

Susitna-Watana Hydroelectric Project Document

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1.1. Analysis of Fish Harvest Rates in and Downstream of the Susitna-Watana Hydroelectric Project Area

1.2. Requester of Proposed Study

AEA anticipates resource agencies will request this study.

1.3. Responses to Study Request Criteria (18 CFR 5.9(b))

The following sections provide the necessary context and justification for the proposed study.

1.3.1. Describe the goals and objectives of each study proposal and the information to be obtained

The goal of this study is to compile and analyze baseline information on the harvests of resident and anadromous fishes in and downstream of the Project area to understand the potential for Project construction and operations to alter harvest rates. The study area includes the middle and lower mainstem of the Susitna River, which are located within the Alaska Department of Fish and Game (ADF&G) Northern Cook Inlet and Upper Copper/Upper Susitna River Management Areas. This study has two primary objectives:

- Describe the baseline harvest levels and in-river locations used by anglers for all commercial, sport, personal use, and subsistence fisheries encompassing Susitna River resident and anadromous fish.
- Describe the potential for flow and habitat-related changes to alter harvest rates based on potential changes in fish abundance and distribution as estimated from other Project studies.

1.3.2. If applicable, explain the relevant resource management goals of the agencies and/or Alaska Native entities with jurisdiction over the resource to be studied

To be completed by the requesting organization.

1.3.3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study

Fisheries resources are owned by the State of Alaska, and the Project could potentially affect these public interest resources by affecting fish habitat.

1.3.4. Describe existing information concerning the subject of the study proposal and the need for additional information

ADF&G documents legal catches from commercial, sport, personal use, and subsistence fisheries. Fishing effort and harvest success are summarized from harvest reports by fishery, management area, district, subdistrict, and, when possible, by smaller statistical areas. Most of these data are compiled and stored by ADF&G in a statewide harvest database. Some subsistence fishing activity is summarized based on household surveys.

Commercial harvests are recorded and readily available in the ADF&G database. All five species of Susitna River salmon are subject to commercial harvest in Upper Cook Inlet, and of

those, sockeye salmon are the most harvested. Recent efforts by the ADF&G Gene Conservation Laboratory, using genetic mixed stock analysis techniques, have had success identifying stock-of-origin in commercial fishery catches such that the contribution of Susitna-origin sockeye salmon can be estimated (Barclay et al. 2010). Efforts are underway to develop the baseline and resolution for other salmon species.

Sport fishing effort and harvest of sport fish species in Alaska have been estimated and reported annually since 1977 using a mail survey. Harvest reports are required to be submitted by anglers. Susitna River drainage sport fish harvest and effort estimates by fishery and species are available from the ADF&G database dating back to 1996 and from historical reports since 1977.

Personal use and subsistence harvest data are reported annually in ADF&G Annual Management Reports, for example, Ivey et al. (2009). In the Subsistence Resource Data Gap Analysis (2011), Northern Land Research, Inc. concluded that current quantitative information on subsistence harvests within the Project Area is outdated. They also noted that there is no information about subsistence harvesters who may currently be using the area and that subsistence use maps are not available for many communities or for all species harvested in each community. No electronic database currently exists for subsistence information.

To assess Project effects on harvest rates, it is necessary to draw upon other studies that are designed to estimate abundance and distribution of the various fish stocks. Existing information includes fish spatial and temporal distribution and relative abundance information from existing recent and early 1980s studies. The Aquatic Resources Data Gap Analysis (ARDGA; AEA 2011a) and PAD (AEA 2011b) summarized existing information and identified data gaps for adult salmon, resident and rearing fish, and for subsistence resources (Northern Land Research, Inc. 2011). In recent years, ADF&G has conducted adult salmon (sockeye, coho, and chum) spawning distribution and abundance studies in the Susitna River (e.g., Merizon et al. 2010; Yanusz et al. 2011). In 2012, ADF&G expanded its scope to include Chinook and pink salmon. Other concurrent studies include the Salmon Escapement, Fish Distribution, and Abundance in the Upper Susitna River, Fish Distribution and Abundance in the Lower and Middle Susitna River, Characterization of Aquatic Habitats in the Susitna River Study, and Subsistence Use.

1.3.5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.

For resident and anadromous fish, the Project has the potential to alter fish habitat, affect fish population structures, and has the potential for direct and indirect mortality to fishes as a result of facility construction and hydropower operation (AEA 2011). Fish may be affected indirectly through the loss and alteration of habitats, habitat fragmentation, and instream flow changes from development of the Project, but also by disturbance during Project construction and operation. Depending on the location, direction, and magnitude of the effect, there is the potential for the Project to change distributions and abundance of fish that, in turn, might affect commercial, sport, personal use, and subsistence fishing.

This study addresses the following issues identified in the PAD (AEA 2011b):

- R3: Potential effects on fishing opportunities due to the Project.
- S1: Potential changes in subsistence fishing and hunting opportunities due to Project-related effects on fish and wildlife populations.
- So5: Changes in direct and indirect commercial opportunities related to recreation, including fishing, hunting, and trapping, and commercial non-consumptive uses due to the Project.

Information from this fish harvest study will be used in combination with other studies to assess Project effects. Harvest Study results will be used to inform the licensing process by analyzing baseline harvest data from the Project area downstream to where the Susitna River joins Upper Cook Inlet. This study would provide a basis for impact assessment [and](#); [development of impact protection, mitigation, and enhancement measures as necessary;](#) [and developing resource management and monitoring plans.](#)

1.3.6. Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

This study is designed to coalesce and synthesize baseline data on commercial, sport, personal use, and subsistence harvests of resident and anadromous fish in the Project area and other potentially affected areas downstream of the Project; and provide data that will be useful for subsistence, recreational, and socio-economic impact assessments.

This study will use existing data as well as new data that will be collected during other Project studies. Specific tasks include:

- Compilation and analysis of ADF&G commercial catch records, sport fishery creel surveys, personal use fishery harvest permit records, and subsistence catch surveys;
- Review of ADF&G subsistence surveys and harvest reports;
- Review of ADF&G management reports;
- Review of ADF&G genetics reports;
- Review of ADF&G fisheries outlooks and harvest surveys;
- Interviews with area and regional biologists; and
- Collection of additional data on subsistence use as necessary.

Once harvest data for the various fisheries have been compiled and fish abundance and distribution studies have been completed, comparisons can be made with development plans to assess potential changes in fishing opportunity and harvest rates. [The data used in this study will be derived from two sources: 1\) resource agency reports that summarize estimates of](#)

salmon harvest and escapement based on regionally standardized methods and 2) angler surveys collected consistent with approved agency protocols.

1.3.7. Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

This study will focus on analyzing existing harvest data and new data collected from other fish, habitat, subsistence, and recreational studies to maximize the information gained from these data. The majority of this study is a desktop exercise that can be conducted in a cost-effective manner. It is estimated that this study will cost approximately \$100,000.

1.3.8. Literature Cited

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