



**UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration**

*National Marine Fisheries Service  
P.O. Box 21668  
Juneau, Alaska 99802-1668*

October 6, 2011

Duff W. Mitchell  
Business Manager  
Juneau Hydropower Inc.  
P.O. Box 22775  
Juneau, AK 99802

Re: FERC P-13563 Sweetheart Lake Hydroelectric Project

Dear Mr. Mitchell:

The National Marine Fisheries Service (NMFS) has reviewed Scoping Document 1 for the Sweetheart Lake Hydroelectric Project. This document describes the project as a 500-foot long, 90-foot high concrete and rock face dam downstream of the natural outlet of Lower Sweetheart Lake that would create a 1,635 acre impoundment. A nine-foot diameter, 1,650-foot long penstock from the impounded lake would feed into a 30 MW powerhouse. A bypass reach would be created in Sweetheart Creek as the tailrace would return flows downstream of an anadromous fish barrier on Sweetheart Creek. Transmission lines would consist of a combination of overhead and submarine line, either a 0.4-mile long overhead transmission line from the powerhouse to a new dock on the east short of Gilbert Bay, 1.5-mile long submarine transmission line across Gilbert Bay, and a 5.5-mile overland transmission line along the west shore of Port Snettisham; or a 0.4-mile long overhead transmission line from the powerhouse to a new dock on the east short of Gilbert Bay and an 8-mile long submarine transmission line across Gilbert Bay to Port Snettisham.

NMFS is entrusted with federal jurisdiction over marine, estuarine, and anadromous fishery resources under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Anadromous Fish Conservation Act, and the Pacific Salmon Treaty Act. Section 305(b) of the MSA requires federal agencies to consult with NMFS on all actions that may adversely affect Essential Fish Habitat (EFH). If the proposed action would adversely affect EFH, NMFS is required to make EFH Conservation Recommendations, which may include measures to avoid, minimize, mitigate or otherwise offset adverse effects. Section 10(j) of the Federal Power Act (FPA) authorizes NMFS to recommend license conditions necessary to protect, mitigate damage to, and enhance fish and wildlife habitat affected by the project. Section 18 of the FPA provides NMFS authority to issue mandatory fishway prescriptions. In addition, NMFS has responsibilities related to FERC proceedings derived from the Fish and Wildlife Coordination Act, the Clean Water Act, the Endangered Species Act and the Marine Mammal Protection Act.



### *Applicant's Proposal*

The tailrace is described to return flow below the barrier falls, and to enhance the naturally-occurring anadromous fish spawning habitat (Sec 3.1.1 also mentioned in section 3.1.4). We are interested in both the location relative to the barrier falls (i.e., what habitat would be bypassed) and the specific plans to enhance the spawning habitat. In the subsection Proposed Environmental Measures (Section 3.1.4) Juneau Hydropower Inc. proposes to develop and implement downstream fish passage for salmon smolts stocked by Douglas Island Pink and Chum's Snettisham hatchery. We would like to see more detail concerning the design of the tailrace and opportunities to expand salmon spawning habitat at Sweetheart Creek. This section also contains a short description of the water management plan, which includes a schedule for instream flow releases to Sweetheart Creek. It will be important to know the location, timing, and use of the habitat in Sweetheart Creek above and below the tailrace as well as have a good understanding of the hydrology of Sweetheart Lake and Creek, including timing, magnitude and year to year variability. This information should be considered in light of climate change to assess how projected changes may affect the operation and habitat.

### *Potential Studies*

General recommendations for the Sweetheart Lake project studies include: identification and characterization of all marine and anadromous species, life stages, and timing in the project area; inventory and mapping of stream habitat and determination of how habitat would be affected by changing flows; location and characterization of fish passage barriers; and examination of how project operation would affect instream flow conditions, including amount of flow and water quality. Changes in tailrace discharge associated with power house operation should be determined to predict the effects of project operations on habitat availability, quality and use. Continuous stream flow gauging should be conducted in the anadromous reach for a minimum of five years to characterize the stream flow in Sweetheart Creek adequately and allow for extrapolation of flow records from proxy sites with long term stream gauge records or use of other methods of estimating long term stream flow. The stream flow data and habitat information in combination with detailed operation plans, locations of the tailrace discharge area, and ramping rates are needed to design adequate in-stream flow requirements for the anadromous reach.

In the Water Quality and Quantity table of potential studies (Section 5.0) Juneau Hydropower Inc. describes the Water Quantity study as "hydrologic studies of seasonal streamflow in Sweetheart Creek and Lower Sweetheart Lake. These studies may be based on field data and combined with historical US Geological Service stream data and referenced with measured data in nearby basins." The intent appears to be to do an analysis with existing data and not to validate the data with a stream gage installed in Sweetheart Creek; previously the intention of Juneau Hydropower Inc. was to install two stream gages on Sweetheart Creek in addition to a weather station. We recommend installing the two stream gages and the weather station as previously planned and measuring the snowpack in relation to the weather station. When more information is available, after agreed upon studies are designed and conducted, it will be possible to determine flows needed for ecological functions, target ramping rates, and recommend lake

storage and operation schedules that protect anadromous and marine fish and habitat. We also look forward to participating in the study development for baseline surveys of fish species, life histories, and habitats in the project area (p. 32 in the Aquatic Resources section).

NMFS recommends that the regional impacts of predictable climate variability and long-term climate change be assessed in planning stages for this project given that inflows to Sweetheart Lake are predominantly from surface runoff, rain, and snowmelt. Climate models project annual warming of three to four degrees Celsius over the 21<sup>st</sup> century for southeast Alaska and a five to eight percent increase in annual precipitation, with a significant shift from snow to rain. Increases in runoff are expected to exceed increases in precipitation in basins with glaciers, as those glaciers melt, but not after they have receded entirely. Analysis of historical data show that approximately half of the observed warming in southeast Alaska since 1920 is attributable to the variability of the Pacific Decadal Oscillation, a naturally occurring mode. This pattern of climate variability drives persistence of temperature and precipitation anomalies in such a way that hydropower utilities developers and managers should anticipate the possibility of ‘non-normal’ inflows for an entire decade or longer, as part of natural variability. On top of this decadal persistence are the long-term trends associated with global climate change: warming and wetting (Cherry, et. al., 2010<sup>1</sup>). Scoping for new projects such as Sweetheart Lake should analyze long-term (multi-decadal) climate and hydrology datasets and assess downscaled climate projections, while recognizing the limitations of these data and models.

NMFS recommends that the impacts of the project’s submerged power transmission cables on fish, especially migrating salmon species, and marine mammals be addressed in the project’s environmental effects assessment. Very little specific information is available on the electromagnetic field (EMF) characteristics in the project area. Additional information is required before project impacts are assessed and appropriate avoidance or mitigation measures are consequently put into place. It is beyond the scope of this document to provide a summary of the more general information concerning the potential effects of the project on EMF or the effects of any alterations of EMF on fish or marine mammal species, however, effects are likely to be minor and mitigation measures such as cable burial and shielding may easily ameliorate any adverse effects. The effects of other submerged cables in the area should be analyzed for possible cumulative effects of EMF on migrating fish including salmon, elasmobranch fish species such as sharks and rays, and marine mammals.

We recommend development of SMART objectives in order to ensure that studies are well designed and with a clear purpose. The SMART objectives concept is Specific- concrete, detailed, well defined; Measurable- numbers, quantity, comparison; Achievable- feasible, actionable; Realistic- considering resources; and Time-Bound- a defined time line. We suggest that Juneau Hydro review the U.S. Fish and Wildlife Service publication: *Guidelines for Establishing Project Objectives for Biological Fisheries Investigations*.


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<sup>1</sup> Cherry, JE, Walker S, Fresco N, Trainor S, Tidwell A. 2010. Impacts of Climate Change and Variability on Hydropower in Southeast Alaska: planning for a robust energy future. Report to NOAA-NMFS Hydropower Coordination Office.

Addressing these information needs would result in a comprehensive, detailed study plan and would provide necessary information for NMFS to make effective conservation recommendations relative to the protection, mitigation, and enhancement of fish and wildlife resources that may be impacted by the project per Section 10(j) of the FPA and Section 305(b)(4)(A) of the Magnuson-Stevens Act.

Please contact Eric Rothwell at (907) 271-1937 ([eric.rothwell@noaa.gov](mailto:eric.rothwell@noaa.gov)), or Susan Walker at (907) 586-7646 ([susan.walker@noaa.gov](mailto:susan.walker@noaa.gov)) with any questions regarding this project review.

Sincerely,

  
for James W. Balsiger, Ph.D.  
Administrator, Alaska Region

Cc:

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