

**Chugach Electric Association, Inc.
Cooper Lake Hydroelectric Project
Agency Meeting on 2002 Data Collection
Chugach Electric Association Training Room, Anchorage
May 17, 2002**

SIGN-IN SHEET

Name	Affiliation	Contact Information		
		Address	Phone Number	Email
Ron Rickman	USGS	1209 Orca St Anchorage, AK 99501	786-7131	rickman@usgs.gov
Glenda Landua	ADF&G	514 Funny River Rd, Soldotna, AK 99611	907-260-4882	glandua@borough.kenai.ak.us
Ken Lord	USDOJ –FWS	4230 University Dr, #300 Anchorage 99508	271-4184	Email out of service. Fax: 271-4143
Lance Trasky	ADF&G H&R	333 Raspberry Rd Anchorage, AK 99518	267-2335	lance_trasky@state.ak.us
Ann Rappoport	USFWS	605 W 4 th Rm G-61 Anchorage, AK 99501	271-2787	ann_rappoport@fws.gov
Clayton Hawkes	ADF&G	Box 240020 Douglas, AK 99824	465-4289	clayton_hawkes@fishgame.state.ak.us
Ray Morgan	Matanuska Electric Assn.	Box 2929 Palmer, AK 99645	761-9318	info@matanuska.com and raymorgan@alaska.net
Larry Peltz	NMFS		271-1332	lawrence.peltz@noaa.gov
Margaret Beilharz	USFS	57600 McKenzie Highway McKenzie Bridge, OR 97413	541-822-7238	mbeilharz@fs.fed.us
Joe Klein	ADF&G	333 Raspberry Rd. Anchorage, AK 99518	267-2148	joe_klein@fishgame.state.ak.us
Jeff Breakfield	ADF&G	43961 K Beach Rd #B Soldotna, AK 99669	262-9368	jeff_breakfield@fishgame.state.ak.us
Carl H. Harmon	Chugach Electric Assoc., Inc.	Box 196300 Anchorage, AK 99519-6300	907-762-4739	carl_harmon@chugachelectric.com
Tom Lovas	Chugach Electric Assoc., Inc.	Box 196300 Anchorage, AK 99519-6300	907-762-4770	tom_lovas@chugachelectric.com
Karen Demsey	Long View Associates	3055 NE Everett St, Portland, OR 97232	503-234-9414	kdemsey@compuserve.com

**Relicensing Participants Work Session:
Cooper Lake Hydroelectric Project Relicensing Studies
May 17, 2002**

FISHERIES AND AQUATIC RESOURCES: COOPER CREEK

SUGGESTED TASK ¹	POTENTIAL 2002 EFFORT/NOTES ²
I. Estimating Historical Fish Values	
A. Historical research.	<ul style="list-style-type: none"> • May be other sources of anecdotal information relevant to historical fish resources (local residents; e.g., Ken Lancaster, Dave Watsjold's (USFWS) dad) • Evaluations of project effects should include flows, temperature, substrate, fish habitat, and fish populations
B. Perform paired stream analysis (Juneau, Grant, Ptarmigan).	<ul style="list-style-type: none"> • Instead, could take 2 streams, range of good to poor production/habitat, to identify range of possible historical conditions within which the Cooper Creek fishery could lie. • Evaluation of existing information on other creeks to judge comparability. • Basin wide approach to analysis, using existing information
C. Perform geomorphological/hydraulic modeling.	<p>Proposed reconnaissance-level/baseline data tasks for 2002:</p> <ul style="list-style-type: none"> • Elevation survey of entire stream • Flow/temperature data (Stetson Creek [may be sufficient to gage flow only on Stetson, because monitor downstream of Stetson will capture combined temp of Cooper above, and Stetson], Cooper Creek above Stetson, existing gage near mouth) • Habitat survey • Substrate information
II. Evaluating Current Fish Use	
A. Evaluate adult fish.	<ul style="list-style-type: none"> • Possible extension of weir studies, late April through October to get more complete picture of migration (need to

¹ Includes potential study efforts suggested by Chugach's environmental studies team and by participants at the meeting.

² Reflects input and discussion at the meeting regarding specific data collection that agency representatives suggested be conducted beginning in 2002.

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SUGGESTED TASK ¹	POTENTIAL 2002 EFFORT/NOTES ²
	<p>evaluate feasibility of this)</p> <ul style="list-style-type: none"> • Thermal modeling to evaluate conditions suitable for migration into Cooper Creek, and successful spawning • Info on early season use by rainbow trout
B. Evaluate juvenile fish.	<ul style="list-style-type: none"> • Hankin and Reeves survey to assess rearing in Cooper Creek
III. Prediction of Fish Use/Habitat Under Various Mitigation Scenarios	
A. Perform geomorphological/hydraulic modeling.	<ul style="list-style-type: none"> • USFS stream habitat survey protocol (assess channel morphology; standard approach, can compare to other systems, up to tier 3) • Same 2002 baseline data collection efforts proposed above • Consider measuring intragravel temperature/IGDO • Substrate analysis (embeddedness, permeability); compare to similar creeks and habitats [to evaluate possible limiting factors for future mitigation] --- photography/GIS approach (experimental USGS method); air permeability approach • Evaluation of potential benefit of channel maintenance flows • May need to consider winter sampling for ice cover conditions
B. Perform paired stream analysis.	
IV. Habitat/Water Quality Data Collection	
A. Monitor water temperature and flow in Cooper Creek.	<ul style="list-style-type: none"> • For temperature, SNTEMP is a possible model. • Additional monitoring stations: above Stetson Creek, mouth of Stetson Creek (perhaps flow only)

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SUGGESTED TASK ¹	POTENTIAL 2002 EFFORT/NOTES ²
	<ul style="list-style-type: none"> • Monthly duration curves for stream flows (pre-and post-project); graphical and tabular (5% increments) • Periodicity tables for species that use Cooper Creek • Evaluations of project effects should include flows, temperature, substrate, fish habitat, and fish populations
B. Monitor water temperature and flow in Stetson Creek.	<ul style="list-style-type: none"> • For temperature, SNTMP is a possible model.
C. Measure turbidity, suspended solids, and settleable solids in Cooper and Stetson Creeks.	<ul style="list-style-type: none"> • Evaluate light penetration with increased clearwater flow
D. Collect water chemistry data.	
E. Collect macroinvertebrate baseline data (for comparison to future conditions).	<ul style="list-style-type: none"> • Density of macroinvertebrates • Species • Habitat area available to macroinvertebrates (wetted perimeter under different flow scenarios) • Sample macroinvertebrate populations above and below Stetson Creek • Look at sampling done in other streams in area
F. Collect stream sediment chemistry data (residual mercury from placer mining).	<ul style="list-style-type: none"> • Fish tissue analysis may be an alternative approach • Compare sediment composition with (geologically) similar streams

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FISHERIES AND AQUATIC RESOURCES: COOPER LAKE

TASK	POTENTIAL 2002 EFFORT/NOTES
I. Identification of Aquatic Resources Potentially Affected by Fluctuating Lake Levels	
A. Locate rainbow trout spawning areas.	[Rainbows enter tributary streams around mid-June; a couple of spawning streams have been identified] <ul style="list-style-type: none"> • Visual observations of spawning areas
B. Locate Arctic char spawning areas.	[Can spawn down to 200 ft; two forms of arctic char in lake; spawn in fall when lake level at its highest; incubation occurs during drawdown period (i.e., potential for dewatering of redds)] <ul style="list-style-type: none"> • Basic life history work, to determine implications of drawdown schedule • Start developing more complex study programs • Evaluate existing surveys using netting at different depths to stratify results and estimate where spawning may be occurring • Radio tagging studies to track char to spawning grounds (in conjunction with trapping) • Acoustic surveys to locate spawning grounds
C. Investigate seasonal distribution of fish within shallow lake zones.	<ul style="list-style-type: none"> • Evaluate adequacy of existing shoreline bathymetry
II. Resident Fish Population Studies	
A. Investigate arctic char population estimation.	<ul style="list-style-type: none"> • Mark-recapture studies to determine current population status • Start developing more complex study program
B. Investigate rainbow trout population estimation.	<ul style="list-style-type: none"> • Mark-recapture studies (in conjunction with studies of char population)
C. Consider implications of non-native stocks of rainbow trout in Cooper Lake	

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TASK	POTENTIAL 2002 EFFORT/NOTES
III. Resident Fish Life History Studies	
A. Investigate arctic char life history, growth, food habits, etc.	
B. Investigate rainbow trout life history, growth, food habits, etc.	
C. Track arctic char genetic studies.	
IIIB. Fish Entrainment	<ul style="list-style-type: none"> • Full or partial netting, seasonally (at outfall) to determine size and abundance of fish entrained • Hydroacoustics (results would need to be verified) • Evaluate potential for screening of intake (could be done instead of entrainment studies)
IV. Physical Data Collection	
A. Collect seasonal water temperature profiles in west lake basin.	<ul style="list-style-type: none"> • Thermographs to develop continuous temperature information through summer (NW basin of Cooper Lake; potentially in other basin to evaluate temperature patterns)
B. Perform general limnological studies.	<ul style="list-style-type: none"> • Review existing data (1998/99 ADFG limnology study) to see if additional field studies needed on water quality, biotics • Characterization of current productivity of lake (benthic zone); baseline for comparison to future conditions • Effect on benthic productivity of proposed greater range of lake level fluctuation
C. Investigate alternatives for tapping surface water for flow into Cooper Creek	(Engineering evaluation; to include evaluation of reliability of design [e.g., siphon])

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FISHERIES AND AQUATIC RESOURCES: KENAI LAKE AND RIVER

TASK	POTENTIAL 2002 EFFORT/NOTES
I. Current Fish Use and Habitat Value of Kenai R. between Kenai L. and Cooper Creek	
A. Describe salmon spawning and rearing.	<ul style="list-style-type: none"> • Further review of existing information to determine whether additional information is needed
B. Describe rainbow trout and Dolly Varden feeding and rearing.	
II. Current Fish Use and Habitat Value of Kenai R. between Cooper Creek and Skilak Lake	
A. Describe salmon spawning and rearing.	
B. Describe rainbow trout and Dolly Varden feeding and rearing.	
II. Prediction of Fish Use and Habitat Alteration under Reduced Flow in Kenai River Below Kenai Lake	
A. Perform geomorphological/hydraulic modeling.	<ul style="list-style-type: none"> • Wetted perimeter in upper Kenai R. at different flows (particular in 200-600 cfs range / winter low-flow conditions) • Precipitation/freezing effects on river flows; help define extreme conditions • Clarify effect of project outflows on Kenai Lake outlet/outflow (use existing information) • Reconnaissance evaluation of potential modeling approaches

**Relicensing Participants Work Session:
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TASK	POTENTIAL 2002 EFFORT/NOTES
	<ul style="list-style-type: none"> Put flow data into monthly duration curves (also applies to Cooper Creek)
II.B. Effects at powerhouse outflow	
A. Collect water chemistry data.	<ul style="list-style-type: none"> Collect temperature, DO, conductivity, nitrogen supersaturation, turbidity data
B. Investigate effects on fish.	<ul style="list-style-type: none"> Characterize fish spawning and rearing at outfall from powerhouse Potential for attraction to / injury in draft tubes at powerhouse Attraction to powerhouse outfall; implications for migration of fish in Kenai Lake
III. Effect of Project Releases into Porcupine Creek	
A. Fish use and habitat values of Porcupine Creek.	<ul style="list-style-type: none"> Evaluate fish populations in Porcupine Creek
B. Physical changes resulting from controlled flow additions.	
IV. Streams on Project Access Road	<ul style="list-style-type: none"> Look at fish in these streams and conditions of fish passage structures
V. Streams along power line ROW access roads	<ul style="list-style-type: none"> Effects on fish habitat of use of these access roads (e.g., ATV use)