United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Southern Alaska Fish and Wildlife Field Office
Anchorage Fish and Wildlife Conservation Office
4700 BLM Road
Anchorage, Alaska 99507

In Reply Refer to:
FWS/R7/SAFWFO

Ms. Samantha Owen
Senior Regulatory and Licensing Consultant
McMillen Jacobs Associates
1101 Western Avenue, Suite 706
Seattle, Washington 98104

Subject: Draft Year 2 Study Reports for the Eklutna Hydroelectric Project (Service file number 2022-0074477)

Dear Ms. Owen:

Thank you for providing the draft Year 2 Study Reports (Reports) for the Geomorphology and Sediment Transport, Instream Flow, Lake Habitat and Fish, River Fish, Stream Gaging, Water Quality, Wetlands and Wildlife Habitat, and Terrestrial Wildlife studies for the Eklutna Hydroelectric Project (Project) on March 24, 2023. The Project is governed by the 1991 Fish and Wildlife Agreement (1991 Agreement), which requires the Project owners (Owners) to conduct studies that examine and quantify, if possible, the impacts to fish and wildlife from the project. The studies must also examine and develop protection, mitigation, and enhancement (PME) measures for fish and wildlife affected by the Project.

The U.S. Fish and Wildlife Service (Service) appreciates the extensive work that went into the Year 2 Study Reports. This information will be crucial for alternatives development and assessment of protection, mitigation, and enhancement measures. We provide the following comments and recommendations.

1. The Reports do not include the most recent information from studies conducted by the Native Village Eklutna (NVE 2023), but do mention the intention to reference these data when they become available. We are specifically interested in NVE's findings of redds, salmon migrating upstream past the lower dam site in Reach 6, and potential spawning habitat along the tributaries of Eklutna Lake and upstream of the lake.
2. The models for the Geomorphology and Sediment Study will be used to help predict how sediment, the channel, and salmon habitat may change in the river system depending on sediment sources and potential flow regimes. However, additional information on sediment is requested, as described below.
3. The Service requests a meeting for our subject matter experts to discuss questions on the Kleinschmidt Instream Flow Year 2 Study, as described below.

Geomorphology and Sediment Transport Study

4.5.1.1. Hydraulic Model Development (pages. 21-22)
Manning's n and hydraulic conditions are extrapolated to 1,500 cubic feet per second (cfs) based on model inputs of 122 cfs. The hydraulic model predicts trends of deposition and erosion within reaches typified by gravel and cobble substrates with flows up to 150 cfs. While the model can predict which reaches saw aggradation or degradation, it's likely that these reaches would not all be aggrading or degrading under reference conditions. This indicates the test flows were not high enough for a sediment transport capacity sufficient to maintain sediment continuity. For transect ADFG6 Down at River Mile (RM) 3.3, the model predicts deposition which is validated by field observations (page 39). However, the photograph in Figure 5.3-10 has bar formation at the site indicative of degraded conditions which means there was insufficient stream power to route sediment.

Sediment transport is typically described in terms of competency and capacity. Competency is described as the largest grain size particle entrained at a given flow within a given channel. Capacity describes the total volume of sediment that channel can move at a given flow, which is particularly relevant to a river like Eklutna with large and irregular sediment inputs. Competency is discussed in the report, but more information on sediment capacity is necessary. Please elaborate on sediment capacity, and display data shown in Figures 6.3-2 and 6.3-3 in a table format with capacity and supply information like in the template, Table 1.

Table 1. Sediment transport is typically described in terms of competency and capacity, with this table as an example of the typical components.

		Supply		Transport		Existing channel particle size (mm)			Particle size assoc w/ armor layer (mm)
Transect	Flow	Bedload	Suspended	Competency (mm)	Capacity (weight/volume)	D50	D84	D100	D?

Instream Flow Study

Appendices 2 and 3, Figures A.2-8, A.2-26, A.2-51 and A.3-11
Four transect-based curves (Reach 5 TR1 Juvenile, Reach 8 TR 1 Juvenile for Chinook, Reach 11 TR7 Spawning, Reach 11 TR7 Juvenile) and one reach-based curve (Reach 11 Spawning for Chinook) do not have a distinct peak, and Weighted Useable Area continues to increase beyond the Physical Habitat Simulation Model (commonly referred to as PHABSIM) extrapolation range of 375 cfs. The Instream Flow Study states, "For curves with gradually increasing slopes, percentage gains in habitat are often relatively small compared to flow quantities needed to provide those gains" (page 36). While this may be so, we recommend evaluating how a higher extrapolation range could impact these curves, and subsequently the flows presented in Table 2.8-1 (page 39).

Similarly, the habitat-to-flow relationships resulting from the 2D modeling are described in Section 4.4.5 (page 81) and the monthly flow release schedule based on the results are presented in Table 4.6-1 (page 99). Habitat gains at different flow levels were assessed for Reaches 3, 4, 6, and 10, with Reach 10 being the only one with a peak within the modeled flow range (10 to 375 cfs). Data for Reaches 3 and 4 indicate that as flows continue to increase beyond the 375 cfs, more off-channel habitat would become connected. Reach 6, which is a transport reach and not ideal for rearing habitat, also shows an increasing amount of habitat with additional flow, but as stated in the report, this reach is confined and lacks the off-channel complexity of Reaches 3 and 4. As a result, the curve shows the greatest amount of rearing habitat in the main channel is provided by the lowest flows of 10 cfs. Table 4.6-1 presents monthly flow levels that provide a percentage of maximum rearing habitat based on Reach 6 (the transport reach) and Reach 10, since these represent "the river segment that would receive the greatest benefit (as a percentage of flow increase over baseline from flow releases from Eklutna Lake" (page 98). While Reaches 3 and 4 were excluded, they were considered in the time series analysis (Section 4.7). We request additional information on how the low flows associated with maximum rearing habitat gains in the main channel of Reach 6 are influencing the results in the flow release schedule. If the habitat models could have been projected beyond 375 cfs, how much would that have impacted the values in the flow release schedule and time series analysis?

Thank you for the opportunity to review and comment on the draft Year 2 Reports. For more information or if you have any questions, please contact Senior Fish and Wildlife Biologist Wildlife Conservation, Ms. Jennifer Spegon at (907) 271-2768 or via email jennifer_j_spegon@fws.gov, or Senior Fish and Wildlife Biologist Ecological Services, Ms. Carol Mahara at (907) 271-2066 or via email carol_mahara@fws.gov and reference Service file number 2022-0074477.

Sincerely,

DOUGLASS COOPER

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Date: 2023.04.21 14:47:49 -08'00'

Douglass M. Cooper
Branch Chief, Ecological Services

Literature Cited

Kleinschmidt. 2023. Eklutna hydroelectric project Eklutna River instream flow year 2 study report draft. March 2023.

Native Village of Eklutna. 2023. Eklutna Lake and tributaries salmon habitat. Unpublished, summary of findings and field notes. Eklutna Aquatics Working Group. April 10, 2023.