

# STATE OF ALASKA

## DEPARTMENT OF FISH AND GAME

### SPORT FISH DIVISION

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September 29, 2004

Mr. Burke Wick, Project Manager  
Chugach Electric Association, Inc.  
P.O. Box 196300  
Anchorage, AK 99519-6300

Dear Mr. Wick:

Re: Cooper Lake Hydroelectric Project Relicensing (FERC No. 2170)  
Chugach Electric Association  
Comments on Draft License Application for Relicensing

In response to Chugach Electric Association, Inc's (CEA) May 26, 2004 letter requesting comments on the attached Draft License Application (DLA) for relicensing the Cooper Lake Hydroelectric Project and July 16, 2004 letter extending the comment deadline until September 30, 2004, the Alaska Department of Fish and Game (ADF&G) provides the follow comments.

According to the DLA, there are no significant changes proposed in project facilities. The Project consists of the following facilities:

- Cooper Lake Dam, a rock-and-fill structure across Cooper Creek at the outlet of Cooper Lake;
- Cooper Lake Dam spillway, located at the left abutment of the dam, consisting of an excavated channel with a 3-foot-high concrete weir. The weir has a crest length of 50 feet at elevation 1,210 feet above mean sea level (feet MSL);
- Cooper Lake, a natural lake that was increased in area to 2,910 acres by impoundment up to the licensed normal maximum operating elevation of 1,210 feet MSL. The current normal maximum operating level is 1,194 feet MSL, with a corresponding reservoir area of 2,620 acres;
- An intake structure, located on the Cooper Lake shoreline, approximately 5 miles southeast of the dam. Elevation of the invert of the opening to the tunnel/penstock is at 1,151 feet MSL (43 feet below the water surface at the current normal maximum pool elevation of 1,194 feet MSL);

- A tunnel and penstock extending 10,686 feet east from the intake to the powerhouse on Kenai Lake;
- A powerhouse, containing two turbine/generator units, each rated at 9.69 megawatts (MW);
- A single-phase 4.16-kilovolt (kV) distribution line from the powerhouse to the intake structure;
- A 6.3-mile-long 69-kV transmission line from the powerhouse to the Quartz Creek Substation in Cooper Landing; and
- 69/115-kV step-up transformer and appurtenant switchgear facilities at the Quartz Creek Substation.

The upper Kenai River watershed is affected by the hydroelectric project facilities. Cooper Lake has been completely diverted from Cooper Creek to Kenai Lake to pass through the powerhouse. Porcupine Creek, which flows from Rainbow and Cleaver Lakes into Kenai Lake, is affected by periodic releases from the penstock and may be connected to Kenai Lake during periods of high flow. Kenai Lake and the upper section of the Kenai River, between the lake and Cooper Creek, may be affected due to changes in flow regimes resulting from the diversion of Cooper Lake flows.

Cooper Creek is a major tributary to the Kenai River, which is one of Alaska's most important salmon rivers. Pursuant to AS 41.14.870(a), Cooper Creek is identified as ADF&G anadromous water body (number 115-33-10200-2016) in the *Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes*, which is on the Federal Energy Regulatory Commission's April 2002 revised list of comprehensive plans. Cooper Lake supports populations of Arctic Char and Rainbow trout. Cooper Creek supports populations of Dolly Varden, and is utilized by king, coho, and sockeye salmon at various life stages. Porcupine creek supports populations of Dolly Varden.

Many wildlife species depend on the fish from these water bodies as food source. In addition, access road, penstocks, pipelines, and power line corridors may impact habitat used by wildlife.

We look forward to working with CEA and the newly initiated Settlement Working Group to address project-related impacts to fish and wildlife resources.

### **General Comments**

1. Prior to construction and operation of the Cooper Lake project, Cooper Creek reportedly supported several fish species, including chinook, coho, sockeye and pink salmon, rainbow trout and Dolly Varden. Under current conditions, Cooper Lake project provides no instream flows to Cooper Creek, adversely affecting these fishery resources. As described in the DLA, recent studies indicate Dolly Varden is currently the primary fish species present in Cooper Creek, with limited observations of use by salmon and rainbow trout. Impacts to the fishery resources since construction and operation of the project has been attributed primary to colder stream temperatures

in Cooper Creek resulting from elimination of warmer water from Cooper Lake and possible reduction in water quantity.

Instream flow requirements for fish in Cooper Creek will depend in part on the seasonal presence of the species of fish and life phases that could potentially use Cooper Creek, water temperature, and fluvial/hydro-geomorphic characteristics needed to sustain seasonal production. Instream flow shifts and variations can also have an impact on terrestrial wildlife, in terms of migration routes, availability of food, riparian habitat, etc.

To assess instream flow needs in Cooper Creek, Chugach Electric Association (CEA) decided to conduct an Instream Flow Incremental Methodology (IFIM) study using the Physical Habitat Simulation model (PHABSIM). This approach required collection of site-specific information to enable better resolution of the instream requirements for the aquatic resources. We agree PHABSIM has the ability to provide refined instream flow analyses if the fieldwork, modeling, and analyses are conducted properly. Application of this model requires that assumptions used by the model will also be met. For example, icing conditions in the study area during portions of the year have the potential to violate model assumptions and different analyses may be needed during these periods to determine instream flow requirements.

CEA is still in the process of completing the instream flow analyses for Cooper Creek and therefore, our recommendations for fish and wildlife resources affected by the project cannot be provided until the final report is completed and staff have had an opportunity to review the results.

## 2. Cooper Lake Fish Resources:

As summarized in Exhibit E.IV. of the DLA, the 2003 study data suggests that there is a relatively large population of Arctic Char in Cooper Lake. The lower end of the 90% confidence interval is approximately 93,000 fish. The persistence of a population of Arctic Char in the lake suggests that entrainment may not currently be a significant problem. However, the absence of an intake screen and the documented high velocities measured near the intake suggest that entrainment is in fact occurring.

While it appears that the evidence is not strong enough to suggest that a screening system be installed, we believe two approaches to address this issue need to be taken. First, ongoing fish population sampling should be done to continuously monitor whether the population is remaining stable. If at some time over the term of the license evidence exists to suggest that entrainment may be a significant issue, then additional studies will be needed to determine if prevention, mitigation and enhancement (PME) measures are appropriate. Second, since some entrainment is almost certainly occurring, we feel that this issue should be included in the discussions of the Settlement Working Group.

Also, the DLA presents a limited amount of information on spawning habitat in Cooper Lake. As previously discussed at relicensing meetings, the spawning surveys were conducted in 2003, which was a year with unusually high reservoir levels. Data would need to be collected over

several years and at differing reservoir levels that reflect the range of natural variability and project operations in order to arrive at an accurate estimate of effects on spawning habitat.

We are also willing to work with CEA on any plans for the improvement of fishing access and opportunities in Cooper Lake, as discussed on pages E.IV 91-92. However, we take issue with the statement on page E.IV91 (and a similar one below it) that "...increased fishing of Artic Char might benefit the overall population." We do not consider improved angler access and facilities to be a PME in this context, as we do not believe that increased harvest will increase the size of the fish in the population.

### 3. Kenai Lake Fish Resources:

While we feel that attraction of fish to the powerhouse outfall is possible and, therefore, do not concur with the statement on page E.IV97 that such an effect is unlikely to occur, there is not enough data or other evidence to suggest that the problem is significant for us to pursue PME measures at this time. If at some time over the term of the license evidence exists to suggest that entrainment may be a significant issue, additional studies will be needed to determine if PME measures are appropriate.

### 4. Upper Kenai River Fish Resources:

We agree that there is insufficient information to document any adverse effects on fish populations including spawning habitat. While it is possible that there is a beneficial effect from flow augmentation in the upper Kenai, we do not agree that it is presumably beneficial, as stated on page E.IV97. This conclusion compares post-project to pre-project conditions, and states post-project conditions are more favorable. Conditions are different, but there is no data to suggest that post-project conditions are more beneficial to salmon than pre-project conditions.

We do not support the PME of further research on the upper Kenai River and Kenai Lake. We would prefer to see on-the-ground projects that directly benefit the resources affected by the project, or related off-site PME measures within the Kenai River watershed if PME measures within the project area cannot be identified.

5. Porcupine Creek Fish Resources:

As discussed on page E.IV92, we will work with CEA to finalize the written operation policy for the project, including methods to avoid erosion and flow problems in Porcupine Creek, and ask that the final plan be filed with FERC, after it is approved by the appropriate state and federal agencies.

We concur with the proposed PME measure on page E.IV94, to either replace the culvert on Porcupine Creek, or modify the streambed such that fish passage is restored. Our staff will be pleased to work with you on this project, as well as with ADNR / OHMP, who will be issuing the permit for any instream work that occurs.

6. Terrestrial/Wildlife:

We disagree with several statements made in the DLA pertaining to this section. For example, we disagree with the statement on page 37 of the Terrestrial/Wildlife Study that states “Beneficial effects from the ongoing operation of the project include the perpetuation of early successional shrubs and willow/alder vegetation within the zone of periodic reservoir inundation on the south and southwest shores of Cooper Lake.” Similarly, we disagree with the following statement in Exhibit E, page V71: “The ongoing reservoir operations have some beneficial effects for wildlife, including the perpetuation of early successional shrubs and willow/alder vegetation within the zone of periodic reservoir inundation on the south and southwest shores of Cooper Lake, thereby providing forage for moose.”

We agree that the project has changed the habitat in this area as well as the rest of the inundation zone around Cooper Lake. It is likely that the denudation of the Cooper Lake shoreline has resulted in loss of wildlife habitat utilized by moose and other species of wildlife. However, making a before/after project conclusion based on limited data, and excluding other possibly detrimental effects, is inappropriate. There is not enough evidence presented to indicate whether the net benefit to wildlife (and fish) of the lake shore inundation has been positive or negative. Indeed, it was not the stated intent of the project studies to compare the current project condition to the natural state of the lake or any other area prior to construction of the project. Furthermore, neither the study design nor the data collected is sufficient to reach such a conclusion. Therefore, both from a methodological standpoint (comparing pre and post-project conditions) and from a data standpoint (sufficiency of the data to arrive at a conclusion), this and similar statements in the Terrestrial/Wildlife study results are not supported by the evidence.

The DLA discusses the risk of avian electrocution (page E.V.45), and concludes that the project is in compliance with the guidelines in “Suggested Practices for Raptor Protection – State of the Art in 1996” by the Avian Power Line Interaction Committee. We expect that any new or rebuilt power poles shall conform to these standards, and that any bird collisions that are discovered will be reported to ADF&G and USFWS.

We do not agree with the conclusion on page E.V-80 that increasing flows to Cooper Creek is likely to reduce habitat for moose and other browsing animals. Fluvial processes are important in maintaining floodplain browsing habitat (Helm and Collins 1997) where moose find unequalled forage biomass and stability (Peek 1997). Increases in flow into the stream will likely increase available browsing habitat as well as the level of plant species richness, which would result in a positive benefit to a number of wildlife species.

We concur with the general recommendation in Exhibit E, on pages V83-85, that nesting platforms be pursued as a PME measure for water birds, if further analyses reasonably demonstrates that the target species will utilize them. Additionally, we are interested in pursuing the possibility of implementing a wetland creation project at the south end of Cooper Lake, as discussed at a recent project meeting. We encourage CEA to examine its feasibility cooperatively with state and federal agencies and other interested parties.

#### 7. Roads and Stream Crossings:

The final report on the road and stream crossing condition survey has not yet been released, so we will refrain from commenting until such time that the final report is available. However, as a general recommendation, we suggest that the correction of any fish passage or significant erosion problems at stream crossings of fish-bearing waters be given high priority. Also, while we understand that it is required for all roads and crossing on lands managed by the US Forest Service (USFS), we recommend that the best management practices contained in the USFS Region 10 Soil and Water Conservation Handbook (FSH 2509.22) be applied consistently throughout the project area.

Please contact me (907-267-2312) if you have any questions.

Sincerely,

/s/ *Jim Ferguson*

Jim Ferguson  
Statewide Hydropower Coordinator

cc:

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## References

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