

## **DRAFT STUDY PLAN FOR BLUE LAKE FISHERIES**

### **BLUE LAKE HYDROELECTRIC PROJECT (FERC No. 2230)**

**Spawning Surveys, Fall, 2002-Spring, 2003**

### **CITY AND BOROUGH OF SITKA ELECTRIC DEPARTMENT**

#### **INTRODUCTION**

The City and Borough of Sitka Electric Department (City) is in the process of relicensing the Blue Lake hydroelectric Project (Project). As part of the relicensing process, the Federal Energy Regulatory Commission (FERC) regulations require that licensees conduct certain natural resource studies to develop a baseline for use in subsequent environmental reviews and assessments.

The Project area includes water resources which have not been intensively inventoried in the past 5 years, including Blue Lake and Sawmill Creek. The City, through preliminary consultation with Alaska state and federal resource agencies, has begun study of Sawmill Creek, the primary Project waterway. During the 2003-2006 relicensing period, the City will further study both Blue Lake and Sawmill Creek prior to preparing the Draft License Application. Consultation on planning for those studies will be concentrated during spring, 2003.

Because of the need to more accurately evaluate rainbow trout spawning, the primary fishery resource in Blue Lake, the City has begun preliminary consultation to develop an approved study program which will be in place at the time these fish begin spawning in 2003. This spawning study plan addresses only the surveys necessary to determine the timing of spawning and areas where spawning occurs. More detailed survey methods applicable to other Blue Lake resources will be determined at a later date.

The City plans to hire a fishery contractor to conduct the Blue Lake and other Project-related fisheries studies. In this draft plan, where the term "City" is seen associated with a proposed field or office study, it implies use of a qualified contractor.

#### **RAINBOW TROUT SPAWNING IN BLUE LAKE.**

From an earlier study (Aram Van Der Hovanisian, 1994) and anecdotal evidence, it is known that rainbow trout in Blue Lake probably spawn in certain lake tributaries and in lakeshore upwelling areas near certain tributary mouths. It is

generally felt that spawning activities, including fish congregation at the mouths of tributaries, and spawning migrations up the tributaries begins when the tributary water temperature reaches 5 to 7 degrees Centigrade. Spawning may occur over as short a period as a few days, or may last for a few weeks, but does not extend into the summer months. It is generally thought that most of the trout spawning takes place in Blue Lake Creek, the main tributary to Blue Lake.

## **STUDY METHODS.**

Methods proposed in this draft study plan are only for that work which will be done in fall, winter and early spring, 2002 and 2003, to document spawning. Other methods may be used to describe other life stages which may be observed in subsequent seasons and for the remainder of the licensing period.

The City's draft proposal has two main elements: 1) Emplacement of Thermographs; and 2) Direct Spawning Observations which we propose to employ as soon as possible. Two additional elements, Evaluation of Migration Barriers and Blue Lake Creek Habitat Analyses, as described below, may be possible during the 2002-2003 studies, but will be done only if time permits and after completion of the temperature monitoring and direct spawning observation surveys.

### **Emplacement of Thermographs.**

Since spawning (both upstream migration and actual spawning) is known to be tied to temperature, thermographs will be placed in selected tributaries before the spring rise in water temperature. Thermographs will be fitted with data-loggers to continuously read temperatures over the observation period. The following specifications will be agreed upon between the City and ADF&G:

- Brand(s) and model(s) of thermographs and data loggers;
- Recording interval; and
- Frequency of data retrieval.

Generally, thermographs will be emplaced during fall, 2002, during or after a joint City-agency reconnaissance visit to determine the most likely tributaries to survey.

### **Direct Spawning Observations.**

The City will conduct at least two site visits during the expected spawning period to attempt to directly observe spawning. Qualified observer(s) will observe likely spawning areas in both Blue Lake Creek and other selected tributaries. After

initial site visits, observers will have prepared stream or tributary maps on which they will locate all observed fish, documenting:

- Whether they exhibit spawning behavior;
- Stream or tributary location relative to documented habitat types; and
- Estimated size.

### **Other Study Elements.**

Other study elements will be conducted on Blue Lake during and after the spawning season. These surveys will not, however, be the focus of the initial spawning surveys during 2002-2003, and will be done only if time permits. They are:

#### ***Evaluation of The Barrier on Blue Lake Creek.***

A cascade or waterfall some distance upstream of the mouth of Blue Lake Creek may serve as a barrier to rainbow trout spawning migration at certain flows. The City will survey (to the extent possible given other 2002-2003 survey requirements) this cascade during each of the spawning observation site visits (above) and at other times during successive seasons, to evaluate its potential as a migration barrier. During the 2002-03 surveys, the waterfall and other potential migration impediments will be photographed. If time permits, the stream flow at the time of the observation will be estimated or measured.

#### ***Habitat Survey of Blue Lake Creek.***

To the extent possible, researchers in 2002-03 will begin the process of mapping Blue Lake Creek fish habitat. This will entail development of a base map showing the accurate course and dimensions of the stream, with subsequent marking of stream habitat types (according to US Forest Service habitat mapping guidelines) and specific habitat features. The habitat maps will be used to document fish location and activity throughout the relicensing studies.

### **DATA ANALYSIS**

The primary objective of the 2002-2003 surveys will be to document the rise of tributary water temperatures during winter and early spring, particularly noting when these temperatures rise to 5 to 7 degrees Centigrade. Data from the thermographs will be downloaded and graphed. Fish observations, if any, will be presented on stream maps available at the time, along with the field notations of spawning activity and other comments.

## **REPORTING.**

An informal report will be prepared for the 2002-2003 spawning observations after the spawning data is complete. This informal report will be distributed to interested agencies for review and comment. Results of the spawning surveys will also be included in the formal 2003 fisheries survey report(s) which will be completed after the 2003 field season. The spawning survey results will be discussed during the 2003 study planning to assist in developing those study plans, and plans for successive years. It is hoped that these early studies will help refine the overall Blue Lake fisheries study plans and will improve the overall quality of relicensing studies.

## **REFERENCE**

Aram Der Hovanisian, John. 1994. Stock assessment of rainbow trout in a southeast Alaska impoundment. Master's thesis, University of Alaska, Fairbanks. 164 pp.