave pool, the play area pools, the boulder clusters, and their associated scour pools will provide some depth and cover in the action area where essentially none currently exists. These habitat improvements, although minor, will be maintained by routine wave park maintenance over the 30-year life of the project. Tree removal necessary for construction will have no effect on future instream large wood recruitment or fish cover in the action area. There is no large wood in the east channel now because it is regularly removed by the City and Lemhi County, and it will continue to be removed, to protect infrastructure, boaters, and personal property regardless of the proposed action. No instream large wood will be removed. If instream wood needs to be moved during construction, it will be relocated to remain instream and it will continue to provide the same amount of cover as existed pre-project.

The action will terrace 180-feet of the island's bank. The City has rocked this section of bank multiple times, including an 80-foot section done as an emergency measure after the 2017 flood. The large boulders and riprap used for the terracing will provide somewhat less interstitial habitat during periods of high flow than the current rock riprap and woody shrubs until willow and other shrubs are reestablished. However, independent of this action, the City would continue to armor this bank with COE emergency permitting on an as needed basis. Interstitial spaces available within boulders and riprap, while not ideal, are used by juvenile salmonids when more suitable habitat is not available (Schmetterling et al. 2001). Similar terracing will occur on the levee side of the east channel. That bank is regularly cleared and rocked by the City to retain qualification for the National Flood Insurance Program. As such, terraced bank is likely to

provide similar quality and quantity of habitat as the pre-project levee does. For these reasons, the action's effects on cover/shelter are likely to be insignificant.

Space. During construction, the available space in the dewatered east channel will be reduced by about 5.2 acres. During this time, available space in the west channel will simultaneously increase due to the addition of the east channel's flow. After the cofferdams are removed, available space will mostly return to pre-project conditions. There may be minor increases in available space created by new pools in the main channel and the kids play area. Both the temporary loss/gain of space during construction and the small post-project increases in space will be too small to have meaningful influence on the available habitat. For these reasons the action's effect on space is considered insignificant.

Safe Passage. The east channel currently has no physical barrier to upstream fish passage for any species. Pre-consultation coordination between SWPA, their engineers, and NMFS biologists/engineers focused heavily on ensuring the new structures would have little to no influence on fish passage. After reviewing the design plans and associated modeling results, NMFS' engineer and fish biologist concluded the new whitewater park would not impair upstream passage of adult anadromous fish. The new play wave feature will likely impair juvenile upstream salmonid passage during low flows. However, during pre-consultation, the design was revised to provide upstream juvenile fish passage opportunities through the side channel/kids play area. Juvenile upstream fish movement likely occurs infrequently in this location given the absence of spawning and summer rearing occurring here and heavy ice conditions in winter when juveniles from other populations could potentially be moving upstream/downstream in search of overwintering habitat. In winter, limited information suggests almost all juveniles migrate to better habitat located farther downstream. Additionally, fish passage will remain unaffected in the west channel at all flows. With the provision of juvenile fish passage via the side-channel during low flows, and uninterrupted upstream passage for adults at all flows, the whitewater park is expected to continue to allow unimpeded fish passage for all life stages and species using the action area. Routine maintenance and evaluation of the structure should ensure safe passage persists for the lifespan of the whitewater park (i.e., 30 years). The City's bank armoring and waterline casing projects will have no influence on fish passage. For the reasons discussed, the actions impact on safe passage post-construction will be insignificant.

During construction, upstream fish passage will only be possible via the west channel. Downstream fish passage will persist through the west channel and the Kids Creek channel that is retained in the east channel. The west channel's upstream barrier will persist between four and six weeks. This temporary blockage is considered an insignificant impact to fish passage given its temporary nature, the retained ability for fish to pass via the west channel, and retention of all downstream migrations for the duration of the project.

For the reasons described in the previous sections, NMFS concurs with the COE's determination that the effects of the actions on designated critical habitat for SR spring/summer Chinook salmon, SR steelhead, and SR sockeye salmon are insignificant.

3. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The DQA specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

3.1 Utility

"Utility" principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are the COE and their permittees (i.e., SWPA and the City). A copy of this opinion was provided to each of these parties. This consultation will be posted at the NOAA Library Institutional Repository (https://repository.library.noaa.gov/welcome). The format and naming adheres to conventional standards for style.

3.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, "Security of Automated Information Resources," Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

3.3 Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01, et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this opinion contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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