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Fisheries: Rebuttal to Perpetua’s Expert Fisheries Report and Water Conservation and Tunnel Report

Prepared for Save the South Fork Salmon

To: Save the South Fork Salmon (SSFS)

From: Timothy Cochnauer, Ph.D

Date: November 6, 2023

Re: Rebuttal to Perpetua Resources Idaho Expert Report on Fisheries (Sept. 10, 2023) and
Expert Report on Water Conservation and Tunnel Report (Sept. 11, 2023)

I have prepared this rebuttal report in response on behalf of Protestant Save the South Fork Salmon (“SSFS”) to Perpetua Resources Idaho, Inc.’s (“Perpetua”) Expert Report on Fisheries and Expert Report on Water Conservation and Tunnel, and associated water rights permit and transfer applications before the Idaho Department of Water Resources for permit nos. 77-14377, 77-14378, 77-14379, 77-14381; applications for transfer nos. 85396 (77-7122), 85397 (77-7285), 85398 (77-7293), 85399 (77-7141); and application for exchange no. 85538 (77-7293) in the name of Perpetua Resources of Idaho, Inc. for the Stibnite Gold Project located in Valley County, Idaho.

I. INTRODUCTION

The Idaho State Water Plan (Idaho Water Resources Board, 2012) identifies use of water for the protection of fish and fish habitat as a beneficial use. The fish community in the Stibnite area and in downstream reaches supports a rare assemblage of fish species, iconic to Idaho, which deserve protection as a beneficial use. Chinook Salmon, steelhead, and Pacific Lamprey are all listed by the Idaho Department of Fish and Game (“IDFG”) as “Species of Greatest Conservation Need,” all with rankings of Tier 1 (Idaho Department of Fish and Game, 2023). Chinook Salmon, steelhead, and Bull Trout are also listed under the federal Endangered Species Act (“ESA”) as “threatened.” Pacific Lamprey, Westslope Cutthroat Trout, and Interior Redband Trout are also listed as “Sensitive Aquatic Species” by the US Forest Service (“USFS”) (USFS, 2022).

When migrating Chinook Salmon, steelhead, and Pacific Lamprey enter the East Fork South Fork Salmon River (“EFSFSR”) below Sugar Creek, they have ascended eight mainstem dams and migrated over 700 miles from the ocean, a 1,400-mile round trip for juvenile and adult life stages. They do not feed after entering freshwater and have expended most, if not all, of their energy reserves to reach spawning areas. Actions that degrade their migratory corridors, spawning, or rearing habitats will have serious detrimental effects on their ability to survive and successfully reproduce.

Perpetua's proposed flow depletions related to the water rights applications, and the gauntlet of the proposed fishway tunnel, would make their journey even more difficult before arriving at the speculative enhanced habitat upstream of the Point of Diversion on the EFSFSR.

The National Marine Fisheries Service, in a comment letter to IDWR (National Marine Fisheries Service, 2019), stated that approval of the proposed water rights would adversely affect steelhead and Chinook Salmon.

Recognizing the importance of the fish assemblage and their critical habitats in the EFSFSR, and in light of Perpetua's proposed water withdrawals, it is imperative that the best available stream flow modeling approach be applied to rigorously evaluate Perpetua's proposed water withdrawals in order to protect fish and fish habitat in the EFSFSR watershed.

My technical assessment of Perpetua's water right applications is below. I've concluded the following:

- First, Perpetua's analysis of the impacts to fisheries inappropriately relies on analyses in the Stibnite Gold Project Supplemental Draft Environmental Impact Statement ("SDEIS") (USFS, 2022). The SDEIS analyses do not assess the impacts of water withdrawals in the absence of other mining plan actions.
- Second, the use of Watershed Condition Indicators ("WCI") and the Intrinsic Potential ("IP") models to assess water withdrawal impacts is inappropriately used in the context of assessing impacts to habitat on individual rivers or river reaches.
- Third, Perpetua's expert fisheries report focuses on speculative fish passage and restoration, but neglects an analysis of impacts to habitat due to flow reduction.
- Fourth, Perpetua's expert fisheries report does not delineate the affected EFSFSR subwatershed, nor does it analyze effects to fish of flow withdrawal on the EFSFSR downstream of Sugar Creek.
- Fifth, Perpetua's water right condition is not protective of fish/habitat. Determination of minimum flows required to protect fish habitat, and thus fish, at critical life stages is required..

II. TECHNICAL ASSESSMENT

A. Perpetua's analysis of the impacts to fisheries and fish habitat inappropriately relies on analyses in the SDEIS, which do not assess the impacts of water withdrawals in the absence of other mining plan actions.

Perpetua's expert fisheries report relies on analyses in the SDEIS (USFS 2022) to identify the effects of the proposed water withdrawals on fish and fish habitat. Perpetua's expert fisheries report relies on the SDEIS to claim a decreased project footprint, decreased potential environmental impacts, reduced water management and treatment needs, and lower stream

temperatures. It is, however, unreasonable, inappropriate, and inaccurate to use the analyses in the SDEIS to understand the specific impacts of the water rights withdrawals to fish and/or fish habitat.

First, Perpetua's refined Modified Plan of Restoration and Operations ("ModPRO2"), which is Perpetua's proposed mining action alternative, is only one of the alternatives evaluated in the SDEIS. The environmental impact claims, for example of "decreasing the project's footprint and environmental impacts," "reduced water treatment and needs," and "lowered stream temperatures," all refer to SDEIS effects comparisons between the two different alternatives, and are not comparisons between existing (no mining) conditions and the ModPRO2. The SDEIS analysis of ModPRO2 effects clearly illustrate a large project footprint (compared to existing), many potential environmental impacts, significant water treatment needs (compared to existing), and increased stream temperatures (compared to existing), continuing for decades and possibly a century into the future (USFS 2022).

Second, the ModPRO2 alternative has not been selected by the USFS in a Record of Decision. Nor have the analyses of the environmental impacts in the SDEIS been rigorously evaluated and approved by the USFS.

Finally, use of the analysis in the SDES and associated reports is inaccurate because those documents analyze the impacts to fish and fish habitat from all proposed mining activities, which include future proposed habitat restoration activities, rather than impacts due solely to the proposed water diversions. This is further discussed below in Section II.C.

B. The use of Watershed Condition Indicators and the Intrinsic Potential models to assess water withdrawal impacts are inappropriate.

i. Perpetua's use of Watershed Condition Indicators to assess impacts to habitat does not reflect or take into account proposed water diversions.

Significant issues/indicators and Watershed Condition Indicators ("WCIs") are tools that were used to evaluate impact to fish and fish habitat for the two mining alternatives in the SDEIS. The use of WCIs, however, was not specific to the proposed water diversions under the water right applications. As discussed above, using analyses performed to assess impacts from the entire mining project, including proposed restoration, is inappropriate and does not appropriately delineate the specific impacts to fish and fish habitat solely from the proposed water diversions, which is the subject of this matter.

The use of WCIs is also problematic in this context because WCIs are intended to classify and prioritize stream reaches to determine which areas are in most need of habitat restoration or have the highest potential for quality habitat. Furthermore, WCIs depend on inputs derived from modeled data with limited validation and no indication of uncertainty, which compromises the ability to accurately predict habitat impacts from changes in streamflow. Finally, it is unclear whether the use of WCIs in the SDEIS even considers the proposed diversions. Nowhere in the SDEIS does it refer to the specific flow withdrawal of application permit 77-14378, plus the three transfer withdrawals (application permits 77-7122, 77-7285, and 77-7293) as being

included in the global SDEIS effects analysis tools. Analysis of comprehensive fisheries effects of Perpetua's total 11.14 cfs requested water right is not included in the SDEIS, nor in Perpetua's expert report.

ii. Perpetua's use of Intrinsic Potential modeling is not the appropriate analysis tool for assessing water withdrawals.

Perpetua's use of the Intrinsic Potential ("IP") model to analyze the impacts on fish habitat for Chinook Salmon and steelhead for limited river reaches is inappropriate and results in unsubstantiated claims that fish habitat will not be impacted by the proposed water withdrawals.

The IP model was designed to be used for large landscapes on natural habitats (*Bidlack, et al.*, 2014). It was not, however, intended to be used to determine potential impacts to habitat resulting from water withdrawals in localized stream reaches, like the EFSFSR headwaters. IP models were developed to broadly identify potential habitat across tributary habitats in the Interior Columbia Basin (*Cooney and Holzer*, 2006). The foundation of IP models is based on landform, lithology, and hydrology processes that form important stream habitat for salmonids, but that are not easily altered by anthropogenic influences (*Steel, et al.*, 2016). For example, *Romey* (2018) cautions against using results from IP models to estimate habitat potential for specific stream reaches without knowing the accuracy of the model at the "reach scale." Neither the SDEIS nor Perpetua's fisheries expert report provide an analysis of the accuracy at the "reach scale" for the IP model used to predict changes in habitat potential due to water withdrawals. Therefore, the conclusions it draws regarding the effects of water withdrawals on the EFSFSR are faulty and invalid.

First Perpetua uses the IP model to claim net positive gains in fish habitat upstream of tunnel passage in the EFSFSR—2% for Chinook Salmon and 16.5% for steelhead by year 23 of mine-life upstream of the fishway tunnel. The IP model analysis, however, was not limited to a specific proposed water withdrawal or total proposed withdrawals, and it is unclear if the analysis took into consideration Perpetua's proposed water withdrawals to begin with. Second, if it did consider proposed water withdrawals, it is not clear if or how a detailed and adequate analysis of habitat and fish impacts was performed. This model cannot rigorously identify habitat loss from flow depletion as a result of the water withdrawals (see below). SSFS's IFIM analysis, as explained in the Cochnauer expert fisheries report (Sept. 11, 2023), was designed to identify habitat loss from flow depletion, and demonstrates substantial harm to fish and fish habitat from the proposed water withdrawals.

Second, the modeled gains are "presumed", and based upon the speculative success of the fishway tunnel (USFS, SDEIS p. 4-363, 4-371). The tunnel itself is not part of the water rights application, nor does its success (or failure) impact the quality of habitat of the EFSFSR up or downstream of the tunnel. Therefore, these "net positive gains" in fish habitat related to the tunnel are irrelevant to the analysis here. Furthermore, these presumed gains may never be realized, or may not be realized for decades, after wildly fluctuating IP gains and losses throughout the life of the mine (USFS, SDEIS, 2022 3-363).

C. Perpetua's expert fisheries report focuses on speculative passage and restoration unrelated to the water rights applications, and neglects habitat analysis related to flow reduction resulting from proposed water diversions.

Perpetua's expert fisheries report states that "potential risks to fisheries resources from reduced stream flows as a result of the SGP are the focus of this memo," and the "main area of concern is fish habitat and passage conditions." The bulk of the report, however, focuses on fish passage and speculative restoration, and not risks or impacts to fisheries resources, imperiled fish, and critical fish habitat due to the proposed water diversions.

i. Perpetua's expert report ignores habitat variables other than passage that will be impacted by water diversions.

"Fisheries resources" include many habitat variables other than passage that need to be considered when rigorously assessing the impacts of water diversions. Reduced flow from water diversions can alter hydrology, increase stream temperatures, reduce food availability, impact growth, reproduction, and survival, change water quality, and diminish habitat quality and quantity. These changes adversely affect multiple life stages (adult, spawning, fry, and juvenile) of Chinook Salmon, steelhead, and Bull Trout (*Sergeant et al.*, 2022), in addition to adversely affecting fish passage. Perpetua's expert fisheries report is limited to descriptions of elements protective for passage and design criteria, and the above habitat variables that impact fish growth, reproduction, and survival, other than passage, are ignored in Perpetua's expert fisheries report.

ii. Perpetua relies on actions proposed in the mining plan and not relevant to the water right applications to claim impacts to fish and fish habitat will be negligible.

Perpetua's expert fish report refers to many SGP activities that would affect habitat due to temporary water diversions, stream connectivity restoration, and habitat improvements above the water rights Point of Diversion on the EFSFSR. As explained above, because Perpetua's analysis is not limited to the impact of water withdrawals on streamflow *and* includes many unrelated actions whose alleged positive impacts will not be realized until years after mining operations cease, Perpetua's analysis is not relevant to assessing the specific effects of the withdrawing 11.14 cfs of water proposed in the water right applications.

Perpetua's expert fish report refers to adverse effects of these stream restorations and habitat improvements as "negligible, temporary, and localized." Perpetua's description of adverse effects on fish habitat is in the context of the entire project years after mining operations have ceased and restoration activities are completed, and are thus, not relevant to the current matter.

Similarly, Perpetua's expert fisheries report claims there will be habitat access improvement due to the Burntlog Route culverts. These improvements are not based in fact and thus remain uncertain and questionable. Also, the Burntlog Route culverts are part of just one of the alternatives analyzed in the SDEIS and may not be the alternative permitted by the USFS. Further, they are irrelevant for assessing effects from the water withdrawals.

The SDEIS and fisheries experts have responded that restoration and habitat access improvement measures may not be effective in mitigating serious impacts to already-imperiled Chinook Salmon, steelhead, Bull Trout, and Westslope Cutthroat Trout. Many of these detrimental impacts cannot be mitigated and represent substantial, and long-term to permanent degradation and fish population declines in project area streams and downstream.

For example, comments on the SDEIS state: “The SDEIS clearly confirms that irreversible and irretrievable impacts (to fish) will occur. These include but are not limited to: direct mortality, incidental injury, temporal (more than 100 years in certain stream reaches) and permanent (upper Meadow Creek) loss of critical habitat, decreased suitable and critical habitat, blockage of fish passage, decrease in thermally suitable habitat, permanent displacement of individuals, and net decrease in productivity.”

O’Neal and Gregory (2022) states that: “1 - proposed mitigations in the SDEIS are not sufficient to reliably reverse impacts, much less improve existing, impaired habitat during or after additional mining occurs; 2 - even modern fish passage design simply cannot account for spatial and temporal variability of historic baseline conditions, current conditions, and future conditions that will result from mining and associated development activity in addition to climate change; and 3 - already threatened salmonid populations will not be restored by (and may not survive) newly proposed mining activity and the mitigation methods proposed in the SDEIS.”

The WCI comparison of the entire set of Stibnite mining alternatives, which includes speculative and unproven passage improvement, barrier removals, and other stream restorations, is also irrelevant for assessing effects of water withdrawals. Degradation from reduced streamflow as a result of water use from water rights, must be rigorously evaluated and Perpetua’s expert report fails to specifically analyze these effects on fish. SSFS’ IFIM analysis displays specific analysis of these effects in their expert report.

iii. Tunnel passage is unrelated to the water rights applications, has not been approved by the USFS, and evidence indicates a likelihood it will not work to protect fish or fish habitat.

As discussed above, Perpetua’s expert fisheries report promises provision of “fish passage” through a tunnel, yet the proposed tunnel is hypothetical with no evidence for the likelihood of its success. Claims of the success of this tunnel are assumed in the body of the SDEIS. There are however, many questions regarding the effectiveness and efficacy of the EFSFSR tunnel to pass fish (Joint Comments on SDEIS, 2023) (stating, “The U.S. Fish and Wildlife Service (USFWS) notes, in a letter to Midas Gold dated October 3, 2019, “Even after close consultation and collaboration with NMFS, meeting applicable NMFS passage criteria and guidelines, and executing all potential adaptive management measures, there exists a reasonable probability that the project will not be able to volitionally pass fish safely, timely, or effectively”).

There is little rationale to support the proven success of such a tunnel in the SDEIS. Of the references cited, none analyzed Chinook Salmon, Bull Trout or steelhead, or sites with characteristics similar to Stibnite (i.e., from an accessible river to an inaccessible channel

upstream). *Gowans, et al.* (2003) tracked Atlantic salmon in Scotland on a river system from a reservoir through four fish passes including fish ladders, fish lifts, and a tunnel. Only 4 out of 54 tagged adults made it to spawning grounds. *Wollenbaek, et al.* (2011) examined genetic connectivity of lake-dwelling Arctic char in Norway across a dam through a subterranean tunnel and spill gates. The char were represented by two genetically distinct lake populations, and connectivity was demonstrated, but it was questioned to what extent char utilized the tunnel for upstream migration.

Perpetua's Water Conservation expert report even acknowledges that fish passage may not be possible, as "fish may fail to ascend the tunnel or fall back." The report indicates that trap and haul facilities will solve this passage problem. Trap and haul facilities are notorious for causing high rates of mortality and injury. The backup plan, should the tunnel not work, would be to salvage, trap, and relocate fish. According to the SDEIS (USFS, 2022), fish salvage and relocation activities would result in fish injuries (in some cases more than once) and incidental mortalities, with moderate, localized, and long-term impact on all fish species. Passage cannot be assured, therefore emphasis must be placed on other habitat variables which will certainly be affected by reduced flows from the water rights applications.

D. Perpetua's expert fisheries report does not delineate the affected EFSFSR subwatershed, nor does it analyze effects to fish of flow withdrawal downstream of Sugar Creek.

Perpetua's expert fisheries report states that the discussion is focused on impacts within the headwaters of the EFSFSR subwatershed. However, Perpetua fails to define the subwatershed in the expert report. This omission underestimates the scale of potential effects from streamflow reductions and other impacts resulting from the water rights applications. SSFS' IFIM analysis displays a reduction of Chinook Salmon, steelhead, and Bull Trout habitat in the EFSFSR below the confluence of Sugar Creek (see SSFS' expert report).

E. Perpetua's water right condition is not protective of fish/habitat.

Perpetua has proposed to limit water withdrawals affecting the EFSFSR below Sugar Creek to less than 20% of unimpaired flows when flows fall below 25 cfs ("20% Proposal"). Thus, when flows reach 25 cfs, the amount of water that would remain in the EFSFSR below Sugar would be 20 cfs, i.e. a 20% reduction. The 20% Proposal that restricts diversions to limit habitat impacts may prevent complete dewatering of the EFSFSR, but is it still likely to significantly and adversely impact fish and fish habitat.

Below are two flaws and potential resolutions in Perpetua's 20% Proposal:

- The flow remaining in the EFSFSR could conceivably drop below 20 cfs before the 25 cfs threshold is met. For example, if the unimpaired flow is 25.5 cfs and 9.6 cfs is withdrawn, the remaining flow would be 15.9 cfs, a 36% reduction. To protect fish and fish habitat, a guaranteed flow of at least 20 cfs should be provided during that period of time when the natural flow approaches 25 cfs.

- Perpetua's 20% Proposal stipulates, "Calculations shall be based on running 3-day averages of net diversion and gaged streamflows." Fish respond to immediate changes in streamflow suggesting that instantaneous flow rates should be used, rather than 3-day averages.

F. Minimum flows are needed for protection of fish and fish habitat.

A minimum streamflow should be guaranteed at critical times in order to protect fish habitat. The Instream Flow Incremental Methodology (IFIM) (USFWS, 1982) is a computer based modeling system that calculates the gain or loss of aquatic habitat with increases or decreases in instream flow. IFIM involves putting site-specific data for stream flow and habitat descriptors (i.e., probability of use) into a group of models called Physical Habitat Simulation (PHABSIM). PHABSIM is a group of hydraulic models that predicts depths and velocities of streams over a range of flows. PHABSIM and IFIM together determine the relationship between flows and aquatic habitat.

The IFIM analysis, below, determined that the flow in the EFSFSR above Sugar Creek should be 14 cfs during the Chinook Salmon spawning season and 9 cfs during the remainder of the year to provide adequate flow for salmonid rearing; and for the EFSFSR below Sugar Creek should be 15 cfs during the Chinook Salmon spawning season and 14 cfs during the remainder of the year (Tables 1 and 2). Table 3 provides a comparison of identified minimum and preferred flows with the mean monthly lowest flows on the EFSFSR above and below Sugar Creek. Additionally, the one-day 10-year lowest flow is included in figure legends.

IFIM is defined as the best available model for determining the relationship between streamflows and fish habitats (Washington State Dept. of Ecology, 2010, Publication # Q-WR-95-104). IFIM is the accepted methodology for determining the quantity of instream water (minimum and preferred flows) necessary to provide a healthy and productive habitat for aquatic species. Its consistent use and scientific acceptance has made it the de facto method for quantifying reserved instream water rights to protect fish habitat (Hedden-Nicely, 2020).

The Payette National Forest conducted an IFIM analysis in the 1990's on Sugar Creek, tributary to the EFSFSR, just downstream of the SGP location. Based on information provided by the USFS and IDFG fisheries biologists, instream habitats and the channel morphologies in Sugar Creek and the EFSFSR near the confluence of Sugar Creek are similar such that direct comparisons can be made. As a result, the IFIM data measured in Sugar Creek may be extrapolated to the EFSFSR downstream from Sugar Creek. (For more detail, SSFS expert fisheries report).

Using the extrapolated habitat data, I developed curves depicting the relationships between proposed flow withdrawals (instream flows) and weighted usable areas (WUA) of habitat. (see SSFS expert fisheries report). From these relationships, I defined minimum and preferred streamflows for various fish life stages.

"Minimum flows" were determined by the points of deflection on the flow/weighted usable habitat curves where habitat (WUA) began to substantially decrease with flow reduction

(Figures 1-6). In Figures 1-6, arrows indicate these deflection points. Some of the deflection points are difficult to discern at the scale of this report. That approach was used in the mid-1970's to designate minimum flows on Idaho streams, many of which are incorporated as decreed water rights for fish and wildlife (personal experience of the author). "Preferred flows" were selected on the curves where habitat losses begin to proportionally decrease with reduced flows. The determined and hence, recommended minimum and preferred flow values are listed in the tables below.

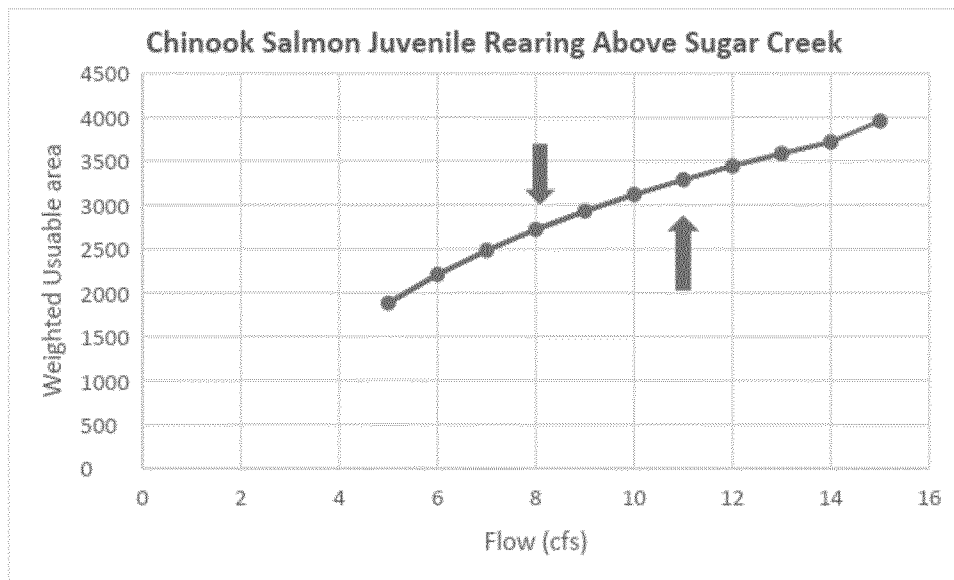


Figure 1. Weighted usable area for Chinook Salmon juvenile rearing in East Fork South Fork Salmon River upstream of Sugar Creek. Down pointed arrow identifies minimum stream flow while up pointed arrow identifies preferred flow. Instream habitat characteristics were extrapolated from previous IFIM study conducted on Sugar Creek.

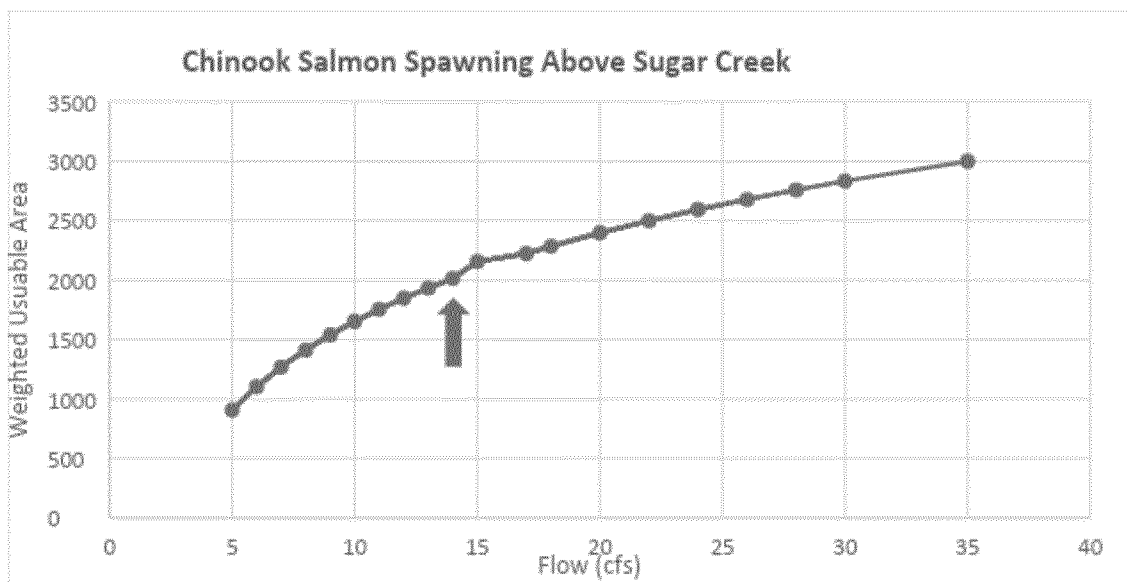


Figure 2. Weighted usable area for Chinook Salmon spawning in East Fork South Fork Salmon River upstream of Sugar Creek. Down pointed arrow identifies minimum stream flow while up pointed arrow identifies preferred flow. Instream habitat characteristics were extrapolated from previous IFIM study conducted on Sugar Creek.

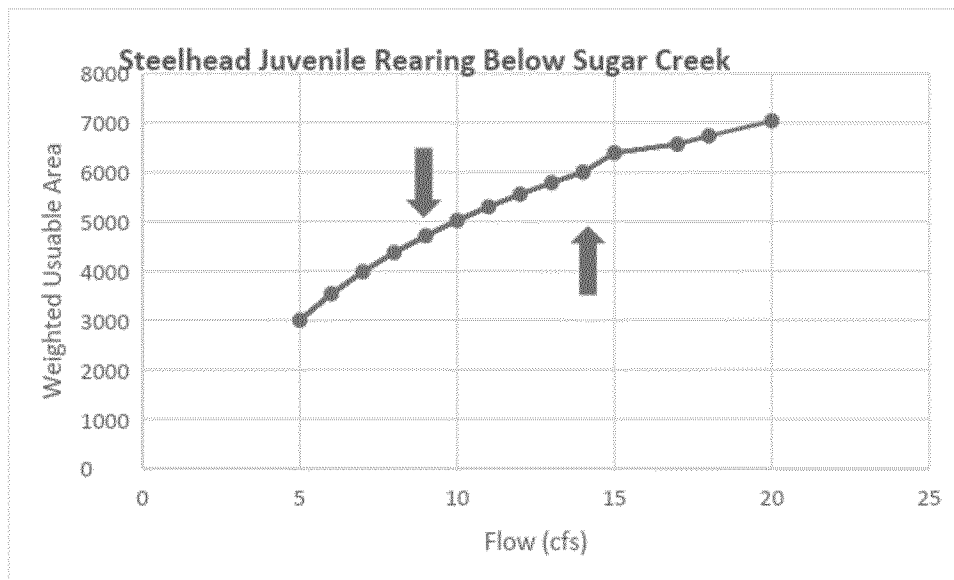


Figure 3. Weighted usable area for steelhead juvenile rearing in East Fork South Fork Salmon River downstream of Sugar Creek. Down pointed arrow identifies minimum stream flow while up pointed arrow identifies preferred flow. Instream habitat characteristics were extrapolated from previous IFIM study conducted on Sugar Creek.

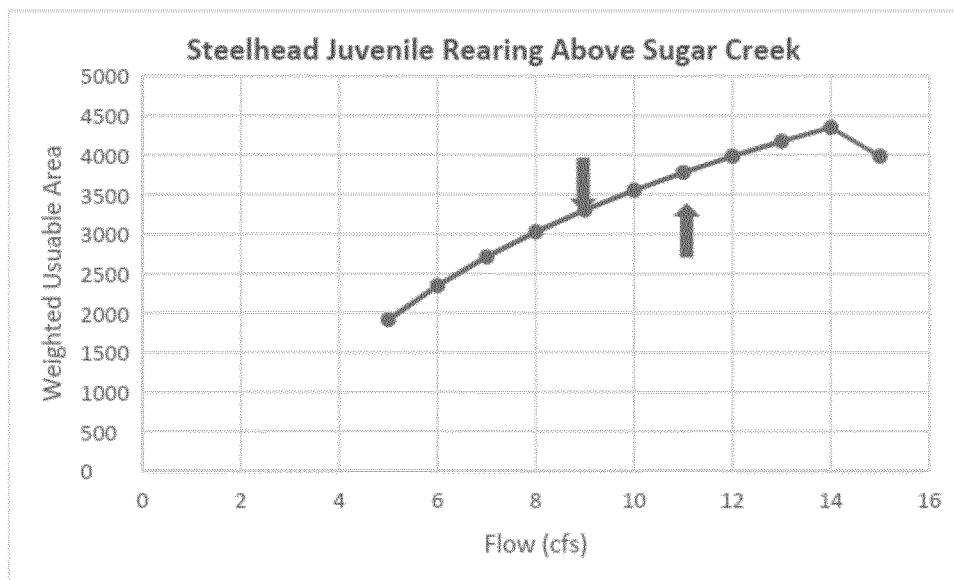


Figure 4. Weighted usable area for steelhead juvenile rearing in East Fork South Fork Salmon River upstream of Sugar Creek. Down pointed arrow identifies minimum stream flow while up pointed arrow signifies preferred flow. Instream habitat characteristics were extrapolated from previous IFIM study conducted on Sugar Creek.

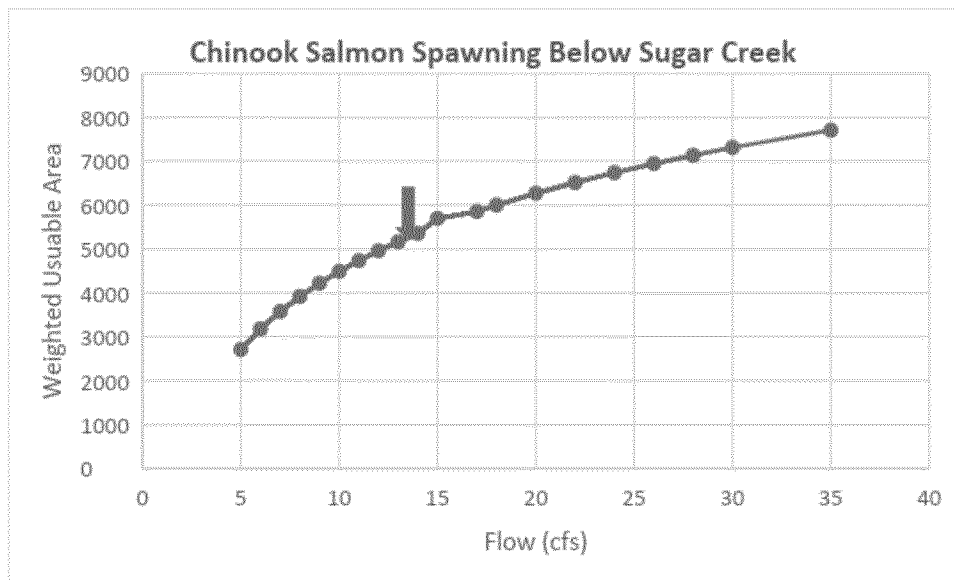


Figure 5. Weighted usable area for Chinook Salmon spawning in East Fork South Fork Salmon River downstream of Sugar Creek. Arrow identifies both minimum and preferred stream flows. Instream habitat characteristics were extrapolated Figure from previous IFIM study conducted on Sugar Creek.

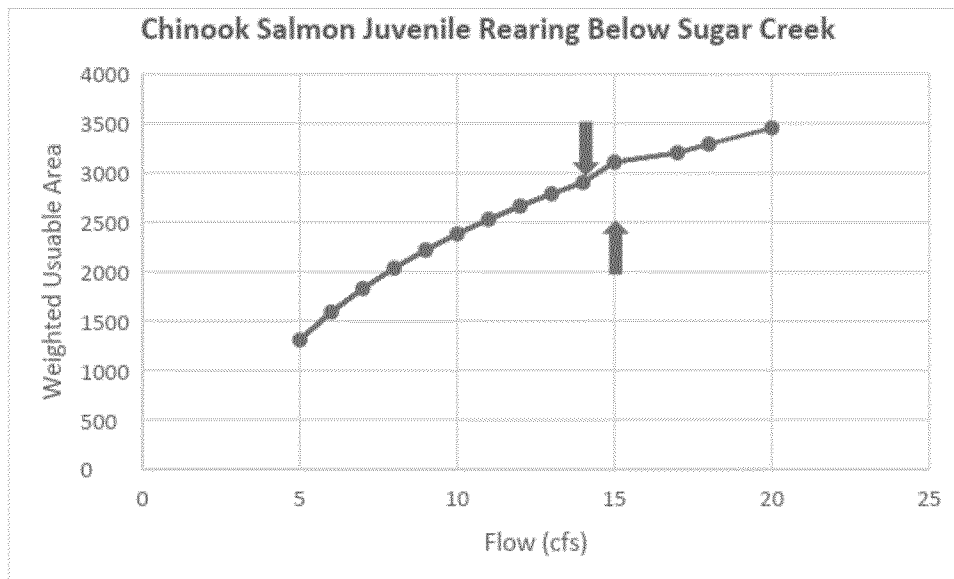


Figure 6. Weighted usable area for Chinook Salmon juvenile rearing in East Fork South Fork Salmon River downstream of Sugar Creek. Down pointed arrow identifies minimum flow while up pointed arrow identifies preferred stream flows. Instream habitat characteristics were extrapolated from previous IFIM study conducted on Sugar Creek.

Tables 1 and 2 show the recommended stream flows for the EFSFSR above and below Sugar Creek. The rearing flows are year-round and the spawning flows for Chinook Salmon are during August and September.

Table 1. Recommended stream flows in cfs for EFSFSR above Sugar Creek.

	Preferred	Minimum (MSF)
Steelhead Juvenile—Rearing	11*	9*
Chinook Salmon Rearing	11*	8*
Spawning	14**	10**

*Year-round

**August - September

Table 2. Recommended stream flows in cfs for EFSFSR below Sugar Creek.

	Preferred	Minimum (MSF)
Steelhead Juvenile—Rearing	14*	9*
Chinook Salmon Rearing	15*	14*
Spawning	15**	15**

*Year-round

**August - September

Table 3 is a comparison of the recommended stream flows with mean monthly flows and one-day 10-year low flows. It can be seen that the recommended flows are all less than the mean monthly flows, and are higher than the one-day 10-year low flows.

Table 3. Comparisons of identified minimum and preferred flows and the monthly mean flows on the East Fork South Fork Salmon River, above and below Sugar Creek.

	Mean Monthly Flow (CFS)*	Abv Sugar Creek (CFS)*	Abv Sugar Creek (CFS)*		Mean Monthly Flow (CFS)**	Below Sugar Creek (CFS)**	Below Sugar Creek (CFS)**
Month		Minimum (CFS)	Preferred (CFS)			Minimum (CFS)	Preferred (CFS)
Jan	11	9	11		18	14	15
Feb	11	9	11		18.7	14	15
Mar	16	9	11		28	14	15
Apr	44	9	11		74	14	15
May	147	9	11		228	14	15
Jun	123	9	11		197	14	15
Jul	33	9	11		57	14	15
Aug	16	10	14		28	15	15
Sep	13	10	14		22.4	15	15
Oct	15	9	11		24.4	14	15
Nov	14	9	11		23.2	14	15
Dec	12	9	11		19.8	14	15

*USGS Gage Station 13311250 (EFSFSR above Sugar) - One day 10 year low flow = 6.8 cfs

** USGS Gage Station 13311500 (EFSFSR below Sugar) - One day 10 year low flow = 11.2 cfs

III. SUMMARY AND CONCLUSIONS

I have performed a technical assessment of Perpetua's expert report on fisheries and expert report on water conservation and tunnel and associated water right applications, and have arrived at the following conclusions:

1. The Stibnite area and the EFSFSR downstream from Stibnite provide critical habitat for imperiled fishes.
2. Perpetua's expert report relies on the SDEIS, which fails to analyze specific effects of Perpetua's water rights flow withdrawal. Thus, much of Perpetua's analyses are irrelevant in the context of this matter.
3. The IP and WCI models are inappropriate for rigorously evaluating the effects of water withdrawals on critical fish habitats and for limited river reaches.

4. Perpetua's expert report focuses on speculative and unproven fish passage and restoration methods, and neglects to present any analysis of changes in critical habitat related to flow reduction.
5. Perpetua's expert report fails to delineate the affected EFSFSR subwatershed, and fails to evaluate effects of flow withdrawal on fish downstream from Sugar Creek.
6. Perpetua's 20% Proposal will not protect fish or their habitat in the EFSFSR.
7. The IFIM model demonstrates that streamflow reduction results in loss of fish habitat, and that minimum flows are essential to conserve fish and fish habitat.
8. The IFIM analysis shows that the minimum flow in the EFSFSR above Sugar Creek should be 14 cfs during the Chinook Salmon spawning season and 9 cfs during the remainder of the year to provide adequate flow for salmonid rearing; and for the EFSFSR below Sugar Creek should be 15 cfs during the Chinook Salmon spawning season and 14 cfs during the remainder of the year.

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