NMFS Comments on the Eklutna Proposed Final Study Plans (Version - February 2021)
(March 11, 2021)

We appreciate all the work put in by the project owners and the stakeholders to revise this study plan and each version has been an improvement on the earlier version. We are providing the following additional requests for changes to the study plan and more clarity on the role of the technical work groups (TWG).

3.1 Instream Flow Study

1) (page 39) We request a TWG meeting concerning whether the seven habitat attributes listed in the study plan are the most important indicators of fish habitat. The proposed seven attributes are depth, velocity, substrate, cover, temperature, and upwelling. Oxygenated water and food availability are two other possibilities. Discuss them in a TWG forum.

2) *(page 42) "In general, a least one run, riffle, and pool unit would be selected for transect placement."* Figure 3-6 shows 11 reaches below Eklutna Lake. Commit to a minimum of 33 transects (cross-sections) in the study plan. If one reach does not have all three stream types, that transect would be added to another reach. Commit to surveying a transect at least every half mile or some similar distance.

3) (page 43) Transect location selection is crucial to the model performance, however, the TWG cannot walk every inch of the stream and select transects locations. Provide more discussion of the back and forth between the TWG and the consultant on transect selection and what month these discussion happens.

4) (page 51) State that the majority of cross-sections will be surveyed using on-the-ground equipment. Lay out the conditions that would compel the consultant to rely solely on LiDAR to define a cross-section. LiDAR might be useful for the initial concepts of cross-section locations that will be presented to the TWG prior to commencing field surveying.

5) (page 47) We disagree that the HEC-RAS model can be accurately extrapolated from a data point in the 150 - 170 cfs range to 1,000 cfs. This is unwise because 1,000 cfs release that has not flown down the channel in 25 years is going to change the channel shape that will correspondingly change depth and velocity. Removing that sentence and let the study plan be silent as to how far the model should be extrapolated.

6) (page 49) The bankfull watermark is often difficult to discern. To insure that the transects capture the surfaces water might flow over in model runs, extend the transects laterally 20 feet past the bankfull mark or 3 vertical feet up, whichever comes first.

7) (page 49) Distinguish two or three classes of sediment smaller than 2mm in this river system. The whitish clay particles common in the Eklutna River behave very differently than sand or even silt when it comes to imbedding spawning gravels. This adds minimal time to field work and even if field technicians are not 100% consistent, value will be added.

8) (page 50) Running the PHABSIMS at 30 different discharges may be attributing more precision to HEC-RAS and PHABSIMS models than is justified. Have each model run be 33 - 50 percent more water than the previous run.

9) (page 52) If the consultant anticipate resurveying some cross-sections between the 150 cfs release in 2021 and the larger release in late 2021 or 2022, state the criteria that will be used to decide which cross-sections to resurvey.

3.2 Sediment Transport Study

10) (page 56) "*Studies through 1948 estimated that an average of 300,000 cubic yards of gravel accumulated behind the lower dam annually."* Since there has not been a flow capable of moving gravel since 2013, wouldn't this point to an extra seven years' worth, or 2.1 million cubic yards, of sediment/gravel in the stream above the former dam site?

11) (page 60) The Sediment Transport study plan should commitment to "greater than" a certain number of transects per reach, or not less than a certain number of total transects between tidewater and the upper dam.

12) (page 60) The total number of cross sections should not be decreased due to the cost of processing subsurface samples. There may be reaches where one subsurface sample could accurately represent multiple cross-sections.

13) (page 60) The project needs to measure roughness, n, outside the bankfull width for the sediment transport model to function well. State whether floodplain roughness will be determined during field surveys, or will it be derived from reviewing aerial photos or video.

14) (page 61) Since the streambed must be dug up, often underwater, to install scour monitors, how will field staff insure that a similarly embedded armor layer is reestablished? If the new armor layer is less embedded around the scour monitors, the study will indicate a lower flow can break-up the armor layer than is generally true.

15) (3.4.2.3) State whether you plan to re-evaluate every cross-sections after each flow. There is value following the 150 cfs flow, but much less after the 75 cfs and 25 cfs releases. It is imperative to visually re-evaluate all cross-sections after the flushing flow and resurvey the ones with significant change.

16) (3.2.4.4) Perceived risk to infrastructure, reservoir stage, economics, compromise and the fickleness of September weather will define the magnitude and duration of the high calibration flow. Claiming this decision is based on HEC-RAS has some merit, but it obscures the true constraints on the decision.

17) (Page 64 - final paragraph) start with "Once a high …" not "If". Have the study plan wording assume the larger flow will happen. This is important to me!

3.4 Macro-invertebrate Study

18) (3.4.3) An invertebrate site in the old sediment wedge or at the old dam site may not be the best use of resources. This area will be continually scouring out or continually having sediment deposited on it. This would favor a suite of "colonizing" or "disturbance adapted" invertebrates. If this area is unlikely to provide good salmon habitat for the next decade, perhaps we care more about food availability (macro-invertebrates) at a different location where juvenile fish would be likely to rear.

3.5 Water Quality

19) 3.5.4.4 - Measuring turbidity during base flow and one release is not sufficient. Most rivers become more turbid during higher flows and there is likely a threshold or tipping point above which turbidity increases greatly. The study should sample turbidity during all releases to see where turbidity begins to spikes, and correspondently when/if it drops back down again.

20) 3.5.4.1 - Leave the thermistor string in the lake all winter. It will provide interesting data and may tell us about winter fish habitat. Putting Hobo temperature loggers at a few additional depths along the string would minimally increase cost and greatly increase understanding of lake stratification.

21) 3.5.4.2 - The DO meter and pH meters cannot represent an entire year by recording values only in July. Deploy the same meters for 2 - 3 weeks in May; 2 - 3 weeks in July; 2 - 3 weeks in late September.

22) 3.5.4.4 - The lake nutrient monitoring described provides very little spatial resolution and no temporal resolution. Sampling at the surface and at depth is a good plan. Consider taking these two samples at five different locations in Eklutna Lake spaced from one end to the other. A second improvement would be to mimic the DO and pH sampling timeframe being 1) post breakup; 2) mid-July; 3) fall. Perhaps a single location could be done at the three different dates and the improved spatial resolution could be only during the July sampling event.

3.6 Stream Gaging

23) (3.6.4.1) How many days of discharge data that can reasonably be claimed to be precise within 15% does the utility consider a full year of data? State this minimum discharge data quality/continuity threshold in the Study Plan and explain what steps will be taken to remediate the situation in the second study year if the threshold is not met the first year. We are concerned with data continuity on the two Eklutna River gages; we agree the two tributary creeks are likely to freeze solid or contribute too little water to measure mid-winter.
24) (3.6.4.1) Atmospheric rivers are causing mid-winter rain on snow events that cause a rapid rise in the hydrograph. Please explain how these will be recorded.
25) (3.6.4.2) Accretion studies should be done at base flow and during a typical summer rain event. Good science/monitoring is repeatable so perform the base-flow accretion study twice during the first study year so its accuracy can be understood. Accretion during rain events is challenging to schedule; target one rainstorm accretion monitoring event in each of the two study years.
26) (3.6.5) Make at least hourly and preferably 15-minute discharge data available to the resource agencies.

3.7 Lake Aquatic Habitat

27) Precisely record gear type and sampling effort so comparisons can be made in future years to document change. Once the glacier is gone Eklutna Lake's productivity and fish biomass may increase.

3.9 Hydro Operations Modeling

28) While we supports using past data, we feel the climate has changed too much since the dam was constructed for the entire discharge/reservoir stage record to be useful for projecting future events. We strongly suggest using the inflow and reservoir level data from only the last 30 years.

3.10 Existing Infrastructure Assessment

29) The drainage outlet gate is dry, or at least under very shallow water at some time during the year. If it was dry, or the pond was almost empty, this would be a safer time to remove the rocks and debris. A similar task led to a diver's death at Hess Creek Dam, in Alaska.