Enclosure 1. Service Review and Comments Eklutna Hydroelectric Project Year 2 Study Plans

The U.S. Fish and Wildlife Service (Service) is engaged in the Eklutna Project to identify and analyze impacts from the Eklutna Dam development on fish, wildlife, and habitat, and to identify measures to mitigate, protect, and enhance impacted resources (mitigation measures).

The Service is currently working with the consultant to provide a final assessment of Study 3.1 Geomorphology & Sediment Transport and Study 3.2 Instream Flow study plans. The Hydrologic Engineering Center's River Analysis System (HEC-RAS) and the Physical Habitat Simulation System (PHAB-SIM) modeling is expected to be complete in summer of 2022. The Service will be able to assess these studies once the Parties to the 1991 Agreement have an opportunity to discuss the results, confidence intervals, and potential subsequent limitations for alternative analysis. The results may indicate a need for additional studies, or they could inform strategies to incorporate adaptive management as part of the Fish and Wildlife Plan. The Service met with the consultant on April 22, 2022, to discuss Studies 3.1 and 3.2, see summary below.

- The Service and the consultant discussed the information collected in 2021 for the HEC-RAS models used in Studies 3.1 and 3.2, and what additional information may be needed and provided this summer. There was mutual agreement for the consultant to engage with the Service when that information is available.
- In discussing the proposed schedule, Year 2 studies may lead to additional questions that may need additional studies or study modifications. If the stakeholder group decides that additional data, modeling or a different approach is needed to analyze methods to mitigate, protect, and enhance resources impacted by the Eklutna Dam Project, then we would request that this data collection or analysis take place in Year 3.
- Additional flows and adaptive flow releases should be considered in order to move sediment and to establish and maintain habitat below the upper dam.

3.1.1.1 Need for a High Calibration flow in 2022

- The quantity of flow released in 2021 was limited due to capacity of the outlet gate, measured in cubic feet per second (cfs). We are concerned that the Year 1 flow releases of 150cfs, 75cfs, and 25cfs will not be sufficient for calibrating the HEC-RAS modeling at higher flow regimes with an acceptable degree of certainty. A range of flows up to the pre-development, unregulated 2-year flood flow, around 1,700 cfs, should be modeled to fully understand the range of flows and potential alternatives. However, due to the limited flows released in 2021, this would require modeling of sediment transport at flows that are 11 times the highest calibration flow. This may introduce a large degree of error in the model predictions at the higher flows. We are concerned the higher channel-maintenance flow regimes would be viewed as unviable alternatives simply due to model uncertainty and associated risks. The limitations of the models should not be the reason for ruling out a particular flow regime or alternative.
- We recommend the consultant consider using another approach, such as the upstream reference reach bankfull discharge, if the models do not provide enough certainty to predict channel formation and maintenance flows up to the 2-year flood flow.

- We recommend an adaptive management approach for flow releases as mitigation measures are implemented, as all modeling methods inherently have uncertainty, even if they are calibrated for the full range of flows with sediment transport data.

Other Service comments on the Final draft of the Year 2 studies are listed below.

2.2.1 Reservoir Operation

- This section refers to the 860-foot elevation feature as a "natural glacier moraine". Figure 2-6 calls the 860-foot feature the "Old Pile Dam Structure". We recommend a description of the old pile dam, its relationship to the natural moraine feature and the historic wood and earth debris and sheet pile, and how damming may have affected the elevation of this feature in between the lake and the 1955 dam.

3.3.4.3 Task 3: Passage Barrier Analysis

- Tables refer to adult salmon - there is no mention of juveniles. We recommend providing methods for how the study will consider juveniles in the context of being able to get up and down river for these cascades.

3.7 Engineering Feasibility and Cost Assessment Study

- Study 3.7 indicates a number of mitigation measures suggested by stakeholders during initial outreach efforts and refers to measures described in the Initial Information Package. We request the opportunity to provide additional measures and input on fish, wildlife, and habitat to ensure a full range of mitigation measures are considered as the study process moves forward.
- The Service requests flows be released into the Eklutna River again this year, if possible, to benefit the river system habitat and possibly move additional sediment from the lower dam.