Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

March 2, 2010

Secretary Kimberly D. Bose — Filed electronically
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Subject: 2009 Environmental Baseline Study Report, Supplemental Information for the Grant Lake/Falls Creek Project (P-13211 and P-13212)

Dear Secretary Bose,

Enclosed please find additional fish and aquatics and water quality baseline environmental information collected to support the Pre-Application Document filed with FERC on August 6, 2009 for the Grant Lake/Falls Creek Project. The report has been posted on the website (www.kenaihydro.com) as well.

Sincerely,

/Brad Zubeck/

Brad Zubeck
KHL Project Engineer

cc: Service Lists for P-13211 and P-13212

Grant Lake/Falls Creek Hydroelectric Project
(FERC P-13211/13212)

Environmental Baseline Studies, 2009

Kenai Hydro, LLC.
3977 Lake Street
Homer, AK 99603

January 2010

Grant Lake/Falls Creek Hydroelectric Project
(FERC P-13211/13212)

Environmental Baseline Studies, 2009

Final Report

Prepared for:
Kenai Hydro, LLC.
3977 Lake Street
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Prepared by:

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2525 C Street, Suite 305
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January 2010

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List of Acronyms

ADF&G	Alaska Department of Fish and Game
ADOT&PF	Alaska Department of Transportation and Public Facilities
AEIDC	Arctic Environmental Information and Data Center (University of Alaska)
AHRS	Alaska Heritage Resources Survey
APA	Alaska Power Authority
ASCI	Alaska Stream Condition Index
AWC	Anadromous Waters Catalog
BLM	Bureau of Land Management
°C	Degrees Celsius
$CaCO_3$	calcium carbonate
cfs	cubic feet per second
cm	centimeter
CPUE	catch per unit effort
°F	Degrees Fahrenheit
DNR	Alaska Department of Natural Resources
DO	dissolved oxygen
EPA	Environmental Protection Agency
EPT	Ephemeroptera/Plecoptera/Trichoptera
FERC	Federal Energy Regulatory Commission
FL	Fork Length
fps	feet per second
ft	feet
G&A	general and administrative
GPS	global positioning system
GWh	gigawatt hours
HBI	Hilsenhoff Biotic Index
HEP	Hydroelectric Evaluation Program
Hg	mercury
IFIM	instream flow incremental methodology
in	inch
KHI	Kenai Hydro Inc.
KHL	Kenai Hydro, LLC
KPB	Kenai Peninsula Borough
kWh	kilowatt hours
LLC	Limited liability company
LWD	large woody debris
m^2	Square meters
$MgCO_3$	magnesium carbonate

mg/L	milligrams per liter
mg/m^3	milligrams per cubic meter
mi	mile
MIF	minimum instream flow
ml	milliliter
mm	millimeter
MSL	Mean sea level
MW	Megawatt
MWh	Megawatt hours
ng/L	nanograms per Liter
NTU	Nephelometric Turbidity Units
NWI	National Wetlands Inventory
O&M	Operations & maintenance
ORP	Oxidation Reduction Potential
P	phosphorous
Pb	lead
PVC	polyvinyl chloride
RM	river miles
RVDs	Recreation visitor days
STD	standard
TDS	total dissolved solids
TL	total length
TSS	total suspended solids
TWG	technical working group
µg/L	microgram per Liter
µm	micrometer
µS/cm	microSiemens per centimeter
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WSE	water surface elevation
YOY	Young of the year

Executive Summary

Kenai Hydro, LLC (KHL) contracted with HDR Alaska, Inc. to conduct environmental baseline studies in 2009 to support a Federal Energy Regulatory Commission (FERC) license application (FERC P-13211/13212) for a proposed hydroelectric project at Grant Lake near Moose Pass, Alaska. This report describes preliminary environmental baseline information collected from 02 June through 31 October 2009. These preliminary studies were intended to aid in the design of formal study plans that will be needed to specifically address requirements of Exhibit E of the FERC license application process. The following water-related study programs are addressed in this document:

- Fish and Aquatic Resources
- Hydrology
- Water Quality

Project History

Hydroelectric potential at Grant Lake has been evaluated several times as a potential power source for the Seward/Kenai Peninsula area. In 1954, R.W. Beck and Associates (cited by APA 1984) prepared a preliminary investigation and concluded that a project at the site had significant potential. The U.S. Geological Survey (USGS) conducted geologic investigations of proposed power sites at Cooper, Grant, Ptarmigan, and Crescent Lakes in the 1950s (Plafker 1955). In 1980, CH2M Hill (cited by APA 1984) prepared a prefeasibility study for a Grant Lake project and concluded that a project developed at the site would be feasible. The Grant Lake Project was referenced in the 1981 U.S. Army Corps of Engineers (USACE) National Hydroelectric Power Resources Study (USACE 1981). The most extensive study was performed by Ebasco Services, Inc. in 1984 for the Alaska Power Authority (now Alaska Energy Authority; APA 1984). The studies included a detailed examination of water use and quality; fish resources; botanical and wildlife resources; historical and archaeological resources; socioeconomic impacts; geological and soil resources; recreational resources; aesthetic resources; and land use (APA 1984). Two of the alternative project configurations evaluated by Ebasco included the diversion of adjacent Falls Creek into Grant Lake to provide additional water for power generation.

During the 1986-87 period a preliminary application document was filed by Kenai Hydro, Inc. (no relation to the current Kenai Hydro, LLC) for a project at Grant Lake. Support for the application included an instream flow study. Because of competing projects and political considerations the project was never pursued beyond the preliminary application phase.

On August 6, 2009, Kenai Hydro, LLC filed a Pre-Application Document (PAD), along with a Notice of Intent to file an application for an original license for the Grant Lake/Falls Creek project (P-13211/13212) under Part I of the Federal Power Act. On September 15, 2009, FERC approved the use of the Traditional Licensing Process for development of the license application and supporting materials. The PAD summarizes existing information and describes the proposed project facilities, which includes a diversion dam at the outlet to Grant

Lake, and a powerhouse along Grant Creek. The proposal includes diverting water from Falls Creek into Grant Lake in the spring, summer, and fall months to provide additional flow and power generation at the Grant Creek powerhouse.

This report provides results of the preliminary environmental baseline data collected from 02 June through 31 October 2009. These preliminary data will provide information useful in the design of formal study plans needed to specifically address requirements of Exhibit E in support of the FERC license application for the Grant Lake/Falls Creek hydroelectric project. Some data requirements for Exhibit E are met by previous studies in support of earlier feasibility and licensing efforts in the 1980s at Grant Lake. The scope of work was focused on filling data gaps and providing current information regarding fish and aquatic resources, stream hydrology, water quality analyses, as well as providing background information needed for the development of an appropriate instream flow study approach.

Study Area

Grant Creek, Grant Lake, and Falls Creek are located near the community of Moose Pass, Alaska (population 206), approximately 25 miles (mi) north of Seward, Alaska (population 3,016), just east of the Seward Highway (State Route 9) which connects Anchorage (population 279,671) to Seward. The Alaska Railroad parallels the Seward Highway and is adjacent to the study area. Cooper Landing, Alaska is located 24 mi to the northwest and is accessible via the Sterling Highway (State Route 1) which connects to the Seward Highway approximately 10 mi northwest of Moose Pass.

Grant Lake is approximately 1.5 mi southeast of Moose Pass. It is located at an elevation of approximately 709 feet (ft) above mean sea level (MSL), with a maximum depth of nearly 300 ft and surface area of 2.6 square miles (APA 1984). Grant Lake's total drainage area is approximately 44 square miles. Tributaries to Grant lake include Inlet Creek at the east end and numerous other short, steep streams, some of which are glacier-fed. Grant Lake is comprised of two basins separated by a natural constriction and island near the midpoint (Figure 2-1). The lake is ringed by mountains of the Kenai Mountain Range to the east, north, and south, with elevations ranging from 4,500 to 5,500 ft.

Grant Lake's only outlet, Grant Creek, runs west approximately 1 mi from the south end of Grant Lake to drain into the Middle Trail River between Upper and Lower Trail Lake. Lower Trail Lake then flows into Kenai Lake which drains into the Kenai River at its west end near Cooper Landing (APA 1984).

Grant Creek has a mean annual flow of 193 cubic feet per second (cfs), and is 5,180 ft long, with an average gradient of 207 ft/mi. Its substrate includes cobble and boulder alluvial deposits and gravel shoals (APA 1984). The stream is 25 ft wide on average. In its upper half, the stream passes through a rocky gorge with three substantial waterfalls and in its lower half, the stream becomes less turbulent as it passes over gravel shoals and diminishing boulder substrate (APA 1984).

Falls Creek is located approximately one mile south of the south end of Grant Lake; it flows into Trail River just downstream of Lower Trail Lake (approximately 1.8 mi downstream of the mouth of Grant Creek. The Falls Creek watershed is 11.9 square miles in area, draining steep terrain between the Grant Lake and Ptarmigan Lake watersheds. It contains no lakes, and has no major tributaries. Estimated mean annual flow of Falls Creek is 38 cfs. Stream flow during the winter is minimal. Falls Creek is 42,240 ft (approximately 8 mi) long, average stream gradient is 418 ft/mi, and stream width averages 15 ft. Falls Creek substrate includes cobble, boulder deposits, a few gravel bars, and a thin layer of fine silt near the mouth. The lower 1 mi of stream has been extensively channelized and modified by placer mining (APA 1984). Three to four acres adjacent to the active channel in the lower 0.5 mi are covered with tailings, and 100 yards of streambed in this area have been relocated (AEIDC 1983).

Fish and Aquatic Resources

The goals of the 2009 fish and aquatic resources study program were to characterize fish use of aquatic habitats in Grant Lake and Grant Creek, describe anadromous fish habitat in Grant Creek, and characterize aspects of stream and lake biology that may be related to overall productivity. Another goal was to determine fish presence and general habitat characteristics of Falls Creek. Work completed in 2009 built upon the data provided by previous studies in this area (AEIDC 1983, USFWS 1961). Specific study objectives are addressed in Section 3.3.2. The fisheries work completed in 2009 will provide preliminary background information necessary for a FERC environmental assessment.

The results of the 2009 fish and aquatic resources study program were generally consistent with the results of other studies conducted in the Grant Creek watershed with respect to species presence and distribution (see Section 3.2, USFWS 1961, AEIDC 1983, APA 1984, Marcuson 1989).

Grant Lake. Previous studies have indicated that Grant Lake supports resident populations of sculpin (Cottidae) and threespine stickleback (Gasterosteus aculeatus); salmon or other salmonid fish such as Dolly Varden have not been caught in Grant Lake or any of its tributaries during environmental assessments (USFWS 1961, AEIDC 1983, APA 1984). The 2009 study program sampled a variety of habitat types and confirmed the results of the past study efforts. The current study, in combination with past study efforts, provides convincing evidence that no salmonid species are present in Grant Lake or its tributaries.

Zooplankton and phytoplankton were collected in Grant Lake in order to estimate the productivity of the lake, with emphasis on the area of the natural outlet and the proposed project intake. The population density at the sample site furthest from the lake outlet was 3.67 organisms per liter while the sample site closest to the lake outlet had densities nearly three times higher at 10.65 organisms per liter. This difference in population density may be relevant to the availability of fish food organisms in Grant Creek. Contrary to the results of the zooplankton sampling, abundance of phytoplankton (as measured by chlorophyll *a* concentration) was greater at the sample site located further away from the lake outlet.

Grant Creek. Grant Creek is a short, high gradient stream that flows about one mile from Grant Lake to Middle Trail River. Fish habitat quality and availability is largely controlled by accessibility and steepness. A series of waterfalls about 500 ft. downstream from the lake outlet blocks access to fish from downstream. The 2009 studies confirmed the results of past studies that have indicated that salmonid fish from the Kenai River drainage are unable to access Grant Creek above the falls. Fish species present within upper Grant Creek (above the falls) are the same as those in Grant Lake, consisting only of sticklebacks and sculpins.

Downstream from the lower falls, Grant Creek flows through a canyon for about 1800 ft. This reach is characterized by cascades with boulder substrate. Fish habitat is limited by the fast water. Small numbers of adult sockeye and Chinook salmon were observed at the lower end of this reach in 2009. Except for the lower few hundred feet, the reach is inaccessible during the open water season due to dangerous conditions. Information is lacking regarding fish numbers and distribution within this upper stream segment.

The segment of stream between the canyon reach and Grant Creek mouth (2600 ft.) is characterized by relatively fast water and dominant riffle type habitats. Substantial numbers of Chinook and sockeye salmon spawn along the stream margin and within limited gravel pockets. The 2009 studies estimated Chinook salmon escapement to Grant Creek at 235 fish and sockeye salmon at 6300 fish. The number of sockeyes present was higher than observed during prior studies. Six coho salmon were observed during the last survey period (late September, 2009). Later surveys were not conducted; therefore, the extent of coho use was not established. The overall distribution of salmon spawning and the locations of high quality spawning areas were delineated within the accessible portion of Grant Creek.

Stream areas with slower water such as backwaters, side channels, and undercut banks provide rearing habitat and refuge for juvenile Chinook and coho salmon, as well as for juvenile Dolly Varden and rainbow trout. While slow water habitats were limited, the density of juvenile salmonids within some of these areas was high. The locations and physical characteristics of these important microhabitat areas were documented for potential input to an instream flow study program.

Main channel pools and fast water areas are occupied by larger rainbow trout and Dolly Varden. Seventy-two adult and subadult rainbow trout were caught during 91 hours of angling effort. Some trout were present in the stream in early summer and more arrived in late summer coincident with the salmon migration. Spawning by rainbow trout is suspected but has not been confirmed. The presence of trout fry in Grant Creek in mid-summer 2009 provided evidence that spawning had likely occurred in the spring.

Macroinvertebrates and periphyton were collected in Grant Creek in order to characterize the baseline condition of the creek relating to productivity and availability of food for resident fish. Population density estimates indicated that macroinvertebrates were more abundant at the creek outlet than at middle reach locations. Periphyton growth as measured by chlorophyll *a* concentrations was also significantly higher at the creek mouth.

Falls Creek. Falls Creek is a high gradient stream characterized by riffle habitats, a small amount of undercut bank, and a moderate amount of large woody debris. Foot surveys on Falls Creek from the Seward Highway Bridge to the mouth of the creek found no adult anadromous fish in July and August. Due to the high turbidity of Falls Creek, there was a possibility that fish were missed. A larger portion of Falls Creek was sampled with minnow traps from 21 to 22 July 2009. A total of 24 fish were captured, all of which were juvenile Dolly Varden.

Water Resources

The primary goal of the 2009 water quality and hydrology study programs was to begin to characterize the water quality, temperature, and hydrology of Grant Creek, Falls Creek, and Grant Lake in support of the Instream Flow Study to begin in 2010 and the FERC licensing process.

Grant Lake, Grant Creek, and Falls Creek have been studied in the past for hydroelectric feasibility. Previous hydrologic investigations in the project area include:

- Historical Grant Creek stream gage data (USGS 15246000) – 11 years of continuous stream gage data from 1947-1958.
- Grant Lake Hydroelectric Project Detailed Feasibility Analysis, EBASCO, 1987, includes modeled Falls Creek data.
- Historical Falls Creek discharge data limited to several instantaneous discharge measurements made over various years including 1963-70, 1976, and 2007- 2008.

Grant Lake water quality and temperature data were collected between June 10th and October 6th; the 2009 hydrology and stream temperature data were collected between June 9th and October 12th.

Hydrology. Stream gages were installed on Grant Creek and Falls Creek. Continuous stage data was recorded from early June through mid-October 2009. The trends reflected in 2009 were consistent with the mean monthly flow distribution from the USGS data (period of record 1947-1958).

Water Quality. Instantaneous water temperature readings associated with water sampling events at Grant Lake were consistent with seasonal changes. At the outlet of Grant Lake water temperature did not vary widely by depth during the month of June.

The surface temperature at the Grant Lake thermistor string during June was approximately 6 degrees colder than during August. During June the temperature profile showed nearly uniform temperature throughout the depth range except in the immediate vicinity of the surface. During August the temperature was higher at the surface than throughout the rest of the depth profile. However, temperature began to decrease near a depth of 9 m, possibly suggesting thermal stratification. By the end of September the water column was approximately 9°C from the surface to a depth of 14m, where the temperature decreased to closer to 7°C at 19.5 m depth, suggesting a break down in thermal stratification and fall turnover. There appears to be some thermocline formation from late July through early September with the top six meters having relatively uniform temperature.

The stream temperature trends of Grant Creek reflect seasonal air temperature changes and were very similar to temperatures found in the upper 3 meters of Grant Lake.

The conductivity values measured in Grant Creek and Grant Lake during the 2009 sampling season are consistent with the historical data from the 1960s and 1980s (Table 4.2; Appendix E).

Measurements of concentrations of dissolved oxygen (DO) in Grant Creek ranged from 7.31 to 7.34 mg/L in June and from 8.22 to 8.40 mg/L in August. Falls Creek measured DO values were 7.96 and 10.65 mg/L in June and August, respectively. DO measurements in Grant Lake were relatively uniform throughout the entire depth profile during both sampling events. DO values measured in Grant Lake in June 2009 ranged from 7.20 to 7.96 mg/L, while August values were much lower - 5.57 to 6.05 mg/L. These data are lower than what would normally be expected in freshwater systems. This was most likely the result of instrument malfunction in the field, and additional data collection will be needed to verify DO levels.

Grant Creek turbidity readings in 2009 ranged from 10.1 to 11.9 NTU, which are higher than historical turbidity results collected in the 1980's (0.35 to 1.1 NTU). Falls Creek historical readings ranged from 0.37 to 6.0 NTU, while 2009 readings were 8.17 to 17.00 NTU.

Laboratory tests in 2009 indicated that the following analytes were either absent or present at extremely low levels: mercury, lead, nitrates,/nitrites, orthophosphates, and phosphorous. The lack of, or minimal amounts of, nutrients in the samples indicate that the system may be nutrient-limited and possibly oligotrophic.

1 Project History and Overview

Kenai Hydro, LLC (KHL) contracted with HDR Alaska, Inc. to conduct environmental baseline studies in 2009 to support a Federal Energy Regulatory Commission (FERC) license application for a proposed hydroelectric project at Grant Lake (FERC P-13211/13212) near Moose Pass, Alaska. Results for the following studies provided in this report include:

1. Fish Resources and Aquatic Resources
2. Hydrology
3. Water Quality

This report provides a description of study results with the intent of enhancing project planning and providing a basis for discussion of project effects.

1.1 Project History

Hydroelectric potential at Grant Lake has been evaluated several times as a potential power source for the Seward/Kenai Peninsula area. In 1954, R.W. Beck and Associates (cited by APA 1984) prepared a preliminary investigation and concluded that a project at the site had significant potential. The U.S. Geological Survey (USGS) conducted geologic investigations of proposed power sites at Cooper, Grant, Ptarmigan, and Crescent Lakes in the 1950s (Plafker 1955). In 1980, CH2M Hill (cited by APA 1984) prepared a prefeasibility study for a Grant Lake project and concluded that a project developed at the site would be feasible. The Grant Lake Project was referenced in the 1981 U.S. Army Corps of Engineers (USACE) National Hydroelectric Power Resources Study (USACE 1981). The most extensive study was performed by Ebasco Services, Inc. in 1984 for the Alaska Power Authority (now Alaska Energy Authority; APA 1984). The studies included a detailed examination of water use and quality; fish resources; botanical and wildlife resources; historical and archaeological resources; socioeconomic impacts; geological and soil resources; recreational resources; aesthetic resources; and land use (APA 1984). Two of the alternatives evaluated by Ebasco included the diversion of adjacent Falls Creek into Grant Lake to provide additional water for power generation.

During the 1986-87 periods a preliminary application document was filed by Kenai Hydro, Inc. (no relation to the current Kenai Hydro, LLC) for a project at Grant Lake. Support for the application included an instream flow study that examined potential impact to fish resources from altered flow regimes. Minimum instream flows were negotiated with the regulatory agencies. Because of competing projects and political considerations the project was never pursued beyond the preliminary application phase.

On 06 August 2009, Kenai Hydro, LLC filed a Pre-Application Document (PAD), along with a Notice of Intent to file an application for an original license for the Grant Lake/Falls Creek project (P-13211/13212) under Part I of the Federal Power Act. On 15 September 2009, FERC approved the use of the Traditional Licensing Process for development of the license application and supporting materials. The PAD summarizes existing information and describes the proposed project facilities, which includes a diversion dam at the outlet to Grant Lake, and a powerhouse along Grant Creek. The proposal includes diverting water from Falls Creek into Grant Lake in the spring, summer, and fall months to provide additional flows and power generation at the Grant Creek powerhouse.

1.2 Project Overview

This report provides results of the preliminary environmental baseline data collected from 02 June through 31 October 2009. These preliminary data will provide information useful in the design of formal study plans needed to specifically address requirement of Exhibit E of the FERC license application process for the development of small-scale hydroelectric energy generation at Grant Creek. Some data requirements for Exhibit E are met by previous studies in support of earlier feasibility and licensing efforts in the 1980s at Grant Lake. The scope of work was focused on filling data gaps and providing current information regarding fish and aquatic resources, stream hydrology, water quality analyses, and on providing background information needed for the development of an appropriate instream flow study approach.

2 Study Area

Grant Creek, Grant Lake, and Falls Creek are located near the community of Moose Pass, Alaska (population 206), approximately 25 miles (mi) north of Seward, Alaska (population 3,016), just east of the Seward Highway (State Route 9) which connects Anchorage (population 279,671) to Seward. The Alaska Railroad parallels the Seward Highway and is adjacent to the study area. Cooper Landing, Alaska is located 24 mi to the northwest and is accessible via the Sterling Highway (State Route 1) which connects to the Seward Highway approximately 10 mi northwest of Moose Pass.

Grant Lake is approximately 1.5 mi southeast of Moose Pass. It is located at an elevation of approximately 709 feet (ft) above mean sea level (MSL), with a maximum depth of nearly 300 ft and surface area of 2.6 mi (APA 1984). Grant Lake's total drainage area is approximately 44 mi. Tributaries include Inlet Creek at the headwaters and other glacial-fed streams in the watershed. Grant Lake consists of front and back basins, which are separated by a natural constriction and island near the midpoint (Figure 2-1). The lake is ringed by mountains of the Kenai Mountain Range to the east, north, and south, with elevations ranging from 4,500 to 5,500 ft.

Grant Lake's only outlet, Grant Creek, runs west approximately 1 mi from the south end of Grant Lake to drain into Middle Trail River between Upper and Lower Trail Lake. Trail River drains Lower Trail Lake, and then flows into Kenai Lake. Kenai Lake drains to the Kenai River at its west end near Cooper Landing (APA 1984).

Grant Creek has a mean annual flow of 193 cubic feet per second (cfs), and is 5,180 ft long, with an average gradient of 207 ft/mi. Its substrate includes cobbles and boulder alluvial deposits and gravel shoals (APA 1984). The stream is 25 ft wide on average. In its upper half, the stream passes through a rocky gorge with three substantial waterfalls and in its lower half, the stream becomes less turbulent as it passes over gravel shoals and diminishing boulder substrate (APA 1984).

Falls Creek is located approximately one mile south of the south end of Grant Lake; it flows into Trail River just downstream of Lower Trail Lake (approximately 1.8 mi downstream of the mouth of Grant Creek), see Figure 2-1 (Photographs of the study area are provided in Appendix B.). The Falls Creek watershed drains steep terrain between the Grant Lake and Ptarmigan Lake watersheds, is 11.9 mi^2 in area, contains no lakes, and has no major tributaries. Estimated mean annual flow of Falls Creek is 38 cfs. Stream flow during the winter is minimal. Falls Creek is 42,240 ft (approximately 8 mi) long, average stream gradient is 418 ft/mi, and stream width averages 15 ft. Falls Creek substrate includes cobble, boulder deposits, a few gravel bars, and a thin layer of fine silt near the mouth. The lower 1 mi of stream has been extensively channelized and modified by placer mining (APA 1984). Three to four acres adjacent to the active channel in the lower 0.5 mi are covered with tailings, and 100 yards of streambed in this area have been relocated (AEIDC 1983).

3 Fish & Aquatic Resources

3.1 Introduction

Grant Lake and Grant Creek support different assemblages of fish species and possess varying quality and quantity of fish habitat. Only non-anadromous fish have been found in Grant Lake (AEIDC 1983, USFWS 1961, Johnson and Klein 2009), whereas anadromous fish are present in Grant Creek. The following sections describe the 2009 aquatic and water resources baseline study results for fish and aquatic resources associated with the Grant Lake Hydroelectric Project.

Because of its geographic isolation, Grant Lake supports only resident populations of sculpin (Cottidae) and threespine stickleback (*Gasterosteus aculeatus*). Salmon were not observed in Grant Lake or any of its tributaries during environmental assessments (USFWS 1961; AEIDC 1983; APA 1984); and are not included in the Anadromous Waters Catalog (AWC) published by Alaska Department of Fish and Game (ADF&G; Johnson and Klein 2009). Whereas, most of Grant Creek is accessible to anadromous fish from the Kenai River drainage and is included in the AWC due to the presence of spawning Chinook (*Oncorhynchus tshawytscha*), sockeye (*O. nerka*), and coho (*O. kisutch*) salmon and rearing coho salmon (Johnson and Klein 2009).

Other components of the aquatic ecosystem, such as macroinvertebrates and periphyton, often serve as indicators of system productivity or health. Macroinvertebrates and periphyton in Grant Creek are essential as food sources for fish. As the primary food source for juvenile salmonids, macroinvertebrates are potentially a limiting factor in the number of juveniles that survive and remain in Grant Creek. Some fish and many macroinvertebrates depend on periphyton as their primary food source. Changes in water quality can quickly affect periphyton and macroinvertebrate assemblages.

Similarly, zooplankton and phytoplankton in Grant Lake are a primary food source of resident fish populations in Grant Lake. These organisms are also likely washed into Grant Creek through the natural outlet of Grant Lake and may become a food source for juvenile salmonids in the creek. Changes in the water quality in the lake or the flow through the natural outlet may affect zooplankton and phytoplankton availability as a food source.

3.2 Previous Studies

Previous FERC licensing efforts in the 1960s and 1980s for a proposed hydroelectric project at Grant Lake included studies of fish resources in Grant Lake, Grant Creek, and Falls Creek. The Arctic Environmental Information and Data Center (AEIDC 1983) conducted fish sampling from 1981 to 1982 as part of comprehensive environmental baseline study effort and USFWS (1961) conducted limited sampling from 1959 to 1960.

3.2.1 Grant Creek Fish Resources

Both anadromous and resident fish are present in Grant Creek, including salmon, trout and other fish. Spawning Chinook, sockeye, and coho salmon, as well as rainbow trout (*Oncorhynchus mykiss*) and Dolly Varden (*Salvelinus malma*) are found in the lower reaches of Grant Creek (APA 1984, Johnson and Klein 2009). Rearing Chinook, coho and rainbow trout are also present (APA 1984, Johnson and Klein 2009). Round whitefish (*Prosopium cylindraceum*) and Arctic grayling (*Thymallus arcticus*) were caught during angling surveys (APA 1984).

The upper portion of Grant Creek is impassable to salmon 0.5 mi (APA 1984) to 1 mi (Johnson and Klein 2009) upstream of the mouth. The most favorable fish habitat is likely concentrated within the lower portion of stream. Habitat for juvenile fish exists mainly in stream margins, eddies, deep pools and side channels offering reduced velocities (APA 1984). Substrate material is coarse throughout the entire length of the creek due to high water velocity, which tends to wash away smaller gravels (APA 1984). Isolated areas of suitable spawning gravels occur in the lower half of the stream (APA 1984).

Periodic minnow trapping on Grant Creek from July 1959 through January 1961 captured Chinook salmon, coho salmon, Dolly Varden and sculpin (extent of sampling area unknown; USFWS 1961). Minnow trapping and electrofishing in lower reaches of Grant Creek for week-long periods in October 1981 and March, May, June, and August 1982 yielded higher catches of trout, salmon, and Dolly Varden in the fall and summer than in winter and spring (AEIDC 1983). Catches of Dolly Varden were generally the most abundant fish in minnow traps, followed by juvenile Chinook, juvenile rainbow trout, and juvenile coho. Juvenile Chinook were the most commonly caught fish during electrofishing surveys (APA 1984).

APA (1984) estimated that Grant Creek supported 250 Chinook spawners and 1,650 sockeye spawners. These estimates were likely biased low due to the limitations of visual counting methods. The stream was also estimated to support 209 8-inch or larger “trout” (including Dolly Varden and rainbow trout; APA 1984). Spawning coho were not surveyed (APA 1984), but have been recorded as being present at unknown levels in the stream by the AWC (Johnson and Klein 2009). Maximum counts from intermittent stream surveys by ADF&G were 76 Chinook (1963) and 324 (1952) sockeye salmon.[1]

3.2.2 Grant Creek Instream Flow

A limited instream flow study was conducted on Grant Creek in the 1980s by Kenai Hydro, Inc. (KHI; unrelated to Kenai Hydro, LLC). The study related documents include reports and written communications between KHI and State and Federal agencies in 1986 and 1987 relative to a FERC license application for the proposed Grant Lake Hydroelectric Project (FERC No. 7633-002). The documents include draft and final reports of a limited instream flow incremental methodology (IFIM) investigation and negotiated minimum instream flows (MIF) and ramping rates (Envirosphere 1987, KHI 1987a, KHI 1987b). A technical memorandum detailing the results of the previous instream flow study efforts is provided in Appendix A.

[1]Anadromous Waters Catalog Stream Nomination #08-153, http://www.sf.adfg.state.ak.us/SARR/FishDistrib/Nomination/FDDNomHome.cfm

3.2.3 Grant Creek and Falls Creek Macroinvertebrates and Grant Creek Periphyton

A number of previous macroinvertebrate and periphyton studies have taken place in and near the project area.

Surber sampling conducted in Grant Creek and Falls Creek in 1981 and 1982 indicated that benthic macroinvertebrate diversity was low, as is typical of cold, glacial fed streams (APA 1984). The most abundant taxa in Grant Creek were midge species (Chironomidae), followed by mayflies (Ephemeroptera), stoneflies (Plecoptera), and clams. No seasonal variation in macroinvertebrate abundance was observed in Grant Creek. The dominant taxa in Falls Creek were midges and mayflies, although stoneflies, caddisflies, and other species of true flies (Diptera) were present. Densities of all insect taxa, other than mayflies, were low. In Falls Creek, macroinvertebrates were typically most abundant in late summer.

Investigations conducted in 1982 showed that the periphyton community in Grant Creek was dominated by diatoms (APA 1984). Diatoms were most abundant in spring. APA (1984) concluded that input of leaves and other organic matter from along side the stream (allochthonous contribution), along with input of phytoplankton and zooplankton from Grant Lake, was likely more important than periphyton as the basis of productivity in Grant Creek.

3.2.4 Falls Creek Fish Resources

Falls Creek is classified as anadromous in its lower 2,300 ft for the presence of Chinook salmon (Johnson and Klein 2009). Juvenile Chinook salmon and Dolly Varden have been found in its lower section. A series of waterfalls prevents fish passage above the lower 2,300 ft of the stream (USFWS 1961, AEIDC 1982, Johnson and Klein 2009, HDR 2009).

USFWS sampled Falls Creek in 1961 by setting minnow traps in the lower 1 mi of the creek. The results of that sampling effort found juvenile Chinook salmon to be present in the lower 600 ft of the creek. Additional investigations by USFWS in 1959 and 1960 indicated that no adult salmon use the creek and that cold water temperatures may limit its production potential (AIEDC 1983).

Falls Creek was also previously studied by AEIDC (1983). The results of this study determined the lower 1 mi of Falls Creeks to contain limited suitable salmon spawning habitat. Dolly Varden were found below an active mining area located immediately to the east of the rail road bridge in the lower 600 ft of the creek. Six minnow traps were set for a total of 108 hours of trapping effort, and captured 21 Dolly Varden ranging from 45 to 98 mm in length.

In 2008, the ADF&G (Johnson and Klein 2009) placed minnow traps in the lower area of Falls Creek below the rail road and highway bridges and found juvenile Chinook to be present.

3.2.5 Grant Lake Fish Resources

Sampling during 1981-1982 by the Arctic Environmental Information and Data Center (AEIDC) found no fish in any of the tributaries of Grant Lake (AEIDC 1983). Sculpin and threespine stickleback were the only fish found to inhabit Grant Lake. A series of impassable falls[2] near Grant Lake's outlet prevents colonization of the lake by salmonids via Grant Creek (APA 1984). Grant Lake supports a "small" population of slimy sculpin (*Cottus cognatus*) and a "dense" population of threespine stickleback (USFWS 1961). Density of threespine stickleback was ten times higher in the lower basin than the upper basin of Grant Lake (AEIDC 1983).

3.2.6 Grant Lake Zooplankton and Phytoplankton

Zooplankton and phytoplankton samples were collected in Grant Lake in 1981-82 by the ADF&G and the U.S. Forest Service (USFS). Results of those studies indicated that the zooplankton community in Grant Lake was dominated by rotifers and copepods (APA 1984). Non-rotifer zooplankton abundance was highest in August, likely following peak abundance of the phytoplankton upon which they feed. Phytoplankton collection in 1982 showed that the dominant taxa were diatoms with the greatest phytoplankton abundance occurring in August (APA 1984).

In 1983, four limnology sites were established in the upper and lower Grant Lake basins. Water quality and zooplankton samples were collected in eight sampling events during open water seasons from June 1983 - September 1985 (Marcuson 1989). Zooplankton and phytoplankton samples were identified to the lowest practicable taxa in 1981 - 1983 (AEIDC 1983, Marcuson 1989).

3.3 Study Goals and Objectives

3.3.1 Study Goals

The goals of 2009 fish and aquatic resources study program were to characterize fish use of aquatic habitats in Grant Lake and Grant Creek, with an emphasis on anadromous fish habitat and to characterize other components of the aquatic ecosystem that relate to overall productivity and/or system health. Another goal was to determine fish presence and general habitat characteristics of Falls Creek. Work completed in 2009 was designed to compliment but not necessarily duplicate work completed earlier (AEIDC 1983, USFWS 1961; see Section 3.2). Specific study objectives are addressed below. The fisheries work completed in 2009 will provide preliminary background information necessary for input to the design of a more detailed study program required as part of the formal FERC licensing process.

3.3.2 Study Objectives

Objectives of 2009 field efforts were to:

[2] 2007 ADFG Stream survey referenced in Anadromous Waters Catalog Stream Nomination #08-153, http://www.sf.adfg.state.ak.us/SARR/FishDistrib/Nomination/FDDNomHome.cfm

1. Characterize resident and rearing fish use of Grant Creek, specifically:
   a) Determine the relative abundance and distribution of juvenile fish in Grant Creek.
   b) Determine relative abundance and distribution of Dolly Varden and rainbow trout present in Grant Creek.
   c) Characterize fish use of microhabitats.
2. Describe the use of Grant Creek by adult migratory fish.
   a) Estimate the abundance and run timing of spawning salmon.
   b) Estimate the abundance and run timing of spawning adult resident fish.
   c) Delineate spawning habitat locations and characteristics.
3. Determine fish presence and distribution in Grant Lake.
4. Develop a Technical Working Group and determine instream flow study methods.
5. Determine fish presence and general distribution in Falls Creek.
6. Collect baseline information on the zooplankton and phytoplankton populations in Grant Lake near the natural outlet to the lake and near the proposed intake.
7. Collect baseline information on the macroinvertebrate and periphyton populations in Grant Creek.
8. Assess chlorophyll *a* concentrations in periphyton and phytoplankton samples as an indicator of primary productivity in Grant Lake and Grant Creek.

3.4 Field Sampling Methods

Multiple sampling methods were used to characterize and enumerate fish presence on Grant Creek, Falls Creek, and Grant Lake. Angling was employed to estimate relative abundance of adult resident fish in Grant Creek. Minnow trapping was used to estimate relative abundance of rearing anadromous and resident freshwater fish in Grant Creek, Falls Creek, and Grant Lake. Electrofishing was used in areas around minnow traps to verify catch results. Gill netting was employed in Grant Lake to document the species in the lake outside of the littoral zone. Foot surveys were employed on Grant Creek and Falls Creek to estimate the escapement of adult anadromous fish.

3.4.1 Establishment of Study reaches on Grant Creek

AEIDC conducted field work in Grant Creek in the early 1980s (AEIDC 1983) and divided the lower half of Grant Creek into four uniform study reaches, each 0.125 mi long. They divided the upper 0.5 mi of Grant Creek into two reaches based on land topography (AEIDC 1983). In June 2009, a total of six study reaches were established on Grant Creek to correspond with historical study reaches. Study reach breaks were marked in the field using surveyor stakes and a handheld global positioning system (Figure 3.4.1-1, see Appendix B for photographs of the study area). Study reach breaks were plotted on an aerial photograph and visually compared to the study reach map established in previous studies, small adjustments were then made to the reach break boundaries as needed to ensure that the historical study reaches were recreated to the best extent possible.

3.4.2 Grant Creek Fish Resources

Rearing Fish Study reaches 1 through 6 were sampled using ¼ in mesh baited minnow traps. Traps were baited with cured salmon eggs. Minnow trapping was conducted on a monthly basis June through September (Figure 3.4.1-1). Study reach 6 was sampled opportunistically in concurrence with two sampling events at Grant Lake in June and August. Minnow traps were set for approximately 24 hours.

All minnow trap sites were marked with a GPS and flagged for future identification (Figure 3.4.1-1). Reach 1 had 10 minnow trapping sites, reach 2 had 10 minnow trapping sites, Reach 3 had 13 minnow trapping sites, Reach 4 had nine minnow trapping sites, Reach 5 had three minnow trapping sites, and Reach 6 had five minnow trapping sites. (Due to the impassible terrain and high water flows in Reach 5 trap sites were limited.) Fish captured were identified to the species level and released near the point of capture. Sculpin were identified to the genus level. A target sample of fish were measured for length to the nearest millimeter (n=20 per sampling event for salmonids and n=10 per sampling event for threespine stickleback); salmonids were measured to fork length (FL) or the tip of snout to the fork in their tail and other fish were sampled for total length (TL) or the tip of snout to the end of their tail.

A subsample of the minnow trapping sites (n=2) were electrofished in order to identify and enumerate fish that may not be readily captured in minnow traps, such as sockeye salmon. Electrofishing, using a Smith-Root Model LR24 backpack electrofisher occurred at two sites per reach, with the exception of Reach 5, which was not electrofished due to high velocity flows and deep water conditions. Electrofishing occurred after the minnow traps were removed from the stream in order to not interfere with trap catch. Fish captured in the minnow traps were retained during the electrofishing effort, so as not to recapture them. Each site was electrofished for approximately one minute. High flows and turbid water conditions in Grant Creek during August made electrofishing impractical. Effort was made to electrofish different sampling sites in each reach during multiple sampling events.

Adult Resident Fish Angling surveys were used to characterize the use of Grant Creek by adult and subadult rainbow trout and Dolly Varden. Four angling stations were established within each study reach, with the exception of Reach 5, which contained two angling stations (Figure 3.4.1-1). Angling did not occur in Reach 6 because of a known fish migration barrier (see Section 3.2.2) and previous study results documenting the absence of adult salmonids in Grant Lake (USFWS 1961, AEIDC 1983, and APA 1984). Study reaches 1 through 4 contained the same number of angling stations (n=4) per river mile (RM) so that the level of effort between reaches could be as uniform as possible. Since only the lower 300 m of Reach 5 were accessible, only two angling stations were contained in Reach 5. Each angling station was fished for 30 minutes using rod and reel methods in accordance with ADF&G Sport Fishing Regulations and Fish Resources Permit SF2009-130. Sampling events occurred approximately every 10 days, except during the last week of July when sampling was not conducted due to flood stage water levels. Lures included spinners, flies, and beads. Bait (e.g. preserved salmon eggs) was used during one sampling event in August then discontinued to ensure that the results of all sampling events were comparable. Captured fish were observed for previous markings. If no previous marks were present, then ¼ in of the upper lobe of the caudal fin was clipped for future identification. If the caudal fin was already marked the fish was noted as a recaptured fish on the field datasheet. All fish caught were identified to the species level, measured, and released near the point of capture. Notes were made as to the spawning condition and sex of the fish.

Catch per unit effort (CPUE) for the resident and rearing fish study was calculated by dividing the total number of fish captured within each study reach by the total amount of sampling effort in each study reach. For the purposes of this study CPUE is defined as fish per hour of sampling effort (angling hour or minnow trap hour) and is used as a measure of relative abundance.

Adult Salmon Foot surveys were conducted every 10 days June through September to estimate the abundance and determine the distribution of spawning anadromous fish in Grant Creek and Falls Creek. One sampling event was missed in late July due to high water. A two person crew started at the mouth of the creek, with one person on each bank. Each person surveyed upstream, counting fish within the nearest one-half of the creek (i.e. mid-stream inward to the streambank). The number of live fish were counted and tallied by species for each survey. Number and location of active redds, areas of concentrated spawning activity, and the numbers of carcasses were also recorded. Due to the high turbidity in the creek (which ranged from 0.66 to 9.38 Nephelometric Turbidity Units; [NTUs]), adult fish may have been missed.

An estimate of total escapement for Chinook and sockeye salmon was calculated based on live fish counts using the area-under-the-curve (AUC) method described by Bue et al. (1998). This method uses a trapezoidal approximation to estimate the number of live fish present in the stream for the days not surveyed. This method has been in use for more than 25 years (Neilson and Geen 1981, English et al. 1992, Bue et al. 1998, Hilborn et al 1999).

The AUC method relies on three critical types of data consisting of live fish counts, an estimate of survey life and an estimate of observer efficiency (Hilborn et al. 1999). Live fish counts are number of fish counted during each foot survey. Survey life is the average number of days a fish was alive in the survey area and observer efficiency represents the proportion of the true number of fish that are present and actually counted by the surveyor.

Survey life can vary between species and within each season. Survey life estimates for sockeye salmon for example, range from 7 to 26.5 days (Shardlow 2004). Survey life for Chinook and sockeye salmon in Grant Creek is not known. An estimate of 14 days for Chinook and 9 days for sockeye salmon was used in the calculations based on observer experience and knowledge of the system.

Observer efficiency can vary spatially, temporally, and between surveyors depending upon factors that affect the surveyor's ability to view an individual fish, such as stream width, depth and water clarity. Observer efficiency values have been obtained through the use of weir counts where the total number of fish in the stream is known and then compared to foot survey counts (Fried et al. 1998). Since there was not a weir on Grant

Creek in 2009 nor have there been previous efforts on Grant Creek to determine observer efficiency, subjective estimates of observer efficiency consisting of 0.30 for Chinook and 0.50 for sockeye were used based on observer estimates. A lower observer efficiency value was used for Chinook because of more turbid water conditions in Grant Creek during the time adult Chinook salmon were present.

The escapement estimate for Grant Creek was calculated by dividing the area-under-the-curve (e.g. fish days) by survey life and then multiplying by an observer efficiency correction factor to adjust for the proportion of fish actually observed. Naturally, if the observer only sees a portion of the fish present, then the estimate will be biased low and the adjustment for observer efficiency corrects this bias. The overall formula is as follows:

$E = (AUC/s)\ v$

where E is escapement, AUC is area under the curve, s is stream life, and v is observer efficiency

3.4.3 Grant Creek Instream Flow and Microhabitat Preference Study

The purpose of the Grant Creek instream flow study is to determine the potential effects on physical habitat and water temperature in Grant Creek of a range of flow regimes that could result from hydropower development proposed by KHL. The primary goal of the 2009 instream flow study program was to establish a technical working group (TWG) consisting of state and federal resource agency staff, project staff and interested members of the local community. Once established, the TWG met five times during the 2009 study season to review the results of the 2009 aquatic baseline study efforts, discuss alternative methodologies, and determine the need for additional information to support the primary instream flow study effort to occur in 2010.

One outcome of the Instream Flow TWG meetings held in early in 2009 was the identification of a need for site-specific information regarding key habitats and identification of critical suitability factors influencing the use of those habitats that might be altered by project effects. The intent was to use this information to develop a methodology for instream flow analysis that would be tailored to the conditions existing within Grant Creek. Consequently, a study was initiated to address these questions.

Selection of Study Sites Study sites were selected based on the variety of habitats available that were suitable for sampling. Portions of some habitat units were not included in the 2009 surveys due to safety concerns created by swift water conditions. Study site selection also targeted sites that were expected to contain high densities of fish, such as backwater areas; along stream margins; side channels; and portions of the stream associated with large woody debris (LWD). In an effort to include a subset of habitats available in Grant Creek, areas not expected to contain high numbers of rearing fish, such as fast water in the middle of the stream channel was also sampled, where safety conditions allowed. A total of 16 sample sites were established: 11 sites in the main channel and five sites in other channels. The 11 sites in the main channel included five riffles, one backwater pool, one backwater slough, two scour pools, one cascade, and an overflow channel. The other channel sites included two sites in a distributary channel

(Reach 1); two sites in a secondary channel (Reach 3); and one site in a tertiary channel (Reach 3) (Figures 3.4.3-1, 3.4.3-2, 3.4.3-3, 3.4.3-4, and 3.4.3-5).

Description of Micro-habitat Areas Aquatic habitat was described at each sample site by recording macro-, meso-, and micro- habitat characteristics. At the macro-habitat level, the location of the sample site was noted, and described as either fastwater or pool. These broad categories were then broken down into the meso-habitat level, such as glide, riffle, cascade, backwater, scour, or slough (USFS 2001).

Meso-habitats were further broken down into micro-habitats. Micro-habitat sample areas were described and classified based on several criteria including:

1. Location relative to the main channel
2. Depth and flow regime
3. Presence of cover
4. Type of instream cover when present

Fish Use of Micro-habitat Sample Areas Snorkeling was the primary method to document fish presence. Electrofishing was used primarily to confirm species identification and calibrate fish length estimates.

Fish presence was recorded in each discrete microhabitat sample area. This approach was used with the intent to correlate fish presence with the microhabitat characteristics present at location.

Fish were identified to the species level and their fork lengths were estimated (i.e. 20 mm size bins). Dominant and subdominant types of substrate and cover were recorded in the vicinity of each fish observation. The micro-habitat within the sample site was also identified. Depth and velocity measurements were taken at a subset of fish observation locations during snorkeling and also throughout the sample site where fish were not observed nor collected during electrofishing. Qualitative judgments were made regarding which factors were most influential in determining fish use and habitat suitability.

3.4.4 Grant Creek Macroinvertebrates and Periphyton

Macroinvertebrate and periphyton samples were collected once during the 2009 field season, on 06 August. The sampling event was combined with water quality sampling in Grant Lake, Grant Creek, and Falls Creek as well as with zooplankton and phytoplankton sampling in Grant Lake. The event took three days, with one complete day spent collecting macroinvertebrate and periphyton samples in Grant Creek.

Samples were collected at two locations within Grant Creek, GC100 and GC300 (Figure 3.4.4-1). Sampling site selection was based on preliminary project design and natural characteristics of the creek. GC100 is located immediately upstream of the natural split in the creek near the outlet into Middle Trail River. GC300 is located near the proposed powerhouse discharge into Grant Creek.

Macroinvertebrates Benthic macroinvertebrate samples were collected at two sites in Grant Creek; GC100 and GC300. Two sampling methods, the Alaska Stream Condition Index (ASCI) method (Major and Barbour 2001) and the Surber sampler (Eaton et al.

1995), were used to collect macroinvertebrates. The ASCI sampling method was used to begin developing baseline descriptions of macroinvertebrate populations in a range of habitats within the sampling reach. The ASCI method uses a D-frame kick net to sample representative habitats in a 100 meter sampling reach. Twenty subsamples are collected proportionately throughout these habitats. All organisms collected were composited into one sample per site and preserved in 70% isopropyl alcohol. Habitat information, such as riparian vegetation and stream substrate types, was also collected.

In addition to the habitat associated ASCI samples, five samples (pseudo-replicates) of macroinvertebrate populations residing specifically in riffle/cobble areas were collected using a Surber sampler. Surber sampling techniques were used to estimate population densities in riffle/cobble habitat. Each sample was bottled and preserved separately.

All macroinvertebrate samples were returned to the HDR laboratory for sorting and identification. ASCI samples were subsampled until a target of 300 (+/- 10%) organisms were counted. All organisms were sorted from each Surber sample. Identification was completed to genus or the lowest practicable taxon.

Periphyton Periphyton samples were collected at sites GC100 and GC300, concurrent with macroinvertebrate sampling (Figure 3.4.4-1). Periphyton were sampled by removing material from 10 cobbles selected from a riffle/cobble area that had not been disturbed (Eaton et al. 1995). Material was scrubbed from a five centimeter square area on each cobble and rinsed onto a 45-micrometer (μm) glass fiber filter attached to a hand vacuum pump. Water was extracted from the sample and 1-milliliter (ml) saturated magnesium carbonate ($MgCO_3$) solution added to the filter as a preservative. The dry filter was wrapped in a larger filter (to absorb any residual water) and placed in a labeled zipper seal bag with silica gel desiccant. Filters were frozen in a lightproof container for shipment to the laboratory (ADF&G 1998 and pers. comm. Bill Morris, ADNR 2007). Frozen samples were then sent to an Analytica Group laboratory in Juneau for chlorophyll *a* analysis.

Data Analysis Organisms from both ASCI and Surber macroinvertebrate samples were identified to genus or the lowest practicable taxon. Taxonomic data from the ASCI samples was used to calculate several descriptive population metrics: population density, percent Ephemeroptera/Plecoptera/Trichoptera (EPT), taxa diversity, and percent dominant taxa. In addition, Hilsenhoff Biotic Index (HBI) scores, and habitat assessment scores were calculated for ASCI samples. Population density, percent EPT, taxa diversity, and percent dominant taxa also were calculated for Surber samples.

3.4.5 Falls Creek Fish Resources

Falls Creek (Figure 3.4.5-1) was sampled on a reconnaissance level only. It was sampled for juvenile fish using minnow traps in July 2009 to determine the species composition, distribution, and relative abundance. Habitat characteristics such as habitat type, stream gradient, cover, amount of LWD, and substrate type were also recorded.

Foot surveys were conducted from the Seward Highway Bridge to the mouth of the creek to determine if spawning anadromous salmon utilize the creek. A two person field crew walked the banks of the stream from the Seward Highway Bridge to the mouth of Falls

Creek, looking for anadromous salmonids. Foot surveys occurred approximately every 10 days in conjunction with the Grant Creek foot surveys.

3.4.6 Grant Lake Fish Resources

A total of two sampling events were conducted on Grant Lake, one in June and the other in August. Each sampling event occurred over a period of three days. A combination of sampling methods was used including minnow trapping, electrofishing, and gill netting.

Rearing Fish Minnow trapping was used in littoral habitats of Grant Lake and its tributaries during June and August. The 2009 sampling effort targeted locations previously sampled by AEIDC (1983), in addition to new sites (Figure 3.4.6-1). With the exception of the tributary streams during the June event, all minnow traps were set for approximately 24 hours, minnow traps that were placed in the tributaries during June were set for between two and four hours. All fish were identified to species level with the exception of sculpin, TL measured, and released near the point of capture.

Electrofishing occurred in the tributaries of Grant Lake near the east side of the lake in the back basin (Figure 3.4.6-1). Most electrofishing occurred in areas around minnow trapping sites for catch verification; however, some additional sites were electrofished to determine species presence. Time electrofished was approximately one minute at each site. Fish captured were identified to species level, TL measured, and released near the point of capture. Sculpin were identified to the genus level.

Adult Resident Fish Variable mesh gill nets were deployed in approximately the same locations as sampled in 1982 (AEIDC 1983) as well as other locations that appeared to be representative habitats (n=9 locations, Figure 3.4.6-1). Two 100 ft long by 6 ft deep gill nets were fished in June with mesh sizes of ¾ in, 1 in, 1.5 in, and 2 in. A third 100 ft long by 8 ft deep variable mesh gill net was added for the August sampling event with mesh sizes from 1 to 5 in. Gill nets were set at a variety of depths, both perpendicular and parallel to the shoreline and fished overnight.

3.4.7 Grant Lake Zooplankton and Phytoplankton

Zooplankton and phytoplankton samples were collected once during the 2009 field season, on 07 August. The sampling event was combined with water quality sampling in Grant Lake, Grant Creek, and Falls Creek as well as with macroinvertebrate and periphyton sampling in Grant Creek. The event took three days, with one complete day spent on Grant Lake.

Sampling occurred at two locations within Grant Lake (Figure 3.4.4-1). Two sampling sites were established to assess conditions in areas of the lake that may be directly impacted by the proposed project. One sampling site was established near the natural outlet of the lake and was named GLOut. The second site was established in the general area of the proposed intake. This site, GLTS, also has a thermistor string installed to record water temperature.

Zooplankton One zooplankton sample was collected at both GLOut and GLTS. Samples were collected using an 18 in diameter 80 µm mesh plankton vertical tow net (Eaton et al. 1995). The net was lowered into the water column using an attached weight to sink it and to keep it from drifting while being towed. The end of the net was capped with a collection bottle into which all zooplankton were trapped. Any organisms attached to the net were rinsed into the collection bottle. The sample was then transferred to a storage bottle and preserved 70% isopropyl alcohol and the sample was returned to the HDR lab for processing. Each sample consisted of one vertical tow.

Rose Bengal solution was added to the sample and allowed to stain the zooplankton for 24 hours before counting and identification. The sample was reduced to 100 mL and 5 mL draws were placed on a counting cell for identification. Draws of 5 mL continued to be withdrawn from the concentrated sample until at least 300 organisms were counted and identified.

Phytoplankton Phytoplankton samples were collected at both GLOut and GLTS. One liter samples were collected using a Niskin bottle sampler (Eaton et al. 1995). The phytoplankton samples were collected at the same time and the same depths as water quality samples. Samples were collected at the surface and at mid-depth at GLOut. Phytoplankton was collected at three depths at GLTS: surface, mid-depth, and a meter above the substrate. The liter of sample was then filtered through a 45-µm glass fiber filter attached to a hand vacuum pump. Filtered samples were preserved with 1-ml saturated $MgCO_3$ solution added to the filter. The dry filter was wrapped in a larger filter (to absorb any residual water) and placed in a labeled zipper seal bag with silica gel desiccant. Filters were frozen in a lightproof container for shipment to the laboratory (ADF&G 1998 and pers. comm. Bill Morris, ADNR 2007). Frozen samples were then sent to an Analytica Group laboratory in Juneau for chlorophyll *a* analysis.

Data Analysis Organisms from the zooplankton samples were identified to order. Zooplankton population density, the number of organisms per liter of water, was calculated by dividing the total number of organisms collected by the total volume of water that passed through the zooplankton net. Percent dominant taxa, the percent of the total number of organisms represented by a taxon, were calculated by dividing the total number of organisms in the sample by the total number of organisms in each individual taxon. Phytoplankton samples were analyzed to determine concentration of chlorophyll *a* as milligram per cubic meter (mg/m^3). Phytoplankton analysis results for each sampling site were averaged.

3.5 Results

The results of the 2009 fish and aquatic resources study program were generally consistent with the results of other studies conducted in the Grant Lake watershed with respect to species presence and distribution (see Section 3.2, USFWS 1961, AEIDC 1983, APA 1984, Marcuson 1989).

3.5.1 Reach Descriptions

Grant Creek consists primarily of fast water habitat. Reaches 1 through 4 are dominated by fast water riffles with a low number of deep main channel scour pools and backwater sloughs; cascade habitat dominates Reach 5. General habitat characteristics and fish use within each reach is described below:

- **Reach 1** is an alluvial reach at the lower end of Grant Creek, where a distributary channel splits from the main channel. Both channels discharge into Middle Trail River. Reach 1 is dominated by riffle habitat with some scour and backwater pools (Figure 3.5-1). One of the more important salmon spawning areas in Grant Creek is just above the distributary split (Figure 3.5-2). The distributary channel provides good rearing habitat conditions during the open water season but may go dry during the winter (Figure 3.5-2). Reach 1 is accessible to foot travel with trails on each side of the creek. The fish species present in Reach 1 are adult and juvenile sockeye, Chinook, and coho salmon, sculpin, rainbow trout, and Dolly Varden.
- **Reach 2** is dominated by riffle habitat with scour and backwater pools (Figure 3.5-1). A remnant channel located on the south bank enters the main channel of Grant Creek in this reach which provides good juvenile fish rearing conditions. Salmon spawning is most abundant on the stream margins (Figure 3.5-2). Reach 2 is accessible via a trail on both banks of the stream. Fish present in Reach 2 are adult and juvenile sockeye, Chinook, and coho salmon, rainbow trout, and Dolly Varden.
- **Reach 3** is dominated by riffle habitat with a larger portion of scour and backwater pools than the previous reaches (Figure 3.5-1). There is a large island complex in Reach 3. Chinook salmon as well as sockeye salmon spawning habitat is present in the main channel area (Figure 3.5-2). The backwater areas as well as the side channel contain good rearing fish habitat (Figure 3.5-1). Reach 3 is accessible via a trail on both sides of the creek, although on the left bank there are two side channel crossings. During high flows, the crossings are impossible. Fish present in Reach 3 are adult sockeye salmon, adult and juvenile Chinook and coho salmon, Dolly Varden, rainbow trout, sculpin, and threespine stickleback.
- **Reach 4** is dominated by riffle habitat with one large scour pool located near the head (Figure 3.5-1). There is an overflow channel on the right bank of Grant Creek in this reach. It provides the primary rearing habitat in this reach (Figure 3.5-2). Both Chinook and sockeye salmon have been documented spawning in this reach (Figure 3.5-2). Reach 4 is accessible via a trail on both sides of the creek. Fish present in Reach 4 are adult sockeye salmon, adult and juvenile Chinook and coho salmon, Dolly Varden, rainbow trout, sculpin, and adult Arctic grayling.
- **Reach 5** is located in a canyon and is mostly inaccessible to foot traffic during the open water season. The lower-most 300 m can be accessed during the summer months because of a shelf on the left bank. Reach 5 is not accessible from the right bank side or further up the left bank side. Reach 5 is dominated by cascade habitat (Figure 3.5-1). Only the first 300 m of Reach 5 were investigated in 2009 due to impassible terrain. No spawning was documented in Reach 5; however, foot surveys indicated that adult salmon were present in Reach 5 (Figure 3.5-2). Fish observed in Reach 5 included adult Chinook and sockeye salmon, adult and juvenile coho salmon, Dolly Varden, and rainbow trout.

- **Reach 6** is located between the outlet of Grant Lake and the lower-most waterfall. It consists of series of falls with backwater, pools, and riffles interspersed between them (Figure 3.5-1). Reach 6 is most easily accessed via the Grant Lake outlet. There is no known spawning or rearing of salmonids in Reach 6 (Figure 3.5-2). The only fish present are sculpin and threespine stickleback.

3.5.2 Grant Creek Fish Resources

Rearing and Adult Resident Fish Overview Resident and rearing fish in Grant Creek were found to consist of juvenile Chinook, coho and sockeye salmon, rainbow trout, Dolly Varden, sculpin, and threespine stickleback (Figure 3.5.2-1). Minnow trapping efforts in Grant Creek consisted of a total of 4,332.42 trap hours. Study Reach 3 received the most effort at 1,147.27 hrs followed by Reach 2 at 990.27 hrs, Reach 1 at 957.57 hrs and Reach 4 at 825.45 hrs. Study Reaches 5 and 6 received considerably less effort due to limited access (Table 3.2).

A total of 2,081 fish were captured during minnow trapping events in June through September (Table 3.3). The most abundant fish in catches were juvenile Dolly Varden (925 fish, Figure 3.5.2-1, Table 3.3). Juvenile coho salmon were the next most abundant species (776), followed by Chinook salmon (191). Eighty-three threespine stickleback, 82 rainbow trout, 22 sculpin, and two sockeye salmon were also caught. Sockeye salmon are rarely attracted to minnow traps.

A total of 167 fish were electrofished at the minnow trapping sites in June through September (Table 3.3). Two sites per reach in Reaches 1 through 4 were electrofished. Coho salmon were the dominant species (59), followed by Dolly Varden (43), Chinook salmon (20), rainbow trout (19), and sculpin (16); six juvenile sockeye salmon were electrofished in June along with four threespine stickleback.

Angling effort at 18 sites in Grant Creek consisted of a total of 90.82 hours (Table 3.1). Reaches 1-4 each had four angling sites with total effort per reach ranging from 19.0 to 20.5 hours. Reach 5 had two angling sites and received 10.65 hours. Total catch for angling from June through August in Reaches 1 through 5 was 72 rainbow trout, 14 Dolly Varden, three sockeye salmon, and one Arctic grayling for a total of 90 fish (Figure 3.5.2-4).

Rearing Fish Spatial Distribution Study Reach 4 had the highest combined CPUE for all reaches across all months, followed by Reaches 1 and 5, then Reaches 3, 2, and 6 (Figure 3.5.2-5). Reach 1 had the highest abundance of juvenile Chinook and juvenile coho salmon. Dolly Varden had the highest CPUE of all fish in all reaches except Reach 6 (Figure 3.5.2-5). The relative abundance of juvenile Chinook steadily decreased moving upstream to Reach 5 where no Chinook were captured. This is consistent with the snorkel survey results (see Section 3.5.4). Juvenile coho abundance decreased slightly upstream although they were relatively abundant in the lower portion of Reach 5. Reach 6 was the only reach in which no salmonids were captured since it is not accessible to salmonids (Figure 3.5.2-5). Excluding Reach 6, the relative abundance of juvenile salmonids was lowest in Reach 2, followed closely by Reach 3, then Reaches 4 and 5, and finally Reach 1.

In Reaches 1, 2, and 4, riffles had the highest CPUE of any habitat type (Figures 3.5.2-6, 3.5.2-7, and 3.5.2-8). However, it should be noted that minnow traps were always set in relatively slow water near the channel margins; consequently, microhabitat characteristics may be more important than the adjacent dominant habitat type. In Reach 3, backwater/pool had the highest CPUE of any habitat type (Figure 3.5.2-9). It should be noted that Chinook salmon were not found in riffle habitat in Reach 3. In Reach 5, cascade had the highest CPUE of any habitat type; however, it was the only habitat type available in Reach 5 and only a small portion of Reach 5 was sampled (Figure 3.5.2-10).

Some inconsistency exists between the minnow trapping results and the snorkel survey results conducted for the instream flow study (see Section 3.5.4). Snorkel survey and minnow trapping results both show a relative decrease in the number of juvenile Chinook moving upstream in Reaches 1 through 4. Snorkel surveys found Chinook to be the most commonly encountered species, followed by coho and Dolly Varden. Minnow traps also captured these species, but Dolly Varden were the most abundant, followed by coho and Chinook salmon. With the exception of backwater pool habitat in Reach 3, minnow traps captured few juvenile salmon in backwater pool habitats, whereas the snorkel surveys found an abundance of fish in these areas.

Rearing Fish Temporal Distribution Between the months of June and September, CPUE was lowest in June (Figure 3.5.2-11). In July, minnow trapping catches showed a marked increase in the relative abundance of Dolly Varden in Reaches 1 through 5 and an increase in CPUE for juvenile coho salmon in Reaches 1 and 2. Minnow trapping catches for August showed a substantial increase in all juvenile fish species captured, although juvenile rainbow trout remained somewhat low across all months sampled. Relative abundance of Chinook salmon appeared to have increased the most between July and August. In the month of September, coho salmon where the most abundant species captured in all reaches, followed by Dolly Varden, rainbow trout, and Chinook salmon.

Rearing Fish Age Class Length frequencies of juvenile coho and Chinook salmon in August and September exhibit a bell shaped distribution (Figure 3.5.2-2 and 3.5.2-3). This suggests that there is one age class predominating for these species, however no age data was collected from scales or otoliths.

Juvenile Chinook salmon studies conducted by ADF&G (Bendock 1995 & 1996) in the Kenai River and at Deep Creek reported mean lengths of age 1 Chinook salmon smolt in May through July ranging from 85.5 mm to 98 mm. Bendock 1995 also reported age 0 Chinook at Deep Creek to have an average length of 70.9 mm in late July. The average length of juvenile Chinook salmon captured in Grant Creek was 67 mm and 76 mm in August and September respectively indicating that young of the year (YOY) appears to be the dominant age class, with a few possible age I fish present.

A juvenile coho salmon study conducted by ADF&G (Carlon 1992) in the Kenai River mainstem and two tributaries reported age 1 coho smolt in May and June to have an average lengths ranging from 76 mm to 122 mm. The average length of juvenile coho salmon captured in Grant Creek was 58 mm in August and September indicating that young of the year (YOY) appears to be the dominant age class, with a few possible age I fish present.

Length frequencies for Dolly Varden in August and September exhibit a bell shaped distribution with a mode of 91-100 mm (Figure 3.5.2-12). Length frequencies for rainbow trout in August and September indicate the presences of YOY fish and the presences of some age I or older juvenile fish (Figure 3.5.2-13).

Adult Resident Fish Adult and sub adult resident fish present in Grant Creek include rainbow trout and Dolly Varden. For purposes of this study, all rainbow trout and Dolly Varden larger than about 180 mm were considered to be "adults" even though many of these fish were likely too small to be sexually mature. Adult rainbow trout likely moved into Grant Creek in the spring with some trout remaining in the creek through the summer and fall. The 2009 study found no direct evidence of spawning. The spawning condition of rainbow trout caught during the month of June could not be determined and there were no evident signs of spawning or spawned out rainbow trout in Grant Creek. However, the presence of YOY rainbow trout fry provides convincing evidence that some spawning may have occurred, possibly prior to initiating angling surveys on 02 June 2009. Additional rainbow trout likely moved into the creek in late summer in response to the presence of salmon eggs.

Dolly Varden were present in Grant Creek in low numbers throughout the study period, but were increasing in number as the salmon returned. Dolly Varden may spawn in Grant Creek in the fall and early winter months, but studies to date have not investigated Dolly Varden spawning.

Adult Resident Fish Spatial Distribution Across all months, Reach 3 had the highest relative abundance for all species, followed by Reaches 5, 4, and 1 with Reach 2 having the lowest relative abundance of adult fish (Figure 3.5.2-14). Rainbow trout were the most abundant in Reach 5, followed by Reaches 3, 4, 1, and Reach 2. The relative abundance of Dolly Varden was the highest in Reach 1 followed by Reaches 3, 2, and 5. Adult Dolly Varden were not caught in Reach 4. A single Arctic grayling was caught in Reach 4.

A total of 72 rainbow trout were captured during angling surveys (Figure 3.5.2-4; Table 3.4). Anecdotal results on rainbow trout recapture indicate nine fish (12.5 %) were recaptured over the course of the sampling season. Recaptures were relatively equal throughout the sampling season, with June 12, having the highest rate at three fish recaptured. As of June 12, only 10 fish had been marked, indicating a 30 % recapture rate.

Adult Resident Fish Temporal Distribution CPUE for rainbow trout was highest in August in Reach 3 when it was approximately 2.5 fish per hour. Reach 1 in June, Reaches 1 and 2 in July, and Reaches 3 and 5 in September had the lowest CPUE with no rainbow trout caught during those months. There is a clear increase in the CPUE in August in all reaches (Figure 3.5.2-15a), which also corresponds with the arrival of Chinook salmon in Grant Creek. In September, Dolly Varden in Reach 3 had the highest relative abundance at 1.0 fish/hour (Figure 3.5.2-15b). In September, a decrease in the relative abundance of rainbow trout across all reaches was apparent. Also in September, an increase in the relative abundance of Dolly Varden was apparent.

Adult Resident Fish Age Class Length frequency data for rainbow trout in June indicate a majority of fish caught were in the size range of 221 mm – 240 mm or 321 mm – 340 mm (Figure 3.5.2-16). Length frequency data for rainbow trout in August indicate the majority of fish caught were in the size range of 181 mm – 220 mm (Figure 3.5.2-17). Length frequency graphs for Dolly Varden in Grant Creek in June and August indicate multiple age classes are present (Figures 3.5.2-18 and 3.5.2-19).

Adult Salmon The 2009 escapement estimate based on foot surveys for Chinook salmon is 231 fish (Figure 3.5.2-20). The highest individual survey count was 62 live fish observed on 23 August 2009. Chinook salmon entered Grant Creek on August 10^{th}, and spawning abundance peaked on approximately August 23^{rd}. By August 31^{st}, adult Chinook salmon began to decline in numbers and by September 11^{th} adult Chinook salmon were no longer present in Grant Creek (Table 3.5).

The 2009 escapement estimate based on foot surveys for sockeye salmon is 6,293 fish (Figure 3.5.2-21). The highest individual survey count was 1,351 fish observed on September 11^{th}. Sockeye salmon were first observed in Grant Creek on August 13^{th} and spawning abundance peaked on September 11^{th}. By September 16^{th} spawning sockeye abundance began to decline and by September 29^{th} spawning sockeye abundance declined to 78 fish (Table 3.5). For the purposes of the escapement estimate it was assumed that no spawning sockeye salmon were present in Grant Creek after October 9^{th}.

A total of six adult coho salmon were observed in Grant Creek, all of which were counted during the final foot survey event on September 29, 2009 (Table 3.5). It is recommended that foot surveys conducted in future years include surveys during the months of October and November to estimate adult coho salmon spawning abundance.

3.5.3 Grant Creek Instream Flow Study

The purpose of the Grant Creek instream flow study is to determine the potential effects on physical habitat and water temperature in Grant Creek of a range of flow regimes that could result from hydropower development proposed by KHL. The development of the Grant Creek instream flow study is a collaborative effort that includes the members of the TWG. The TWG met on several occasions in 2009 to discuss elements of the study design. The following sequence of events occurred in 2009:

- 24 March 2009. TWG presentation in Moose Pass. Included presentation and discussion of draft hydrology, water quality, aquatic biology, and instream flow study plans.
- 21 April 2009. TWG meeting in Kenai. Included presentation of 2009 hydrology and aquatic biology study plans, and discussion of draft instream flow study plan.
- 18 May 2009. Hydrology, water quality, and aquatic biology study plans uploaded to www.kenaihydro.com website.
- 19 May 2009. TWG conference call. Included discussion of modification to 2009 hydrology study plan and applicable instream flow assessment methodologies.
- 10 June 2009. Jason Kent (HDR) sent TWG compilation of documents forwarded by Jason Mouw (ADF&G) regarding instream flow study methodologies.

- 01 July 2009. Jason Kent sent TWG a Technical Memorandum regarding the habitat use (snorkeling) work proposed for the 2009 field season.
- 16 July 2009. TWG conference call. Included presentation of 2009 mid-season results of Grant Creek hydrology, water quality, and aquatic biology studies.
- 27 August 2009. Kenai Hydro, Inc. (KHI) 1984 instream flow study report and associated documents uploaded to www.kenaihydro.com website; Jason Kent sent announcement email to TWG.
- 08 September 2009. Jason Kent sent TWG summary of KHI 1984 instream flow study (attached as Appendix A).
- 22-24 September 2009. TWG meeting in Moose Pass. Included field trip to Grant Creek, presentation of 2009 hydrology, water quality, and aquatic biology studies, and presentation and discussion of proposed instream flow study approach. Also included optional field trip for instream flow study site selection.
- 07 October 2009. Jason Kent sent TWG summary Technical Memorandum describing instream flow study plan – revised based on input from TWG on 22-24 September meeting.

Fish Use of Microhabitats A total of 16 sample sites were established and distributed in the creek as follows: 11 sites in the main channel and five sites in "other" channels. The 11 sample sites in the main channel included five riffles, one backwater pool, one backwater slough, two scour pools, one cascade, and an overflow channel[3]. The "other" channel sites included two sites in a distributary channel (Reach 1); two sites in a secondary channel (Reach 3); and one site in a tertiary channel (Reach 3)(Figures 3.4.3-1, 3.4.3-2, 3.4.3-3, 3.4.3-4, and 3.4.3-5).

The field team identified microhabitat sample areas: faster pools, fastwater riffles, margins with undercut bank, margins without undercut bank, LWD dam, and margin shelf associated with LWD, and backwater pools, sloughs, and pockets, as shown in Table 3.5. The sample sites were lumped into three primary categories for analyses: main channel sites, backwater areas, and other channels, each of which was further subdivided based on microhabitat characteristics (Table 3.6).

Rearing and Adult Resident Fish Juvenile Chinook, coho, and sockeye salmon; juvenile Dolly Varden; juvenile and adult rainbow trout; adult Arctic grayling; and sculpin were observed during the June snorkeling event. Overall, Chinook salmon was the most abundant juvenile fish observed, followed by coho and sockeye salmon (Figure 3.5.3-1). Rainbow trout were the most abundant resident fish species observed, followed closely by Dolly Varden. Two adult Arctic grayling were also observed.

Fish Species by Age Class All coho and sockeye salmon observed in June 2009 appeared to be YOY (<60 mm). A majority (92 %) of Chinook salmon observed appeared to YOY, only 8 % were older (>60 mm; age I) (Figure 3.5.3-2).

[3] The overflow channel was separated from the main channel by a gravel bar.

Rainbow trout were the most abundant resident species observed with multiple size classes present. Nearly 60 % of the rainbow trout were estimated to have fork lengths greater than 200 mm; these fish were considered to be subadults or adults. The remaining 40 % that were less than 200 mm were considered juveniles. The smallest size class of rainbow trout was estimated to be smaller than 40 mm. The majority (89 %) of Dolly Varden were juveniles (<200 mm), with nearly half the fish length less than 100 mm.

Fish Species Spatial Distribution by Reach Juvenile Chinook and coho salmon were observed throughout the lower 4 reaches (Figure 3.5.3-3). Chinook salmon were especially abundant in Reaches 1 and 2, while coho salmon were the more abundant species observed in Reaches 3 and 4. No juvenile coho or Chinook salmon were observed in Reach 5.

Sockeye salmon fry were observed in Reaches 1 – 3, with the highest concentration in the distributary channel in Reach 1. Sockeye salmon were also observed at three main channel sample sites. A deep undercut bank associated with backwater area in Reach 3 (Figure 3.5.3-3) was the farthest upstream sockeye salmon fry observation.

Rainbow trout were observed in all reaches, excluding Reach 2 (Figure 3.5.3-3). Larger (>200mm) rainbow trout dominated the species composition in Reach 4 and Reach 5 and were also observed in deep areas in Reach 3, likely due to the presence of deep pool habitats. Dolly Varden were observed in all reaches with the exception of Reach 4. Dolly Varden and rainbow trout dominated the species composition in Reach 5. Two adult Arctic grayling were observed, both in Reach 5.

Fish Presence by Habitat As expected, juvenile salmon were typically observed more frequently in areas with slower velocities and abundant cover. Based on the three-day sampling event in June 2009, the three microhabitats occupied by juvenile rearing salmon in Grant Creek include backwater areas (i.e., sloughs and pocket water) and stream margins, especially those with undercut banks (Figure 3.5.3-4).

Backwater areas, margin shelves associated with large woody debris, and stream margins with undercut bank appear to be important microhabitats for juvenile Chinook salmon. Similarly, coho salmon occupied backwater areas and margins with undercut banks, some of which were situated along fast stream margins. Sockeye salmon were most commonly observed using backwater areas in the main channel. No juvenile fish were observed along stream margins without undercut bank or large woody debris.

The larger (>60 mm) assumed age I Chinook, along with Dolly Varden, were observed using fast water (i.e., closer to velocity breaks) than the YOY Chinook and coho salmon.

Based on observations from the three-day event, subadult/adult (>200 mm) rainbow trout was the most abundant and commonly observed species occupying deep/fast pools and fastwater riffles.

Typically, the larger (>200 mm) rainbow trout and Dolly Varden were observed using deeper and faster pool habitat in the main channel (Figure 3.5.3-5). For example, nearly 70% of the “subadult/adult” (>200 mm) rainbow trout and 100% of Dolly Varden >200 mm were observed in main channel pools and riffles. Smaller (juvenile <200 mm) rainbow trout and Dolly Varden were observed throughout the various microhabitats, though typically areas with faster velocities compared to that of YOY salmon observations.

YOY Chinook and sockeye salmon dominated the species composition of fish in the distributary channel, while coho salmon, followed by rainbow trout, were the primary fish species that occupied the secondary channel (Figure 3.5.3-6).

Coho salmon were observed using stream margins with undercut bank in the secondary channel; rainbow trout was the only fish species observed using the middle portion of the channel of the secondary channel, similar to the pattern observed in the main channel microhabitats sampled (Figure 3.5.3-6).

3.5.4 Grant Creek Macroinvertebrates and Periphyton

Macroinvertebrates and periphyton were sampled at two locations in Grant Creek on 06 August 2009. All macroinvertebrate samples were identified to genus or the lowest practicable taxon (Table 3.7).

Descriptive metrics calculated for samples collected using ASCI methods included population density, percent EPT, taxa diversity, and percent dominant taxa. HBI scores and habitat assessment scores also were calculated for each sampling site. Population density, percent EPT, taxa diversity, and percent dominant taxa were calculated for samples collected using Surber samplers (Table 3.8).

Grant Creek periphyton samples were analyzed for chlorophyll *a* concentration.

Macroinvertebrate Population Density

Alaska Stream Condition Index (ASCI) ASCI methods required collecting 20 sub-samples in a 100 m stream reach. Organisms were collected from approximately 0.15 square meter of substrate in each sub sample, thus a total of approximately 3.0 square meters (m^2) was sampled. Macroinvertebrate density at GC100 was 5475 organisms in approximately 2.0 m^2 or 274 organisms per 0.1 m^2. At GC300 approximate population density was 1061 organisms per 2.0 m^2 or 53 organisms per 0.1 m^2.

Surber Five samples were collected using Surber samplers at each site. The Surber sampler encloses 0.1 m^2 of substrate. Surber samples were analyzed individually to calculate a range of population densities in the riffle samples. The population density at GC100 ranged from 76 organisms per 0.1 m^2 to 212 organisms per 0.1 m^2. The average Surber sample density at GC100 was 148.4 organisms per 0.1 m^2. GC300 had a range of 41 to 184 organisms per 0.1 m^2. The average population density for Surber samples at GC300 was 98.8 organisms per 0.1 m^2 (Figure 3.5.4-1).

Macroinvertebrate Percent EPT Ephemeroptera, Plecoptera and Trichoptera are three families of macroinvertebrates that are typically regarded as indicators of aquatic habitat quality because of their low tolerance to organic pollution and impaired water quality relative to some other taxa.

Among macroinvertebrates collected using the ASCI method, percent EPT at GC100 was 1.90 % of the total population and at GC300 was 3.59 % of the total population.

The percent EPT of macroinvertebrates collected using Surber samplers ranged from 3.28 % to 16.92 % at GC100 and from 24.49 % to 39.90 % at GC300. The average percent EPT among Surber collected samples at GC100 was 7.72 % and at GC300 was 31.49 % (Figure 3.5.4-2).

Macroinvertebrate Taxa Diversity Taxa diversity is the total number of different taxa found in a sample. Macroinvertebrates in the ASCI sample at GC100 had a taxa diversity of 10 taxa while the taxa diversity at GC300 was 12 taxa.

Surber collected samples at GC100 had a taxa diversity range of 18 to 20 taxa. The average at GC100 was 18.6 taxa. The taxa diversity at GC300 ranged from 11 to 20 taxa. The average at GC300 was 15.2 taxa (Figure 3.5.4-3).

Macroinvertebrate Percent Dominant Taxa The dominant taxon among macroinvertebrates in the ASCI sample at GC100 was Bivalvia, which comprised 83% of the total organisms (Figure 3.5.4-4). The dominant taxon among macroinvertebrates in the ASCI sample at GC300 was also Bivalvia at 78% (Figure 3.5.4-5). Dominant taxon calculations for Surber sample data were averaged to determine overall dominant taxa for the sampling site. The dominant taxa among macroinvertebrates in the Surber samples at GC100 and GC300 was Chironomidae, which comprised 85% and 48% of the total organisms, respectively (Figures 3.5.4-4 and 3.5.4-5).

ASCI HBI and Habitat Assessment Scores Additional metrics that can be calculated using ASCI method collected data include the HBI score and Habitat Assessment scores. HBI values assigned to organisms range from 0-10, where 0 indicates the least tolerant and 10 indicates the most tolerant. These values are translated into a score of from 0-10 indicating average tolerance of taxa present at the site. Habitat scores range from 0-200 with 0 being the most impaired and 200 being the most macroinvertebrate habitat rich environments.

The HBI score for the ASCI sample at GC100 was 7.5 and the habitat assessment score was 200. The HBI score for the ASCI sample at GC300 was 7.1 while the habitat assessment score was 190.

***Periphyton Chlorophyll* a** Chlorophyll *a* concentrations at GC100 ranged from 7.48 mg/m^3 to 82.00 mg/m^3. The average concentration at GC100 was 34.79 mg/m^3. Concentrations at GC300 ranged from 2.94 mg/m^3 to 23.20 mg/m^3. The average concentration at GC300 was 12.70 mg/m^3 (Figure 3.5.4-6).

3.5.5 Falls Creek Fish Resources

Foot surveys took place on Falls Creek from the Seward Highway Bridge to the mouth of the creek. No adult anadromous fish were seen during foot surveys from July – September. Due to the high turbidity of the Falls Creek, there was a possibility that fish were missed. NTUs ranged from 16.6 – 19.3 during August and September; however, they dropped to 2.9 on 29 September.

Falls Creek is a high gradient riffle stream with small amounts of undercut bank and moderate amounts of large woody debris.

A 700 m reach of lower Falls Creek was sampled using minnow traps from 21 to 22 July 2009 (Figure 3.5.5-1). A total of 24 fish were captured, all of which were juvenile Dolly Varden (Figure 3.5.5-1). Fork length ranged from 58 mm to 175 mm (Figure 3.5.5-2). The majority of the fish captured ranged in size from 58 mm – 69 mm, indicating that YOY is the dominant age class of Dolly Varden present in Falls Creek. Dolly Varden in the range from 81 mm – 140 mm likely represent age I fish and those sized 171 – 180 mm may represent age II fish.

3.5.6 Grant Lake Fish Resources

Minnow trapping occurred at 28 sites in June and August (Figure 3.4.6-1). A total of 4,877 fish were minnow trapped. Seventy nine of them were sculpin and 4,798 were threespine stickleback (Table 3.9 and Figure 3.5.6-1). A majority of the threespine stickleback were captured in the front basin of the lake.

Tributaries at the back of Grant Lake were electrofished in June and August at 18 sites (Figure 3.4.6-1). Six threespine stickleback and 18 sculpin were captured (Table 3.9).

Variable mesh gill nets were set in nine locations around Grant Lake in June and August (Figure 3.4.6-1). The gill nets were set at depths from 3 m to 51 m. Four threespine stickleback were capture alive in the gill nets in August (depths ranged from 4 m – 7 m) (Table 3.9). No other species were caught.

3.5.7 Grant Lake Zooplankton and Phytoplankton

Zooplankton and phytoplankton were sampled at two sites in Grant Lake on 07 August 2009. Zooplankton were identified and taxa diversity, population density and percent dominant taxa were calculated for each sample. Phytoplankton samples were analyzed for chlorophyll *a* content.

Zooplankton Taxa Diversity, Population Density, and Percent Dominant Taxa Zooplankton samples were identified to order. GLTS and GLOut both had three identified taxa; rotifers, copepods and protozoans. The zooplankton population density at GLTS was 3.67 organisms per liter. Population density at GLOut was 10.65 organisms per liter.

The dominant taxon at both GLTS and GLOut were rotifers. At GLTS 97 % of the organisms were rotifers and at GLOut 99% of the organisms were rotifers. Other taxa at GLTS and GLOut were copepods and protozoans, with a range of percent dominance of < 0.1 % to approximately 2 %. (Figure 3.5.7-1, Table 3.10).

Phytoplankton Chlorophyll a Chlorophyll *a* concentrations are reported as milligrams per cubic meter (mg/m^3). Concentrations of Chlorophyll *a* ranged from 0.53 mg/m^3 at the lowest depth at the Grant Lake thermistor string site (GLTS) to 1.34 mg/m^3 at the surface. The Chlorophyll *a* concentrations at GLOut were 0.80 mg/m^3 at the middle of the water column and 1.07 mg/m^3 at the surface (Figure 3.5.7-2, Table 3.11).

3.6 Discussion

3.6.1 Grant Creek Fish Resources

Findings from the minnow trap study indicated that Dolly Varden were the most abundant juvenile species in Grant Creek (Figure 3.5.2-1 and Table 3.3). These results are contrary to the snorkeling results, in which few Dolly Varden were observed and Chinook and coho salmon were the dominant juvenile species fish species observed (Figure 3.5.3-1). Daytime snorkeling often is not effective for Dolly Varden observations because of the stream bottom orientation of Dolly Varden and tendency to be inactive during the day. Consequently, the minnow trap results are likely more representative of Dolly Varden abundance. On the other hand, the minnow trap results probably underestimated the abundance of juvenile Chinook and coho salmon. Minnow trap mesh size (¼ in) may have been too large to retain the very small salmon fry, especially in June, or stream velocity may have been too high to allow free movement of the fry into the traps. In August, the numbers of Chinook and coho salmon caught in minnow traps increased as the fork length of the fish increased (Figure 3.5.2-11).

Snorkeling is known to be an effective method of observing Chinook and coho salmon presence because the fish are active during the day and tend to school in mid-channel waters where they are easily visible. The relative abundance of juvenile salmon detected by the snorkeling is likely more representative of stream conditions than indicated by the minnow trapping.

Except for Reach 5, angling effort was fairly uniform throughout all reaches (Table 3.1). Given the uniformity of the sampling effort in the reaches, they can be compared together. Rainbow trout were the dominant species caught (Figure 3.5.2-4) with an increase in relative abundance in August (Figure 3.5.2-15a). This suggests that after spawning occurred fish remained in Grant Creek to recover and feed, then an additional aggregate of fish entered the creek when the spawning salmon arrived. Across all months, Reach 3 had the highest CPUE for angling (Figure 3.5.2-14). This likely indicates that rainbow trout prefer the habitat available in Reach 3.

Salmonids were not caught in Reach 6 (Figure 3.5.2-5). This is most likely due to a series of falls in this reach making it inaccessible to salmonids. As seen in Figure 3.5.2-5, the abundance of juvenile Chinook salmon decreased as distance from the mouth of Grant Creek increased. This is consistent with the snorkeling results.

Length frequency graphs from August and September for coho and Chinook salmon (Figures 3.5.2-2 and 3.5.2-3) indicate the presence of one primary age group with only a few larger fish. This indicates that the dominant age class of Chinook and coho were YOY with few age I fish present in Grant Creek. If this is the case, it is likely that older juvenile Chinook and coho salmon are not overwintering in the creek and few are moving into Grant Creek during the open water period. If Chinook and coho salmon are overwintering in Grant Creek, then based on the length frequency graphs, their survival is low. These results are in concurrence with APA findings (APA 1984).

Moreover, the length frequency graphs from August and September for coho salmon (Figure 3.5.2-2) and rainbow trout (Figure 3.5.2-13) merit some explanation. It is expected that larger fish will be trapped later in the year. However, this is not the case.

In both cases, there was substantial overlap in sizes between months and rainbow trout encompassed a wider range of fish sizes. However as a whole, fish trapped in September were somewhat smaller than fish trapped in August. Given the limited amount of data, it is difficult to determine the actual cause. One likely explanation is lower stream flows in September (Figure 4.5.2-1), may have made the traps more accessible to smaller fish.

When reviewed together, the length frequencies for the minnow trapping and the angling suggest there are multiple age classes for both Dolly Varden and rainbow trout (Figures 3.5.2-13, 3.5.2-16, 3.5.2-17, 3.5.2-12, 3.5.2-18, and 3.5.2-19). This indicates that Dolly Varden and rainbow trout likely use Grant Creek for rearing, spawning and adult feeding. The increase in relative abundance for rainbow trout and Dolly Varden (Figures 3.5.2-15a and 3.5.2-15b) throughout the summer, strongly suggests that adult rainbow trout and Dolly Varden moved into Grant Creek concurrently with the arrival of adult salmon.

Recapture of marked fish through the June12th capture period, indicated that there was a 30 % recapture rate for rainbow trout. This may be indicative of a small spawning population of rainbow trout in Grant Creek. However, the beginning of the study did not coincide with the beginning of the rainbow trout spawning. Therefore, further study needs to be conducted to include the spawning season, to determine the size of the rainbow trout spawning population in Grant Creek.

Findings from this study are similar to the APA (1984) findings. APA determined that Grant Creek supported 250 spawning Chinook salmon, whereas this study estimated an escapement of 231 spawning Chinook salmon (Figure 3.5.2-20). APA estimated that Grant Creek supported 1,650 spawning sockeye salmon. HDR estimated sockeye salmon escapement at 6,293 fish (Figure 3.5.2-21). Both estimates are likely low due to the possible observer inefficiency associated with visual counting methods and the turbidity of the water. The number of Chinook salmon entering, and presumably spawning, in Grant Creek suggests a high density of spawners for such a short stream segment.

In Reaches 1, 2, and 4, riffle margins had the highest relative abundance of fish of any habitat type (Figures 3.5.2-6, 3.5.2-7, and 3.5.2-8). In Reach 3, backwater/pool had the highest CPUE per habitat type (Figure 3.5.2-9). In Reach 5, cascade had the highest CPUE per habitat type but it was the only available habitat (Figure 3.5.2-10). These results are indicative of the type of habitat available and also of the type of habitat that these fish prefer. If more backwater/pools were available, there would most likely be an increase in the number of Chinook and coho salmon.

Rainbow trout and Dolly Varden were the only fish observed during snorkel surveys using fastwater habitat away from the stream margin. Typically, the larger (>200 mm) rainbow trout and Dolly Varden were observed using deeper and faster pool habitat in the main channel. Smaller (juvenile <200 mm) rainbow trout and Dolly Varden were observed throughout the various microhabitats, though typically in areas with faster velocities compared to that of the YOY salmon observations.

Grant Creek is a swift, glacially influenced stream that is somewhat narrow for the amount of flow it supports during the peak flow period in July when high flow conditions can exceed 500 cfs. During winter conditions Grant Creek contains relatively low flow conditions ranging from 15 to 20 cfs. Results from the 2009 juvenile salmon study showed a low number of age I fish present in Grant Creek, which suggests that overwintering of juvenile fish and/or dispersal of juvenile fish into the creek from downstream is limited.

Study Reaches 1-4 supports the greatest abundance of suitable fish habitat in Grant Creek; and while Reach 5 is accessible to anadroumous fish, salmon presence there appears to be somewhat diminished. This is likely due to a bedrock substrate, high flows and a fish passage barrier in the upper end of the reach. Rainbow trout do appear to occupy the lower portion of Reach 5 as indicated by the results of the resident fish study.

Although Study Reach 5 has not been fully characterized, it is evident that the lower reaches of Grant Creek (Reaches 1-4); contain a relative majority of suitable spawning and rearing fish habitats. In spite of high velocity flow conditions in the main channel, the presence of lateral habitats such as backwater areas and stream margins with undercut microhabitats in the main channel and the distributary channel appear to provide important rearing habitats for rearing salmon and resident fish. Study Reaches 1-4 contain all of these critical habitat factors. However, they are not evenly distributed between study reaches. Study efforts in 2010 will focus on identifying and defining the distribution of critical micro habitats, and, in conjunction with the instream flow study, provide an estimate as to how the proposed project could affect micro habitat conditions.

3.6.2 Grant Creek Instream Flow and Microhabitat Preference Study

Collaboratively, the TWG and KHL decided to select an instream flow study methodology based on the knowledge obtained from the summer 2009 aquatic resources and hydrology studies. Data and analysis from these studies were shared with the TWG in July and September. The microhabitat preference study suggested specific habitat types that would be most appropriate for analysis to determine the impact of flow alterations on fish population. A proposed instream flow approach methodology that emphasizes specific high use habitats was presented to the TWG on 23 September. Revisions to this approach were made based on TWG input, and will provide the basis for preparation of a final instream flow study plan.

3.6.3 Grant Creek Macroinvertebrates and Periphyton

Macroinvertebrates and periphyton were collected in Grant Creek to begin to characterize baseline productivity and nutrient and forage availability at GC300 and GC100. The results of analysis of both macroinvertebrate and periphyton data differed between sitesGC100 and GC300. Overall variation in habitat, including gradient and canopy cover, could account for differences in the data between sites.

Macroinvertebrate Population Density Population density estimates indicated that populations of macroinvertebrates at GC100 were greater than at GC300 regardless of sampling method (Figure 3.5.3-1). However, population density also differed between sampling methods, which focus on different habitats. At GC100 population density over a variety habitats, as estimated from data collected by the ASCI methods, was somewhat greater than population density in riffle/cobble habitats, as calculated from Surber sampler data. The reverse occurred at GC300. A large rain event that occurred in late July through early August could have caused differential scouring of organisms from GC300.

Macroinvertebrate Percent EPT The percent of EPT taxa at GC300 was higher than at GC100 (Figure 3.5.3-2). Riffle/cobble habitat, a habitat preferentially colonized by EPT, dominates at GC300. GC100 has a wider variety of habitats available to macroinvertebrates. The difference between sites in percent EPT of macroinvertebrates collected by Surber sampler, which sample only riffle/cobble habitat, is possibly due to other habitat characteristics, such as temperature and volume of winter flows. More data will be needed to better understand this difference.

Macroinvertebrate Taxa Diversity Taxa diversity between the Grant Creek study sites differed slightly, as shown in the data collected by Surber sampler (Figure 3.5.3-3). Taxa diversity at GC100 is somewhat higher than GC300 using Surber collected data. However, when using the ASCI collected data, taxa diversity was higher at GC300. These results are possibly related to storm events or other habitat characteristics such as relative periphyton availability as food source. Studies conducted in Grant Creek in 1981 and 1982 using Surber samplers revealed that benthic macroinvertebrate diversity was low, with the most abundant taxa being Chironomidae, followed by Ephemeroptera, Plecoptera and clams. (APA 1984). Continued sampling at GC100 and GC300, over a variety of conditions, will help to further describe their baseline characteristics.

Macroinvertebrate Percent Dominant Taxa Some differences between GC100 and GC300 were noted especially in samples collected by the Surber sampler method (Figures 3.5.3-4 and 3.5.3-5). The dominant taxon at both sites in samples collected using the ASCI method was Bivalvia. The dominant taxon at both sites collected using the Surber sampler method was Chironomidae, with Bivalvia dominant at two psuedo-replicates at GC300. GC300 had lower percent dominant taxa values which is indicative of conditions that allow successful colonization by a number of taxa, with no single taxa having an advantage.

The rain event described above may have had a greater impact on larger bodied taxa or taxa incapable of clinging to, or burrowing into the substrate. It is possible that Bivalvia were less affected by the rain event for this reason. Another reason could be that the natural emergence timing of some macroinvertebrates in Grant Creek is earlier in the summer. However, previous studies in 1984 showed that no seasonal variation in macroinvertebrate abundance was observed (APA).

ASCI HBI and Habitat Assessment Scores The habitat scores at both sites indicate that habitat availability and quality is high. The creek and riparian area is undeveloped and there are a large variety of habitats for macroinvertebrates. This would indicate the potential exists for a large diversity of organisms with low tolerance to pollution and disturbance. However, the HBI scores are relatively high, greater than seven (on a scale of 1 – 10 where 1 is optimal). This is largely due to the high tolerance value of bivalves and chironomids which were the dominant taxa at both sites. The large rainfall event could have scoured many organisms with low tolerance values. More data is necessary to discover if the results from this year are within the range of typical conditions, or may have been affected by events such as the rainfall in late July and early August.

Periphyton Chlorophyll a Average chlorophyll *a* concentration at GC100 was nearly three times higher than the concentration at GC300, 34.8 mg/m^3 and 12.7 mg/m^3, respectively. The substrate at both sampling sites is similar, however, some features (e.g.

gradient, temperature, and canopy cover) that could affect periphyton growth at these sites do differ. Continued sampling under different conditions will help to further characterize the periphyton growth at these sites.

3.6.4 Falls Creek Fish Resources

As of 29 September 2009, no adult salmon were seen in Falls Creek. The water was turbid and observation conditions were poor; consequently, some fish may have been missed. Falls Creek is listed in the ADF&G AWC as having adult Chinook salmon present

Only Dolly Varden were trapped in the minnow traps (Figure 3.5.4-1). This result differs from 1959-1961 results when juvenile Chinook were trapped in the lower 600 ft of the stream (USFWS 1961 and Johnson and Klein 2009). However, the minnow trapping data is consistent with the AEIDC data (1983) in which investigators only trapped Dolly Varden. There is the possibility that since the juvenile Chinook salmon were trapped within the lower 600 ft of the stream, that they use Falls Creek infrequently.

3.6.5 Grant Lake Fish Resources

Contrary to the findings of AEDIC (1983), fish were present in the Grant Lake tributaries; both sculpin and threespine stickleback were observed. Threespine stickleback were present throughout the lake (Figure 3.5.6-1 and Table 3.9); however, threespine stickleback were much more abundant in the front basin of the lake, which is consistent with previous reports (USFWS 1961, AEIDC 1983, APA 1984).

Minnow traps appear to be the most effective method for capturing fish in Grant Lake (Table 3.9). However, given the conflicting reports as to the presence of rainbow trout and Dolly Varden (Sisson 1984) or absence of rainbow trout and Dolly Varden (USFWS 1961, AEIDC 1983, APA 1984, Marcuson 1989), multiple sampling methods were used. Minnow traps were placed in the littoral zone of the lake, gill nets were placed at varying depths around the lake, and electrofishing was performed in tributaries and around their mouths. Results of the current study, in combination with past study efforts, provide convincing evidence that no salmonid species are currently present in Grant Lake or its tributaries.

3.6.6 Grant Lake Zooplankton and Phytoplankton

Zooplankton and phytoplankton were collected in Grant Lake in order to estimate the productivity of the lake in the area of the natural outlet and the proposed project intake. Zooplankton and phytoplankton in this area of the lake could be contributing to availability of food resources in Grant Creek. The project design could affect how and where these organisms enter the creek system.

Zooplankton There was no difference in the diversity of zooplankton between the Grant Lake sampling sites; there were a total of three orders of zooplankton identified at each site. The two factors that possibly illustrate best the availability of zooplankton as a possible food resource are population density and percent dominant taxa. The population density at the thermistor string site was 3.67 organisms per liter while the natural outlet site is nearly three times higher at 10.65 organisms per liter. This indicates that zooplankton in Grant Lake occur at higher concentrations in the natural outlet area. Rotifers dominate the zooplankton population, which is comprised of 99% and 97% rotifers at GLOut and GLTS sites, respectively.

Studies conducted in Grant Lake in the early 1980s show that rotifers were the dominant taxa found in Grant Lake, but that copepods also were abundant in large numbers (APA 1984). Copepods have been found to be the dominant food found in fish stomachs even when rotifers were the dominant organisms found in the water body (Bailey et al. 1975). Continued sampling in 2010 will help to better characterize zooplankton conditions in Grant Lake.

Phytoplankton Chlorophyll a Phytoplankton are free floating planktonic plants. Like most plants, phytoplankton thrive in areas with greater sunlight. The results of the chlorophyll *a* analysis show that there is greater concentration of these primary producers in the near surface water. Turbidity analysis and Secchi disc readings recorded during the water quality data collection indicate that sunlight does not penetrate much deeper than 7-10 ft. The area of the lake near the proposed intake and natural outlet of Grant Lake is predominantly shallow water. However, contrary to the results of the zooplankton sampling, concentrations of chlorophyll *a* were greater at the thermistor string site as compared the lake outlet site.

4 Water Resources

4.1 Introduction

Water quality and hydrology baseline studies were conducted in the summer of 2009 in support of the FERC permitting process for the proposed hydroelectric developments at Grant Lake. These baseline water resource studies included water quality and temperature studies on Grant Lake, Grant Creek, and Falls Creek, and studies of the hydrology of Grant Creek and Falls Creek. Baseline data collected during the 2009 field season (approximately mid June through mid October) are presented in this report.

4.2 Previous Studies

The hydroelectric potential at Grant Lake (Figure 2-1) has been evaluated several times as a potential power source for the Seward/Kenai Peninsula area. In 1954, R.W. Beck and Associates (cited by APA 1984) prepared a preliminary investigation and concluded that a project was feasible. The U.S. Geological Survey (USGS) conducted geologic investigations of proposed power sites at Cooper, Grant, Ptarmigan, and Crescent Lakes in the 1950s (Plafker 1955). In 1980 CH2M Hill (cited by APA, 1984) prepared a pre-feasibility study for a Grant Lake project and concluded that a project developed at the site would be feasible. The Grant Lake Project was referenced in the 1981 U.S. Army Corps of Engineers (USACE) National Hydroelectric Power Resources Study (USACE 1981). The most extensive study was performed by Ebasco Services, Inc. in 1984 for the Alaska Power Authority (now Alaska Energy Authority; APA 1984). Two of the alternatives evaluated by Ebasco included the diversion of adjacent Falls Creek into Grant Lake to provide additional water for power generation.

4.2.1 Grant Creek Water Quality

The USGS, USFS, USFWS, ADFG, and AEIDC have previously collected water quality data in Grant Creek. Water chemistry and physical data for Grant Creek were collected intermittently from 1950-1960 (Still 1976, 1980; USFWS 1961) and again in 1981-82 (AEIDC 1983). Previous studies show that the water quality in Grant Creek corresponds to that in Grant Lake. Such a correspondence would be expected when there appears to be little additional input to Grant Creek from tributaries.

4.2.2 Grant Lake Water Quality

Previous water quality studies have been conducted by the USGS, USFS, USFWS, ADFG, and AEIDC in Grant Lake. Water quality and temperature profiles were measured in Grant Lake in 1960, and again in 1981-1982 (Figure 4.2.1-1, AEIDC 1983). Four limnology sites were established in the Grant Lake basins (upper and lower) in 1983 and water quality data were collected during eight open water sampling events from June 1983 - September 1985 (Marcuson 1989; Figure 4.2.1-1).

4.2.3 Falls Creek Water Quality

Falls Creek is approximately 8 miles long and drains directly from the surrounding mountains being fed by numerous small tributaries. Previous studies conducted in the area by USFWS, USGS, and AEIDC have included water quality data collection in Falls Creek. The 1981-82 AEIDC study of Falls Creek collected information on water temperature, dissolved oxygen, salinity, trace metals, and pH among other analytes. Falls Creek was found to be generally colder and more turbid than Grant Creek. The source water for Falls Creek is different than that for Grant Creek and thus Falls Creek was found to have several differences in water quality from Grant Creek.

4.2.4 Grant Creek and Falls Creek Hydrology

Grant Lake, Grant Creek, and Falls Creek have been studied in the past for hydroelectric feasibility. Previous hydrologic investigations in the project area included:

- Historical Grant Creek stream gage data (USGS 15246000) – 11 years of continuous stream gage data from 1947-1958.
- Grant Lake Hydroelectric Project Detailed Feasibility Analysis, EBASCO, 1987 includes modeled Falls Creek data.
- Historical Falls Creek discharge data limited to several instantaneous discharge measurements made over various years including 1963-70, 1976, and 2007- 2008.

4.3 Study Goals and Objectives

This baseline report includes two studies: water quality and hydrology. Figure 4.3-1 provides the study area relevant to these two studies.

The primary goal of the 2009 water quality and hydrology study programs was to begin to characterize the water quality, temperature, and hydrology of Grant Creek, Falls Creek, and Grant Lake in support of the Instream Flow Study to begin in 2010 and the FERC licensing process. Goals included increasing the period of record for water quality parameters in these systems, analyzing relationships between and among them, and collecting surface water temperature data to support the Instream Flow Study.

4.3.1 Study Goals

The water quality study goals were:

- To gather data on a combination of water quality parameters in Grant Creek, Falls Creek, and Grant Lake
- To assess potentially limiting nutrient factors in the natural water conditions based on water quality samples
- To collect temperature data in Grant Lake to develop a temperature profile in the proposed intake area of the lake
- To collect temperature data in Grant Creek and Falls Creek to allow development of water temperature models

- To provide input to an Instream Flow Study and background information for Project environmental assessment

The hydrology study goals were:

- To increase the hydrologic period of record on Grant Creek and Falls Creek
- To provide input to an Instream Flow Study and background information for Project environmental assessment

4.3.2 Study Objectives

The water quality study goals were met by completing the following objectives:

- Collected baseline water quality information in Grant Lake near the natural outlet to the lake and near the proposed intake (GLOut and GLTS, respectively).
- Collected baseline water quality information in Grant Creek (GC100, CG200, GC300).
- Collected baseline water quality information in Falls Creek (FC100).
- Collected water temperature information in a vertical transect near the proposed intake in Grant Lake (GLTS).
- Collected continuously recorded surface water temperature data at four locations on Grant Creek to support the Instream Flow Study. Thermistors were located at GC100, GC250, and GC300, and temperature data were also collected at GC200 in conjunction with temperature data from the continually recording surface water elevation data.
- Build upon data collected in previous studies.

The hydrology study goals were met by completing the following objectives:

- Increased hydrologic period of record by collecting continuous stage data with the use of continually recording surface water elevation data loggers and staff gages installed on Grant Creek at the historical USGS location (GC200) and on Falls Creek at FC100.
- Correlate water surface elevation data, or stage data, to discharge through instantaneous measurements taken at the gauging locations.

The 2009 Grant Lake water quality and temperature data were collected between 10 June and 06 October; the 2009 hydrology and stream temperature data were collected between 09 June and 12 October.

4.4 Field Sampling Methods

4.4.1 Water Quality and Temperature

Water quality and temperature studies were performed in Grant Creek, Falls Creek, and Grant Lake. To consolidate efforts and to prevent the repetition of data collection these studies were performed in concert with the biological sampling of macroinvertebrates and periphyton in Grant Creek and zooplankton and phytoplankton in Grant Lake. Grant

Creek and Falls Creek temperature data collection efforts were often performed in concert with the hydrology sampling efforts.

Site Selection and Instrumentation Sites for water quality samples in Grant Creek and Falls Creek were selected to be co-located with temperature and hydrology study sites. One site on Falls Creek was established approximately 100 ft upstream of the railroad crossing at FC100, where surface water temperature and water surface elevation data were also collected. Three water quality sites were established on Grant Creek; GC100 is directly upstream of the distributary near the mouth of Grant Creek and is co-located with a temperature logging station, GC200 is located at the old USGS gage station where surface water temperature and water surface elevation data were also collected, and GC300 is located in the approximate location of the proposed powerhouse where temperature data were also being collected. Site GC250 is only a surface water temperature data collection site. Sites GC100, GC250, and GC300 had HOBO Pro V2 temperature data loggers installed to continually record water temperature measurements. Temperature data at FC100 and GC200 were logged with HOBO U20 Water Level Loggers in conjunction with hydrology water surface elevation data recording.

Study sites in Grant Lake were selected to focus on the natural outlet to Grant Creek (GLOut) and the general area of the proposed project intake (GLTS). One water quality site was established in each of these locations. The site near the proposed intake was established in a location in the lake that is approximately 20 meters deep. GLOut, near the natural outlet into Grant Creek, was established in an area where the lake depth is approximately 10 meters. Natural fluctuations in the lake level dictate that the actual lake depths at these two locations will vary slightly throughout each year. A thermistor string was installed and anchored at GLTS. The thermistor string was made up of HOBO Pro V2 temperature data loggers at 0.2 meters, 0.5 meters, 1.5 meters, and 3 meters below the lake surface and every three meters after that to a depth of approximately 20 meters; for a total of 10 data loggers.

Water Quality Sampling Water quality samples at the three Grant Creek and one Falls Creek sites were collected using one of three sampling techniques. Depth and width integrated sampling with a DH-81 sampler was conducted when it was necessary to collect water from multiple locations within the cross section of the creek. The DH-81 bottle collects one liter sub-samples; the bottle slowly fills as it is raised and lowered through the water column, enabling the collection of water from the entire depth of the water column. The sub-samples were mixed into one sampling bucket for a complete integration of water from the entire width and depth of the cross section. In the second technique, integrated grab samples were collected when the width of the stream was wide enough to require multiple subsamples from the cross section, but the flow was not deep enough to warrant depth integration. Integrated grab sampling was done by collecting multiple grab samples from across the creek and mixing them in a sampling bucket for one integrated sample. The third sampling technique, grab sampling, was used when the creek was too narrow and too shallow to warrant integrated sampling, or when the creek is very well mixed. In both cases, grab samples were collected from the most well mixed portion of the stream and transferred directly into the sample bottles.

Water quality samples in Grant Lake were collected using a Niskin bottle which allows collection of water at desired depths within the water column. Niskin samplers are designed to be locked open on both ends and lowered vertically into the water column to the desired depth. A messenger weight is then dropped down a line which triggers the bottle to close. The sampler was raised to the surface and water was transferred from the Niskin bottle to a sample bottle. At GLTS, samples were collected at three depths; surface, mid-depth (or just below the thermocline when present), and at one meter above the substrate. At GLOut, water samples were collected at two depths: surface and mid-depth. Water near the substrate was not collected at GLOut because the outlet of Grant Lake is only a few meters deep and collecting water quality data on the water flowing into Grant Creek was the goal when establishing this site.

Water quality samples collected in the creeks and in the lake were all analyzed at SGS Environmental Services in Anchorage, Alaska for the analytes listed in Table 4.1.

In addition to water quality samples sent to the laboratory for analysis, in-situ parameters were measured using a YSI 556 multi-parameter meter. In-situ parameters measured included: pH, dissolved oxygen, specific and relative conductivity, oxygen reduction potential, and temperature. These measurements were collected at each of the creek and lake water quality sampling sites. A four-meter cable was used to measure these parameters at each creek sampling site. The probe was placed in the flowing section of the stream and measurements were allowed to stabilize before readings were recorded. At the two lake sites a 20 meter cable, clearly marked at one-meter intervals, was used to collect in-situ measurements at one meter intervals in the water column.

Water Temperature Data Collection Water temperature data were collected in two ways in the creeks and in the lake. During each water quality sampling trip measurements of in-situ water quality parameters, including temperature, were collected using a YSI 556 multi-parameter meter. Temperature measurements at the creek sites were collected by placing the probe into the stream flow and allowing the temperature measurement to stabilize before recording. Instrument readings at the two lake sites were collected using a 20 meter cable calibrated at one meter intervals. The measurements were used to create a temperature profile at each lake sampling site.

Water temperatures at GC100, GC250, and GC300 were collected using HOBO Pro V2 temperature data loggers. Surface water temperatures at FC100 and GC200 were collected with HOBO U20 Water Level Loggers in conjunction with the hydrology data collection efforts. Data loggers at FC100, GC100, GC200, and GC250 were installed in June 2009. The thermistor at GC300 was installed in July 2009. Temperature readings were recorded every 15 minutes and data were used to create a temperature model for the creeks.

HOBO Pro V2 temperature data loggers were also used at the proposed intake site on Grant Lake. A thermistor string was installed in this location to a depth of 20 meters. Data loggers were attached to the string at depths of 0.2, 0.5, 1.5, 3, 6, 9, 12, 15, 18 and 19.5 meters. The data loggers were programmed to record every four hours. The thermistor string will remain in place and will continue to record at four hour intervals through the winter and throughout 2010. Temperature measurements from the thermistor string were used to create a temperature profile of the lake.

4.4.2 Hydrology

The 2009 Grant Creek and Falls Creek hydrology studies included measurements of surface water discharge coordinated with continuously recorded stage data on Grant Creek and Falls Creek.

Stream Gage Installation (Continuously Recording Data Logger) A stream gage consists of a staff gage and a continuous stage (CQ) data logger, each anchored individually to posts temporarily driven into the stream bed near the shoreline to avoid catching floating debris. HDR used HOBO U20 Water Level Loggers manufactured by Onset Computer Corporation to continuously record water temperature and pressure. Pressure is related to water surface elevation with post-processing and has an accuracy of 0.015 feet. The data loggers were set to record water depth and temperature at 15 minute intervals. Data loggers were installed in June and were removed in mid-October. The schedule for installation and removal is dependent on individual site conditions (e.g., ice cover and water level).

Each staff gage was 4 in wide by 4 ft long, mounted vertically on a post anchored in the stream bed. The data loggers were housed in a polyvinyl chloride (PVC) sleeve attached to post anchored in the streambed. A prefabricated 1 ft PVC housing was connected to the post at the channel bottom with steel clamps. Holes were drilled in the 1 ft long section of the PVC housing to allow unrestricted water pressure over the sensors. An additional 4 ft section of PVC was installed above the housing and connected to the post with steel clamps. Two data loggers were suspended on a stainless steel cable affixed to a screw cap at the top of the long PVC housing. One data logger was suspended approximately 1 in from the top of the PVC housing to record barometric pressure. The second data logger sat on a bolt passed through the bottom of the 1 ft PVC housing to record water pressure. This bolt was the survey reference point for the data logger elevation.

The staff gage installation and logger installation were placed far enough apart that the minor flow disturbances from one did not affect the other. Figure 4.4.2-1 shows a side view of the staff gage and data logger installation. The anchoring posts were approximately 6 ft long pieces of angle iron. Grant Creek and Falls Creek each had one stream gage at GC200 and FC100 (see Figure 4.4.2-1).

A differential vertical survey was performed for each of the data loggers and associated staff gages following installation and prior to removal in the fall. Cross sections at these locations are typically surveyed once per year. Due to high flows, the Grant Creek cross-section was not surveyed in 2009. Multiple temporary benchmarks at each stream gage location provide differential vertical datum checks for the gage equipment to monitor movement. The Grant Creek stream gage is tied into the elevation of the historical USGS gage. The Falls Creek stream gage is tied into the closest Alaska Department of Transportation and Public Facilities (ADOT&PF) control point because the historical USGS gauging site benchmarks were not relocated.

Data from the data loggers were downloaded periodically after installation until they were removed for the season in October.

Instantaneous Discharge Measurements Instantaneous discharge measurements from Grant Creek and Falls Creek in 2009 were obtained applying the following methods:

- Current meter method -Wading method
- Current meter method - Boat method (for medium flow on Grant Creek)

It was not possible to wade Grant Creek during high and medium summer and fall flows, making wading unfeasible for most of the open water season.

Instantaneous discharge measurements followed field procedures laid out in Rantz et al. (1982).

A Marsh McBirney Flo-Mate 2000 current meter and a top-setting wading rod were used for instantaneous discharge measurements. During high or fast water conditions a boat was employed to obtain one discharge measurement at GC200.

4.5 Results

4.5.1 Water Quality

In situ water quality parameters included temperature (°C), specific and relative conductivity, dissolved oxygen percent (D.O. %), dissolved oxygen (D.O. mg/L), pH, and turbidity. Table 4.1, lists parameters analyzed in samples submitted for laboratory analysis. Table 4.2 shows the results for all parameters.

Temperature In Grant Creek (sites GC100, GC200, and GC300) water temperatures ranged from 7.40°C to 9.44°C during June and from 11.26°C to 12.32°C in August during water quality sampling events. In Falls Creek (FC100) the temperature in June was 5.06°C and 7.31°C in August (Figure 4.5.1-1).

In Grant Lake there were two sites, GLTS and GLOut, where water quality samples were collected. At GLTS the temperatures ranged from 4.34°C at a depth of 20 m to 8.64°C at the surface during the June sampling event (Figure 4.5.1-2). During the August sampling event the temperatures ranged from 5.95°C at a depth of 18 m to 14.66°C at the surface. At GLOut in June the temperatures ranged from 7.09°C at a depth of 8 m to 7.95°C at the surface (Figure 4.5.1-3). In August the temperatures ranged from 8.28°C at a depth of 12 m to 14.87°C at the surface. Water temperatures decreased by early October and ranged from 4.7°C at a depth of 19.5 m to 8.9°C at the surface.

Temperature is recorded continuously at four locations along Grant Creek (GC100, GC200, GC250, and GC300) and at the stream gage on Falls Creek (FC100) (Figure 4.3-1). Temperature was recorded continuously at 10 intervals within the upper 20 meters at GLTS. Figure 4.5.1-4 shows temperature as recorded at each depth interval; Figure 4.5.1-5 shows temperature by depth at eight days evenly spaced throughout the recording period. Stream temperatures are illustrated in Figure 4.5.1-6. Temperature from the upper three meters of Grant Lake was compared to the temperature at stream gage GC200 in Figure 1.5.1-7.

Conductivity Specific conductivity at Grant Creek sampling sites ranged from 84 microSiemens per centimeter (µS/cm) to 89 µS/cm in June and was 87 µS/cm at all locations in August (Figure 4.5.1-8). The relative conductivity ranged from 64 µS/cm to

66 µS/cm in June and 64 µS/cm to 65 µS/cm in August (Figure 4.5.1-9). At GC200 during the June event the conductivity reading was unstable, therefore a measurement could not be recorded.

The Falls Creek specific conductivity was 76 µS/cm in June and 85 µS/cm in August. Relative conductivity was 46 µS/cm in June and 57 µS/cm in August.

At Grant Lake in June, conductivity readings at GLOut were not stable and a reading was not recorded. However, in August the specific conductivity ranged from 82 µS/cm to 140 µS/cm (Figure 4.5.1-10). The relative conductivity at the outlet ranged from 52 µS/cm to 77 µS/cm with the lower concentrations being in the lower depths and the higher concentrations being near the surface (Figure 4.5.1-11). At the thermistor string location on Grant Lake (GLTS) the specific conductivity in June ranged from 90 µS/cm at the surface to 92 µS/cm at depths of 19 and 20 m (Figure 4.5.1-12). In August, specific conductivity ranged from and 65 µS/cm at a depth of 16 m to 210 µS/cm at a depth of 5 m. However, the 210 µS/cm reading was somewhat unstable. During the June sampling event the conductivity reading was unstable at the depth of 2 m to 5 m and was unable to be obtained. Relative conductivity ranged from being 55 µS/cm at depths 16 to 20 m to 63 µS/cm near the surface in June (Figure 4.5.1-13). In August relative conductivity ranged from 41 µS/cm at a depth of 4 m to 156 µS/cm at 5 m. The 5 m depth reading was somewhat unstable.

Dissolved Oxygen Dissolved oxygen measurements recorded in 2009 are listed in Table 4.2. Measurements of concentrations of dissolved oxygen (DO) in Grant Creek ranged from 7.31 to 7.34 mg/L in June and from 8.22 to 8.40 mg/L in August (Table 4.2). Falls Creek measured DO values were 7.96 and 10.65 mg/L in June and August, respectively. Measurements of dissolved oxygen in Grant Lake study sites were relatively uniform throughout the entire depth profile during both sampling events. DO values measured in Grant Lake in June 2009 ranged from 7.20 to 7.96 mg/L, while August values were much lower at 5.57 to 6.05 mg/L. Both sets of data are lower than what would normally be expected in freshwater systems. Considering historical data for Grant Lake and Grant Creek (AEIDC 1983, APA 1984), it appears that the results are anomalous. This was most likely the result of instrument malfunction in the field (see Section 4.6).

pH The pH measurements in Grant Creek during the June sampling event ranged from 7.30 standard (STD) units to 7.66 STD units. In August, Grant Creek pH ranged from 7.39 STD units to 7.72 STD units (Figure 4.5.1-20). In Falls Creek the pH was 7.46 STD units at the sampling site in June and 7.15 STD units in August.

The pH at GLTS during the June sampling event ranged from 7.06 STD units at a depth of 19 m to 7.55 STD units at a depth of 6 m (Figure 4.5.1-21). In August the pH ranged from 7.04 STD units at a depth of 18 m to 7.56 STD units at the surface. At GLOut the pH ranged from 7.26 STD units at 1 m depth to 7.98 STD units at 5 m depth in June (Figure 4.5.1-22). In August the pH ranged from 7.07 STD units at a depth of 12 m to 7.47 STD units at a depth of 8 m.

Turbidity Turbidity in Grant Creek ranged from 0.75 NTU to 0.82 NTU during June (Figure 4.5.1-26). In August turbidity ranged from 10.10 NTU to 11.90 NTU. Falls Creek turbidity measured 8.17 NTU in June and 17.00 NTU in August.

Turbidity in Grant Lake at GLTS during June ranged from 0.55 NTU at 18 m depth to 0.90 NTU at 8 m depth (Figure 4.5.1-27). In August the range was 3.52 NTU at a depth of 8 m to 4.84 NTU at a depth of 17 m. At GLOut turbidity in June was 0.82 NTU at the surface and 0.90 NTU at 5 m depth. In August the turbidity was 4.18 NTU at the surface and 5.20 NTU at a depth of 6 m.

Water Quality Analytes The results of laboratory analysis of water samples from Grant Creek, Falls Creek, and Grant Lake for eight analytes are listed in Table 4.2.

Alkalinity Alkalinity in Grant Creek ranged from 24 to 25 mg/L calcium carbonate ($CaCO_3$) in June (Figure 4.5.1-28). In August it ranged from 23 to 23.5 mg/L $CaCO_3$. The alkalinity in Falls Creek was 37.4 mg/L $CaCO_3$ at the sampling site in June. In August the alkalinity was 21.0 mg/L $CaCO_3$.

Alkalinity concentrations at GLTS on Grant Lake ranged from 23.5 to 24.5 mg/L $CaCO_3$ in June and 24.6 to 25.4 mg/L $CaCO_3$ in August (Figure 4.5.1-29). The concentrations at GLOut in June were 23.2 and 23.8 mg/L $CaCO_3$. In August the concentrations were 24.0 mg/L $CaCO_3$ at both depths (Figure 4.5.1-30).

Total Lead Total lead (Pb) in June was detected in Grant Creek in a range of 0.392 to 3.090 microgram per Liter (µg/L) (Figure 4.5.1-31). In August it was not detected at any of the three Grant Creek sites. Pb was undetected in the Falls Creek sample for June However, in August total Pb was detected at the site at a concentration of 0.252 µg/L.

In Grant Lake total Pb was undetected at GLOut in both June and August. There was one detectable concentration at GLTS in June of 1.100 µg/L at a depth of 8 m, but no detectable total Pb at any other depths in June or at any depths in August (Figure 4.5.1-32).

Mercury Low level mercury (Hg) was not detected at any of the three sites in Grant Creek in June (Figure 4.5.1-33). In August it was detected at GC100 and GC200 with concentrations of 1.48 nanograms per Liter (ng/L) and 1.58 ng/L, respectively. At the Falls Creek location low level Hg was detected in both June and August. In June the concentration was 2.00 ng/L and in August 4.42 ng/L.

Low level Hg was not detected during the June sampling event in Grant Lake. However, during the August sampling event detectable concentrations appeared at both sites, at all depths. At GLTS low level Hg concentrations ranged from 1.15 ng/L to 1.65 ng/L (Figure 4.5.1-34). At GLOut concentrations in August were 1.4 ng/L and 2.05 ng/L (Figure 4.5.1-35).

Nitrate and Nitrite, Total Kjeldahl Nitrogen Nitrite plus nitrate was detected at all locations in June in Grant and Falls Creeks (Figure 4.5.1-36). The Grant Creek locations had concentrations that ranged from 0.416 mg/L to 0.461 mg/L in June. In August the concentrations ranged from 0.292 mg/L to 0.323 mg/L. In Falls Creek the concentration of nitrite plus nitrate was 0.145 mg/L during June sampling but was not detected in August. Total Kjeldahl Nitrogen was not detected at any location during either sampling event.

Nitrite plus nitrate concentrations during the June sampling event ranged from 0.410 mg/L to 0.421 mg/L at the GLTS site on Grant Lake (Figure 4.5.1-37). In August the concentrations ranged from 0.280 mg/L to 0.319 mg/L. In June the concentrations at GLOut were 0.414 mg/L and 0.651 mg/L (Figure 4.5.1-38). Total Kjeldahl Nitrogen was not detected at any sampling location during either sampling events.

Orthophosphate and Total Phosphorous Orthophosphate was not detected at any location during either sampling event. However, total phosphorous (P) was detected in June at GC300 at a concentration of 0.0233 mg/L (Figure 4.5.1-39). In August total P was not detected at any location in Grant Creek. Similarly, in June the total P concentration in Falls Creek was 0.0157 mg/L but was not detected in August.

On Grant Lake the only location that had a concentration of total P was at GLTS during the June sampling event with a concentration of 0.0218 mg/L (Figure 4.5.1-40).

Total Dissolved Solids The concentration of total dissolved solids (TDS) at Grant Creek locations during the June sampling event ranged from 53.8 mg/L to 60.0 mg/L and in August from 43.8 mg/L to 60.0 mg/L (Figure 4.5.1-41). The concentration in Falls Creek was 48.8 mg/L in June and 70.0 mg/L in August.

The concentration of TDS at GLTS on Grant Lake during the June sampling event ranged from 61.3 mg/L to 75.0 mg/L (Figure 4.5.1-42). In August the concentrations ranged from 45.0 mg/L to 48.8 mg/L. The concentrations at GLOut in June were 40.0 mg/L and 51.3 mg/L. In August the concentrations were 32.5 mg/L and 47.5 mg/L (Figure 4.5.1-43).

Total Suspended Solids Concentrations of total suspended solids (TSS) at Grant Creek sites during the June sampling event ranged from 0.700 mg/L to 0.800 mg/L (Figure 4.5.1-44). In August the concentrations ranged from 3.400 mg/L to 2.490 mg/L. In Falls Creek in June the concentration was 8.300 mg/L and 8.240 mg/L in August.

Analysis of samples collected in June showed TSS concentrations of 0.70 mg/L to 1.00 mg/L at the GLTS site on Grant Lake (Figure 4.5.1-45). In August the concentration range increased to 1.90 to 2.83 mg/L. At GLOut in June the concentrations were 0.50 mg/L and 0.60 mg/L (Figure 4.5.1-46). In August the concentrations increased to 1.96 mg/L and 2.77 mg/L.

4.5.2 Hydrology

Stream gages were installed on Falls Creek (FC100) and Grant Creek (GC200) on 09 June and 10 June of 2009, respectively. Continuous stage data was recorded at these locations until 12 October 2009.

The stream gages were surveyed with respect to pre-established vertical elevation datum. GC200 was surveyed with respect to the USGS Gage station 15246000 gage height elevations for comparison with historical data. FC100 gage elevations were surveyed with respect to the closest ADOTP&F reference point (CP #131, in ft MSL 1929 NGVD).

Continuous stage data recorded from 10 June though 12 October at GC200 is presented in Figure 4.5.2-1. The water level recorded as pressure has been converted to ft with respect to the USGS gage height. The actual recorded water surface elevations at 15-minute intervals are displayed in the finer light blue colored line, which generally exhibit the daily fluctuation. The thick, dark blue colored line represents mean daily water surface elevations. The aqua colored circles represent field staff gage observations. Error bars are indicated where a fluctuation in water level was recorded at the time of the staff gage reading. Staff gage readings, without discharge measurements are recorded as an additional point of comparison to the electronic record. Only one discharge measurement was completed during the period displayed. The discharge on 22 June 2009 was measured at 423 cfs by the current meter method, employing a boat as described above. Three instantaneous discharge measurements were obtained in the fall of 2008, which are not accompanied by a continuous record. These measurements are as follows:

- 126 cfs | 04 October 2008
- 108 cfs | 23 October 2008
- 47 cfs | 03 December 2008

Continuous stage data recorded from 09 June though 12 October 2009 at FC100 is presented in Figure 4.5.2-2. The following two discharge measurements were made in the fall of 2008:

- 22 cfs | 05 October 2008
- 14 cfs | 24 October 2008

4.6 Discussion

4.6.1 Water Temperature and Water Quality

Stream temperatures were typical for Alaskan streams and were consistent with seasonal changes; temperatures were lower during the June sampling event compared to the August sampling event (Table 4.2). As expected, temperatures in Grant Creek increased downstream, reflecting gradual warming due to contact with air and sun in the shallow, turbulent stream. The historical data for Grant and Falls Creek do not show continuous temperature data for June in any year. However, in 1958 there was a recorded temperature of 10.5 °C at the USGS gage site (USFWS 1961), which was somewhat lower than that measured in 2009.

The water temperature measurements recorded during water sampling events at Grant Lake also changed seasonally. At the outlet of Grant Lake (GLOut) water temperature did not vary widely by depth during the month of June. The difference between temperatures near the surface and at depth was greater in August (Figure 4.5.1-3).

The surface temperature at the Grant Lake thermistor string during the June sampling event was approximately 6 °C colder than during the August sampling event. During the June event the temperature profile showed fairly uniform temperatures with some increase near the surface. During the August sampling event the temperature was higher at the surface than throughout the rest of the depth profile. However, temperature began to decrease near a depth of 9 m, possibly suggesting thermal stratification. By the end of September the water column was approximately 9 °C from the surface to a depth of 14 m, where the temperature decreased to closer to 7 °C at 19.5 m depth.

The continuous Grant Lake temperature record reflects stratified temperatures. At GLTS there appears to be some thermocline formation from late July through early September with the top 6 m having relatively uniform temperatures (Figure 4.5.1-5). The greatest difference in daily mean temperature across the entire depth profile is in mid-July, as shown in Figure 4.5.1-5. The maximum daily mean temperature observed at 19.5 m depth was 14.76 °C on 19 July. Surficial daily mean temperatures at 0.2 meters depth range from: 7.48 °C on 10 June to 15.59 °C on 08 July. The water surface temperatures decrease by the end of September with signs of lake turnover. The stream temperature trends of Grant Creek are very similar to temperatures found in the upper 3 m of Grant Lake.

The conductivity values measured in Grant Creek and Grant Lake during the 2009 sampling season are consistent with the historical data from the 1960s and 1980s (Table 4.2; USFWS 1961, AEIDC 1983). The conductivity meter readings at GC200 during the June sampling event were unstable and were not recorded. Although meters were calibrated daily, these unstable readings could be due to equipment failure in the field. Conductivity measurements will be monitored closely during future sampling events, and a separate backup meter will be onsite for quality control in the event that measurements are questionable.

Results of the Falls Creek conductivity measurements in 2009 were typical of freshwater streams (APHA 2005) and were found to be similar to the Falls Creek conductivity measurements collected during previous studies (USFWS 1961, AEIDC 1983). In the 1980s the relative conductivity ranged from 45 to 150 µS/cm (AEIDC 1983). The highest reading in 2009 was 57 µS/cm. In 1960 the relative conductivity was measured at 94 µS/cm (USFWS 1961).

Measurements of concentrations of dissolved oxygen (DO) in Grant Creek ranged from 7.31 to 7.34 mg/L in June and from 8.22 to 8.40 mg/L in August (Table 4.2). Falls Creek DO measurements were 7.96 and 10.65 mg/L in June and August, respectively. Measurements of dissolved oxygen in Grant Lake study sites were relatively uniform throughout the entire depth profile during both sampling events. DO values measured in Grant Lake in June 2009 ranged from 7.20 to 7.96 mg/L, while August values were much lower at 5.57 to 6.05 mg/L. Both sets of data are lower than what would normally be expected in freshwater systems. For example, DO at 10 °C is normally expected to be approximately 11.29 mg/L (APHA 2005). The historical DO concentrations were also much higher than any concentrations found during 2009 at Grant Lake locations. In 1981 and 1982 DO concentrations ranged from 9.75 to 14 mg/L (AEIDC 1983). The highest concentration observed in 2009 was 7.96 mg/L. Although meters were calibrated on a daily basis, it is possible that the low DO measurements were the result of equipment malfunction in the field. DO measurements will be monitored closely in the field during future sampling events and will be checked with a backup meter if necessary.

The range of pH at all sampling sites and all depths was between 7.04 and 7.98 STD units, and were well within the neutral range for freshwaters (APHA 2005).

Due to the glacial origins of meltwater in the project area, turbidity results could be expected to be somewhat higher than typical freshwater conditions. Turbidity measured in Grant Lake in 1981 and 1982 ranged from 0.24 to 3.8 NTU (AEIDC 1983); results that are similar to data collected in 2009 (0.55 to 5.20 NTU). Grant Creek turbidity readings in 2009 ranged from 10.1 to 11.9 NTU, which are higher than historical turbidity results from the 1980s (0.35 to 1.1 NTU) (AEIDC 1983). Falls Creek historical readings ranged from 0.37 to 6.0 NTU (USFWS 1961, AEIDC 1983), while 2009 readings were 8.17 to 17.00 NTU. Additional data collected during the course of the baseline studies will be examined to determine trends in turbidity values.

Alkalinity in Falls Creek was found to be 37.4 mg/L CaCO3 in June and 21.0 mg/L CaCO3 in August of 2009, and these results are also similar to the results of the 1960s and the 1980s measurements (USFWS 1961, AEIDC 1983).

The results of the 2009 sampling for TDS in Grant Creek range from 53.8 to 62.5 mg/L (Table 4.3). The historical TDS concentrations at Grant Creek ranged from 31 mg/L in June 1982 to 84 mg/L in March 1982 (AEIDC 1983), indicating that this system can be dynamic and that higher concentrations can occur. Falls Creek historical TDS concentrations ranged from 24 mg/L in June 1982 to 60 mg/L in October 1981 (AEIDC 1983), similar to what was found in 2009 (48 to 70 mg/L).

Grant Lake historical TDS concentrations ranged from 33 mg/L in June 1982 to 87 mg/L in March 1982 (AEIDC 1983). This range is similar to the range of concentrations that were found in 2009 (32.5 to 75 mg.L).

The TSS concentrations in Grant Creek and Grant Lake were relatively low. Grant Creek historical data for TSS concentrations ranged from 0.6 mg/L in October 1981 to 4.3 mg/L in August 1982 (AEIDC 1983). These concentrations are consistent with the concentrations found in 2009 (Table 4.3).

Falls Creek TSS concentrations were higher than the concentrations found in Grant Creek, but were within expectations based on previous studies. The historical data has a very wide range with non-detectable concentrations at the low end of the range and the highest at 86 mg/L (AEIDC 1983). During the 2009 sampling, the concentrations were 8.30 mg/L in June and 8.24 mg/L in August. These concentrations show more of a consistent suspended load than those found in the 1980s.

Results of the following laboratory tests in 2009 were either not detected, or were detected in low levels: low-level mercury, lead, nitrates/nitrites, orthophosphates, and phosphorous. The lack of, or minimal amounts of nutrients in the samples indicate that the system may be nutrient-limited and is oligotrophic (Table 4.3). Future studies will further characterize the water quality conditions of these waterbodies.

4.6.2 Hydrology

The range of the dataset shown in Figure 4.5.2-1 for GC200 indicates two peak flows, one receding in early June driven by spring melt-water and another driven by warm summer temperatures in July. The trends reflected in 2009 are consistent with the mean monthly flow distribution from the USGS data (period of record 1947-1958). The same peaks are shown during the same time period for FC100 (Figure 4.5.2-2). A smaller set of peaks and a low-flow event in September were evident in both creeks and resulted from rain events followed by a cooling trend in air temperatures.

The GC200 and FC100 water surface elevation plots show that the staff gage readings do not always correspond with the logged water surface elevations for many of the staff gage readings. These results suggest that a larger data logger stilling well should be employed in 2010 in order to reduce the data variability, or noise, recorded in 2009 that was likely caused by stream turbulence and high stream velocities.

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6 Notes

7 Tables

Table 3.1 Angling effort (hours)

Reach	1	2	3	4	5[b]	Total
June	6.00	6.00	6.33	4.55[a]	3.00	25.88
July	6.00	6.00	6.00	6.00	3.00	27.00
August	6.07	5.95	6.18	6.45	3.65	28.30
September	2.05	1.99	2.03	2.12	1	9.64
Total	20.12	19.94	20.54	19.12	10.65	90.82

[a] One less angling site
[b] Two less angling sites

Table 3.2 Minnow trapping effort (trap hours)

Reach	1	2	3[b]	4[a]	5[c]	6[d]	Total
June	200.95	230.07	190.18	183.48		103.87	908.55
July	295.97	263.53	372.40	219.33	77.20		1,228.43
August	182.00	226.25	271.92	201.60	49.18	105.42	1,036.37
September	278.65	270.42	312.77	221.03	76.2		1159.07
Total	957.57	990.27	1147.27	825.45	202.58	209.28	4,332.42

[a] Reach 4 had one less minnow trap than other reaches.
[b] Reach 3 had three more minnow traps in August.
[c] Reach 5 had three minnow traps.
[d] Reach 6 had five minnow traps.

Table 3.3 Catch table by gear type, Grant Creek

Species	Scientific Name	Number of Fish
Angling		
Rainbow trout	*Oncorhynchus mykiss*	72
Dolly Varden	*Salvelinus malma*	14
Arctic grayling	*Thymallus arcticus*	1
Sockeye salmon	*Oncorhynchus nerka*	3
Total		90
Minnow Trapping		
Chinook salmon	*Oncorhynchus tshawytscha*	191
Coho Salmon	*Oncorhynchus kisutch*	776
Dolly Varden	*Salvelinus malma*	925
Rainbow trout	*Oncorhynchus mykiss*	82
Sockeye Salmon	*Oncorhynchus nerka*	2
Sculpin	*Cottus* spp.	22
Threespine stickleback	*Gasterosteus aculeatus*	83
Total		2,081
Electrofishing		
Chinook Salmon	*Oncorhynchus tshawytscha*	20
Coho Salmon	*Oncorhynchus kisutch*	59
Dolly Varden	*Salvelinus malma*	43
Rainbow Trout	*Oncorhynchus mykiss*	19
Sockeye Salmon	*Oncorhynchus nerka*	6
Sculpin	*Cottus* spp.	16
Threespine Stickleback	*Gasterosteus aculeatus*	4
Total		**167**

Table 3.4 Number of rainbow trout recaptures by survey date and total number of rainbow trout

Survey Date	Total number of rainbow trout marked to date	Number of recaptures
6/2/2009	2	0
6/3/2009	5	0
6/12/2009	10	3
6/22/2009	13	0
7/1/2009	18	1
7/11/2009	18	0
7/21/2009	23	1
8/12/2009	36	2
8/22/2009	52	0
8/29/2009	68	1
9/10/2009	72	1

Table 3.5 Spawning survey results by species and survey date

Survey Date	Species		
	Chinook	Sockeye	Coho
8/1/2009	0	0	0
8/10/2009	4	2	0
8/13/2009	19	1	0
8/23/2009	62	6	0
8/30/2009	31	545	0
9/11/2009	0	1351	0
9/16/2009	0	1188	0
9/29/2009	0	78	6

Table 3.6 General description of microhabitat sample areas surveyed in June 2009

Sample Site Locations	Sample Areas	Typical Characteristics
Main Channel		
	Pool/fastwater	Deep and fast, typically midchannel
	Riffle/fastwater	Fast, typically michannel and margins
	Margin with undercut bank	Stream margin with undercut bank; typically along fastwater in main channel
	Margin without undercut bank	Stream margin with no undercut bank; typically along fastwater in main channel
	LWD dam	LWD creates velocity break (site in Reach 1)
	Margin shelf with LWD	Shallow, wide stream margin with some overhanging vegetation or other instream cover
Backwater/Slough Areas		
	Backwater pool/ slough	Large backwater/low velocity areas, can be located along stream margin near velocity break
	Backwater pocket	Small backwater/low velocity areas, can be located along stream margin near velocity break
Other Channels		
	Distributary channel	Variable microhabitat and depth/flow regimes, all microhabitats present (Reach 1)
	Secondary channel	Typically includes margins with undercut bank, margins without undercut bank, and faster velocity areas in the midchannel. (Reach 3)
	Tertiary channel	Variable microhabitats (Reach 3)

Table 3.7 Benthic Macroinvertebrates – Grant Creek, August 2009					
Site	**Date**	**Sample Type**	**Order**	**Family**	**Genus**
GC100	**8/6/2009**	**Surber**			
			Ephemeroptera	Ameletidae	Ameletus
				Baetidae	Unidentified
					Acentrella
					Baetis
				Ephemerellidae	Drunella
					Ephemerella
				Heptegeniidae	Cinygmula
					Epeorus
			Plecoptera	Chloroperlidae	Unidentified
					Haploperla
					Neaviperla
					Plumiperla
				Nemouridae	Zapada
				Perlodidae	Isoperla
			Trichoptera	Brachycentridae	Brachycentrus
				Glossosomatidae	Glossosoma
				Hydropsychidae	Arctopsyche
				Limnephilidae	Moselyana
			Diptera	Chironomidae	Unidentified
				Empididae	Unidentified
					Chelifera
					Clinocera
				Simuliidae	Simullium
			Bivalvia (Class)	Sphaeriidae	Unidentified
			Gastropoda (class)	Lymnaeidae	Lymnaea
			Arachnida (Class)	Hydracarina (Sub-Order)	Unidentified
			Oligochaeta (Class)	Unidentified	
			Nemotoda (Phylum)	Unidentified	
			Crustacea (Phylum)	Ostracoda (Class)	Unidentified
GC100	**8/6/2009**	**ASCI**			
			Ephemeroptera	Baetidae	Unidentified
				Ephemerellidae	Ephemerella
				Heptageniidae	Cinygmula
					Epeorus
			Plecoptera	Nemouridae	Zapada
				Perlodidae	Isoperla
			Trichoptera	Glossosomatidae	Glossosoma
			Diptera	Chironomidae	Unidentified
			Bivalvia (Class)	Sphaeriidae	Unidentified
			Arachnida (Class)	Hydracarina (Sub-Order)	Unidentified
GC300	**8/6/2009**	**Surber**			
			Ephemeroptera	Baetidae	Acentrella
					Baetis
				Ephemerellidae	Drunella
					Ephemerella

Table 3.7 Benthic Macroinvertebrates – Grant Creek, August 2009					
Site	**Date**	**Sample Type**	**Order**	**Family**	**Genus**
				Heptegeniidae	Cinygmula
					Epeorus
			Plecoptera	Chloroperlidae	Unidentified
					Haploperla
					Neaviperla
					Plumiperla
					Triznaka
					Suwallia
				Nemouridae	Zapada
				Perlodidae	Isoperla
			Trichoptera	Brachycentridae	Brachycentrus
					Microsema
				Glossosomatidae	Glossosoma
				Hydropsychidae	Arctopsyche
				Limnephilidae	Ecclisomyia
				Rhyacophilidae	Rhyacophila
			Diptera	Chironomidae	Unidentified
				Empididae	Chelifera
					Clinocera
				Simuliidae	Simullium
			Bivalvia (Class)	Sphaeriidae	Unidentified
			Gastropoda	Unidentified	
			Arachnida (Class)	Hydracarina (Sub-Order)	Unidentified
			Oligochaeta (Class)	Unidentified	
GC300	**8/6/2009**	**ASCI**			
			Ephemeroptera	Ephemerellidae	Ephemerella
			Plecoptera	Chloroperlidae	Plumiperla
				Perlodidae	Isoperla
			Trichoptera	Brachycentridae	Brachycentrus
			Diptera	Chironomidae	Unidentified
				Empididae	Chelifera
					Clinocera
				Simuliidae	Simullium
			Gastropoda	Lymnaeidae	Lymnaea
				Planorbidae	Unidentified
			Bivalvia (Class)	Sphaeriidae	Unidentified
			Arachnida (Class)	Hydracarina (Sub-Order)	Unidentified

Table 3.8 Benthic Macroinvertebrates Metrics – Grant Creek, 2009

Site	Date	Sample Type	Metric	Result
GC100	8/6/2009	Surber (average of 5 pseudo-replicates)	Population Density	148.4 organisms per 0.1 m^2
			% EPT	7.72%
			Taxa Diversity	18.6
			% Dominant Taxa	85% (chironomidae)
		ASCI	Population Density	274 organisms per 0.1 m^2
			% EPT	1.90%
			Taxa Diversity	10
			% Dominant Taxa	83% (Bivalvia)
			HBI[1]	7.5
			Habitat Assessment[2]	200
GC300	8/6/2009	Surber (average of 5 pseudo-replicates)	Population Density	98.8 organisms per 0.1 m^2
			% EPT	31.49%
			Taxa Diversity	15.2
			% Dominant Taxa	48% (chironomidae)
		ASCI	Population Density	53 organisms per 0.1 m^2
			% EPT	3.59%
			Taxa Diversity	12
			% Dominant Taxa	78% (Bivalvia)
			HBI[1]	7.1
			Habitat Assessment[2]	190

1) HBI = Habitat Biotic Index – scale from 0-10 with 10 indicating highly impaired water bodies

2) Habitat Assessment – scale of 0-200 with 0 being the most impaired macroinvertebrate habitat

Table 3.9 Catch table by gear type, Grant Lake

Species	Scientific Name	Number
Electrofishing		
Sculpin	*Cottus* spp.	18
Threespine stickleback	*Gasterosteus aculeatus*	6
Total		**24**
Gill netting		
Threespine stickleback	*Gasterosteus aculeatus*	4
Total		4
Minnow trapping		
Sculpin	*Cottus* spp.	79
Threespine stickleback	*Gasterosteus aculeatus*	4,798
Total		**4,877**

Table 3.10 Zooplankton, Grant Lake, August 2009

Site	Date	Taxa	# of Organisms	% of Population
GLOut	**8/07/09**			
		Rotifer	1037	98.85
		Copepoda	4	0.38
		Protozoa	8	0.76
GLTS	**8/07/09**			
		Rotifer	553	96.68
		Copepoda	9	1.57
		Protozoa	10	1.75

Table 3.11 Chlorophyll *a* concentrations in Grant Lake and Grant Creek, August 2009

Site	Date	Sample Type	Run Number	Chlorophyll *a* Concentration * mg/M^3
GC100	**8/06/09**	**Periphyton**		
			1	12.50
			2	51.50
			3	16.80
			4	15.00
			5	40.10
			6	19.80
			7	37.60
			8	82.00
			9	7.48
			10	65.10
			Average	**34.79**
GC300	**8/06/09**	**Periphyton**		
			1	19.00
			2	4.54
			3	8.28
			4	10.70
			5	2.94
			6	4.81
			7	5.87
			8	36.00
			9	23.20
			10	11.70
			Average	**12.70**
GLOut	**8/07/09**	**Phytoplankton**		
			1 (surface)	1.07
			2 (mid-depth)	0.80
			Average	**0.94**
GLTS	**8/07/09**	**Phytoplankton**		
			1 (surface)	1.34
			2 (mid-depth)	1.34
			3 (bottom)	0.53
			Average	**1.07**

* Rounded to two decimal places

Table 4.1 Water Quality Parameters

Parameter	Units
Alkalinity (CaCO3)	mg/L
Total dissolved solids (TDS)	mg/L
Total suspended sediment (TSS)	mg/L
Kjeldahl Nitrogen	mg/L
Nitrate/Nitrite	mg/L
Orthophosphate	mg/L
Total phosphorous	mg/L
Lead	µg/L
pH	STD
Temperature	°C
Dissolved oxygen (DO)	mg/L, %
Specific and Relative Conductivity	mS/cm, µS/cm
Oxygen Reduction Potential (ORP)	mV
Turbidity	NTU
Low level mercury	ng/L

Table 4.2 Water Quality Parameters Measured In-Situ at Grant Lake, Grant Creek, and Falls Creek, June and August 2009

Site Name	Date	Depth (m)	Temp (°C)	Specific Conductivity (µS/cm)	Relative Conductivity (µS/cm)	DO* (%)	DO* (mg/L)	pH	Turbidity* (NTU)	Notes
FC100	6/9/2009		5.06	76	46	68.0	7.96	7.46	8.17	
FC100	8/5/2009		7.31	85	57	88.3	10.65	7.15	17.00	
GC100	6/9/2009		9.44	84	57	68.7	7.85	7.39	0.77	
GC100	8/6/2009		12.32	87	66	77.5	8.29	7.40	10.10	
GC200	6/11/2009		7.40			60.9	7.31	7.66	0.75	**
GC200	8/6/2009		11.26	87	64	75.1	8.22	7.39	11.10	
GC300	6/11/2009		7.47	89	64	61.3	7.34	7.30	0.82	**
GC300	8/6/2009		11.49	87	65	77.1	8.40	7.72	11.90	
GLOut	6/11/2009	0	7.95			64.4	7.64	7.27	0.82	**
GLOut	6/11/2009	1	7.90			64.3	7.61	7.26		**
GLOut	6/11/2009	2	7.52			63.8	7.63	7.29		**
GLOut	6/11/2009	3	7.37			63.8	7.67	7.32		**
GLOut	6/11/2009	4	7.27			63.8	7.70	7.37		**
GLOut	6/11/2009	5	7.39			64.1	7.73	7.98	0.90	**
GLOut	6/11/2009	6	7.23			64.0	7.72	7.45		**
GLOut	6/11/2009	7	7.17			63.5	7.67	7.43		**
GLOut	6/11/2009	8	7.09			63.1	7.63	7.41		**
GLOut	8/7/2009	0	14.87	88	71	55.2	5.57	7.24	4.18	
GLOut	8/7/2009	1	13.30	87	67	54.3	5.68	7.24		
GLOut	8/7/2009	2	12.70	140	77	53.9	5.63	7.30		**
GLOut	8/7/2009	3	12.35	89	61	53.1	5.66	7.31		
GLOut	8/7/2009	4	11.99	88	68	52.5	5.65	7.31		
GLOut	8/7/2009	5	11.62	90	67	52.6	5.71	7.25		
GLOut	8/7/2009	6	11.49	91	57	52.3	5.71	7.24	5.20	
GLOut	8/7/2009	7	11.11	82	60	51.9	5.70	7.22		
GLOut	8/7/2009	8	11.02	89	65	51.5	5.69	7.47		
GLOut	8/7/2009	9	10.59	85	62	50.9	5.67	7.38		
GLOut	8/7/2009	10	9.76	85	60	50.1	5.68	7.35		
GLOut	8/7/2009	11	10.01	88	62	50.9	5.75	7.34		
GLOut	8/7/2009	12	8.28	82	52	50.5	5.95	7.07		
GLTS	6/11/2009	0	8.64	90	63	68.4	7.96	7.43	0.64	
GLTS	6/11/2009	1	8.09	90	63	66.2	7.80	7.35		**
GLTS	6/11/2009	2	7.32			65.4	7.86	7.30		**
GLTS	6/11/2009	3	6.93			64.4	7.84	7.30		**
GLTS	6/11/2009	4	6.83			64.3	7.83	7.30		**
GLTS	6/11/2009	5	6.31			63.7	7.86	7.31		**
GLTS	6/11/2009	6	6.04	91	58	63.5	7.89	7.55		
GLTS	6/11/2009	7	5.83	90	57	62.7	7.83	7.49		
GLTS	6/11/2009	8	5.80	91	57	62.3	7.81	7.49	0.90	
GLTS	6/11/2009	9	5.66	91	57	62.0	7.80	7.49		
GLTS	6/11/2009	10	5.41	91	57	61.3	7.74	7.49		
GLTS	6/11/2009	11	5.32	91	57	60.7	7.70	7.47		
GLTS	6/11/2009	12	5.05	91	56	60.1	7.65	7.47		
GLTS	6/11/2009	13	4.87	91	56	59.2	7.58	7.45		
GLTS	6/11/2009	14	4.68	91	56	58.6	7.51	7.42		
GLTS	6/11/2009	15	4.52	91	56	58.0	7.49	7.42		
GLTS	6/11/2009	16	4.43	91	55	57.0	7.37	7.08		
GLTS	6/11/2009	17	4.38	91	55	56.3	7.30	7.41		
GLTS	6/11/2009	18	4.35	91	55	55.8	7.25	7.38	0.55	

Table 4.2 (cont.) Water Quality Parameters Measured In-Situ at Grant Lake, Grant Creek, and Falls Creek, June and August 2009

Site Name	Date	Depth (m)	Temperature (°C)	Specific Conductivity (µS/cm)	Relative Conductivity (µS/cm)	DO* (%)	DO* (mg/L)	pH	Turbidity* (NTU)	Notes
GLTS	6/11/2009	19	4.33	92	55	55.5	7.20	7.06		
GLTS	6/11/2009	20	4.34	92	55	55.6	7.22	7.36		
GLTS	8/7/2009	0	14.66	87	70	56.2	5.63	7.56	3.87	
GLTS	8/7/2009	1	13.07	89	67	54.5	5.72	7.30		
GLTS	8/7/2009	2	12.65	89	69	53.3	5.65	7.35		
GLTS	8/7/2009	3	12.16	87	66	52.9	5.69	7.31		
GLTS	8/7/2009	4	11.95	73	41	53.7	5.80	7.25		
GLTS	8/7/2009	5	11.67	210	156	53.6	5.80	7.26		**
GLTS	8/7/2009	6	11.23	81	63	52.8	5.80	7.21		
GLTS	8/7/2009	7	10.92	86	67	52.4	5.78	7.22		
GLTS	8/7/2009	8	10.71	85	68	52.4	5.81	7.25	3.52	
GLTS	8/7/2009	9	10.37	92	82	52.1	5.82	7.20		
GLTS	8/7/2009	10	9.70	97	67	50.8	5.76	7.16		
GLTS	8/7/2009	11	9.17	87	60	51.9	5.97	7.18		
GLTS	8/7/2009	12	8.71	77	88	51.1	5.94	7.08		
GLTS	8/7/2009	13	8.46	63	43	51.1	5.97	7.13		
GLTS	8/7/2009	14	7.91	89	80	50.6	6.00	7.13		
GLTS	8/7/2009	15	7.00	91	91	49.8	6.05	7.12		
GLTS	8/7/2009	16	6.90	65	89	49.3	5.99	7.07		
GLTS	8/7/2009	17	6.09	96	62	48.4	5.99	7.06	4.84	
GLTS	8/7/2009	18	5.95	87	61	48.0	5.98	7.04		

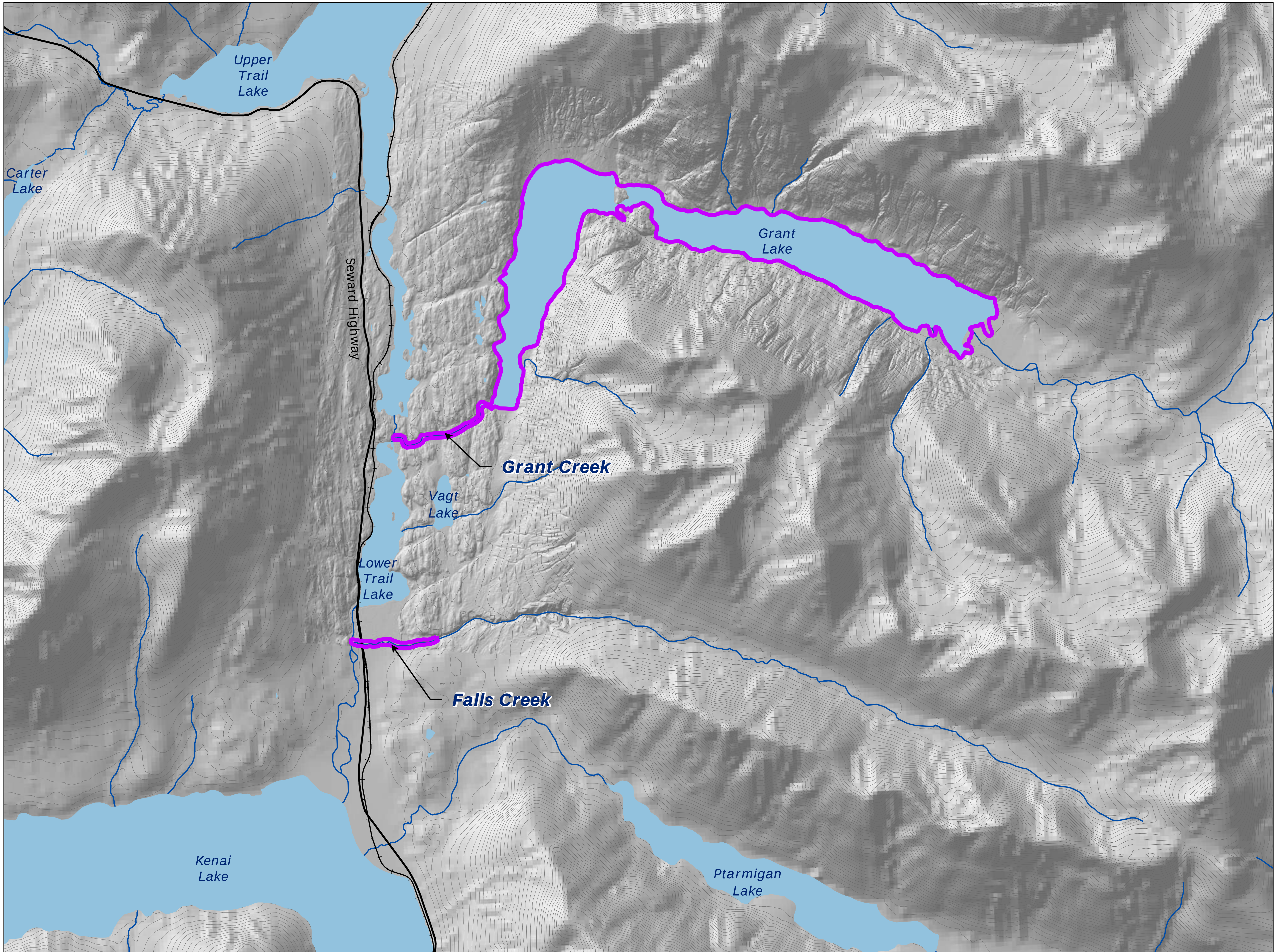
*= Turbidity was only measured at certain depths at the lake sites.

**= Conductivity reading unstable.

Table 4.3 Water Quality Analysis Results for Grant Lake, Grant Creek, and Falls Creek, June and August, 2009

Site Name	Alk (mg/L $CaCO_3$)		Total Pb (µg/L)		Hg (ng/L)		NO_2+NO_3		PO_4 (mg/L)		TDS (mg/L)		TKN (mg/L)		Total P (mg/L)		TSS (mg/L)	
	Jun	*Aug*	*Jun*	*Aug*	*Jun*	*Aug*	*Jun*	*Aug*	*Jun*	*Aug*	*Jun*	*Aug*	*Jun*	*Aug*	*Jun*	*Aug*	*Jun*	*Aug*
GLTSBOT	24.0	25.4	ND	ND	ND	1.65	0.410	0.319	ND	ND	61.3	45.0	ND	ND	ND	ND	0.80	2.83
GLTSMID	24.5	24.6	1.100	ND	ND	1.64	0.421	0.303	ND	ND	68.8	48.8	ND	ND	0.0218	ND	1.00	2.58
GLTSSUR	23.5	24.8	ND	ND	ND	1.15	0.415	0.280	ND	ND	75.0	46.3	ND	ND	ND	ND	0.70	1.90
GLOUTSUR	23.8	24.0	ND	ND	ND	1.4	0.414	0.268	ND	ND	51.3	32.5	ND	ND	ND	ND	0.60	1.96
GLOUTMID	23.2	24.0	ND	ND	ND	2.05	0.651	0.298	ND	ND	40.0	47.5	ND	ND	ND	ND	0.50	2.77
FC100	37.4	21.0	ND	0.252	2.00	4.42	0.145	ND	ND	ND	48.8	70.0	ND	ND	0.0157	ND	8.30	8.24
GC100	24.0	23.0	0.597	ND	ND	1.48	0.461	0.299	ND	ND	53.8	62.5	ND	ND	ND	ND	0.70	2.49
GC200	25.0	23.5	3.090	ND	ND	1.58	0.455	0.292	ND	ND	60.0	43.8	ND	ND	ND	ND	0.80	3.40
GC300	25.0	23.0	0.392	ND	ND	2.05	0.416	0.323	ND	ND	57.5	60.0	ND	ND	0.0233	ND	0.80	2.93

8 Figures



2009 Fish and Aquatic Resources

Study Area

Legend

- Study Area
- Rail
- Seward Highway
- Lakes
- Rivers
- Contours (10 ft)

NORTH

Miles

0 0.5 1

Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR, KPB, USFS
Author: HDR Alaska, Inc.
Date: 07 October 2009

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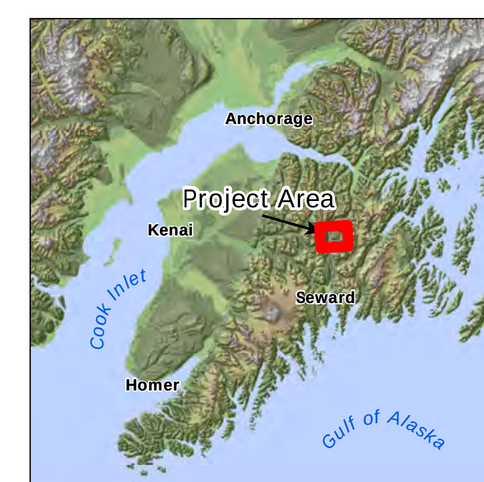
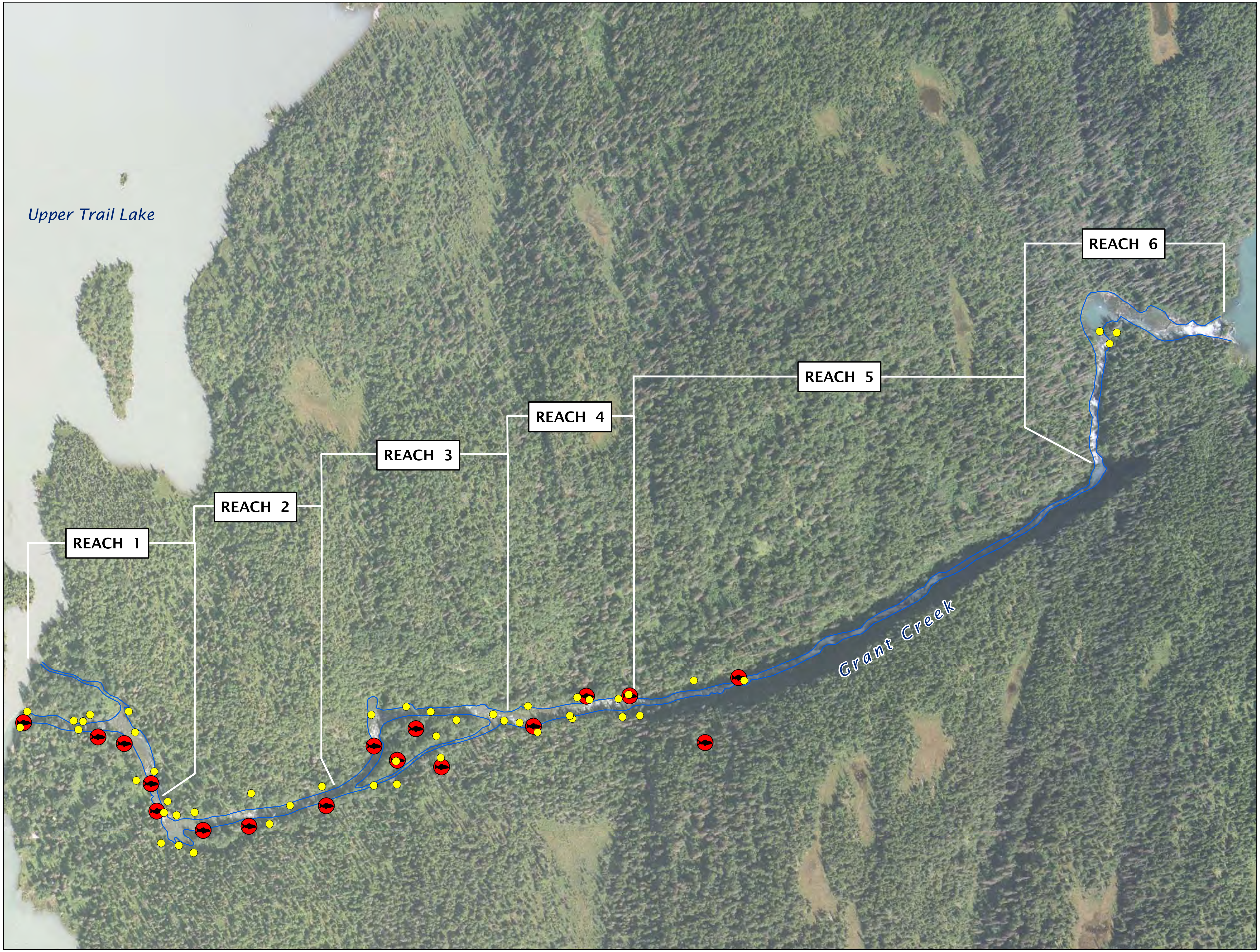


Figure 3.4.1-1



Fisheries Field Studies

2009 Grant Creek Sampling Sites and Reaches

Legend

Minnow Trap / Efish Site

Angling Site

Grant Creek Wetted Edge

NORTH

Feet

0 250 500

Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR Alaska, Inc., USFS, KPB, USGS, Aerometric
Author: HDR Alaska, Inc.
Date: 05 October 2009

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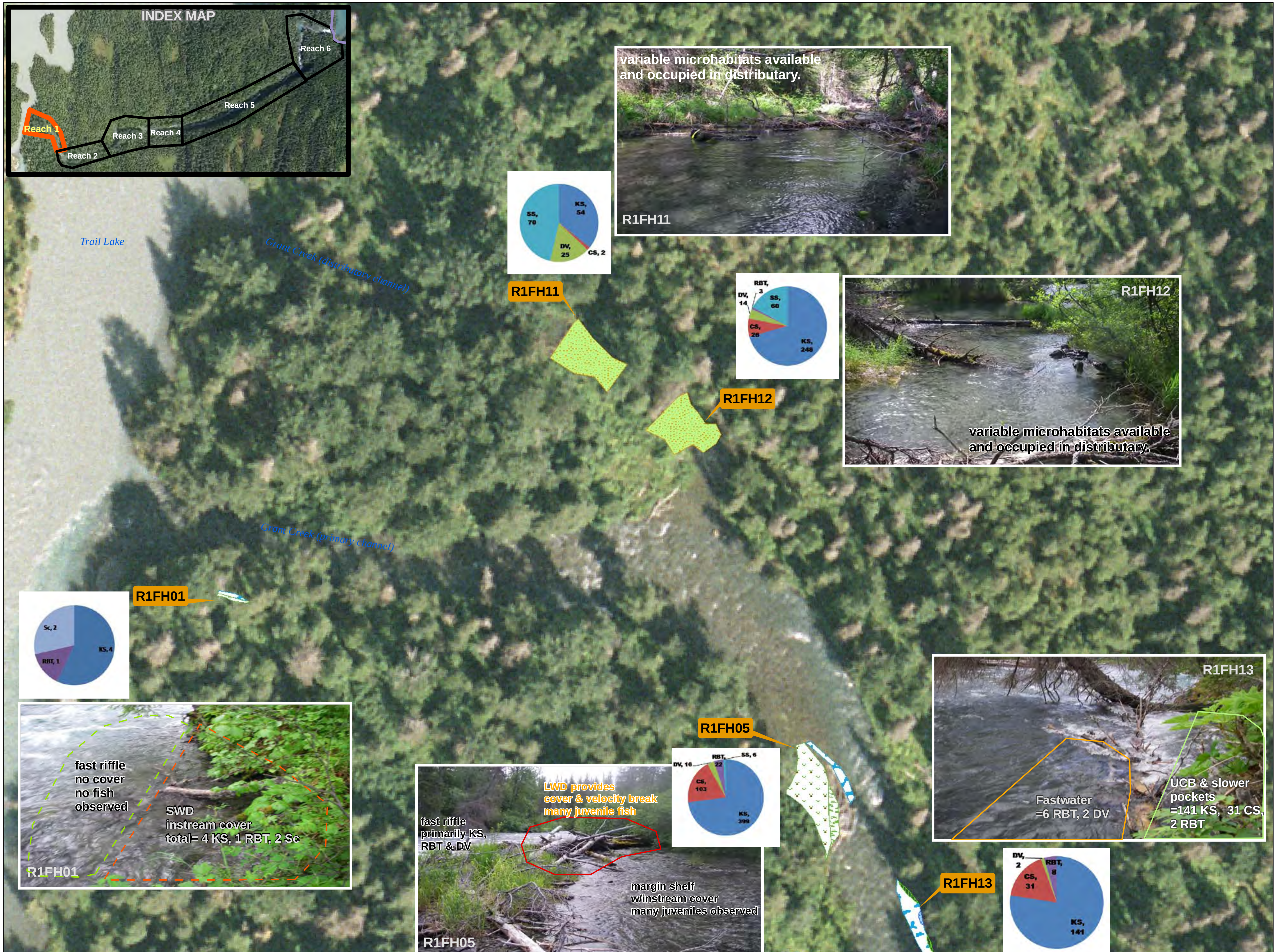
Figure 3.4.3- 1



Instream Flow

Microhabitat Sample Areas
Reach 1, June 2009

Microhabitat Sample Areas

- backwater/slow pockets
- margin with UCB
- margin with no UCB
- pool/fastwater
- riffle/fastwater
- margin shelf w/ instream cover
- large woody debris (LWD) dam
- side channel: variable

Fish Species Color Key

- KS=Chinook salmon
- CS=coho salmon
- DV=Dolly Varden char
- RBT=rainbow trout
- SS=sockeye salmon
- AG=Arctic grayling
- Sc=Sculpin-unspecified

NORTH

Feet
0 50 100

Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR Alaska, Inc.
Author: HDR Alaska, Inc.
Date: October 6, 2009

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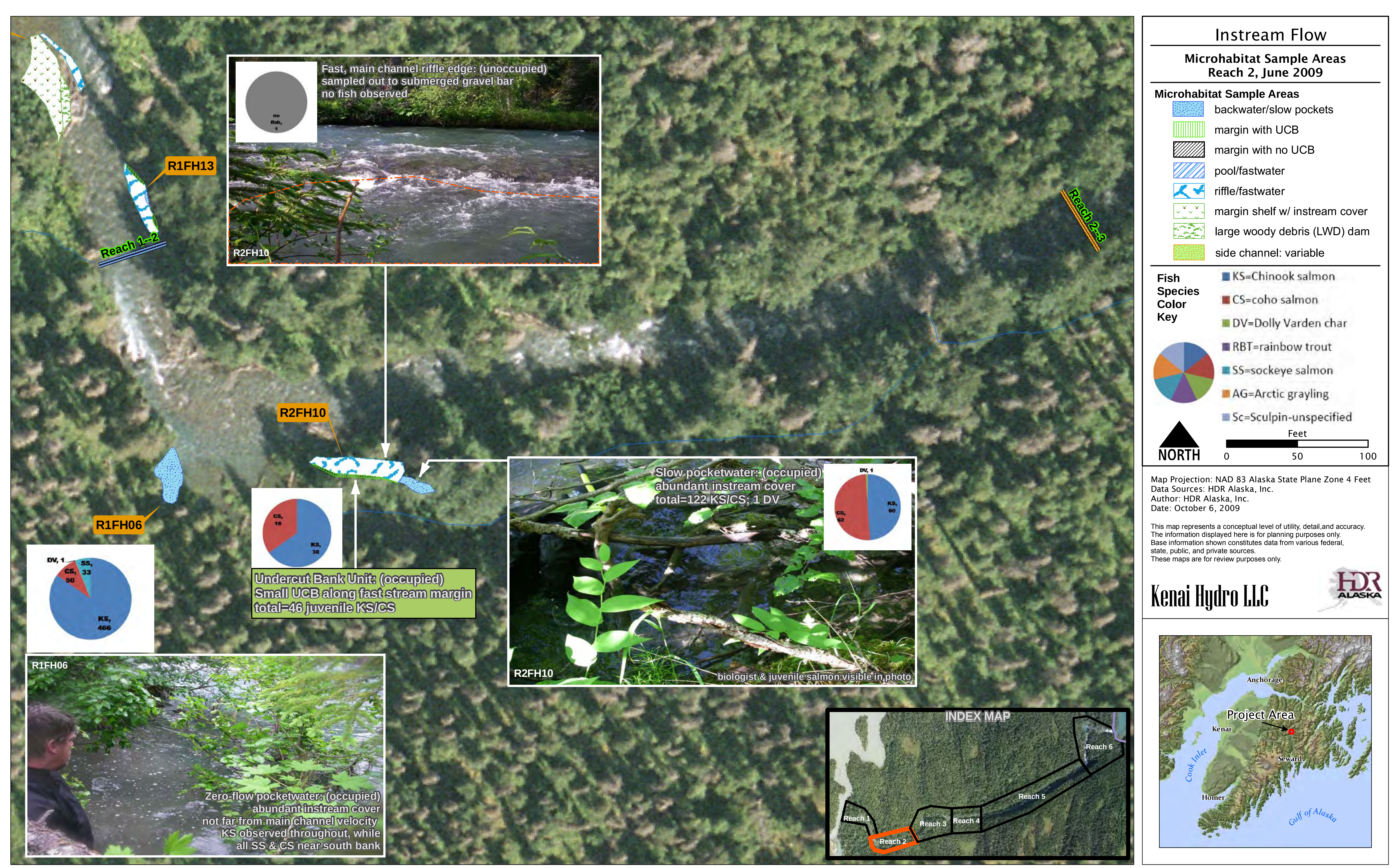
Instream Flow
Microhabitat Sample Areas
Reach 2, June 2009
Microhabitat Sample Areas
backwater/slow pockets
margin with UCB
margin with no UCB
pool/fastwater
riffle/fastwater
margin shelf w/ instream cover
large woody debris (LWD) dam
side channel: variable
Fish Species Color Key
KS=Chinook salmon
CS=coho salmon
DV=Dolly Varden char
RBT=rainbow trout
SS=sockeye salmon
AG=Arctic grayling
Sc=Sculpin-unspecified
NORTH
Feet
0
50
100
Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR Alaska, Inc.
Author: HDR Alaska, Inc.
Date: October 6, 2009
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HDR ALASKA
Anchorage
Project Area
Kenai
Cook Inlet
Seward
Homer
Gulf of Alaska
R1FH13
Reach 1--2
Reach 2--3
Fast, main channel riffle edge: (unoccupied)
sampled out to submerged gravel bar
no fish observed
no fish, 1
R2FH10
R2FH10
R1FH06
CS, 16
KS, 30
Undercut Bank Unit: (occupied)
Small UCB along fast stream margin
total=46 juvenile KS/CS
Slow pocketwater: (occupied)
abundant instream cover
total=122 KS/CS; 1 DV
DV, 1
CS, 62
KS, 60
R2FH10
biologist & juvenile salmon visible in photo
DV, 1
SS, 33
CS, 50
KS, 466
R1FH06
Zero-flow pocketwater: (occupied)
abundant instream cover
not far from main channel velocity
KS observed throughout, while
all SS & CS near south bank
INDEX MAP
Reach 1
Reach 2
Reach 3
Reach 4
Reach 5
Reach 6

Kenai Hydro Environmental Baseline Studies

Figure 3.4.3- 3

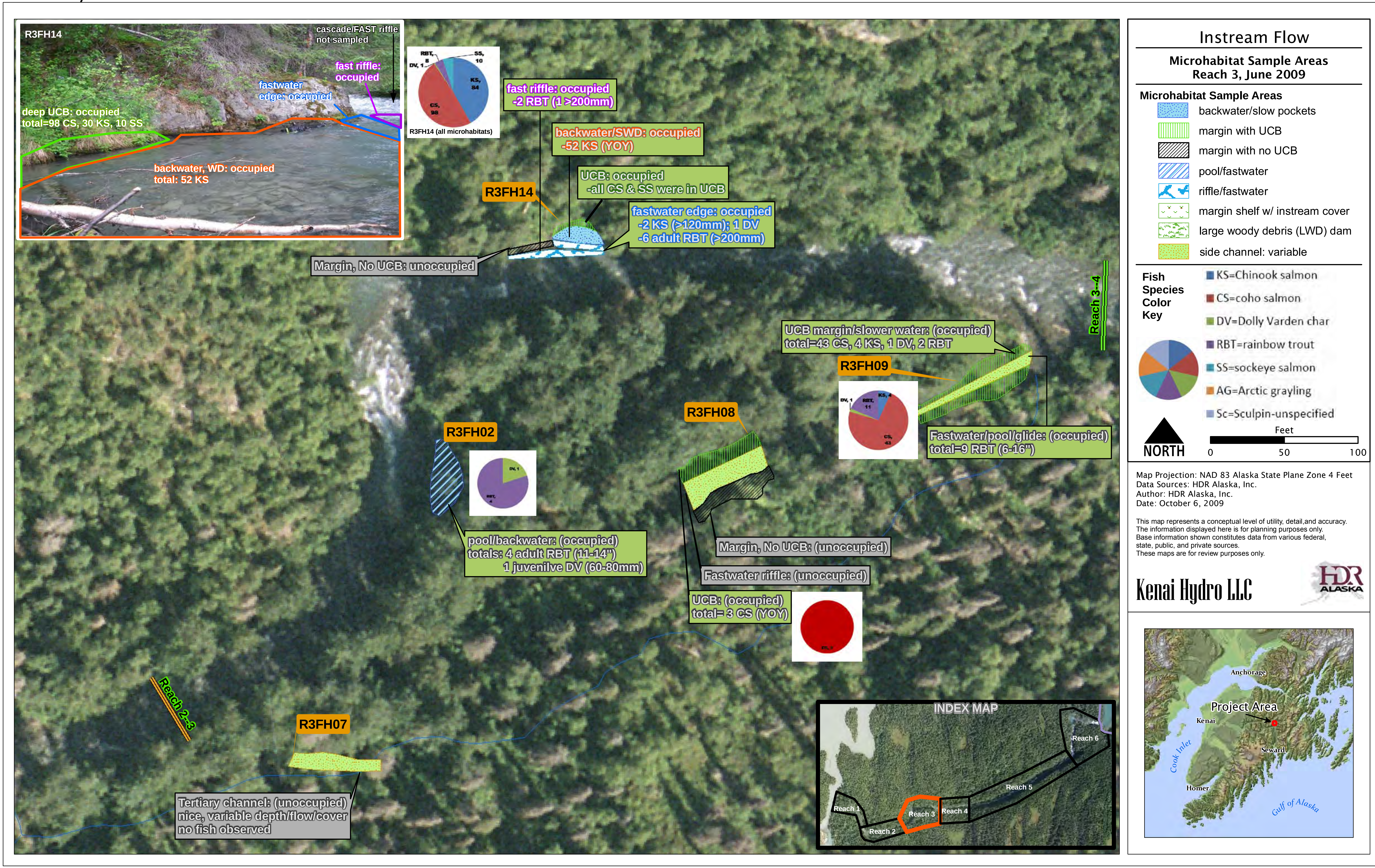
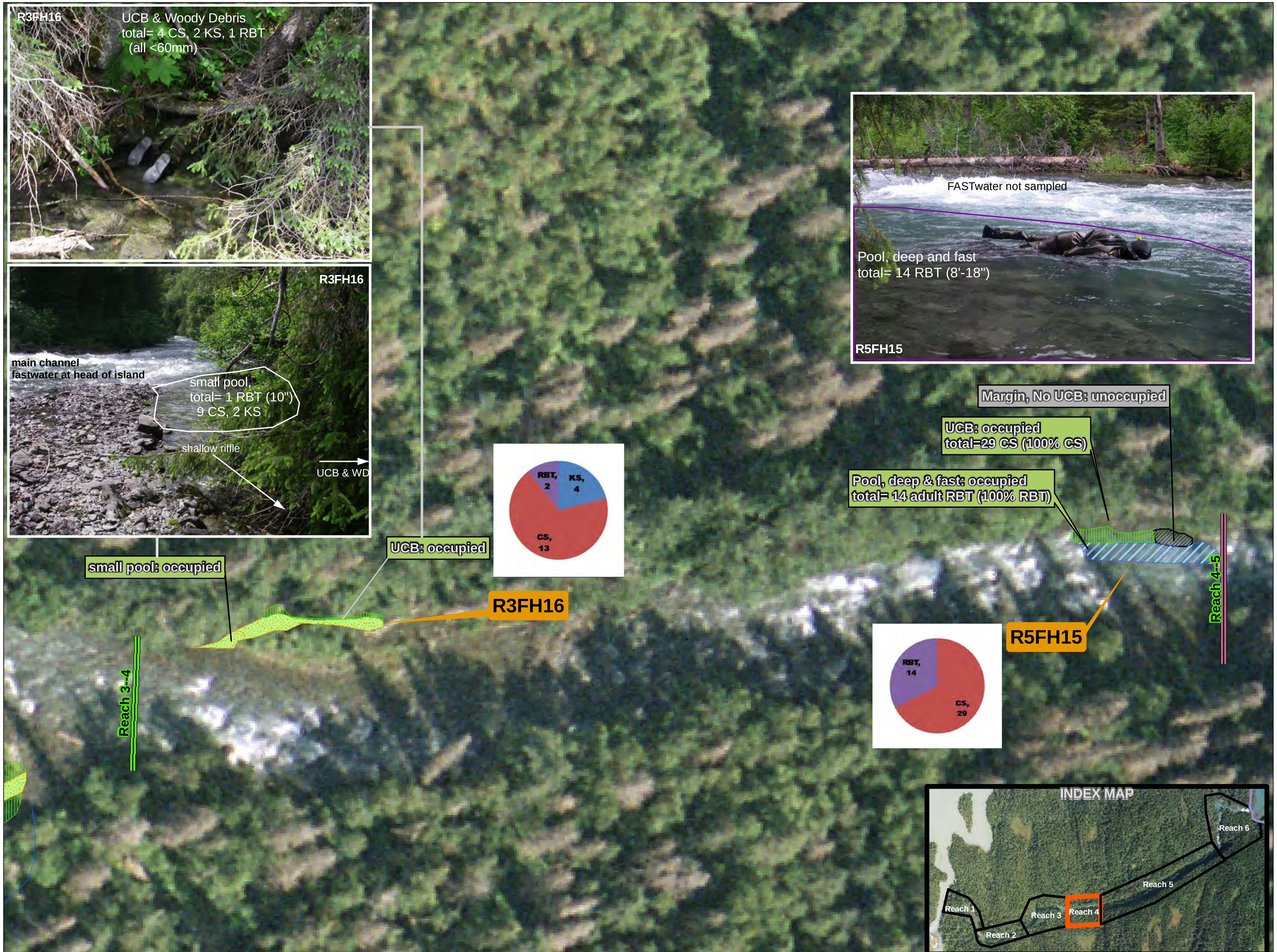


Figure 3.4.3-4



Instream Flow

Microhabitat Sample Areas
Reach 4, June 2009

Microhabitat Sample Areas
- backwater/slow pockets
- margin with UCB
- margin with no UCB
- pool/fastwater
- riffle/fastwater
- margin shelf w/ instream cover
- large woody debris (LWD) dam
- side channel: variable

Fish Species Color Key
- KS=Chinook salmon
- CS=coho salmon
- DV=Dolly Varden char
- RBT=rainbow trout
- SS=sockeye salmon
- AG=Arctic grayling
- Sc=Sculpin-unspecified

NORTH

Feet
0 40 80

Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR Alaska, Inc.
Author: HDR Alaska, Inc.
Date: October 6, 2009

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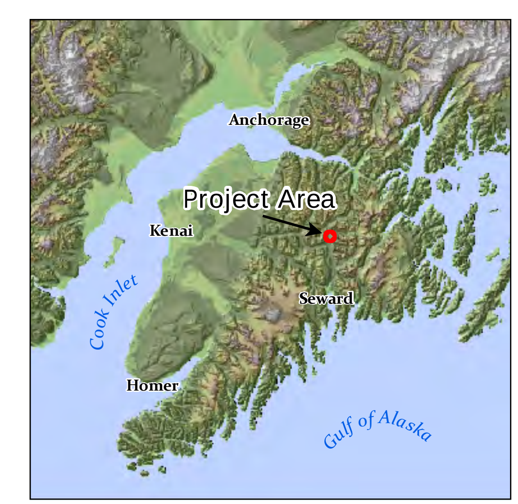

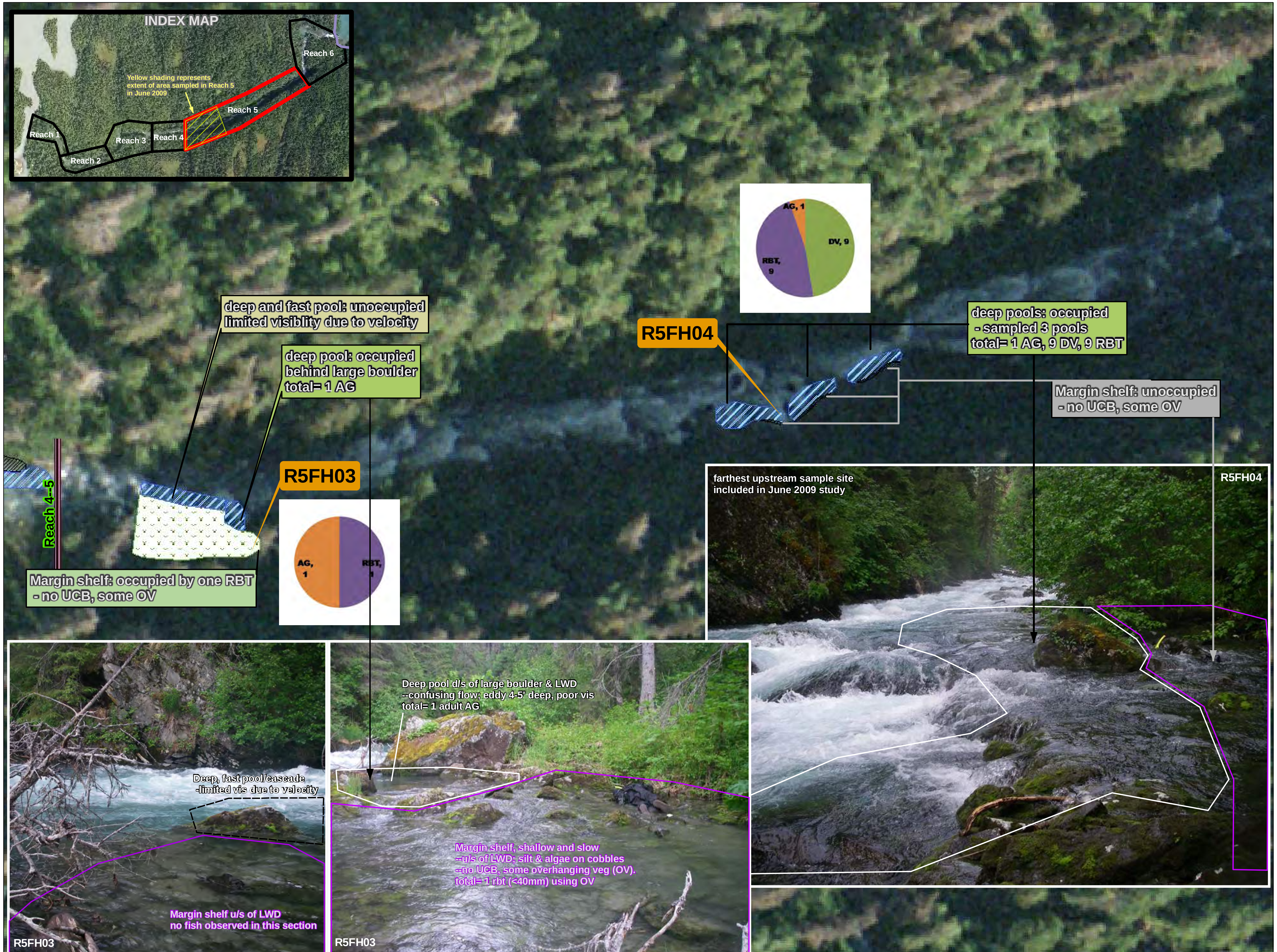

Instream Flow

Microhabitat Sample Areas
Reach 5, June 2009

Microhabitat Sample Areas
- backwater/slow pockets
- margin with UCB
- margin with no UCB
- pool/fastwater
- riffle/fastwater
- margin shelf w/ instream cover
- large woody debris (LWD) dam
- side channel: variable

Fish Species Color Key
- KS=Chinook salmon
- CS=coho salmon
- DV=Dolly Varden char
- RBT=rainbow trout
- SS=sockeye salmon
- AG=Arctic grayling
- Sc=Sculpin-unspecified

NORTH

Feet
0 40 80

Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR Alaska, Inc.
Author: HDR Alaska, Inc.
Date: October 6, 2009

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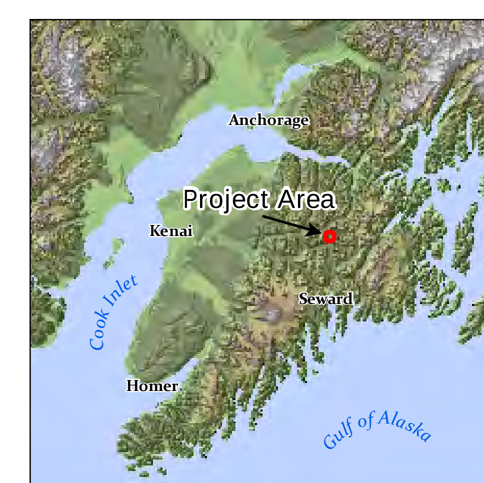
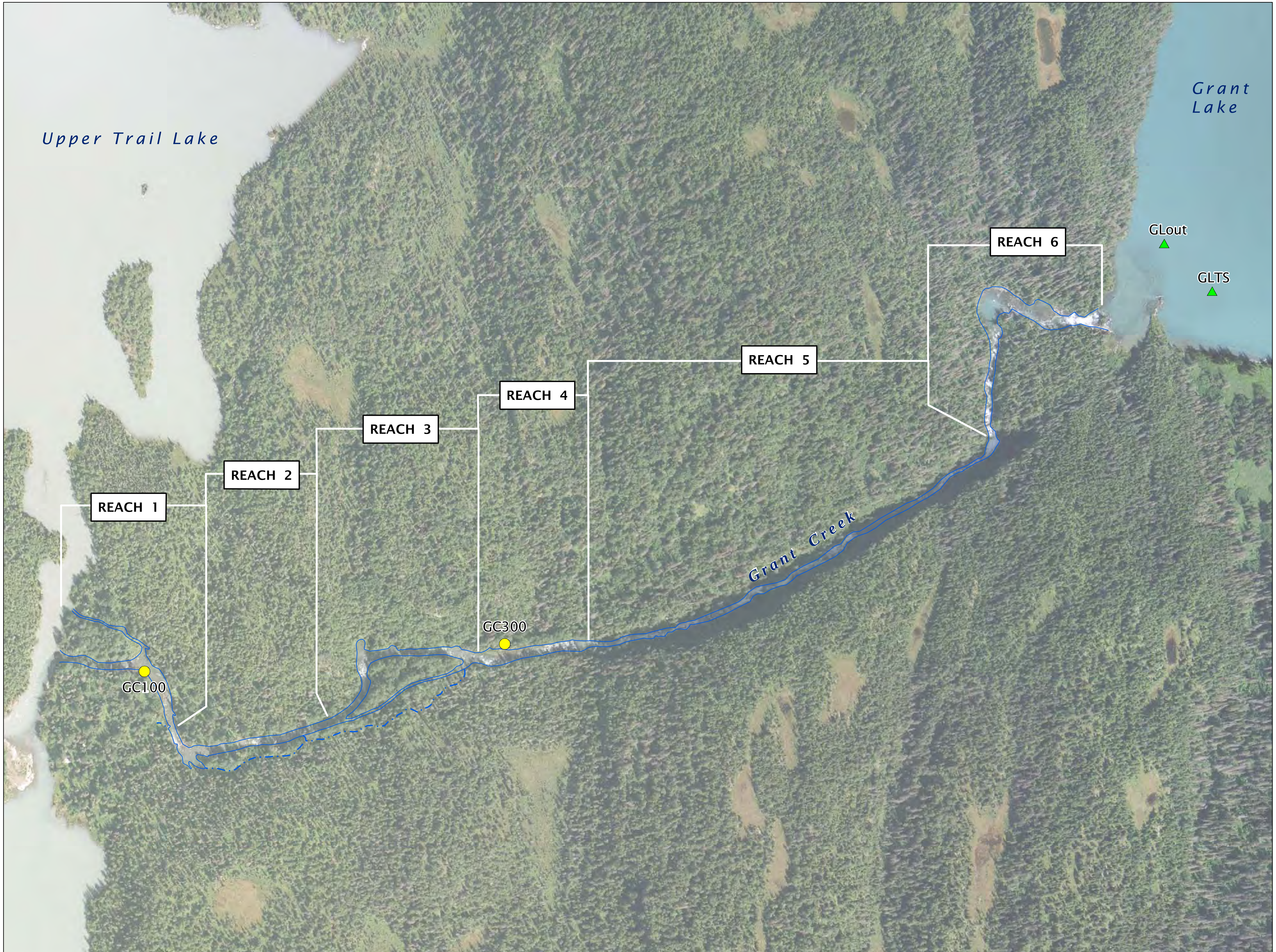


Kenai Hydro Environmental Baseline Studies

Figure 3.4.4- 1



Aquatic Resources

2009 Grant Creek and Grant Lake Aquatic Invertebrates

Legend

- Macroinvertebrates and Periphyton
- Zooplankton and Phytoplankton
- Grant Creek Wetted Edge
- Side or Overflow Channel

NORTH

Feet
0 250 500

Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR Alaska, Inc., USFS, KPB, USGS, Aerometric
Author: HDR Alaska, Inc.
Date: 07 October 2009

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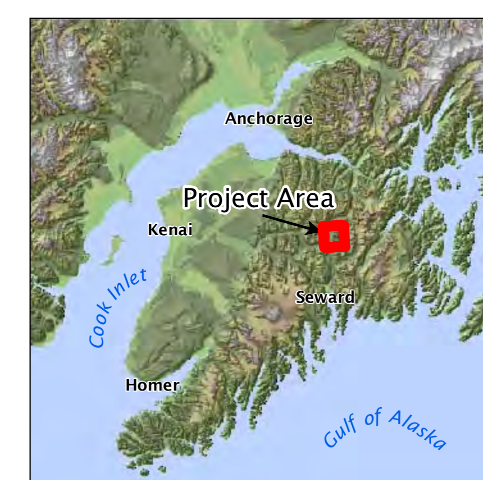

Figure 3.4.5- 1

Fisheries Field Studies

2009 Falls Creek Minnow Trapping

Legend

Minnow Trap Site

NORTH

Feet
0 250 500

Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR Alaska, Inc., USFS, KPB, USGS
Author: HDR Alaska, Inc.
Date: 09 October 2009

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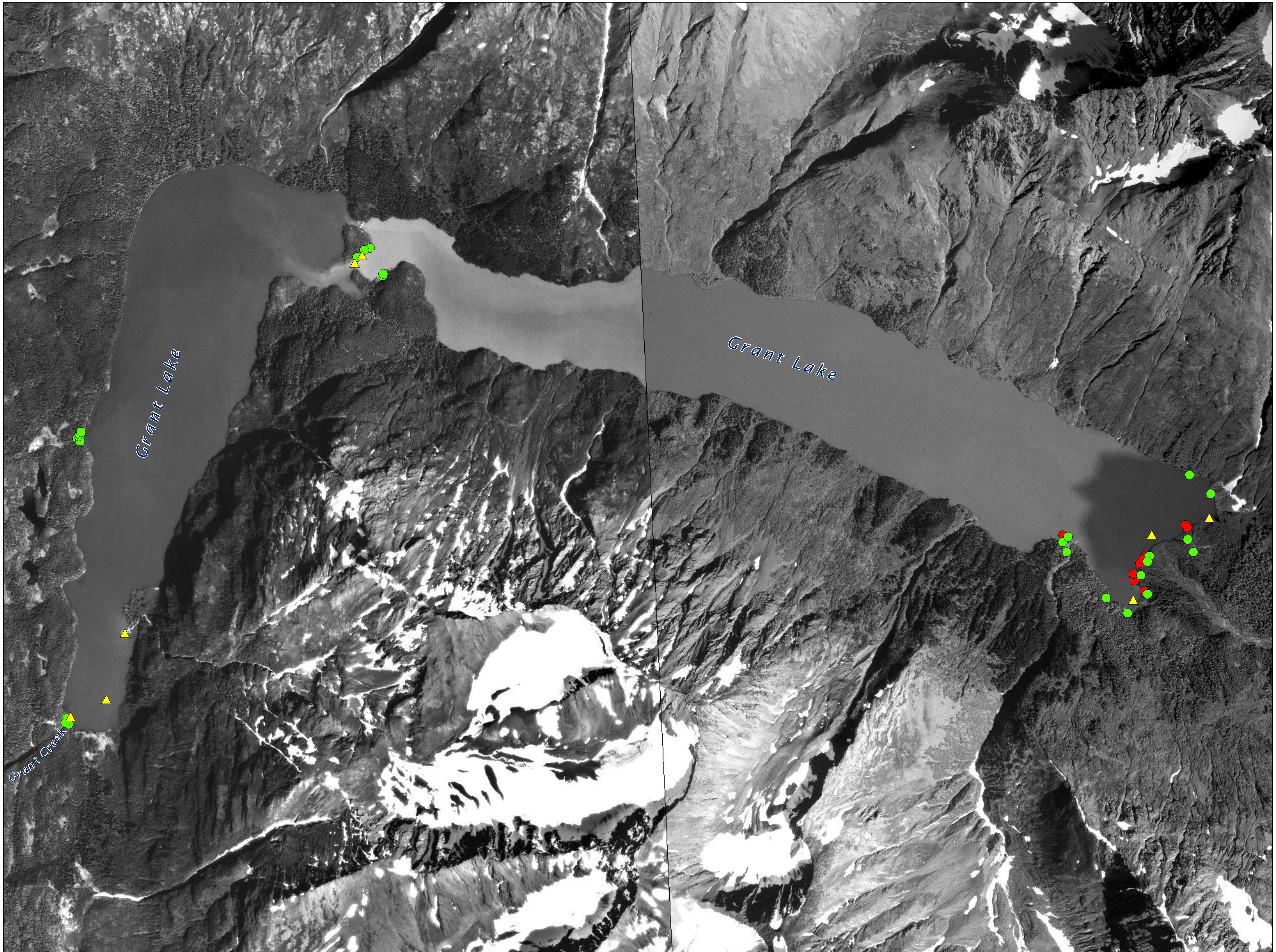
Figure 3.4.6- 1



Fisheries Field Studies

2009 Grant Lake Sampling Sites

Legend

- Gill Net Site
- Minnow Trap / Efish Site
- Efish Only Site

NORTH

Feet

0 2,000 4,000

Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR Alaska, Inc., USFS, KPB, USGS
Author: HDR Alaska, Inc.
Date: 09 October 2009

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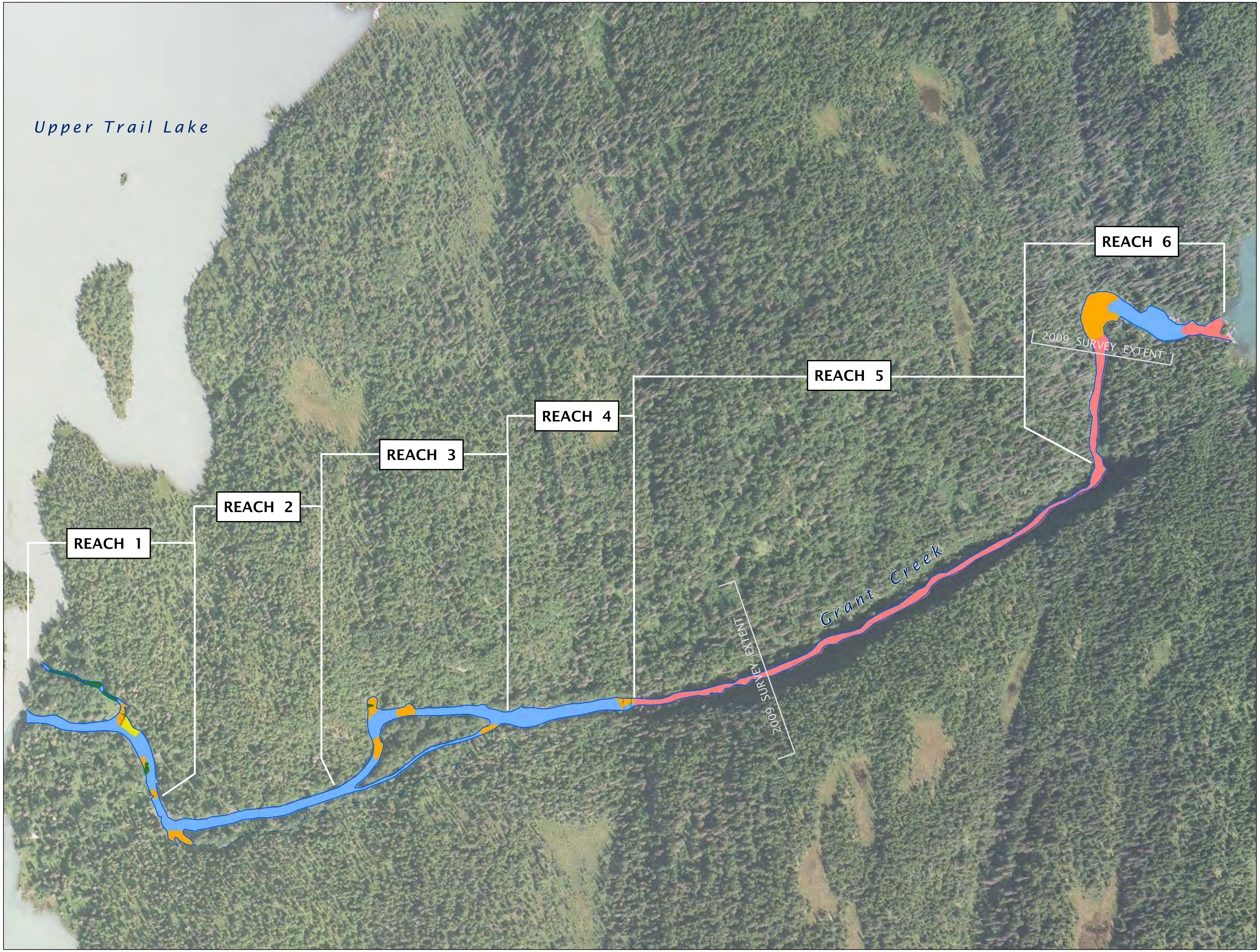

Fisheries Field Studies

2009 Grant Creek
Major Habitat Categories

Legend

- Large Woody Debris
- Cascade Dominated Habitat
- Glide Dominated Habitat
- Pool Dominated Habitat
- Riffle Dominated Habitat
- Grant Creek Wetted Edge
- Side / Overflow Channel

NORTH

Feet 0 250 500

Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR Alaska, Inc., USFS, KPB, USGS, Aerometric
Author: HDR Alaska, Inc.
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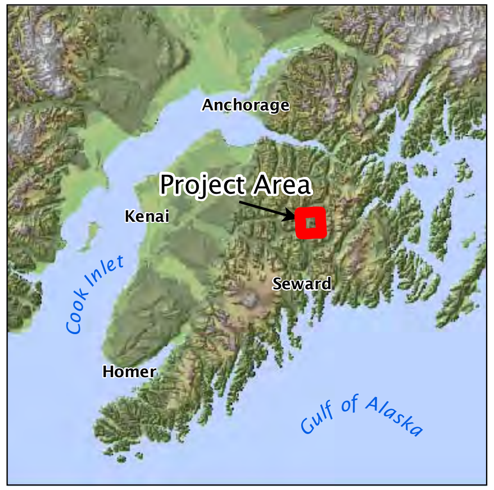

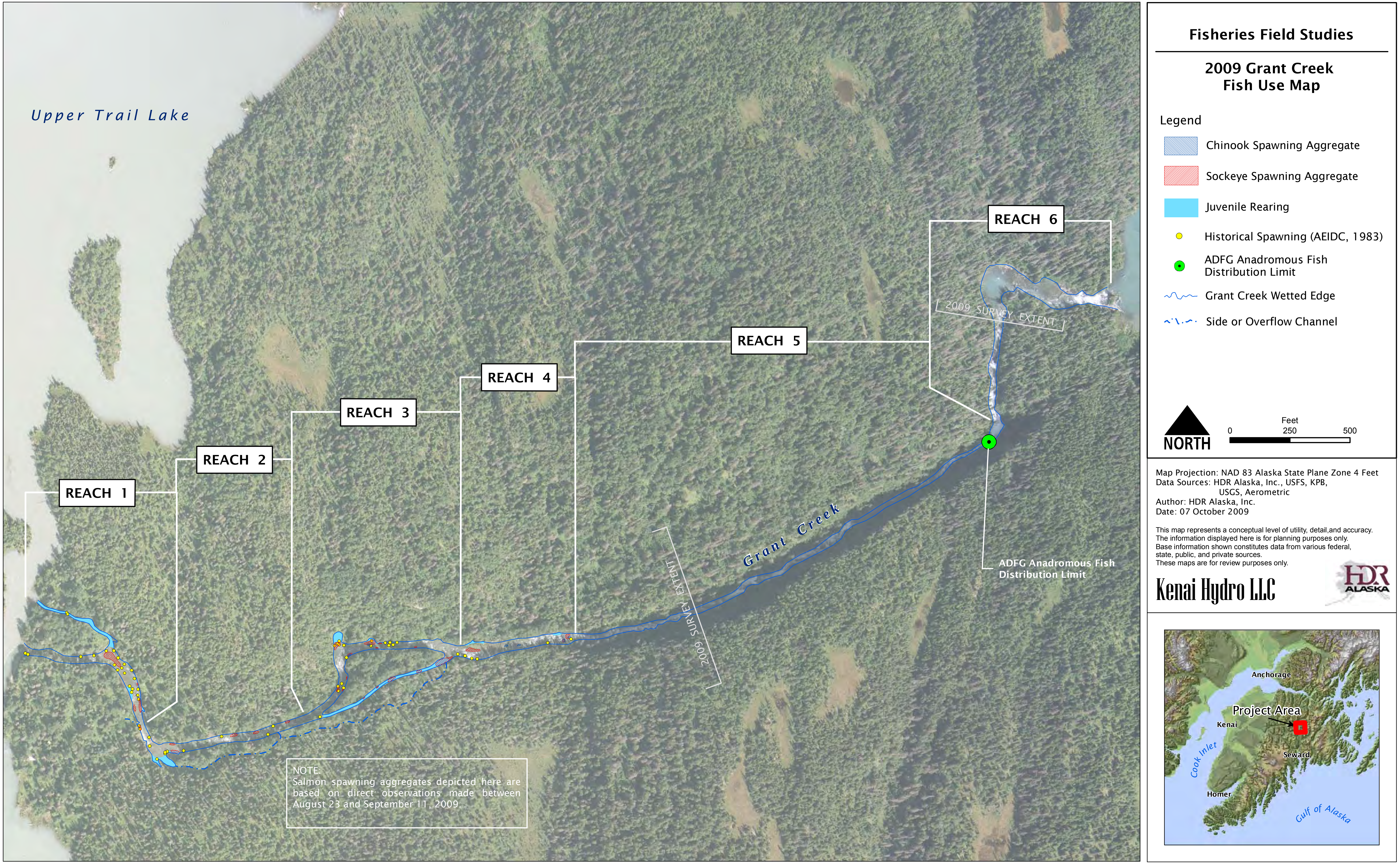
Upper Trail Lake
REACH 1
REACH 2
REACH 3
REACH 4
REACH 5
REACH 6
2009 SURVEY EXTENT
2009 SURVEY EXTENT
Grant Creek
ADFG Anadromous Fish Distribution Limit
NOTE:
Salmon spawning aggregates depicted here are based on direct observations made between August 23 and September 11, 2009.
Fisheries Field Studies
2009 Grant Creek
Fish Use Map
Legend
Chinook Spawning Aggregate
Sockeye Spawning Aggregate
Juvenile Rearing
Historical Spawning (AEIDC, 1983)
ADFG Anadromous Fish Distribution Limit
Grant Creek Wetted Edge
Side or Overflow Channel
NORTH
Feet
0
250
500
Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR Alaska, Inc., USFS, KPB, USGS, Aerometric
Author: HDR Alaska, Inc.
Date: 07 October 2009
This map represents a conceptual level of utility, detail,and accuracy.
The information displayed here is for planning purposes only.
Base information shown constitutes data from various federal, state, public, and private sources.
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Anchorage
Project Area
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Cook Inlet
Seward
Homer
Gulf of Alaska

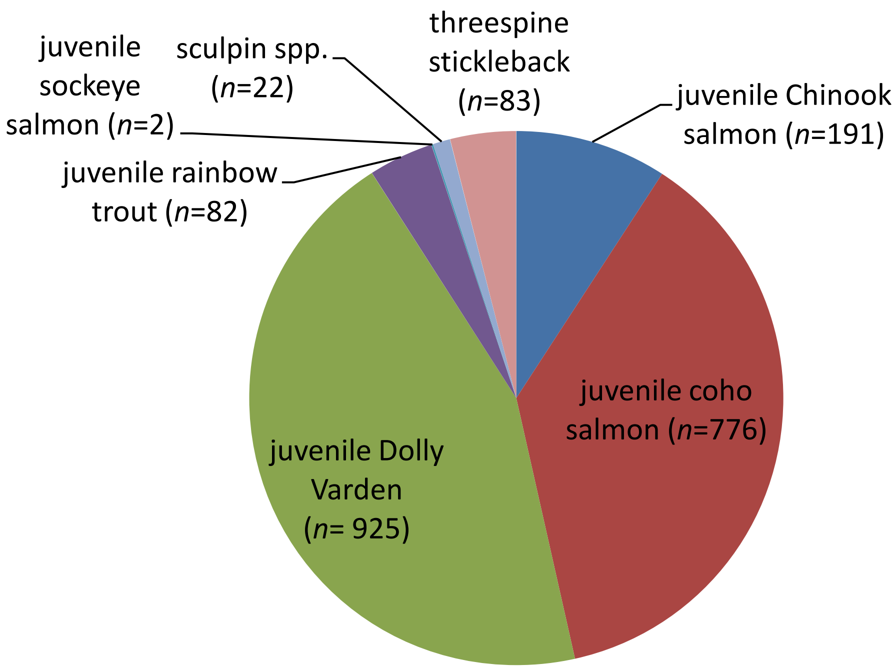


Figure 3.5.2-1 Catch by species in minnow traps in Grant Creek, June – September, 2009

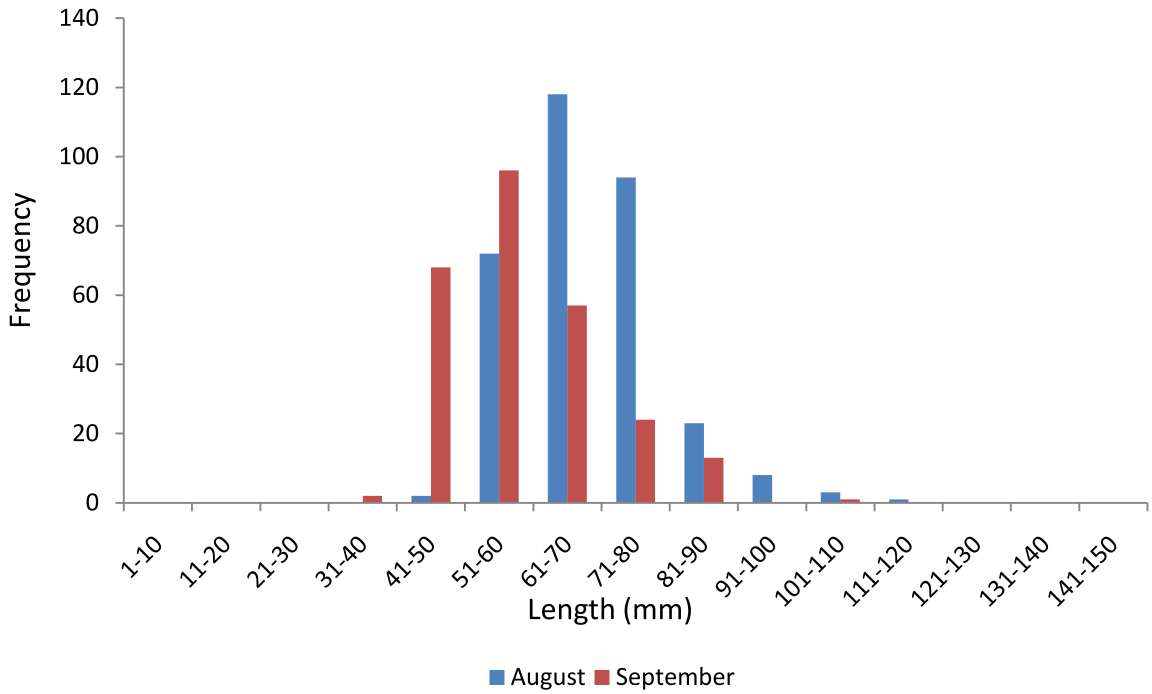


Figure 3.5.2-2 Length frequencies of juvenile coho salmon captured in minnow traps in Grant Creek in August and September, 2009

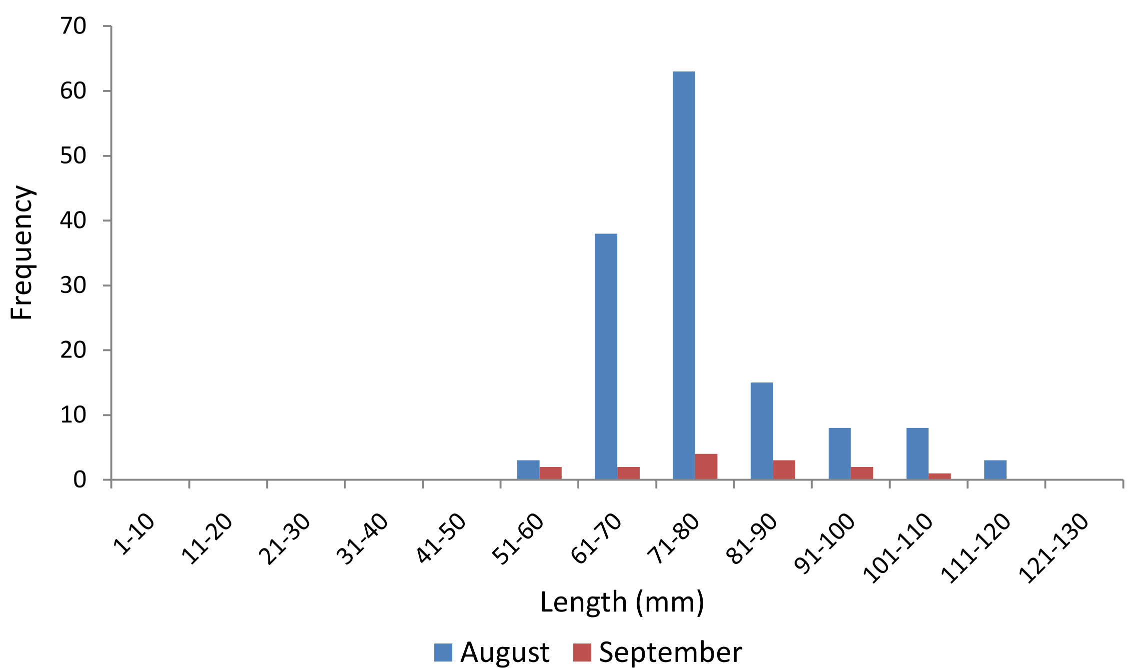


Figure 3.5.2-3 Length frequencies of juvenile Chinook salmon captured in minnow traps in Grant Creek in August and September, 2009

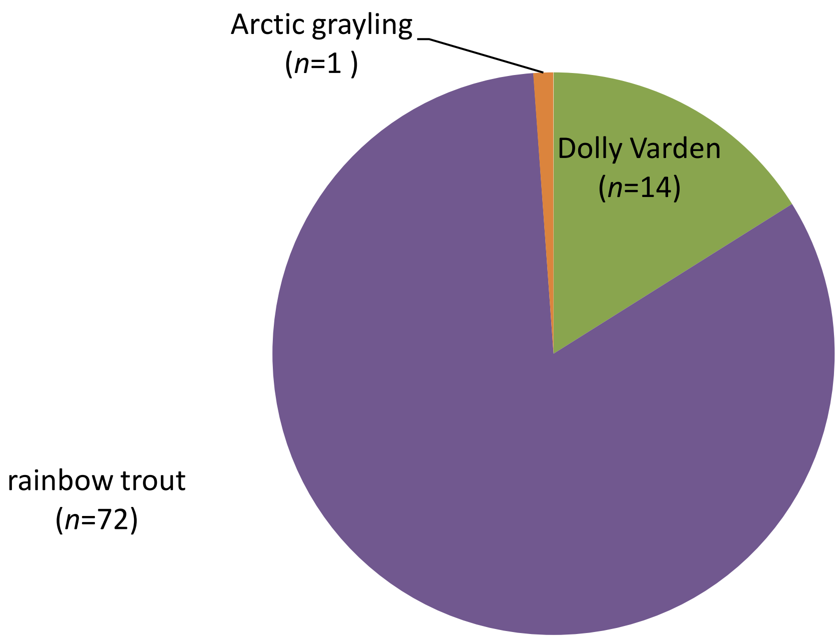


Figure 3.5.2-4 Catch by species for angling surveys in Grant Creek, June – September, 2009

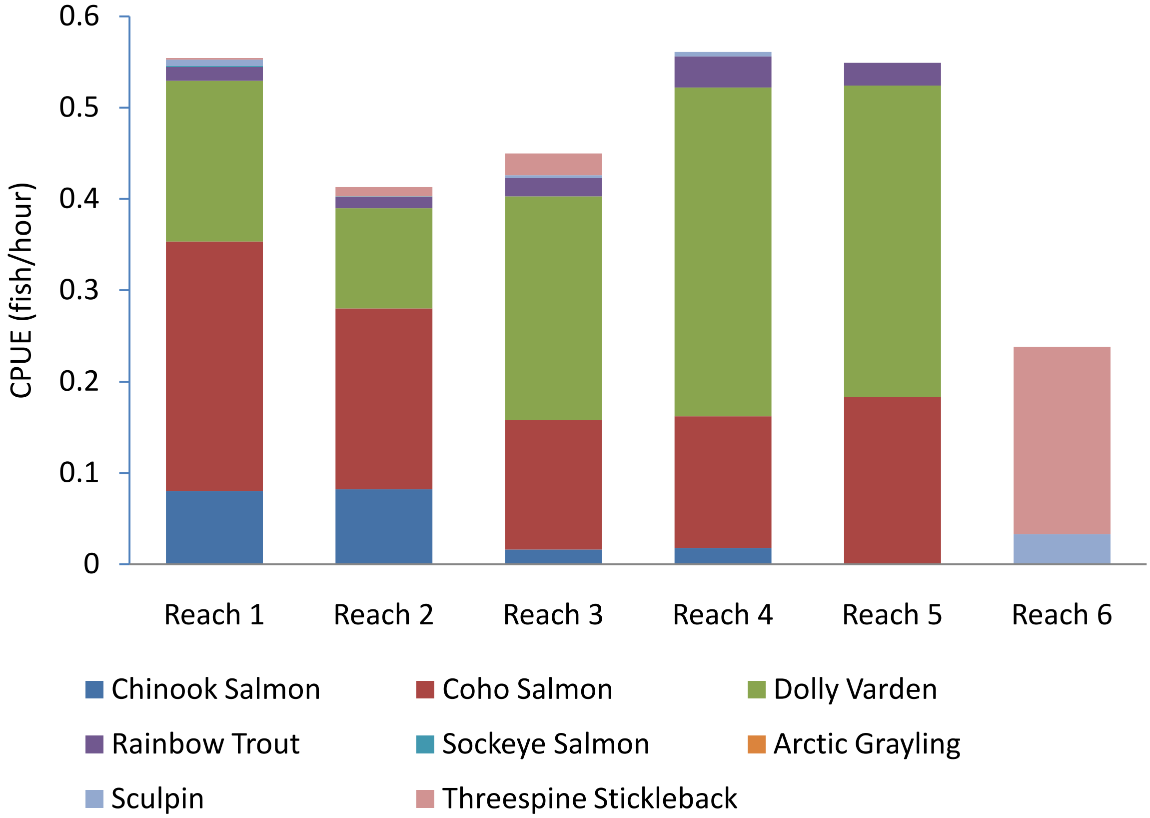


Figure 3.5.2-5 CPUE by reach and species from minnow trapping, Grant Creek, June – September, 2009

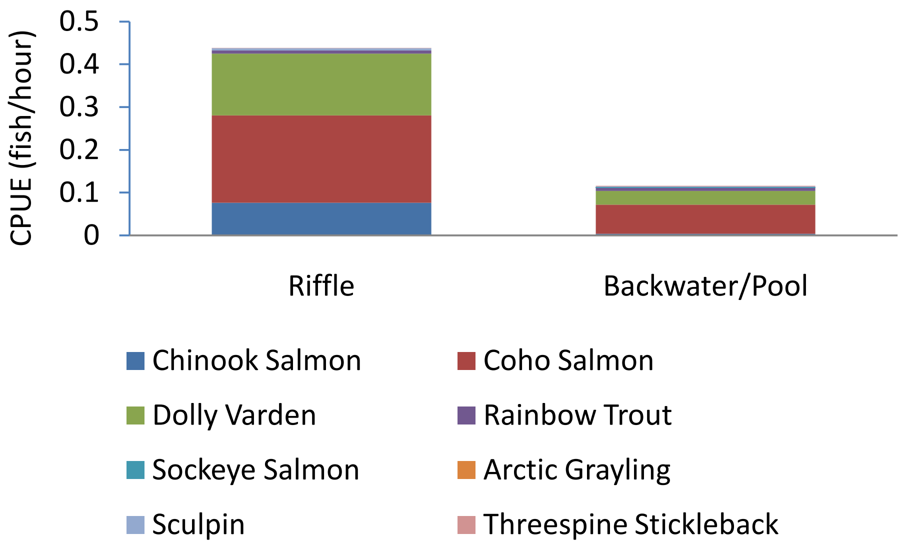


Figure 3.5.2-6 Reach 1, CPUE by habitat, June – September, 2009

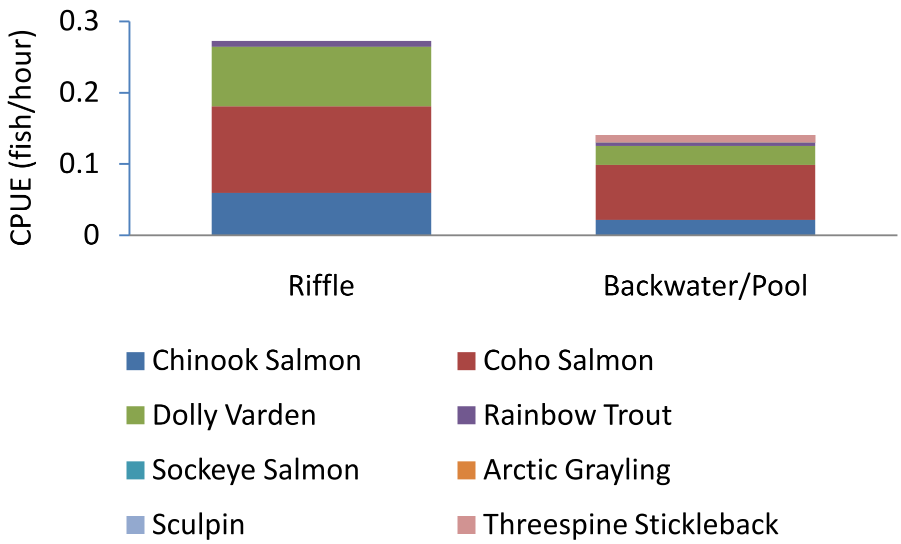


Figure 3.5.2-7 Reach 2, CPUE by habitat, June – September, 2009

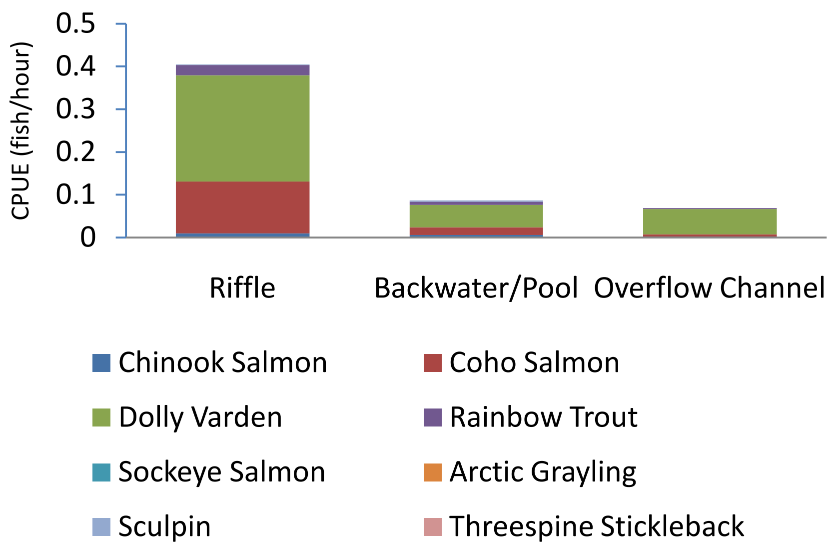


Figure 3.5.2-8 Reach 4, CPUE by habitat, June – September, 2009

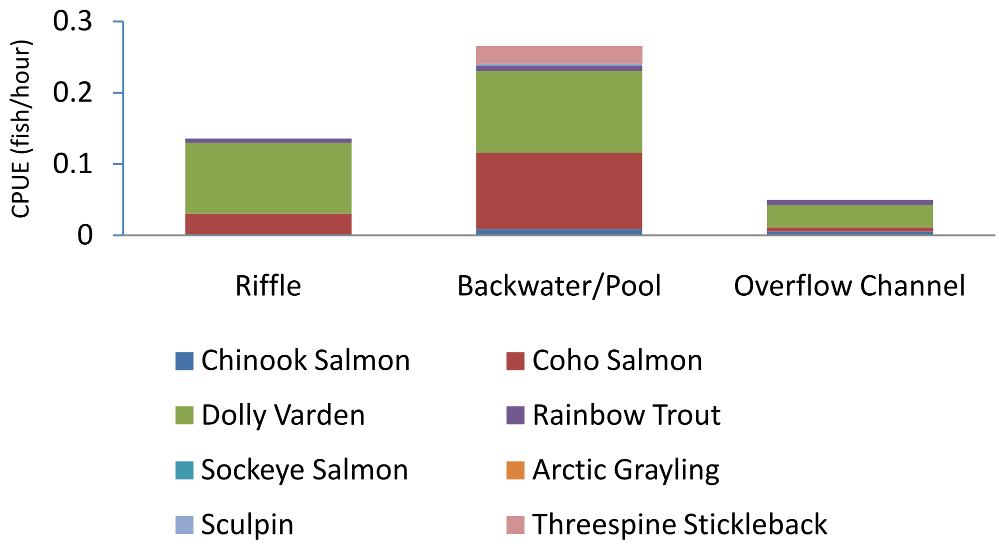


Figure 3.5.2-9 Reach 3, CPUE by habitat, June – September, 2009

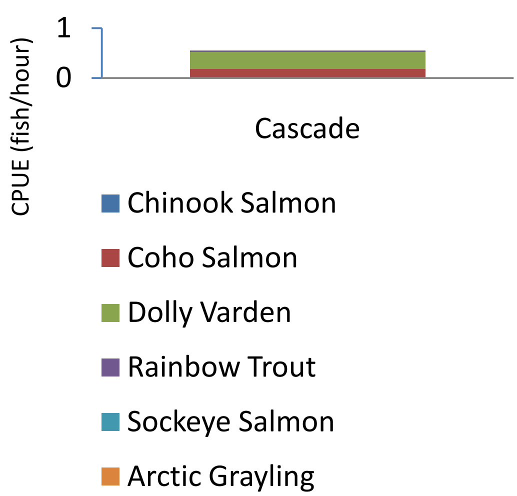


Figure 3.5.2-10 Reach 5, CPUE by habitat, June – September, 2009

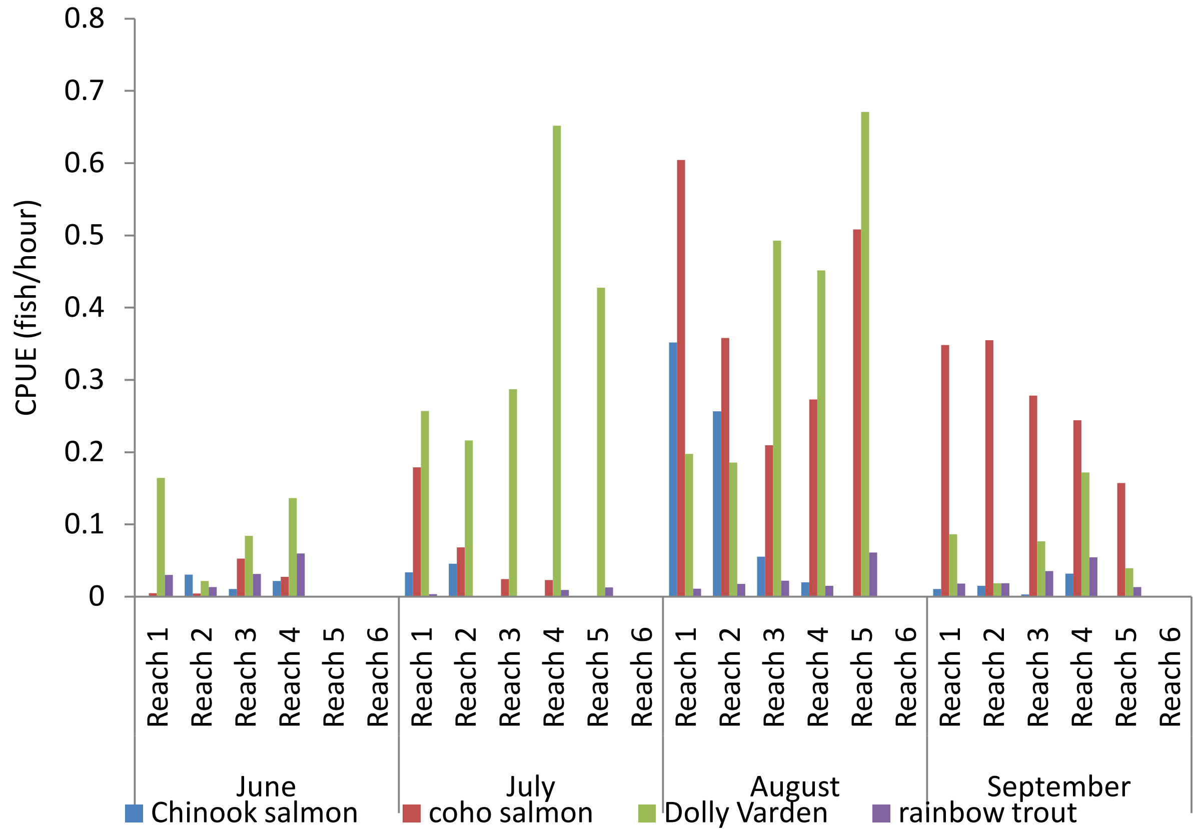


Figure 3.5.2-11 CPUE by reach and species from minnow trapping for selected species, Grant Creek, June – September, 2009

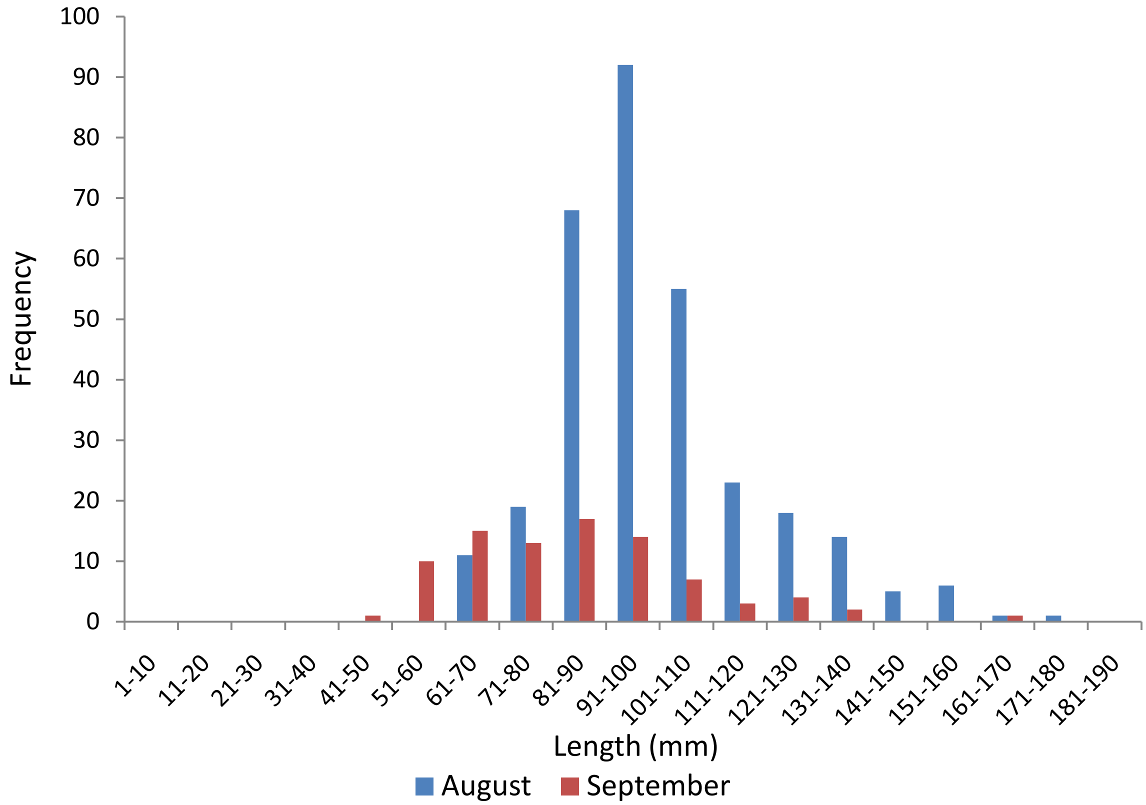


Figure 3.5.2-12 Length frequencies of Dolly Varden captured in minnow traps in Grant Creek in August and September, 2009

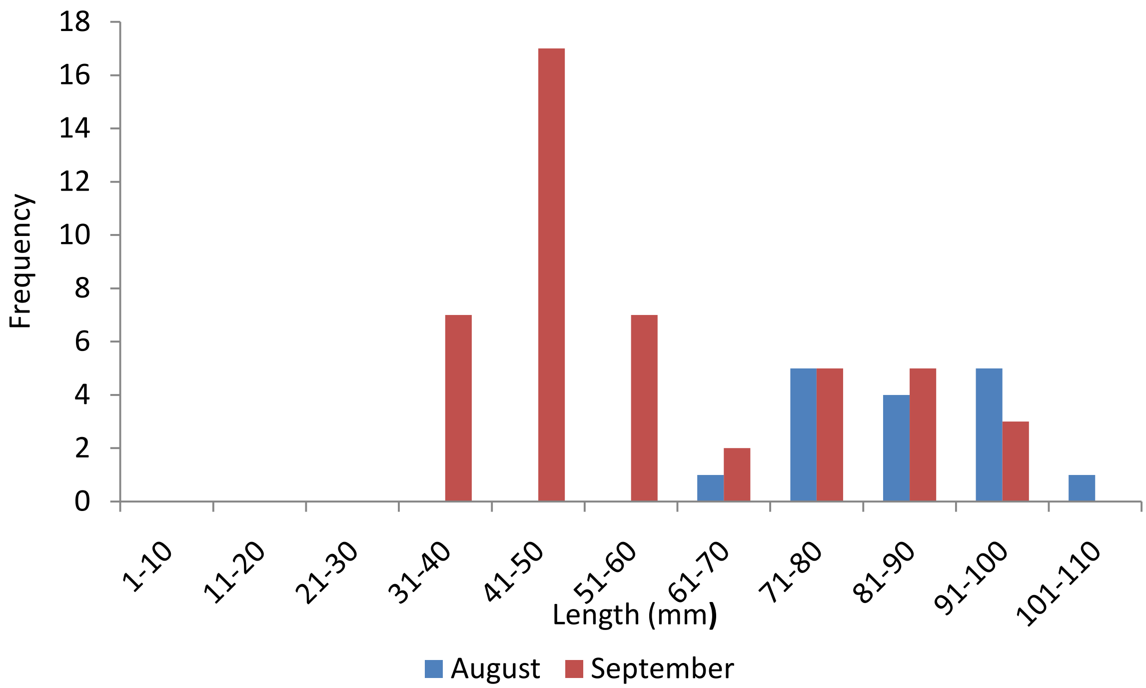


Figure 3.5.2-13 Length frequencies of rainbow trout captured in minnow traps in Grant Creek in August and September, 2009

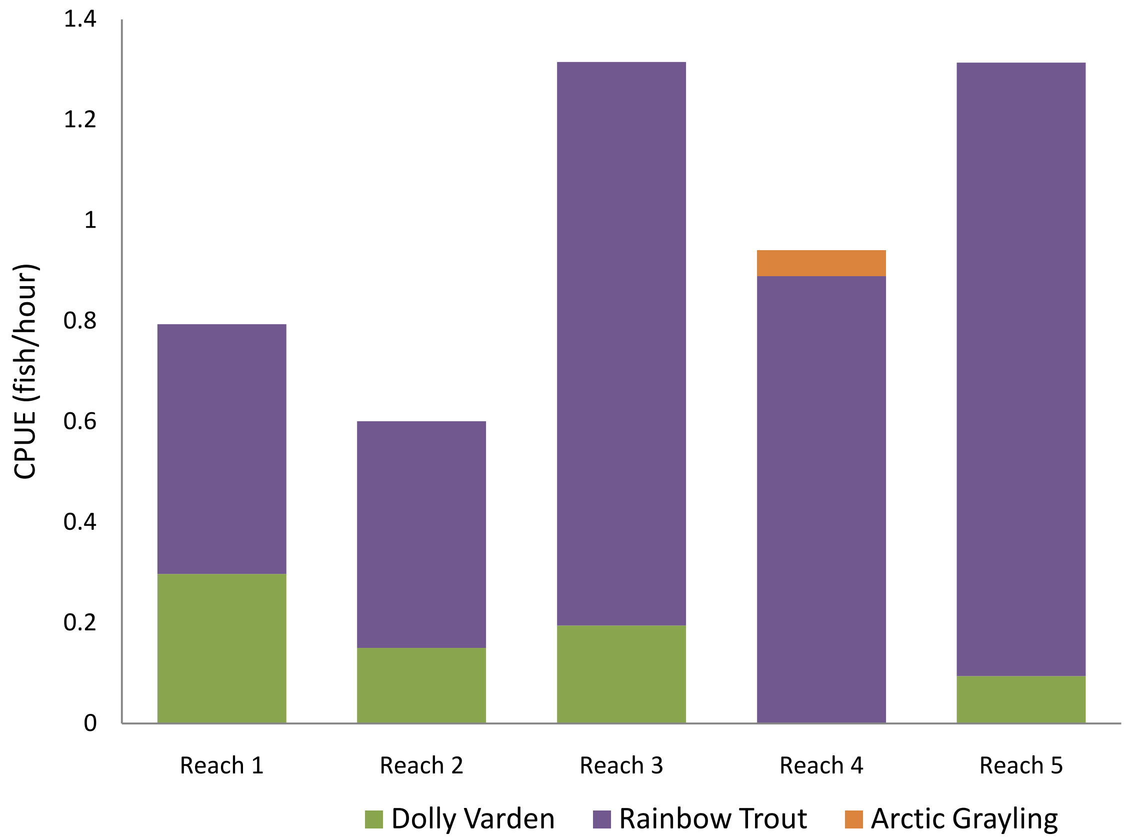


Figure 3.5.2-14 CPUE by reach and species from angling surveys in Grant Creek, June – August, 2009

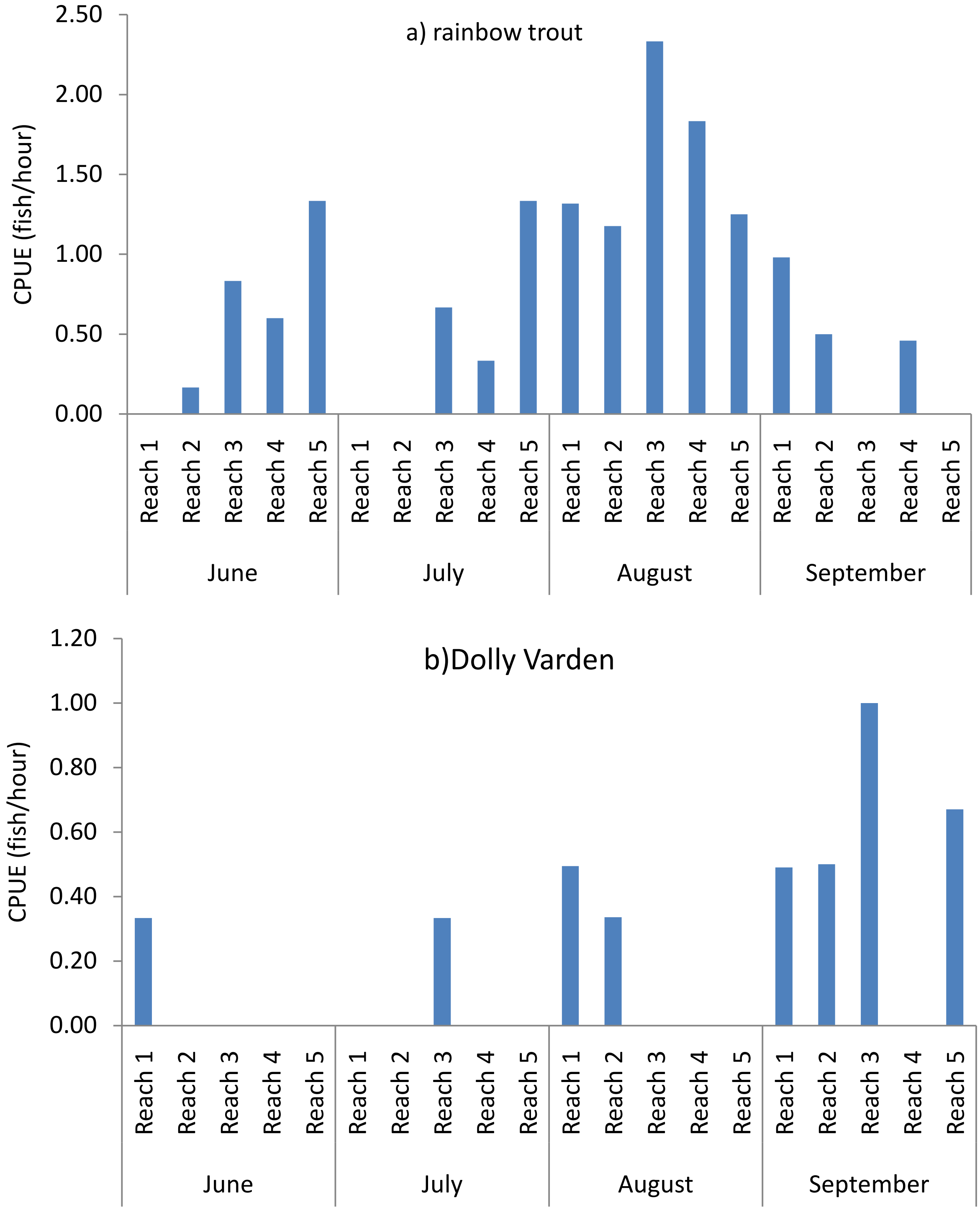


Figure 3.5.2-15 CPUE by month and reach for a) rainbow trout and b) Dolly Varden from angling surveys in Grant Creek, June – September, 2009

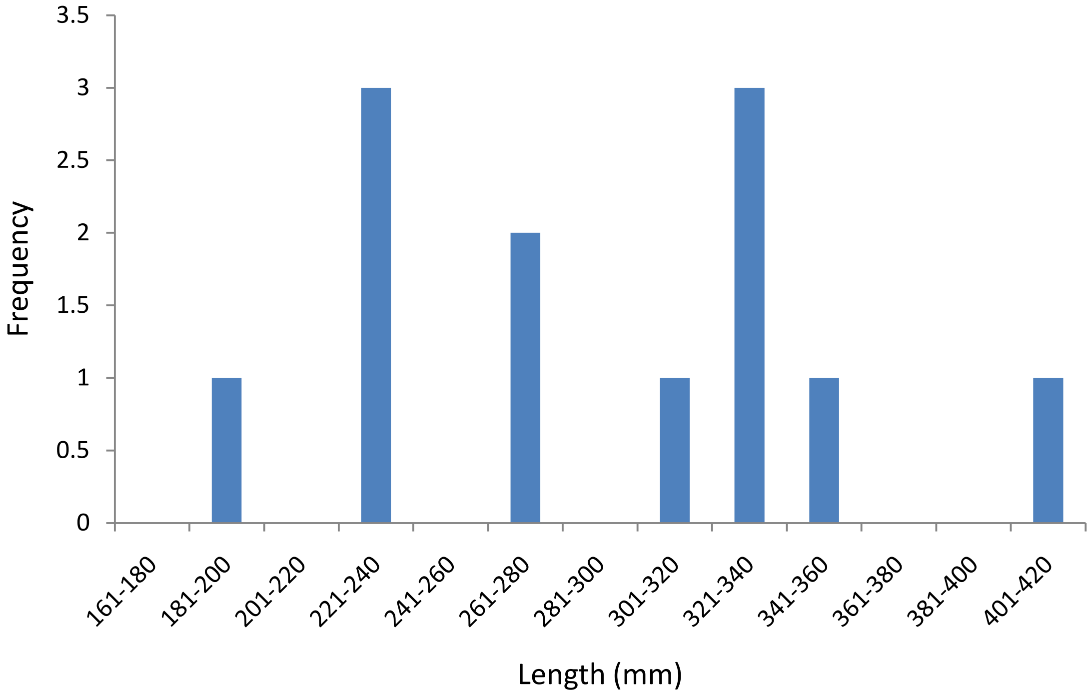


Figure 3.5.2-16 Length frequencies for rainbow trout angled on Grant Creek during June, 2009

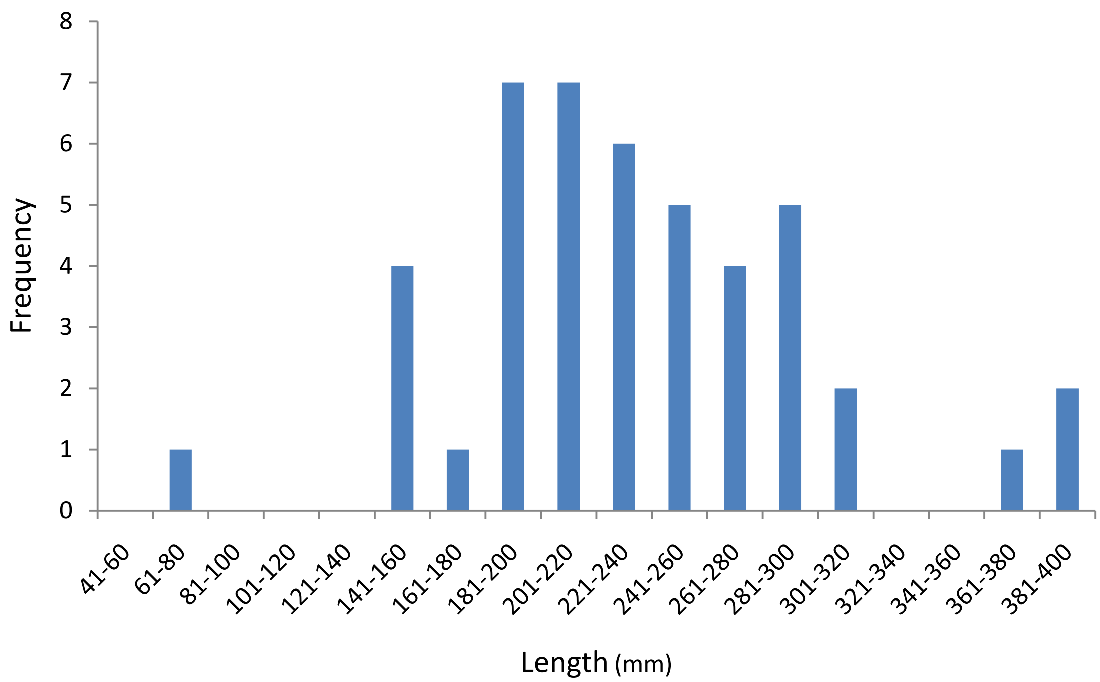


Figure 3.5.2-17 Length frequencies for rainbow trout angled on Grant Creek during August, 2009

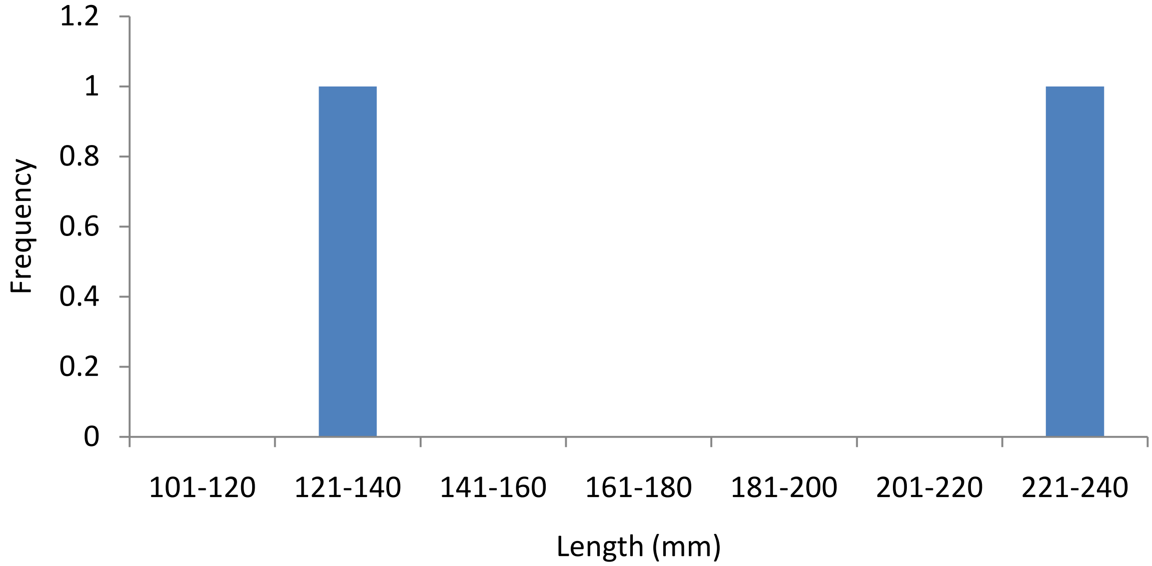


Figure 3.5.2-18 Length frequencies for Dolly Varden angled on Grant Creek during June, 2009

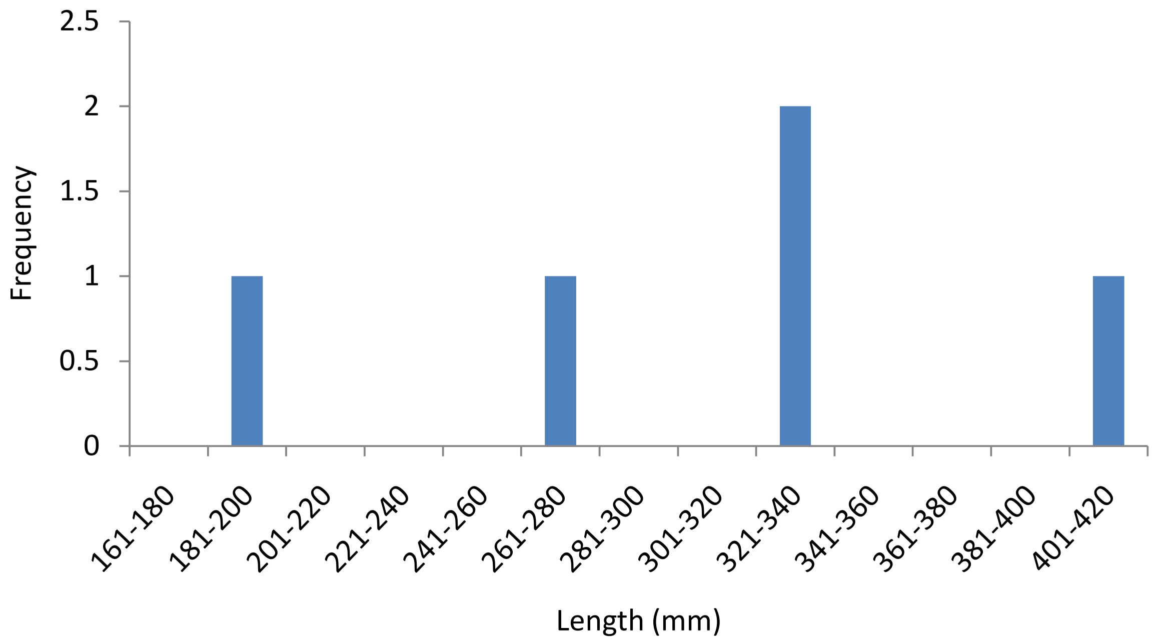


Figure 3.5.2-19 Length frequencies for Dolly Varden angled on Grant Creek during August, 2009

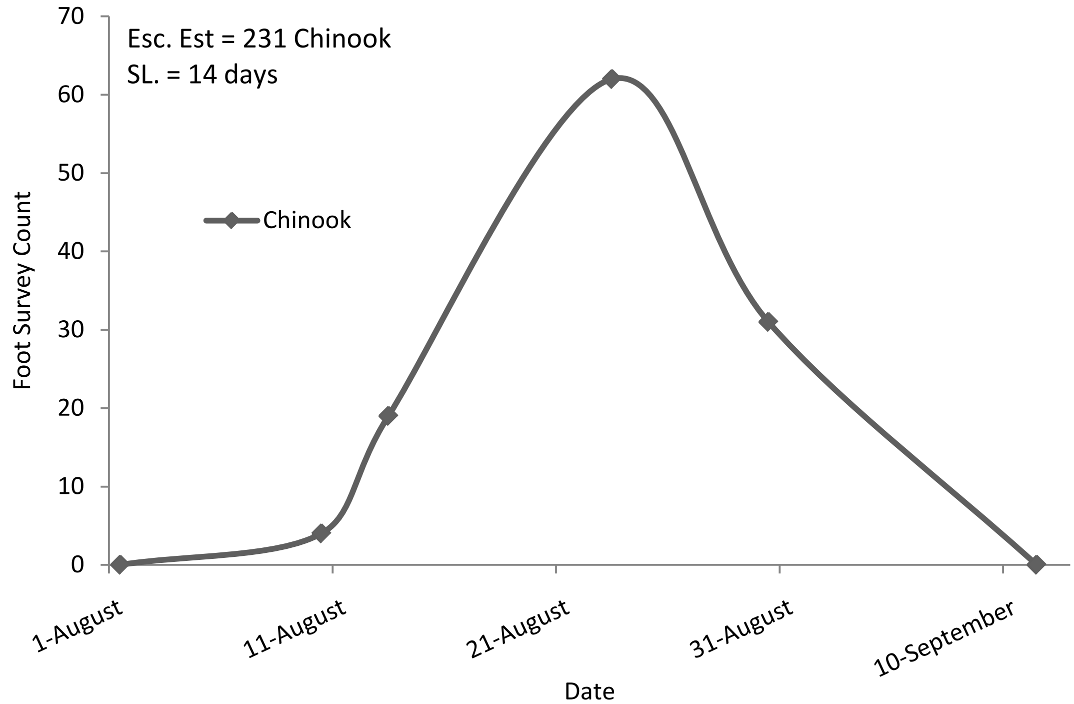


Figure 3.5.2-20 Foot survey counts and estimated escapement for Chinook salmon, June – October, 2009 on Grant Creek

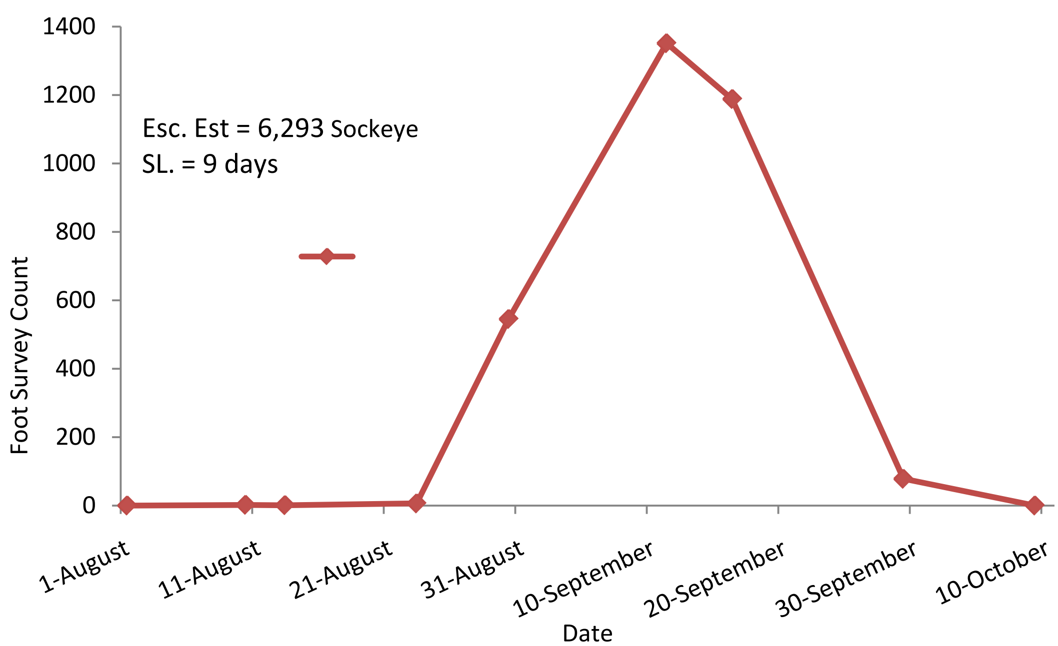


Figure 3.5.2-21 Foot survey counts and escapement estimates for sockeye salmon, June – October, 2009 on Grant Creek

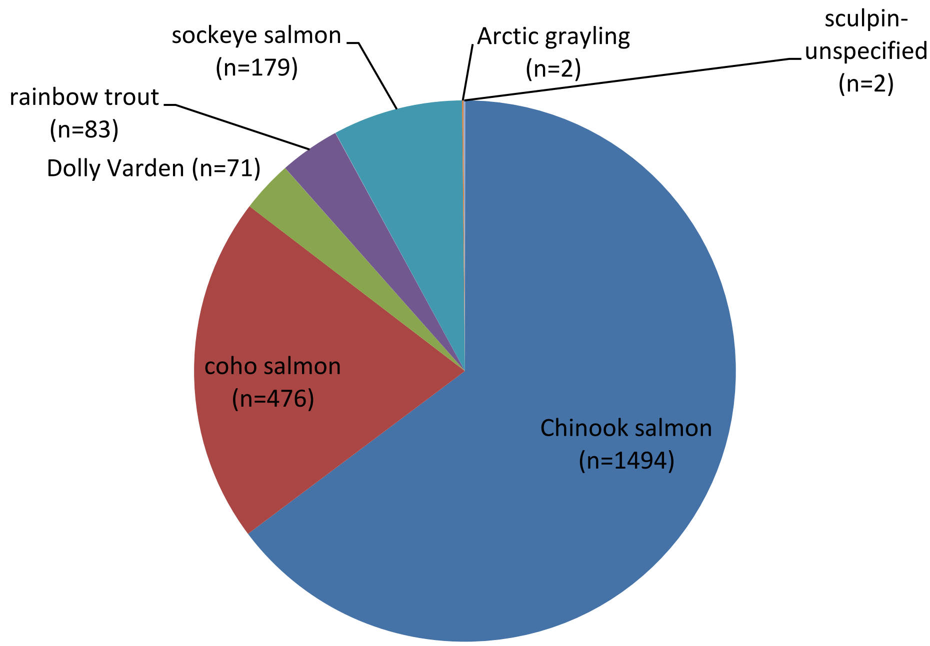


Figure 3.5.3-1 Composition and relative abundance of fish species observed, June, 2009

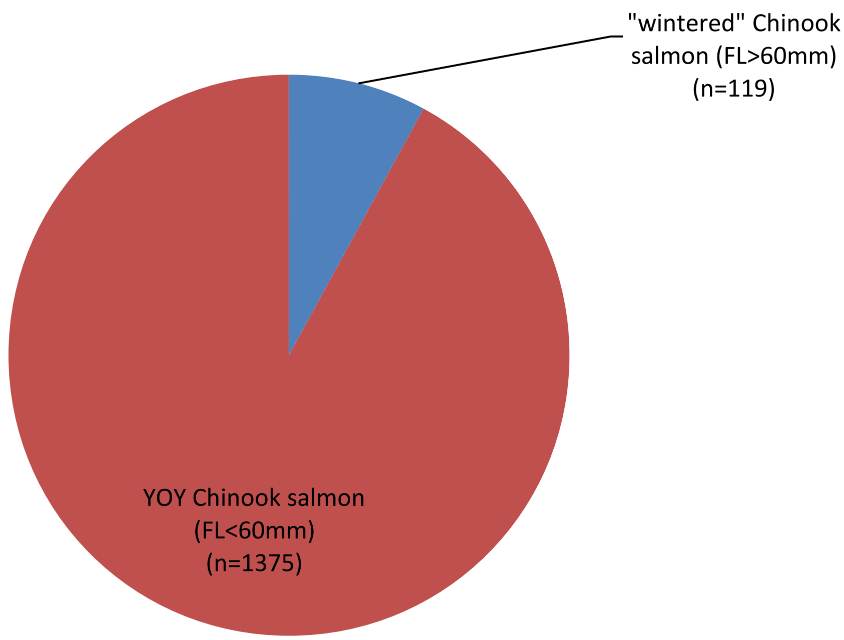


Figure 3.5.3-2 Juvenile Chinook salmon ages observed: June, 2009

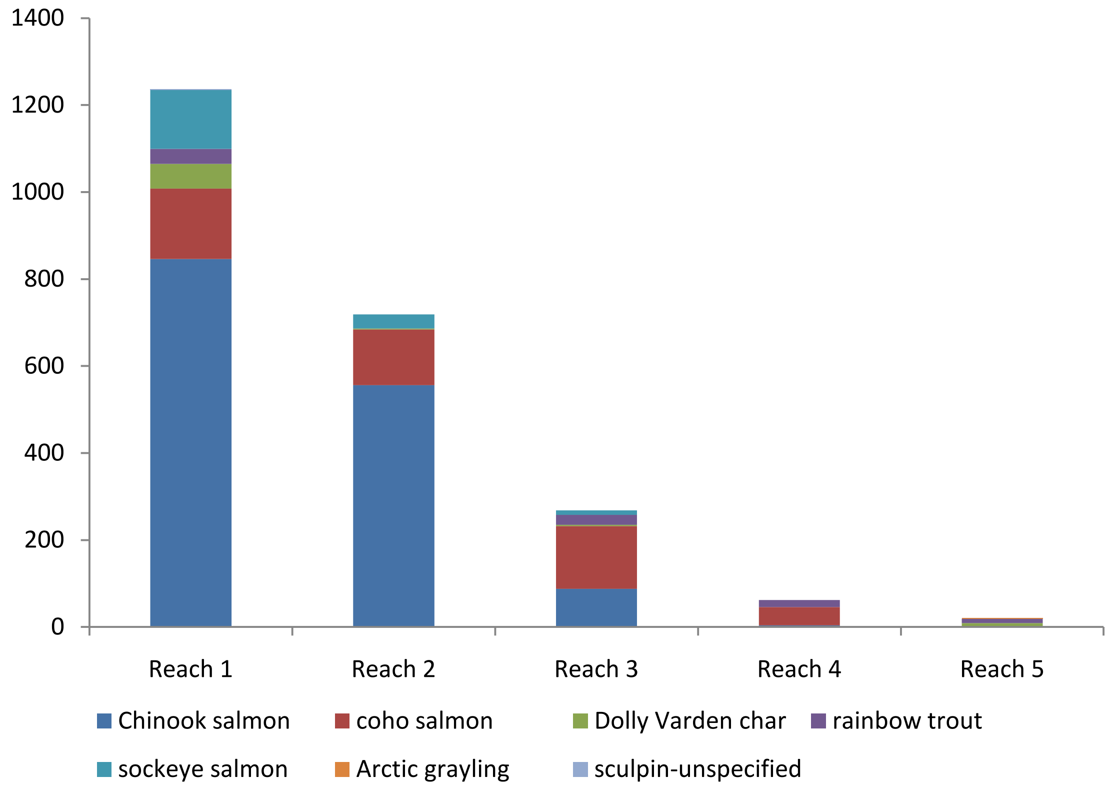


Figure 3.5.3-3 Relative abundance of fish species observed by reach, June, 200

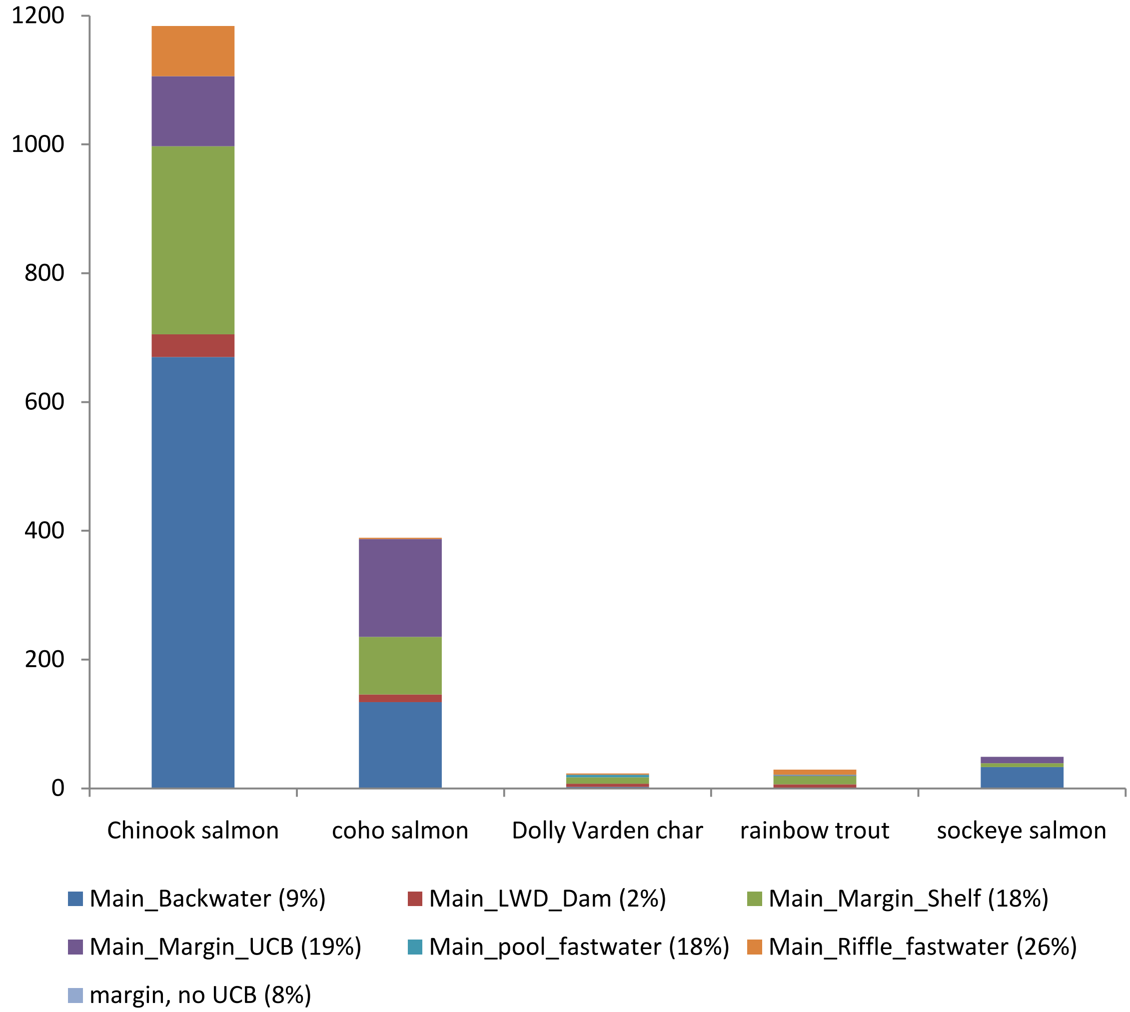


Figure 3.5.3-4 Relative abundance rearing salmon and juvenile resident fish species observed in microhabitat units, June, 2009

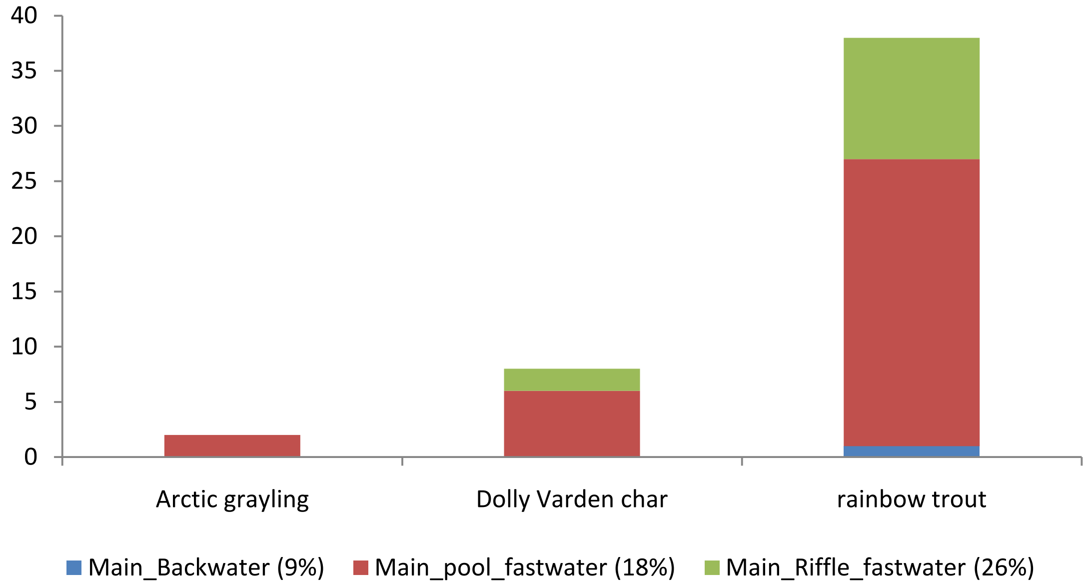


Figure 3.5.3-5 Relative abundance of resident fish (>200 mm) observed in microhabitat units, June, 2009

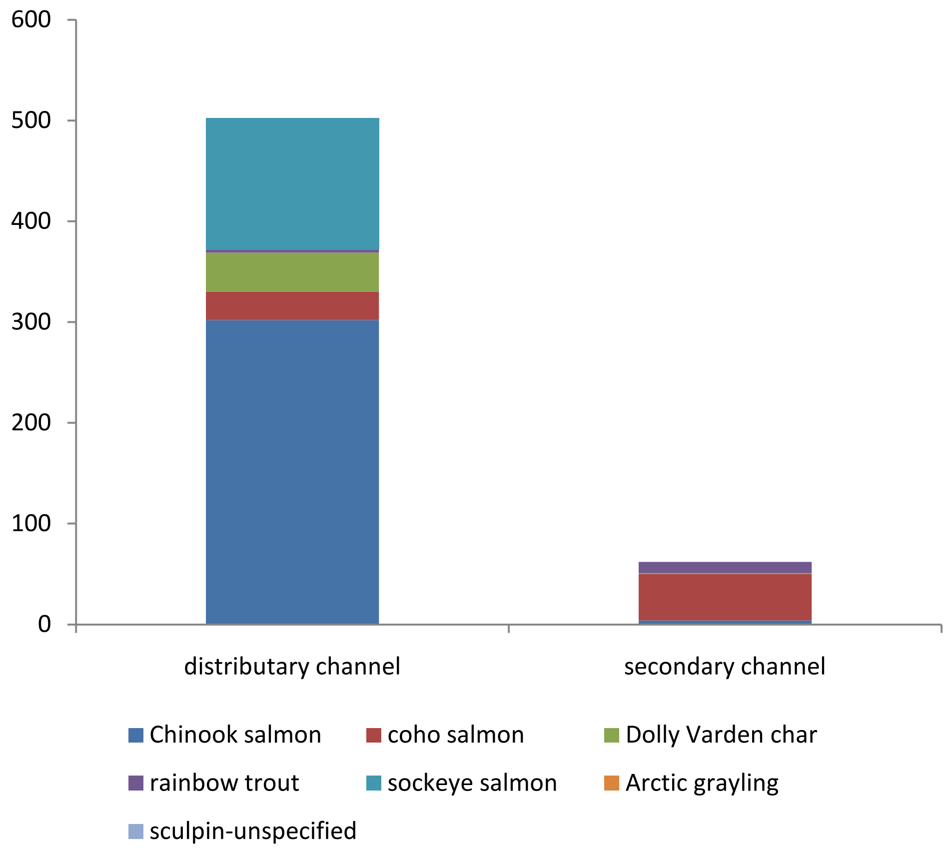


Figure 3.5.3-6 Relative abundance of rearing and resident fish observed in the distributary channel (Reach 1) and secondary channel (Reach 3), June, 2009

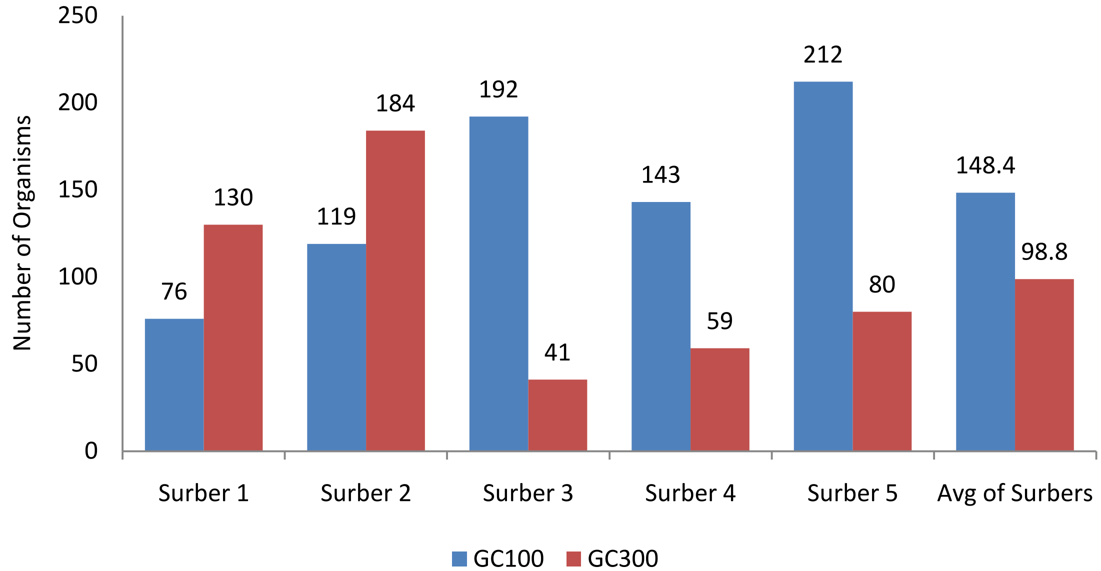


Figure 3.5.4-1 Population Densities at GC100 and GC300 from five pseudo-replicate macroinvertebrate surber samples (per 0.1 M^3), August 2009 – Grant Creek

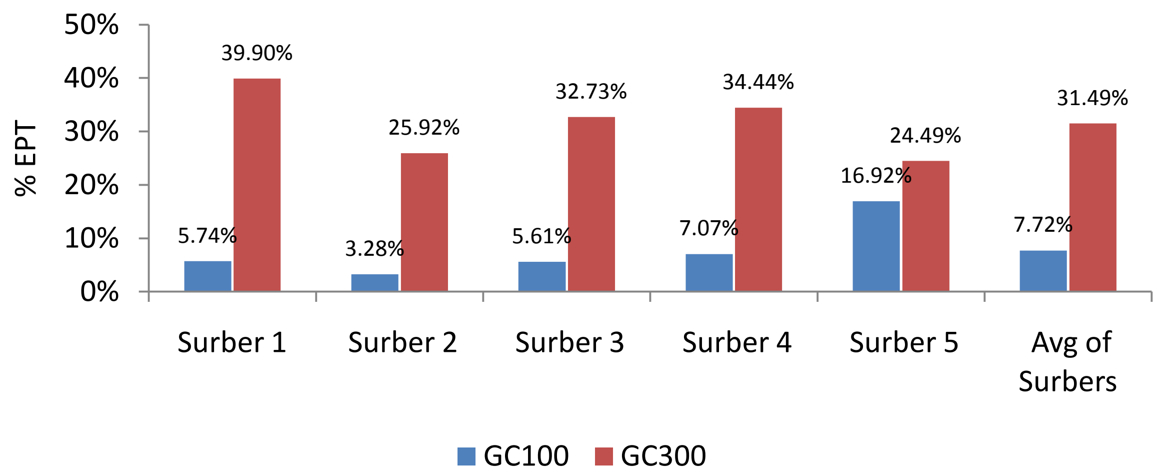


Figure 3.5.4-2 Percent EPT at GC100 and GC300 from five pseudo-replicate macroinvertebrate surber samples (per 0.1 M^3), August 2009 – Grant Creek

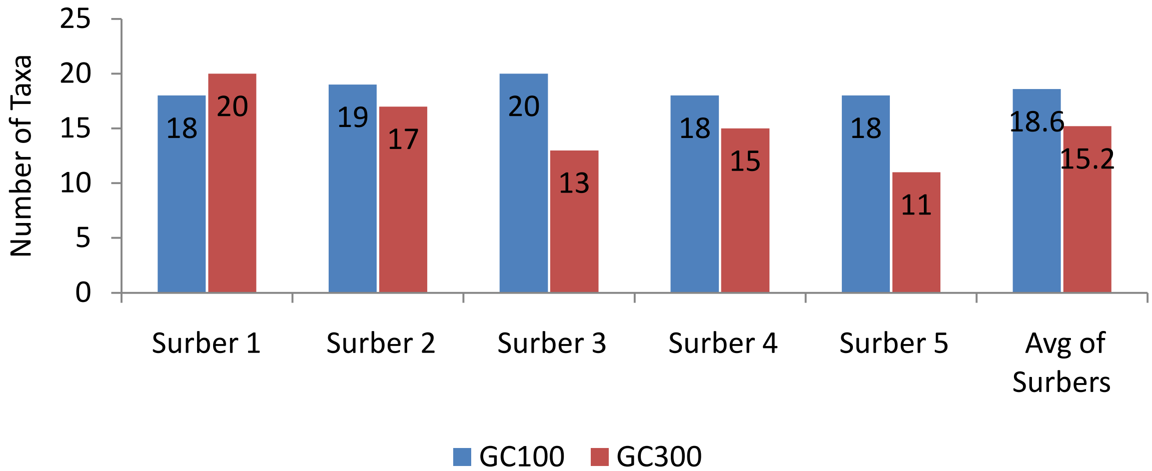


Figure 3.5.4-3 Taxa Diversity at GC100 and GC300 from five pseudo-replicate macroinvertebrate surber samples (per 0.1 M^3), August 2009 – Grant Creek

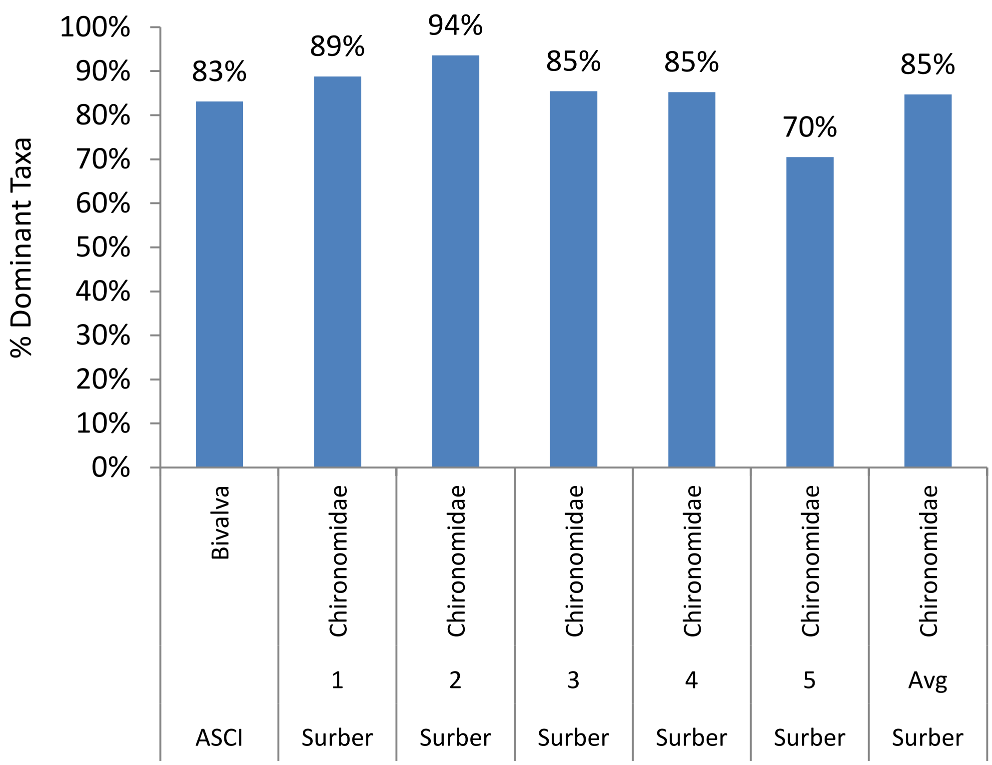


Figure 3.5.4-4 Percent Dominant Taxa in macroinvertebrate samples collected at GC100 on Grant Creek, using ASCI and five pseudo-replicate Surber samples, August 2009

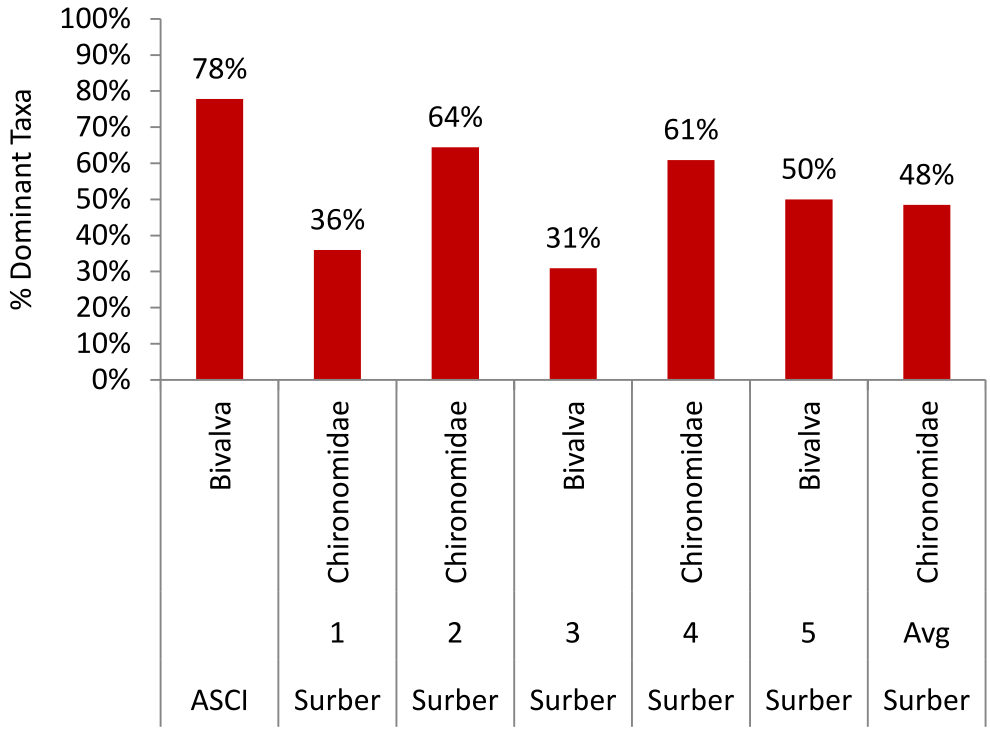


Figure 3.5.4-5 Percent Dominant Taxa in macroinvertebrate samples collected at GC300 on Grant Creek, using ASCI and five pseudo-replicate Surber samples, August 2009

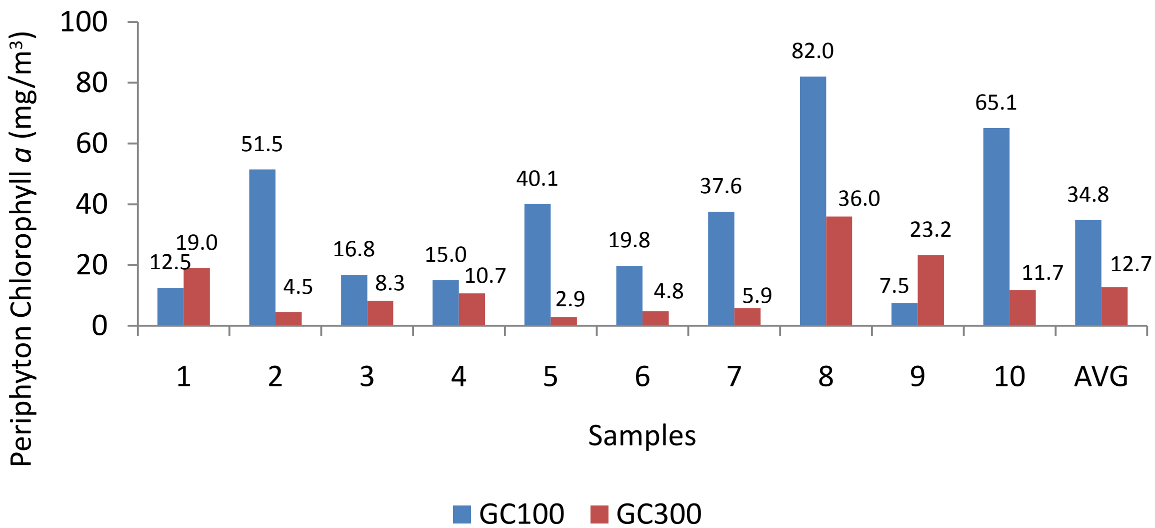


Figure 3.5.4-6 Periphyton Chlorophyll *a* concentrations (mg/m^3) at GC100 and GC300 from ten pseudo-replicate samples, August 2009 – Grant Creek

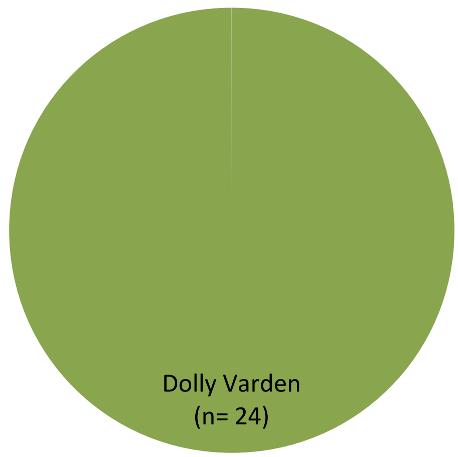


Figure 3.5.5-1 Total catch minnow trapping on Falls Creek, July, 2009

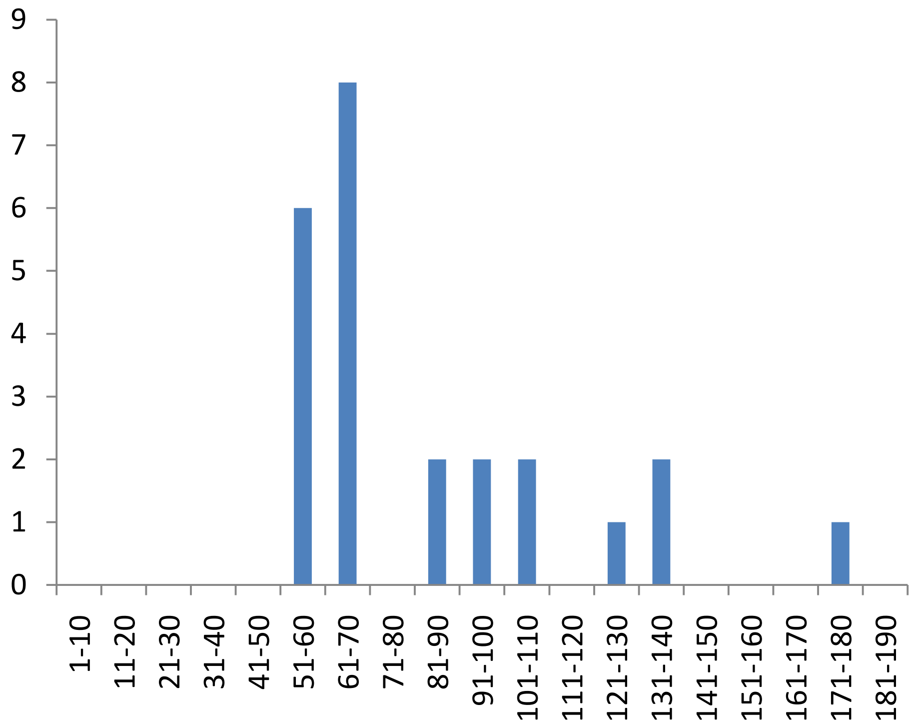


Figure 3.5.5-2 Length frequencies for Dolly Varden minnow trapped in Falls Creek, July, 2009

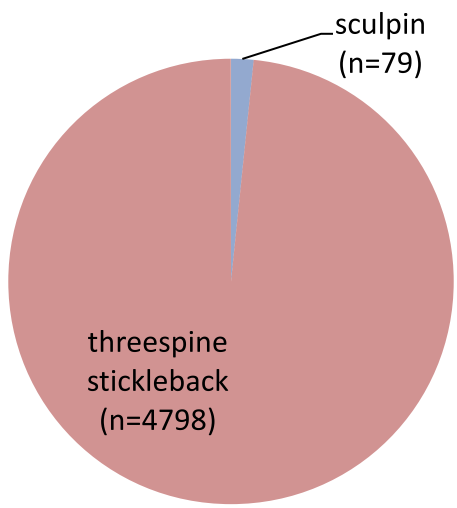


Figure 3.5.6-1 Total catch by minnow traps in Grant Lake, June and August, 2009

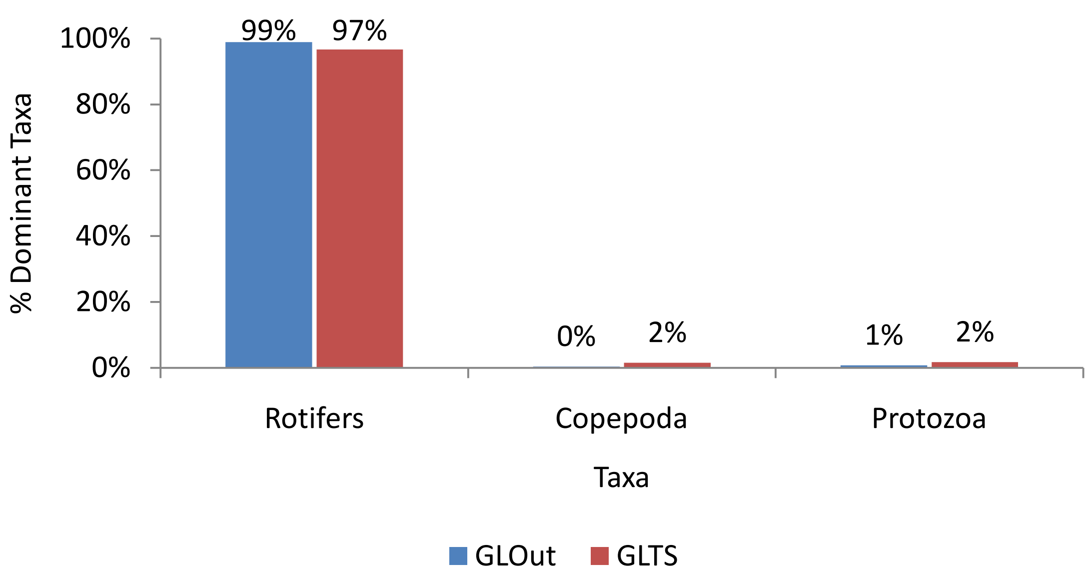


Figure 3.5.7-1 Percent Dominant Taxa in zooplankton samples at GLOut and GLTS, August 2009 – Grant Lake

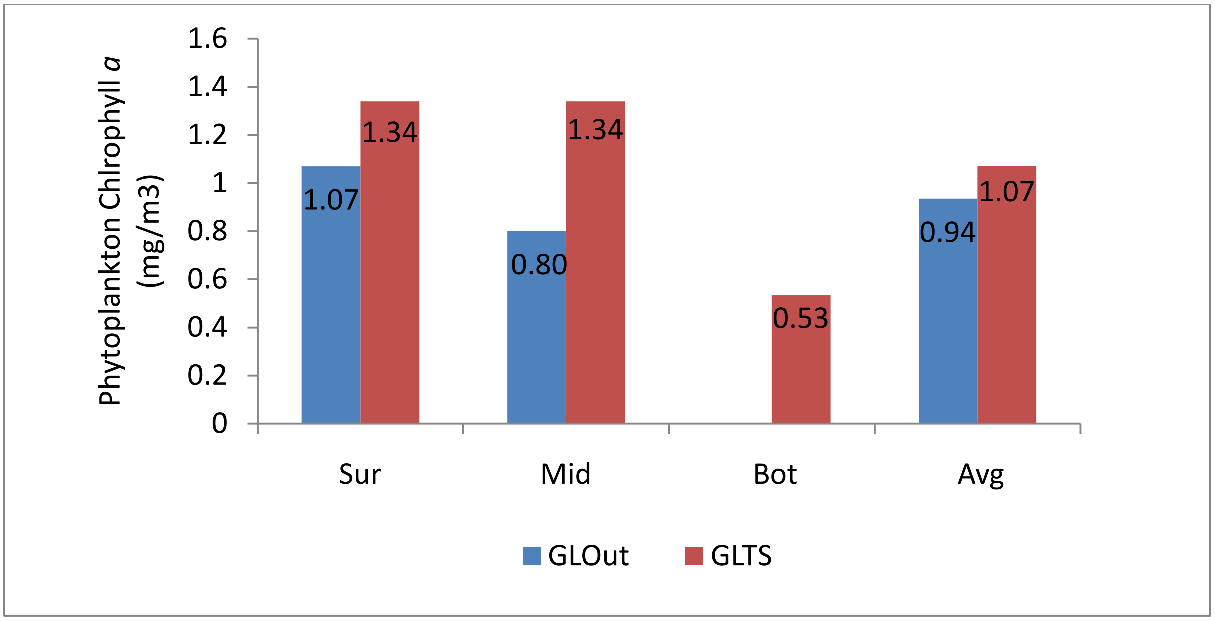
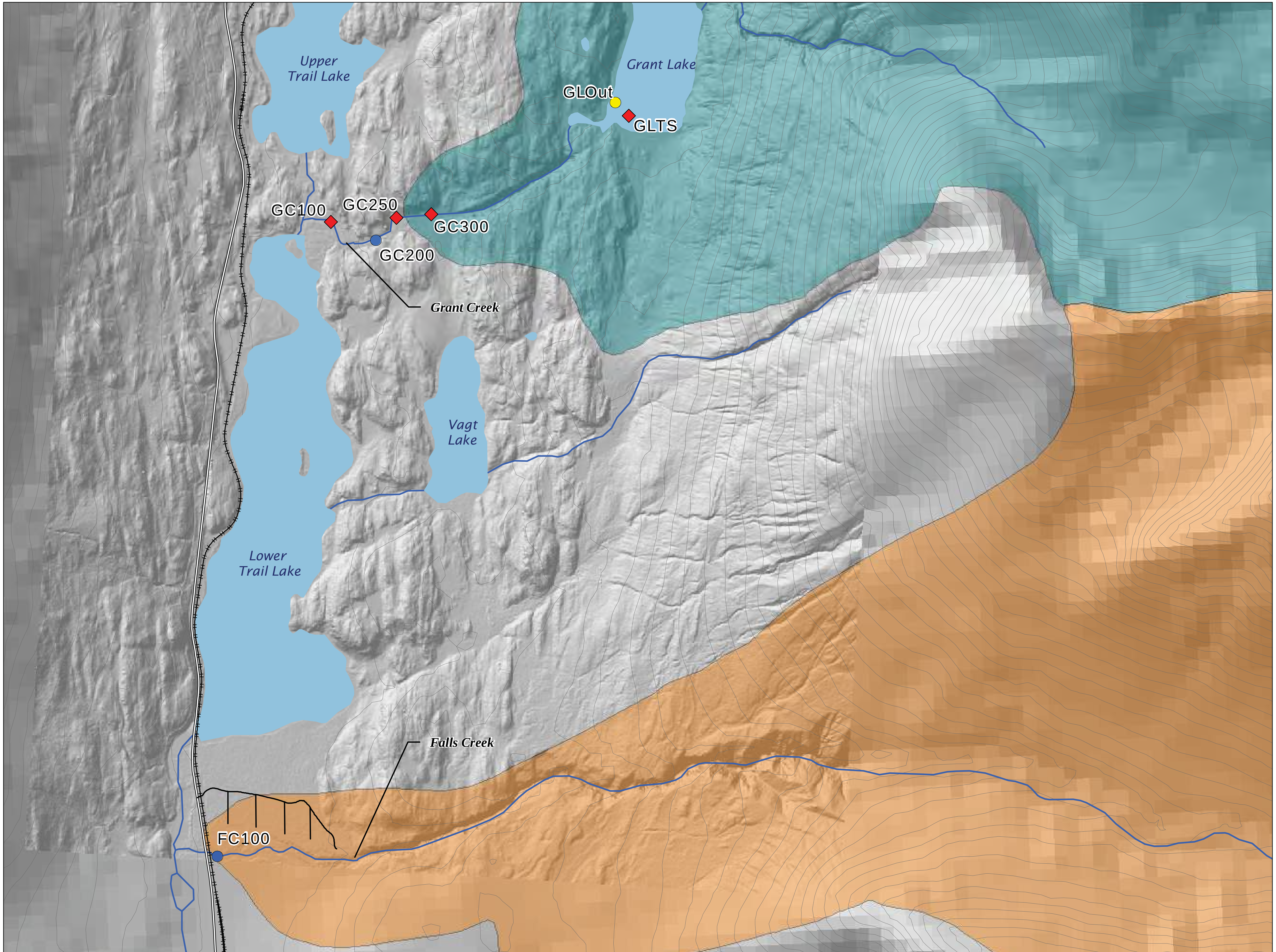


Figure 3.5.7-2 Chlorophyll *a* concentrations (mg/m^3) in phytoplankton samples at GLOut and GLTS, August 2009 – Grant Lake

Figure 4.2.1-1. Sites sampled and types of samples collected at Grant Lake in 1981 – 1982 (AEIDC 1983).

Numbers represent sampling sites; 1= variable mesh gill net sampling sites, 2= minnow trap sites, 3= plankton and water quality sampling sites, 4= benthos sampling sites.

Figure 4.3- 1



Water Quality, Temperature, and Hydrology Study Locations 2009

Legend

- Thermistor
- Gage
- Natural Outlet Sampling Point
- Falls Creek Watershed
- Grant Creek Watershed
- Roads
- Seward Highway
- Rail
- Lakes
- Rivers
- Contours (10 ft)

NORTH

Miles 0 0.5

Map Projection: NAD 83 Alaska State Plane Zone 4 Feet
Data Sources: HDR Alaska, Inc., USFS, KPB, USGS
Author: HDR Alaska, Inc.
Date: 12 October 2009

This map represents a conceptual level of utility, detail, and accuracy. The information displayed here is for planning purposes only. Base information shown constitutes data from various federal, state, public, and private sources. These maps are for review purposes only.

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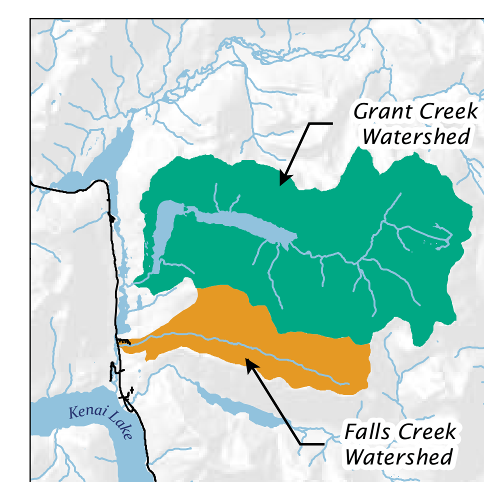


Figure 4.4.2-1. Example staff gauge and data logger installation

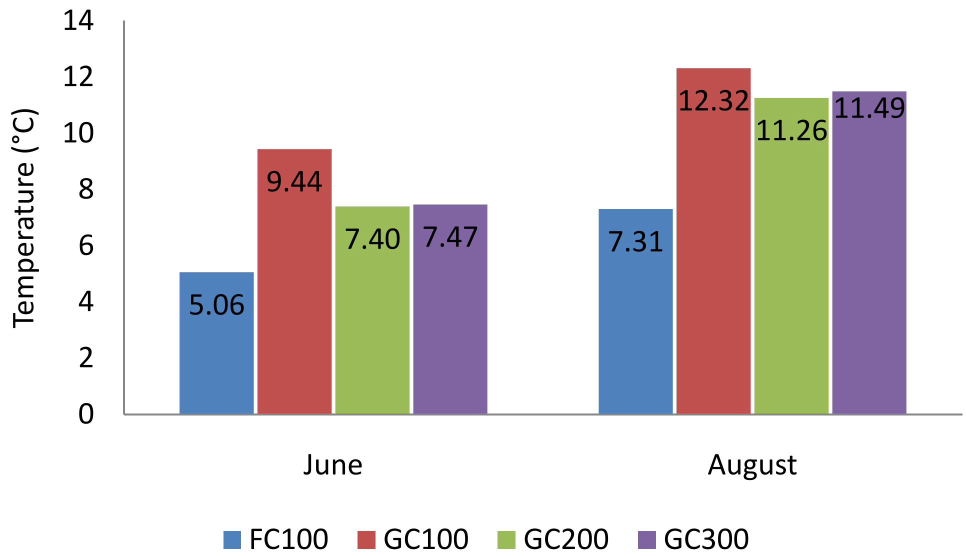


Figure 4.5.1-1. Temperature at Grant and Falls Creek during water quality sampling.

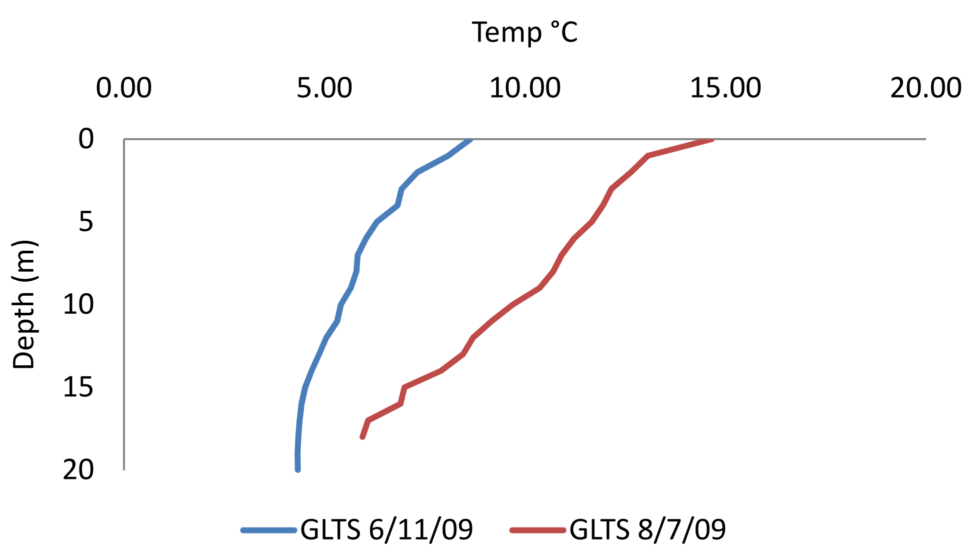


Figure 4.5.1-2. Temperature at Grant Lake Thermistor String location taken during water quality sampling.

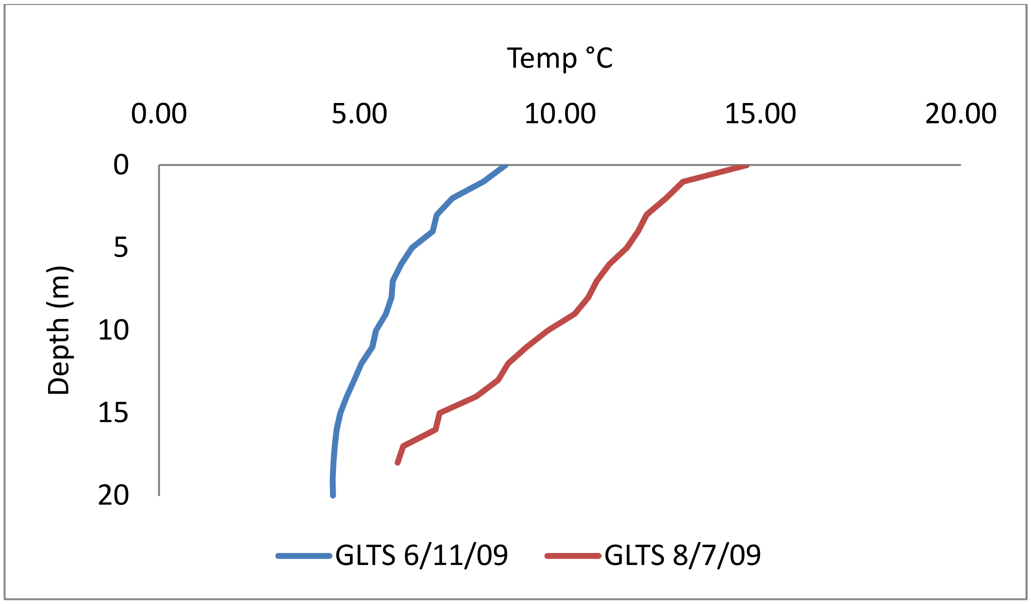


Figure 4.5.1-3. Temperature at Grant Lake Outlet location taken during water quality sampling.

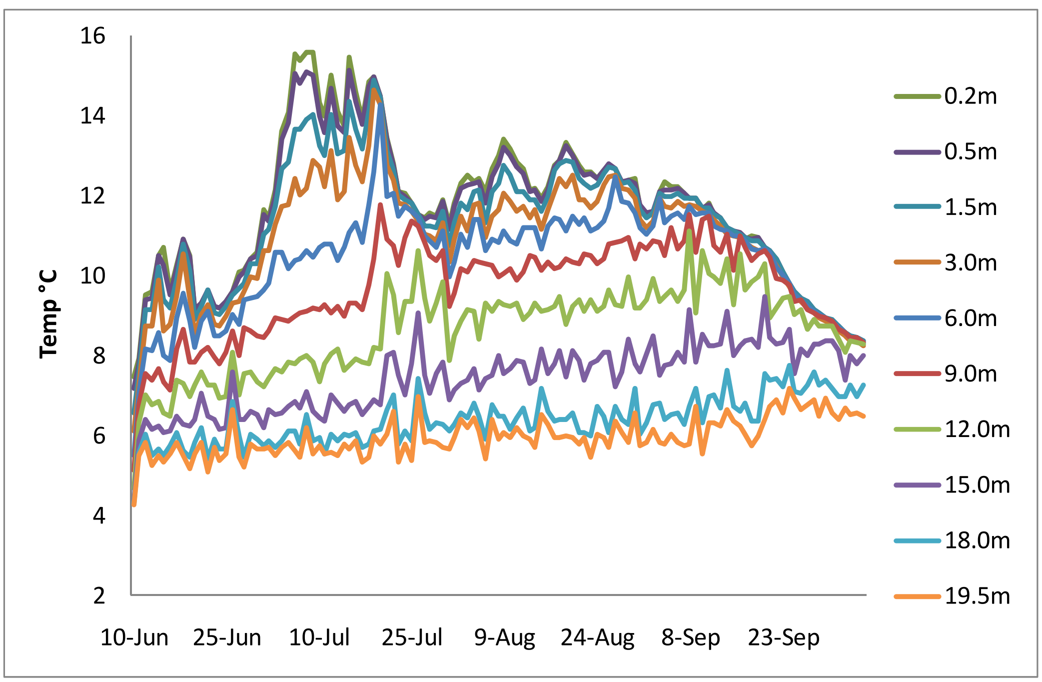


Figure 4.5.1-4. Continuous temperature for all depth intervals in Grant Lake as daily mean values.

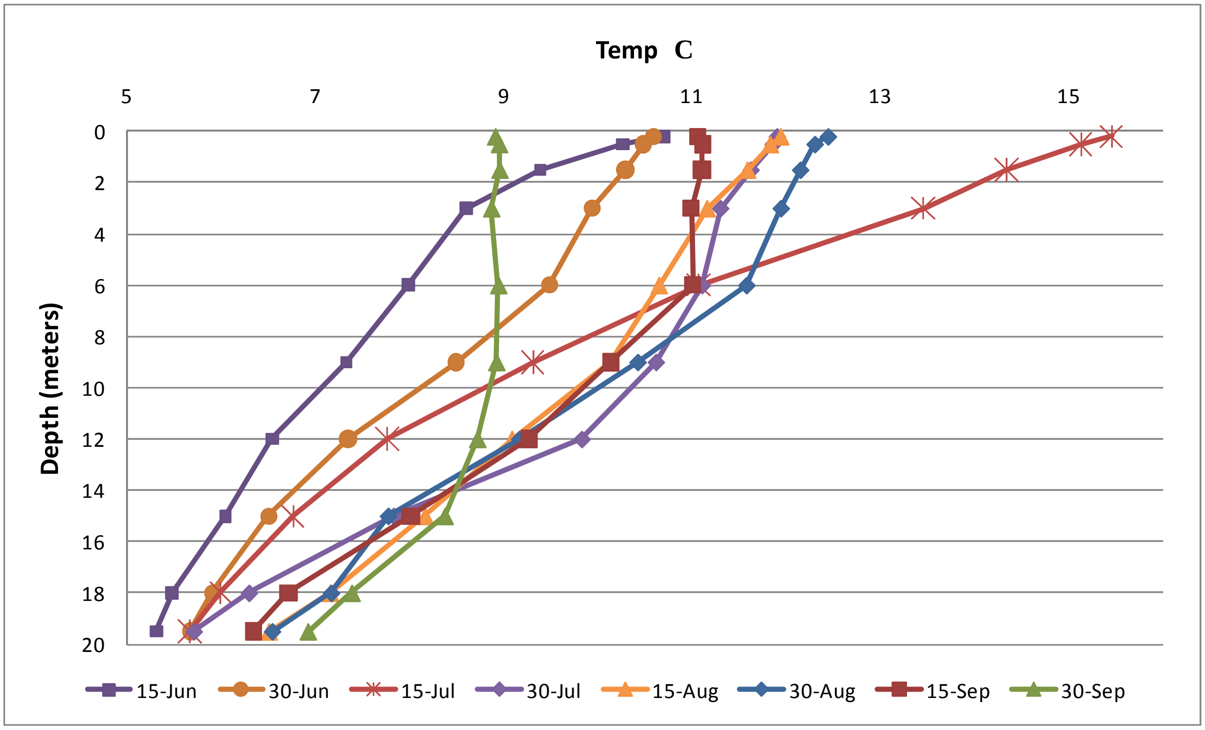


Figure 4.5.1-5. Continuous temperature in Grant Lake as daily mean values.

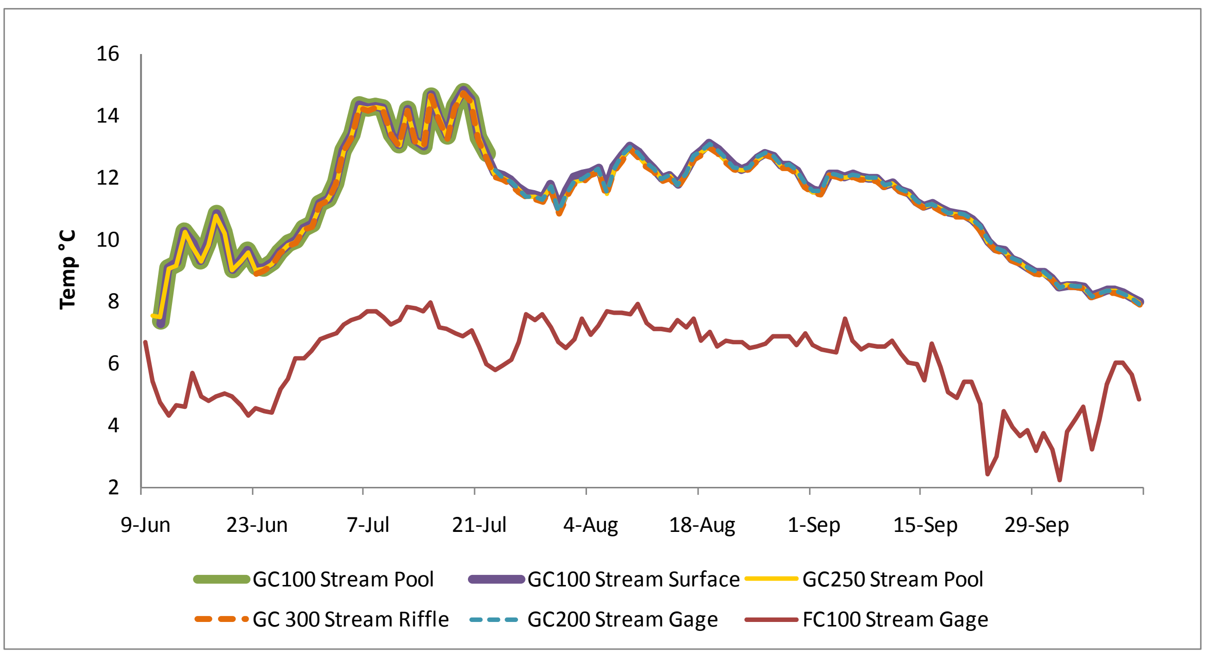


Figure 4.5.1-6. Continuous temperature at stream stations as daily mean values.

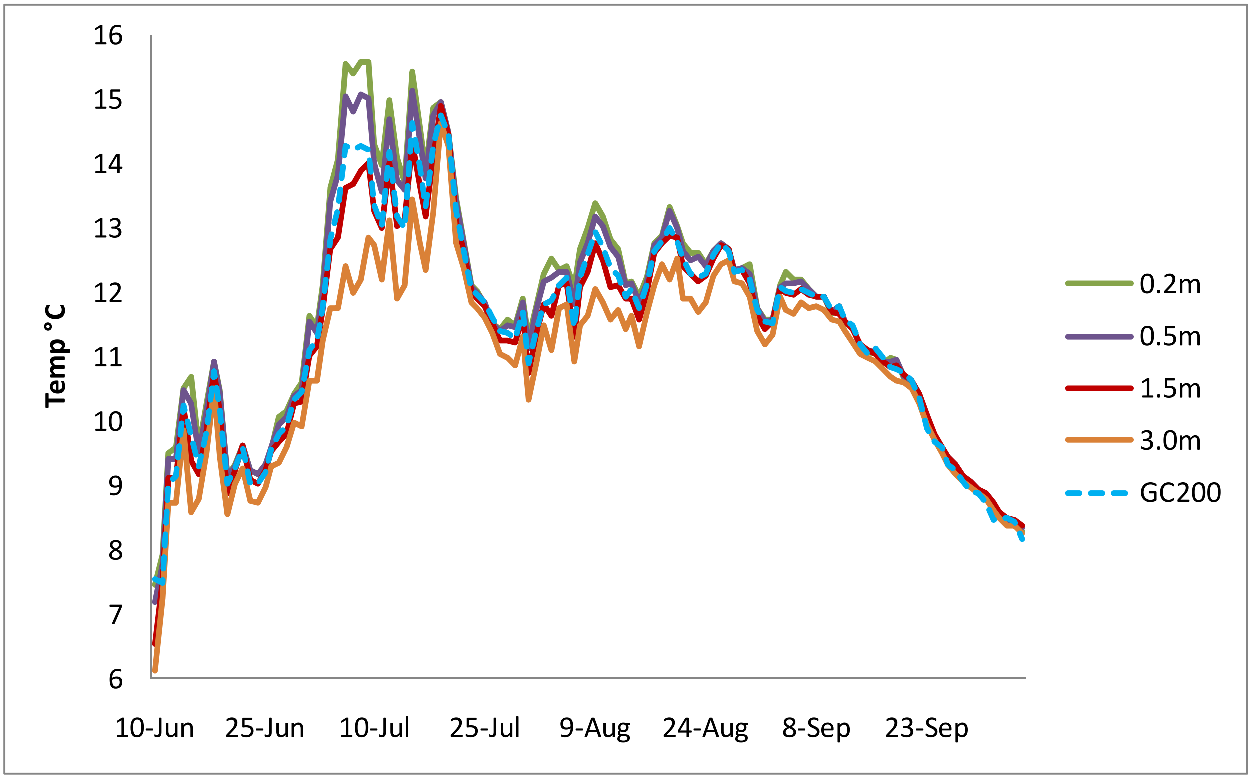


Figure 4.5.1-7. Continuous temperature at shallow depths in Grant Lake and Grant Creek stream gage as daily mean values.

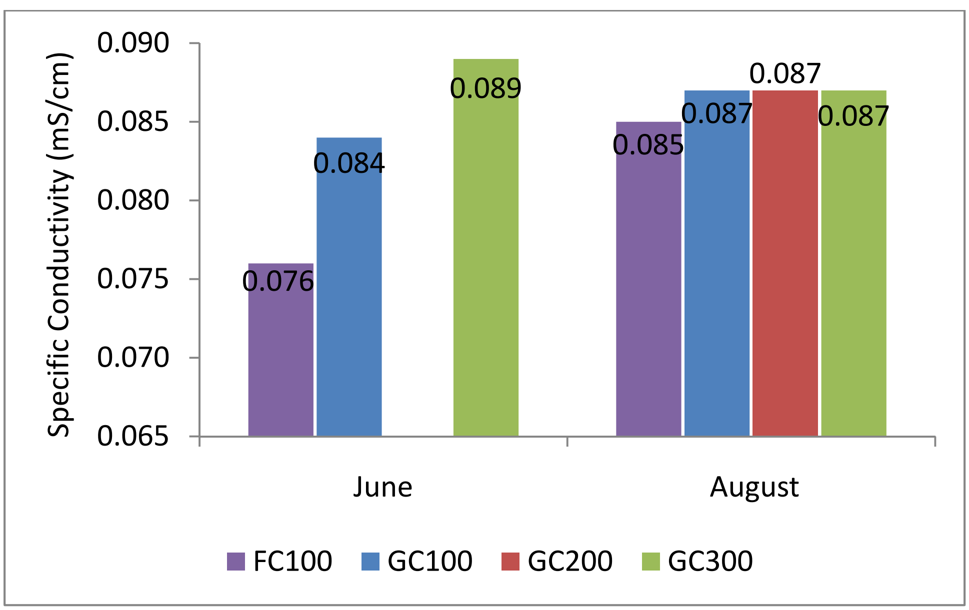


Figure 4.5.1-8. Specific Conductivity at stream sampling locations.

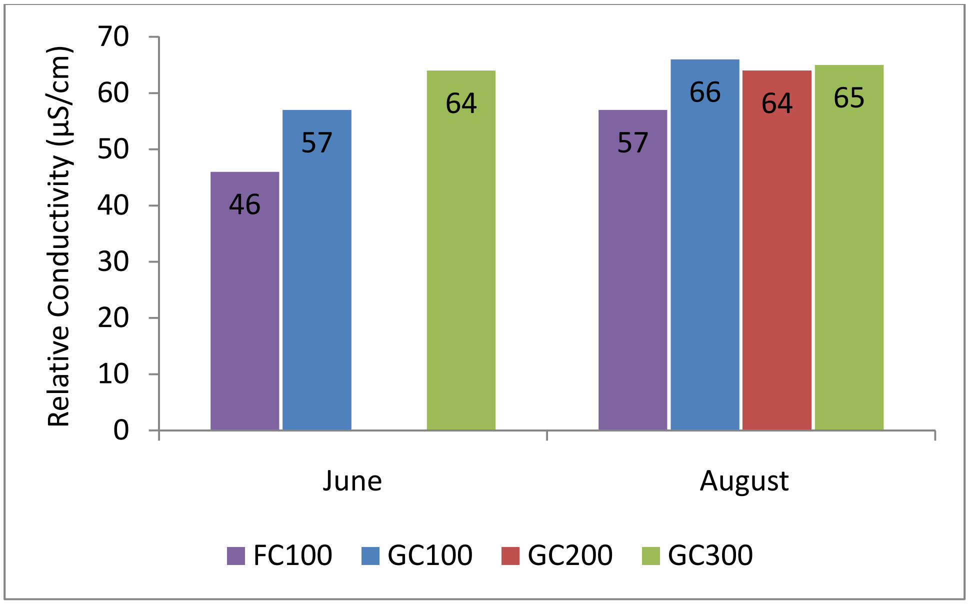


Figure 4.5.1-9. Relative Conductivity at stream sampling locations.

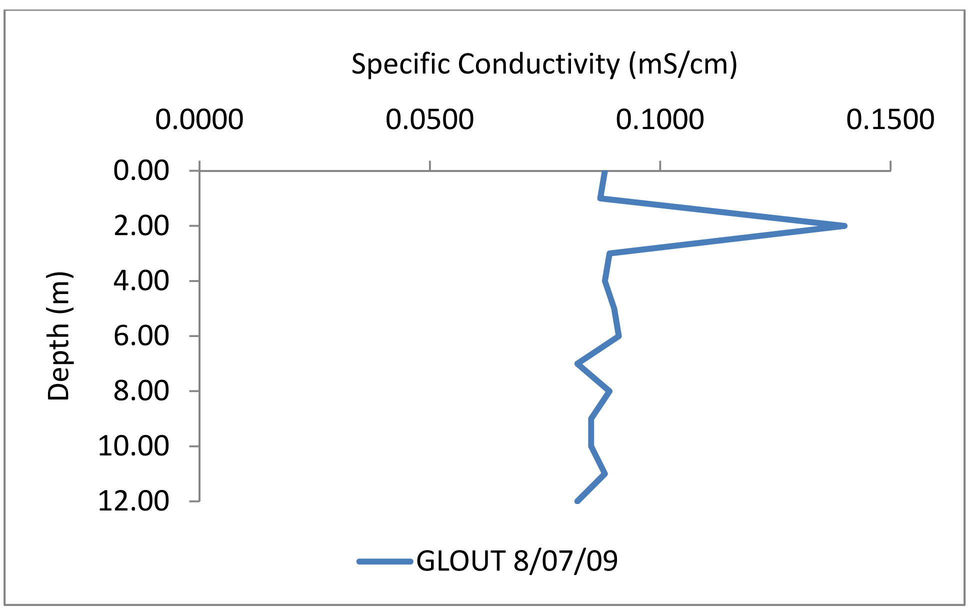


Figure 4.5.1-10. Specific Conductivity at Grant Lake Outlet.

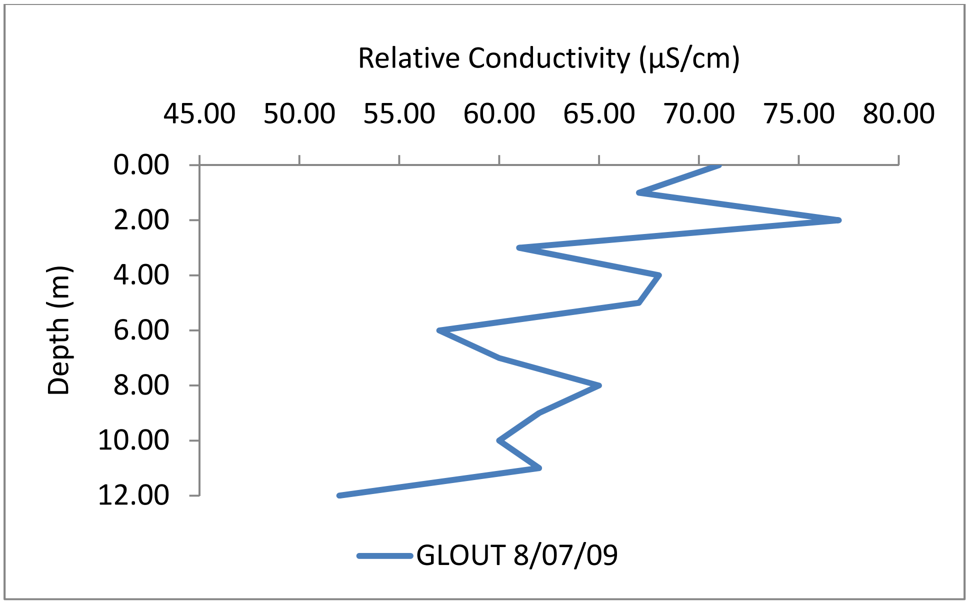


Figure 4.5.1-11. Relative Conductivity at Grant Lake Outlet.

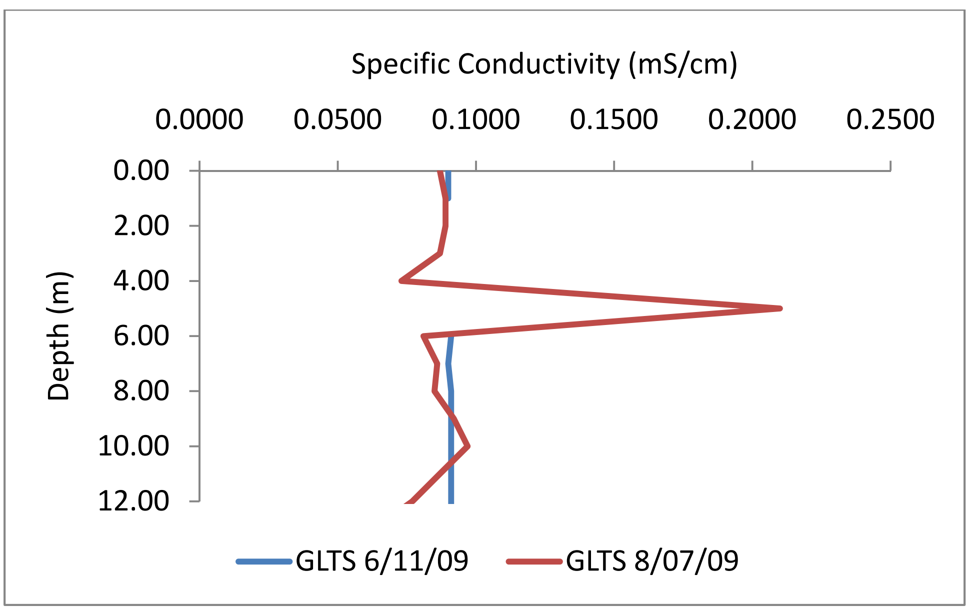


Figure 4.5.1-12. Specific Conductivity at Grant Lake Thermistor String Location.

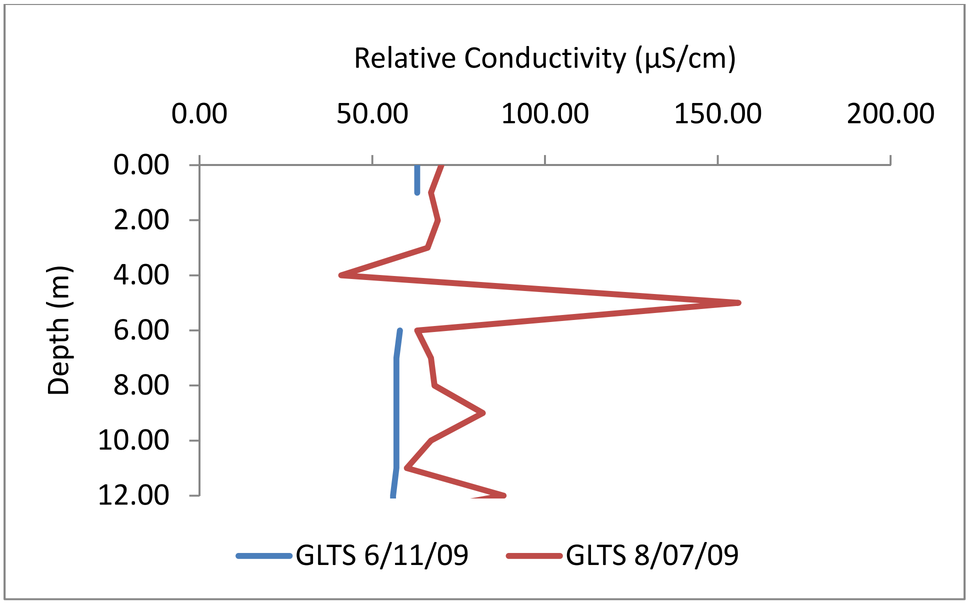


Figure 4.5.1-13. Relative Conductivity at Grant Lake Thermistor String Location.

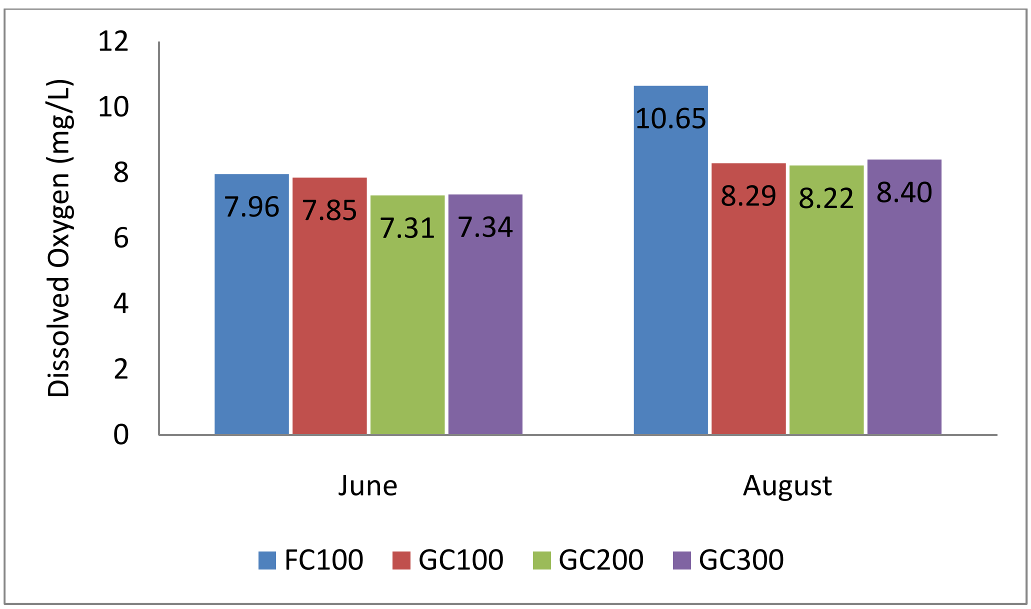


Figure 4.5.1-14. Dissolved Oxygen Concentration at Grant and Falls Creek.

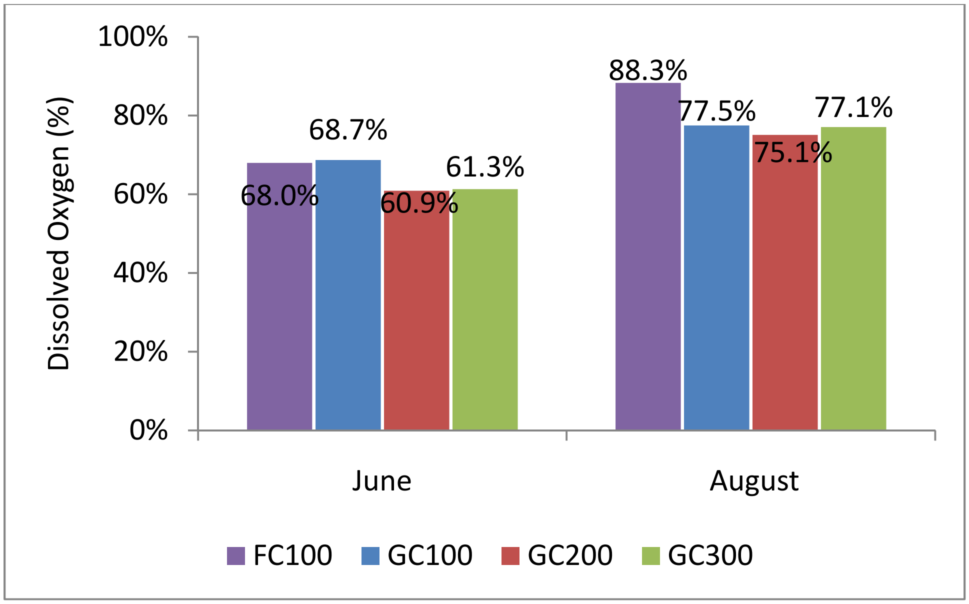


Figure 4.5.1-15. Dissolved Oxygen Saturation at Grant and Falls Creek.

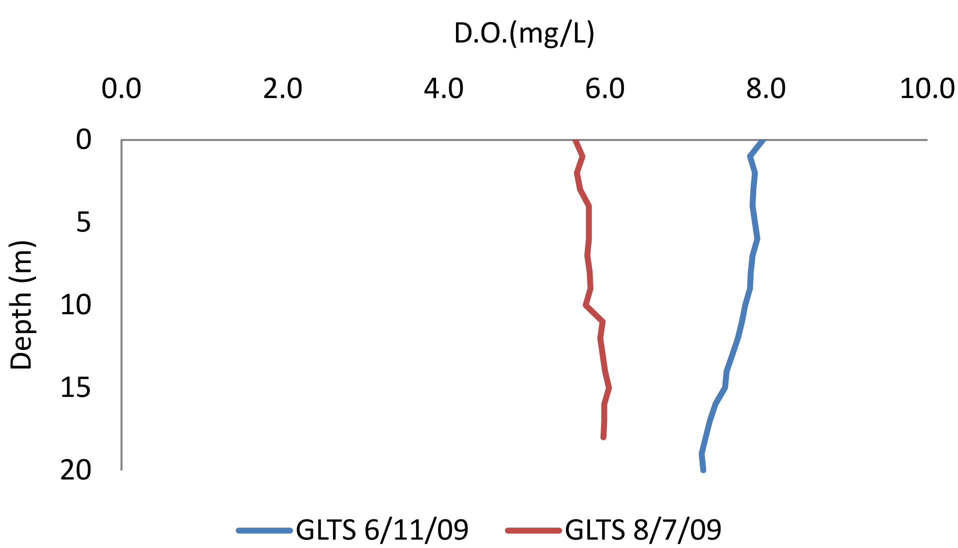


Figure 4.5.1-16. Dissolved Oxygen Concentration at Grant Lake Thermistor String Location.

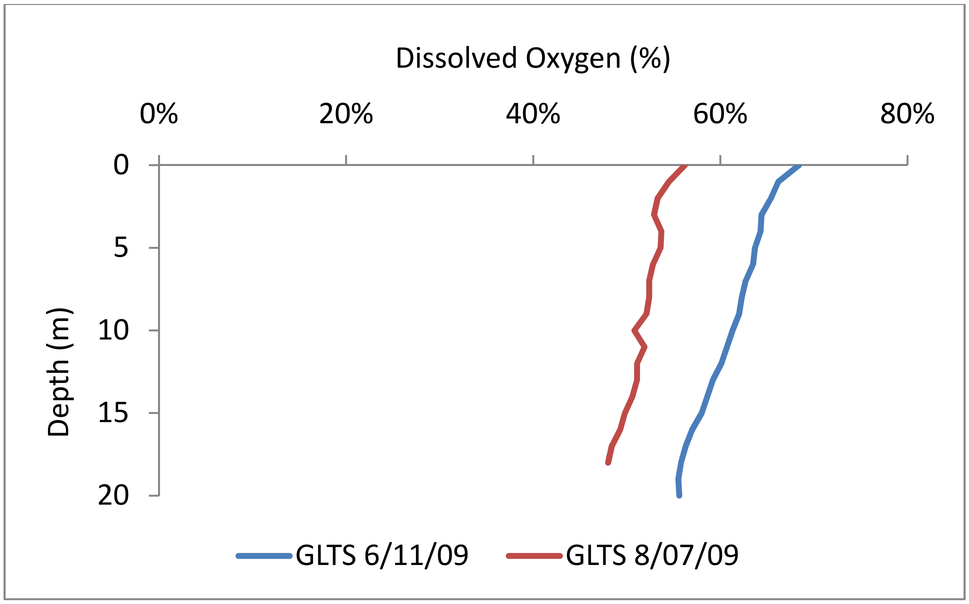


Figure 4.5.1-17. Dissolved Oxygen Saturation at Grant Lake Thermistor String Location

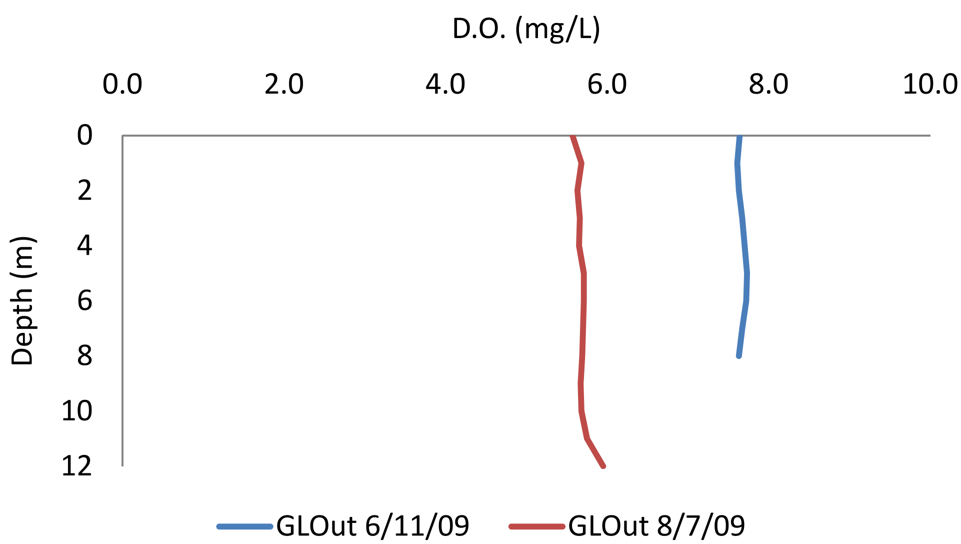


Figure 4.5.1-18. Dissolved Oxygen Concentration at Grant Lake Outlet.

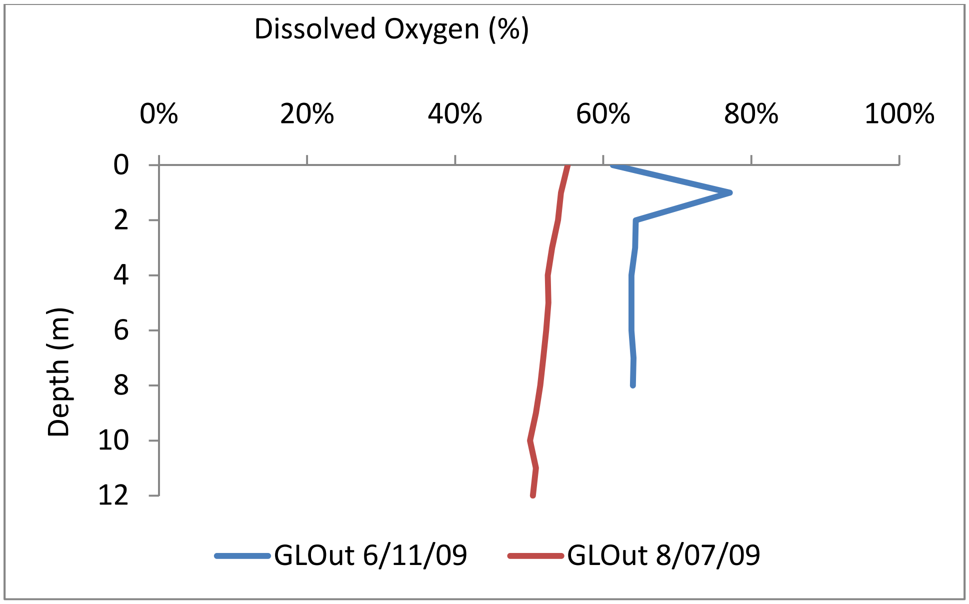


Figure 4.5.1-19. Dissolved Oxygen Saturation at Grant Lake Outlet.

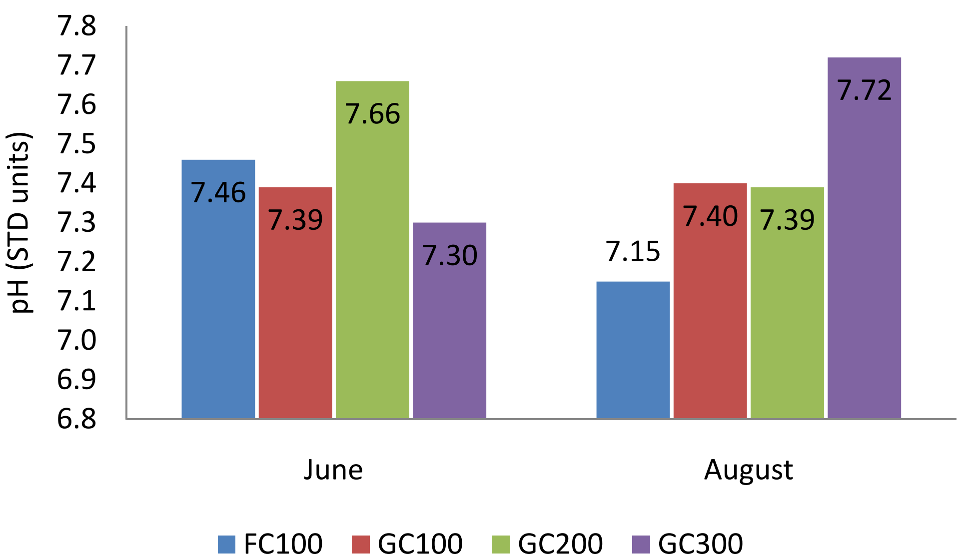


Figure 4.5.1-20. pH Concentrations at all Stream Locations.

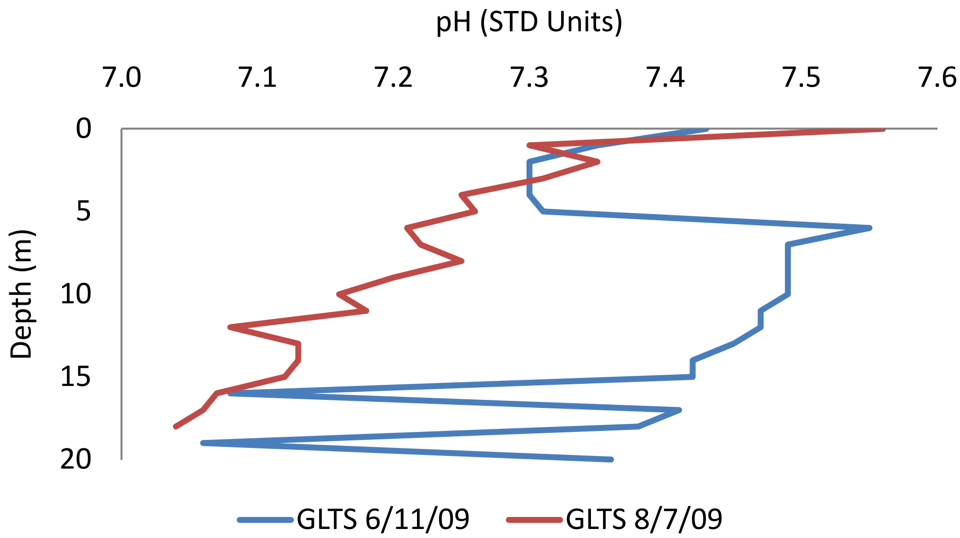


Figure 4.5.1-21. pH Concentrations at Grant Lake Thermistor String Location.

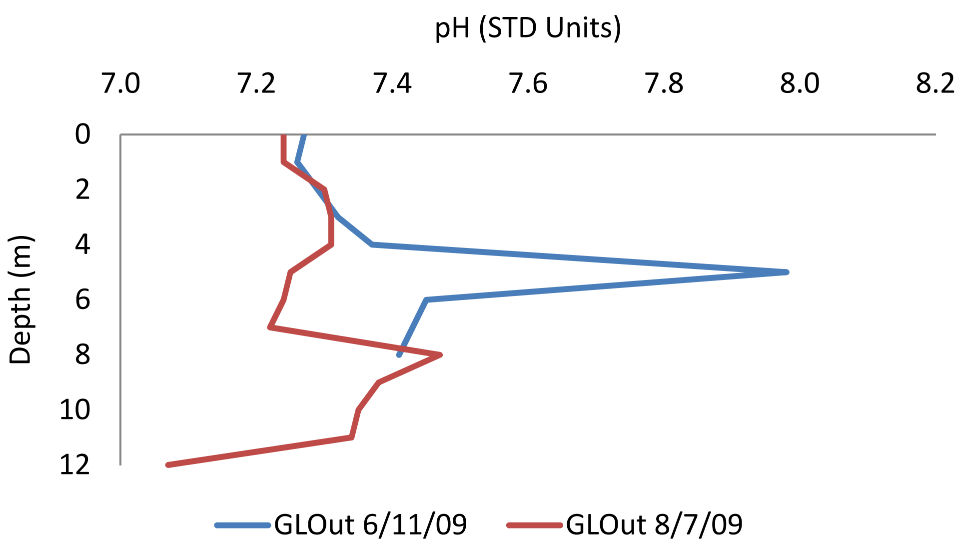


Figure 4.5.1-22. pH Concentrations at Grant Lake Outlet.

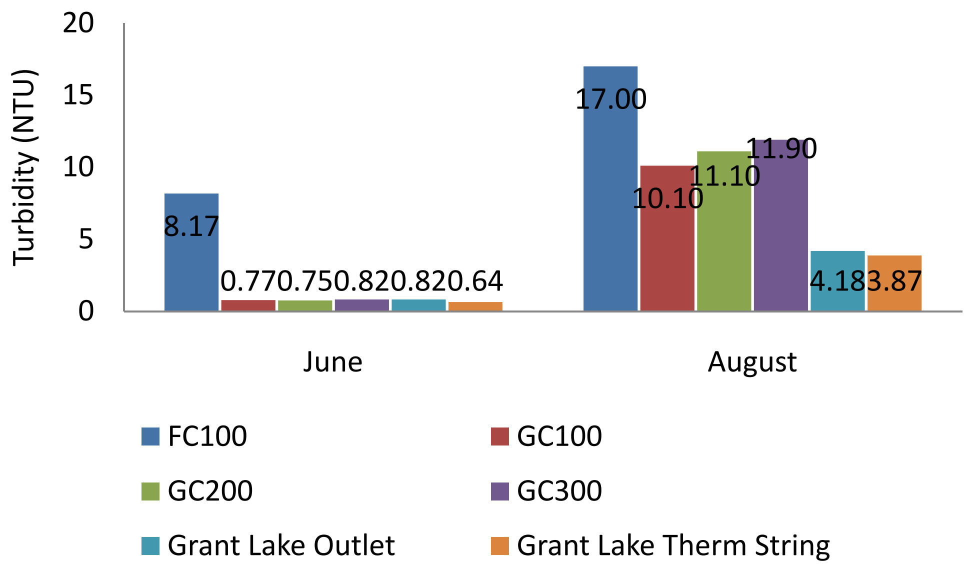


Figure 4.5.1-23. Turbidity at all Grant and Falls Creek Locations with included Turbidity of Surface of Grant Lake.

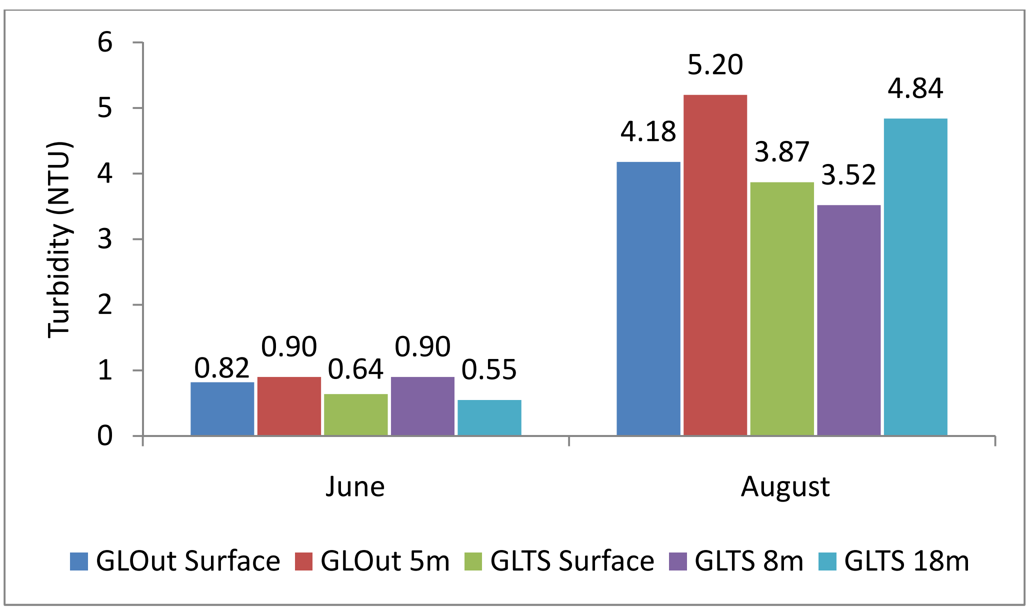


Figure 4.5.1-24. Turbidity at all Grant Lake Locations and Depths.

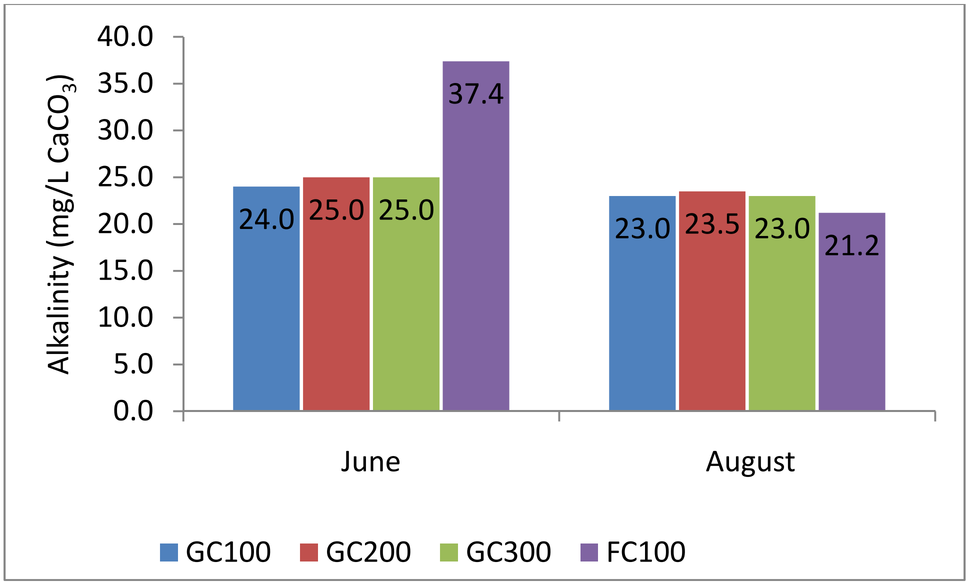


Figure 4.5.1-25. Alkalinity at all Grant and Falls Creek Locations.

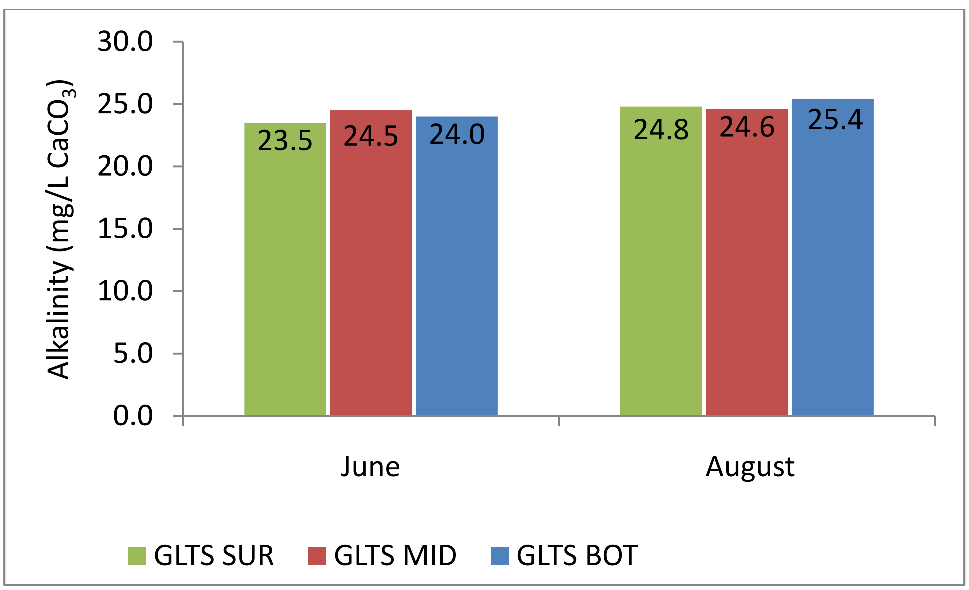


Figure 4.5.1-26. Alkalinity Concentrations at Grant Lake Thermistor String Location.

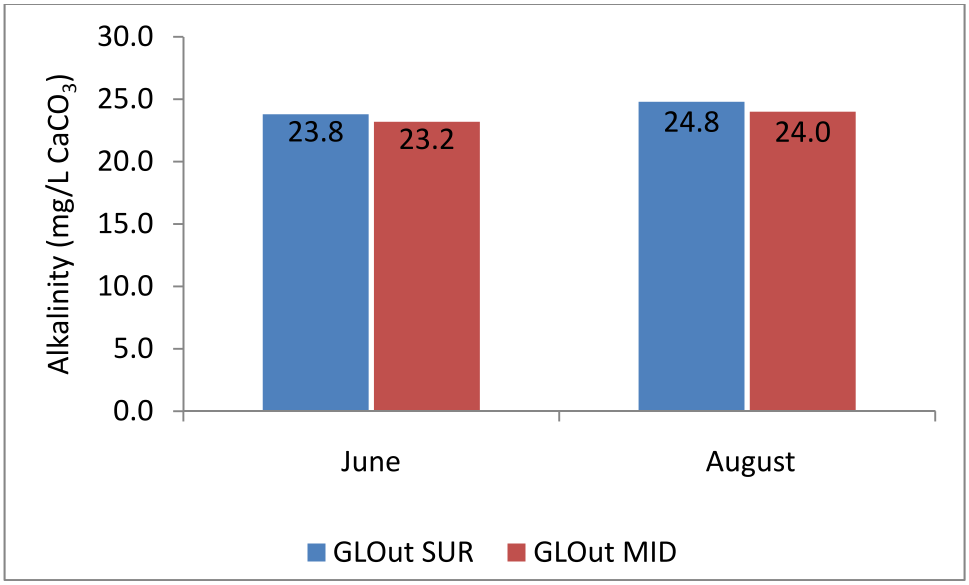


Figure 4.5.1-27. Alkalinity Concentrations at Grant Lake Outlet by Depth.

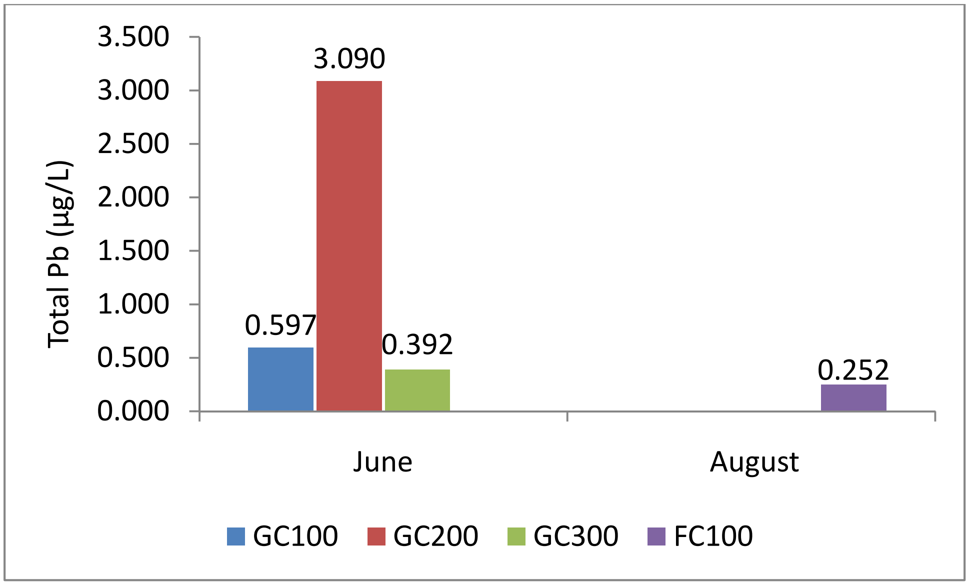


Figure 4.5.1-28. Total Lead Concentrations in Grant and Falls Creek.

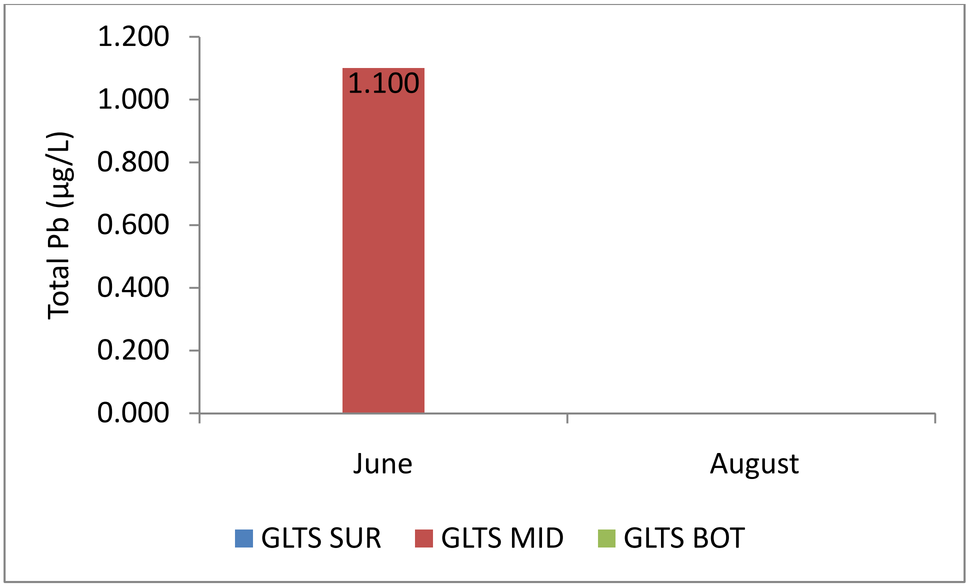


Figure 4.5.1-29. Total Lead Concentrations at the Grant Lake Thermistor String Location.

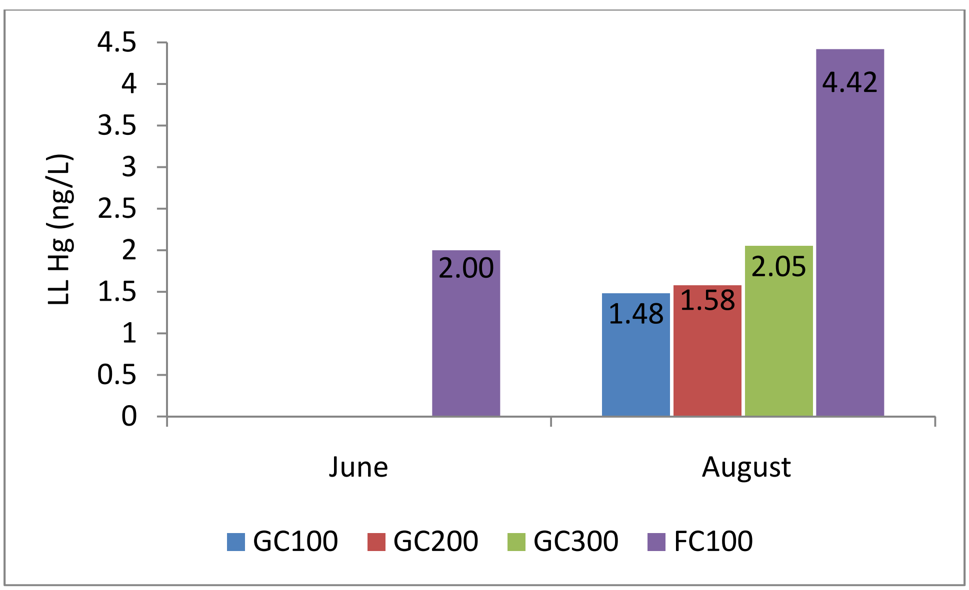


Figure 4.5.1-30. Low Level Mercury Concentrations at Grant and Falls Creek.

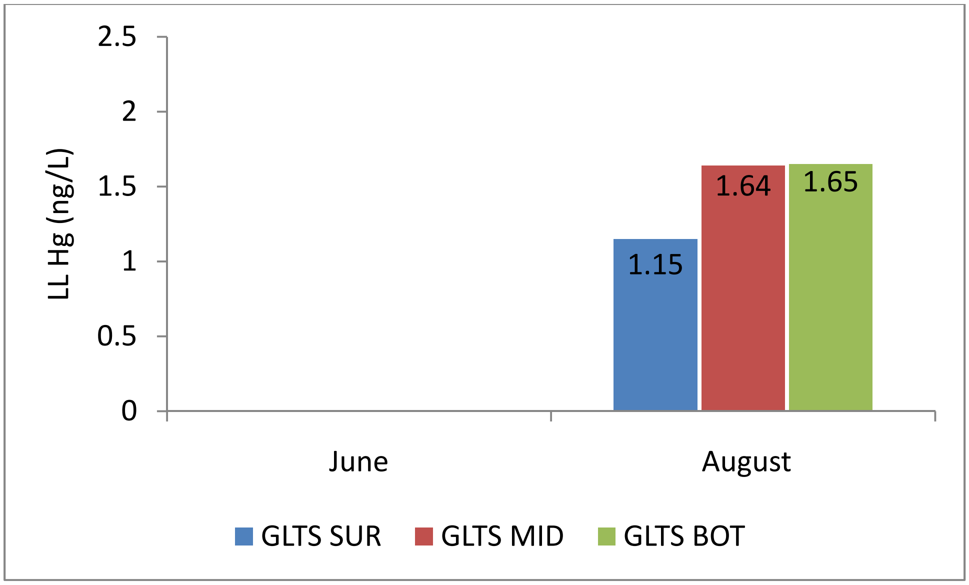


Figure 4.5.1-31. Low Level Mercury Concentrations at Grant Lake Thermistor String Location.

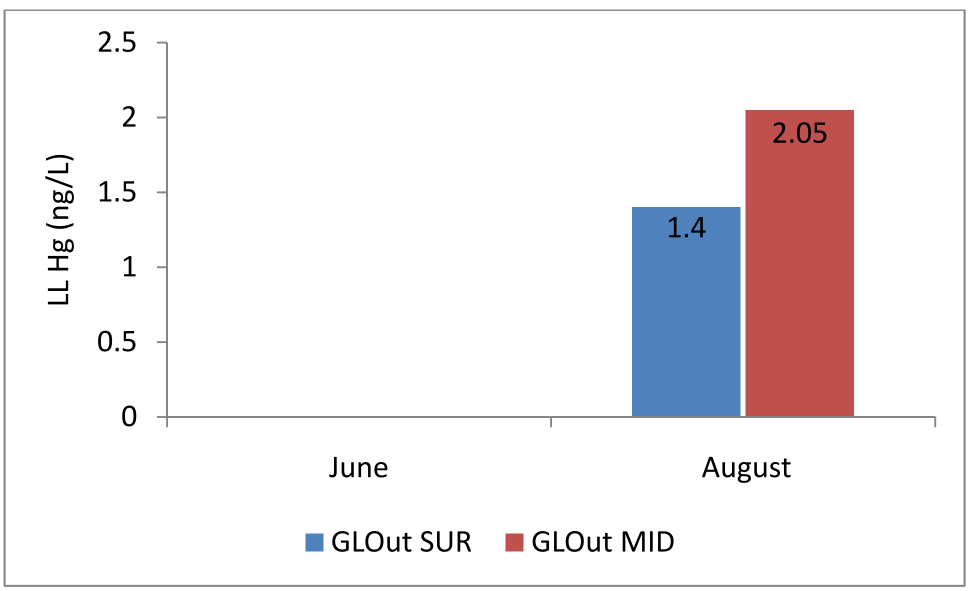


Figure 4.5.1-32. Low Level Mercury Concentrations at Grant Lake Outlet.

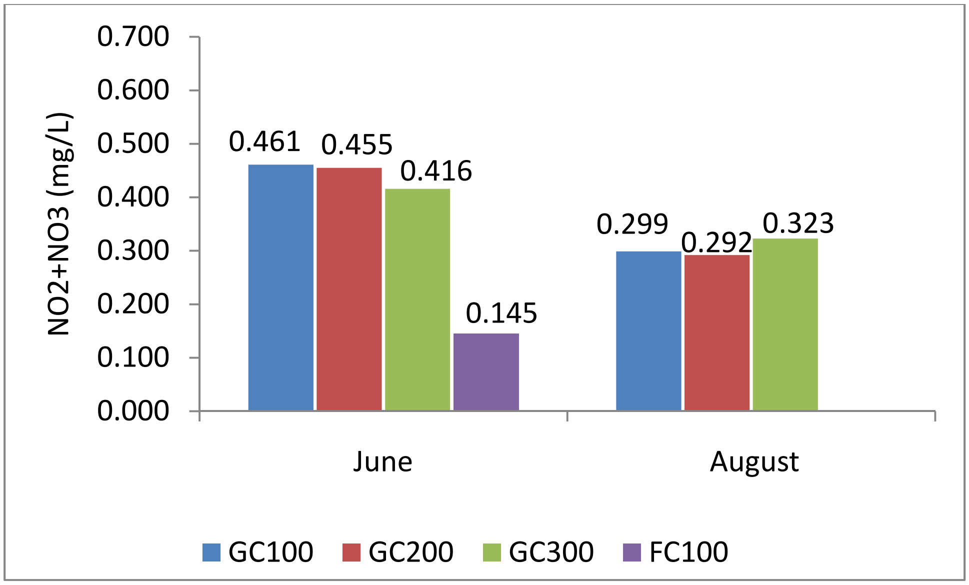


Figure 4.5.1-33. Nitrate and Nitrite Concentrations at all Grant and Falls Creek.

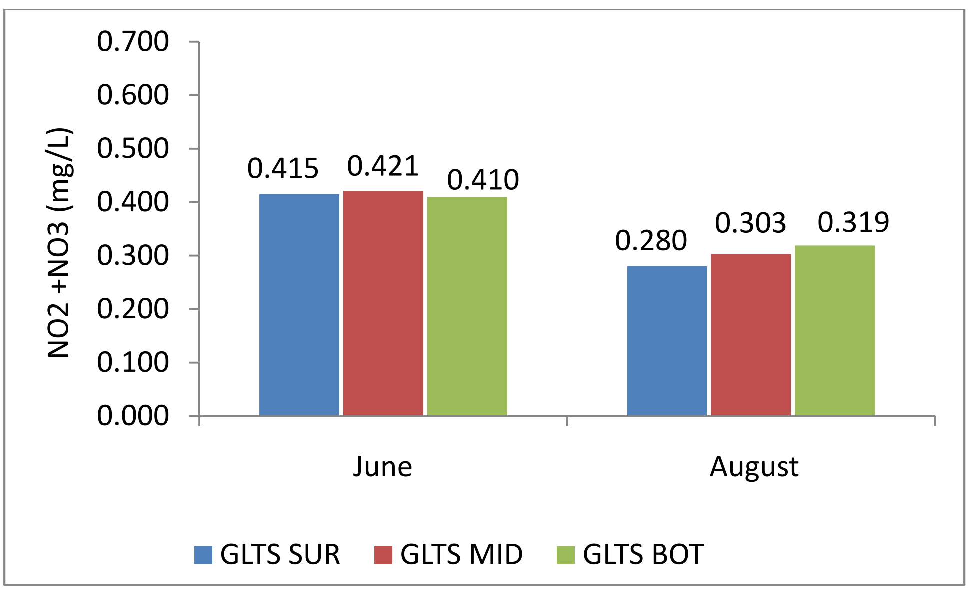


Figure 4.5.1-34. Nitrate and Nitrite Concentrations at Grant Lake Thermistor String Location.

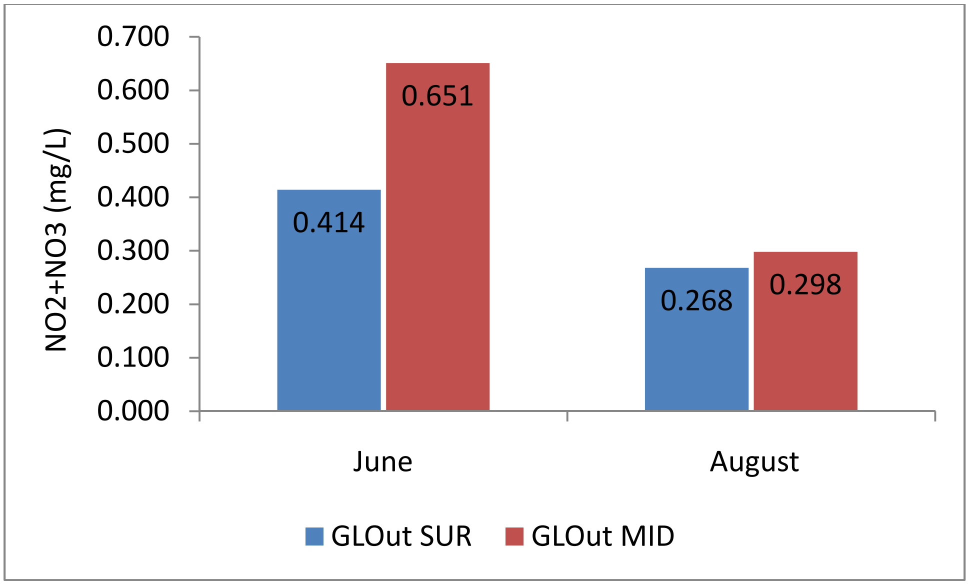


Figure 4.5.1-35. Nitrate and Nitrite Concentrations at Grant Lake Outlet.

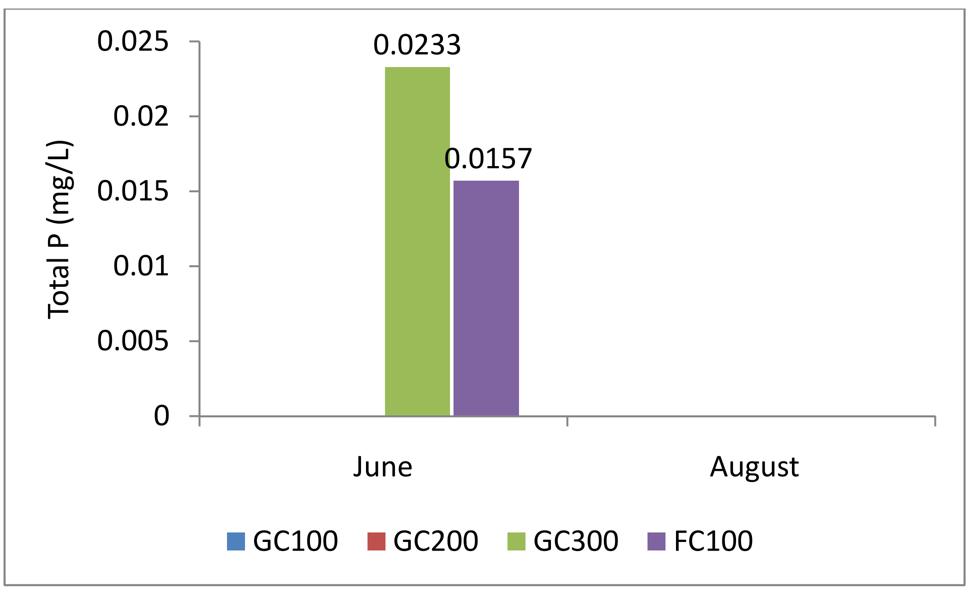


Figure 4.5.1-36. Total Phosphorous Concentrations at all Grant and Falls Creek Locations.

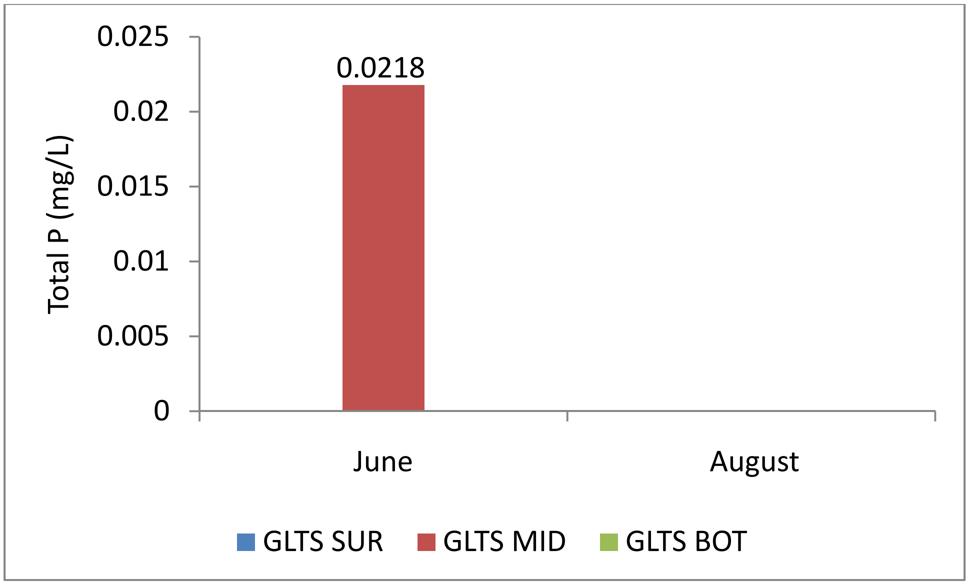


Figure 4.5.1-37. Total Phosphorous Concentrations at Grant Lake Thermistor String Location.

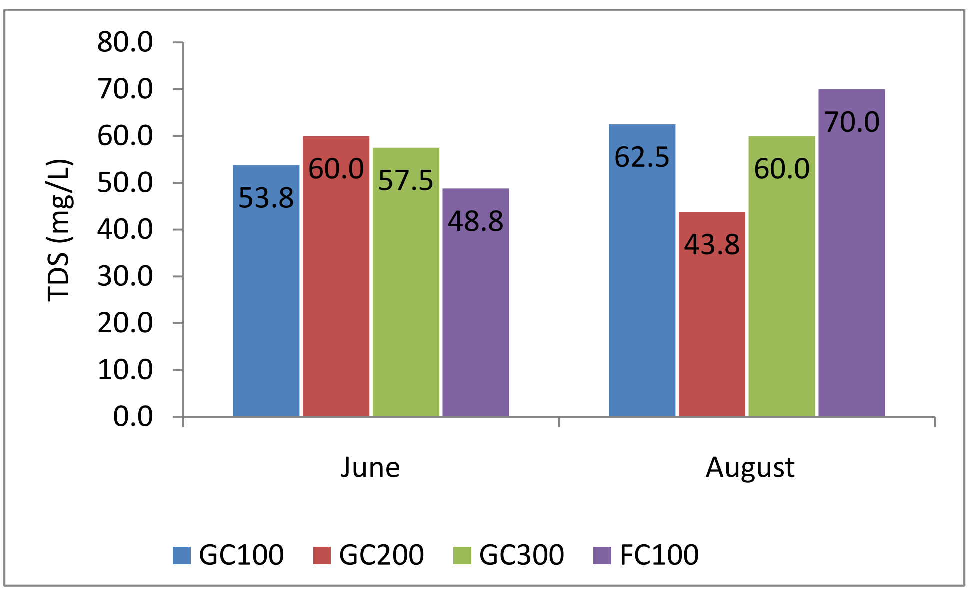


Figure 4.5.1-38. Total Dissolved Solid Concentrations at all Grant and Falls Creek Locations.

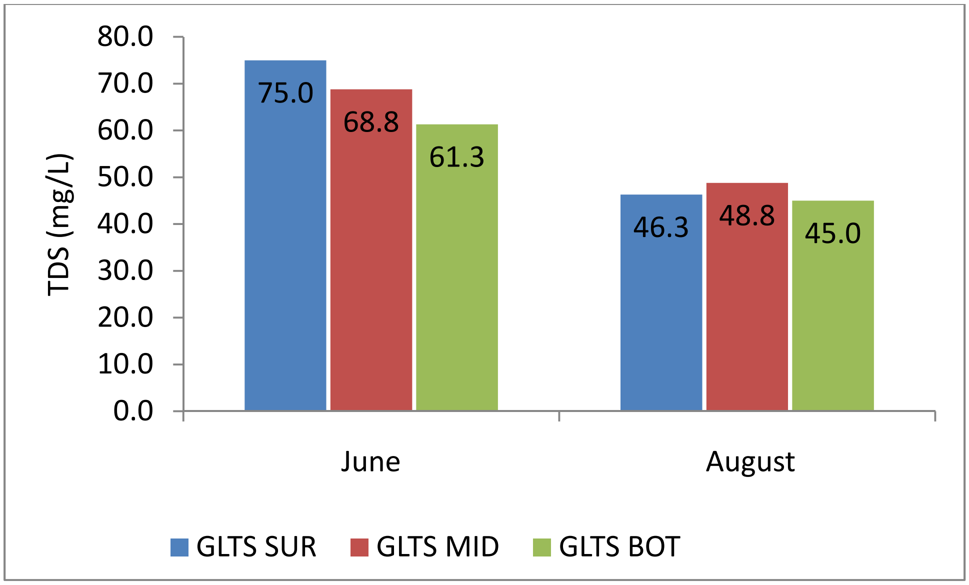


Figure 4.5.1-39. Total Dissolved Solid Concentrations at Grant Lake Thermistor String Location.

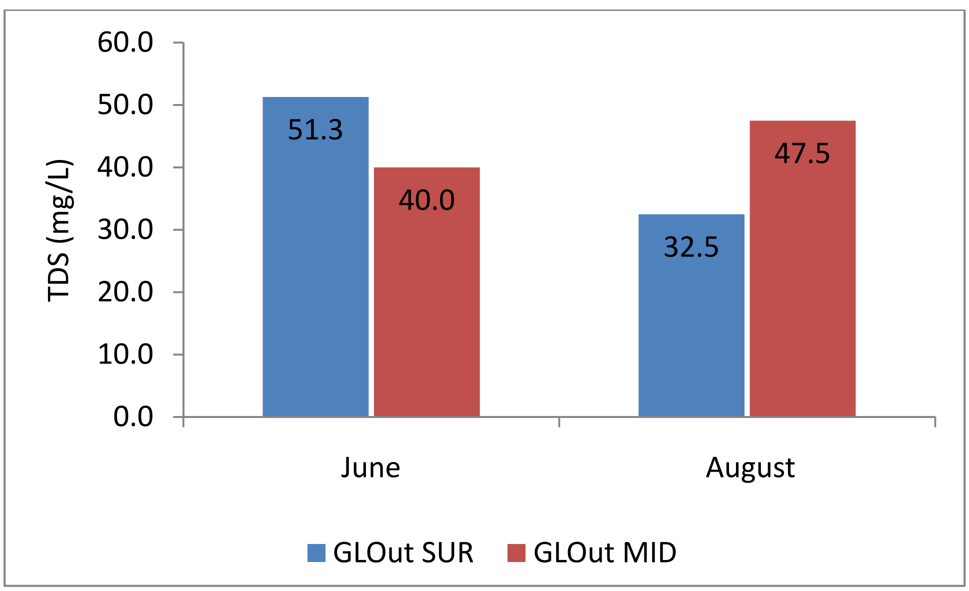


Figure 4.5.1-40. Total Dissolved Solid Concentrations at Grant Creek Outlet Location.

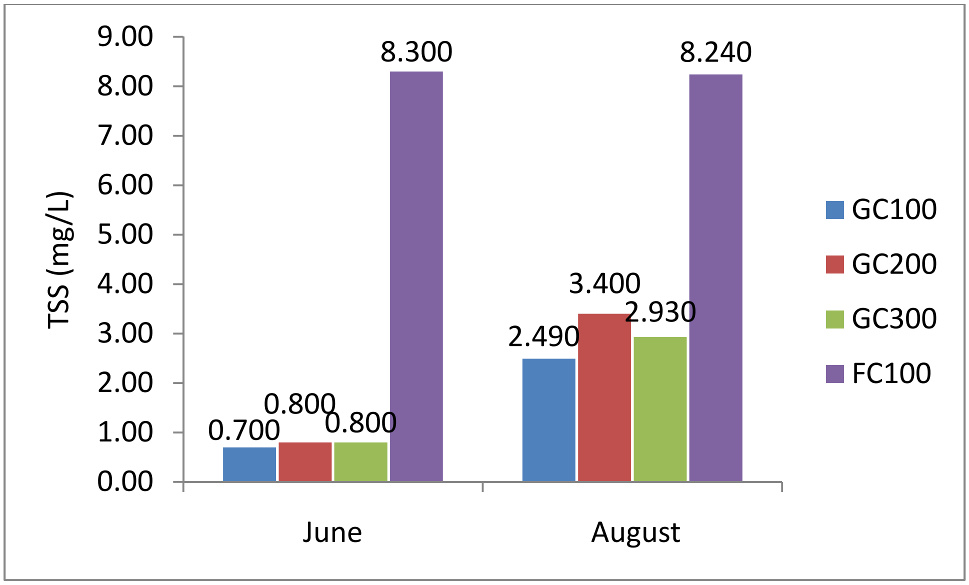


Figure 4.5.1-41. Total Suspended Solid Concentrations at all Grant and Falls Creek Locations.

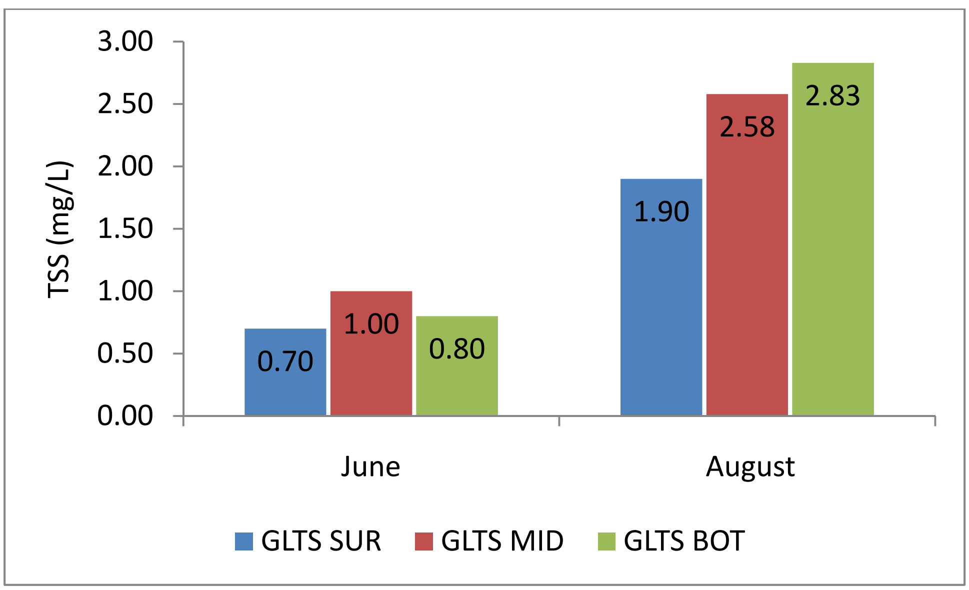


Figure 4.5.1-42. Total Suspended Solid Concentrations at Grant Lake Thermistor String Location.

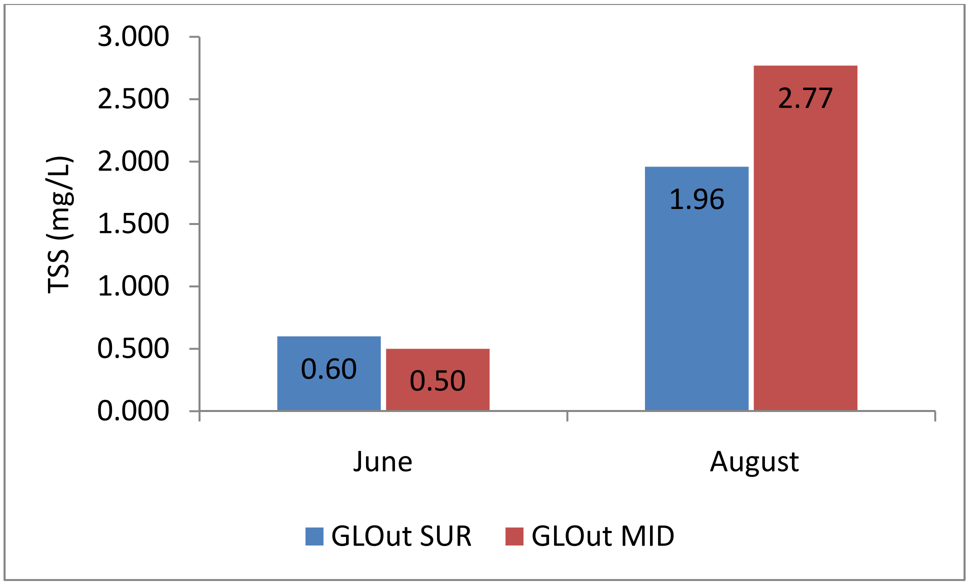


Figure 4.5.1-43. Total Suspended Solid Concentrations at Grant Lake Outlet Location.

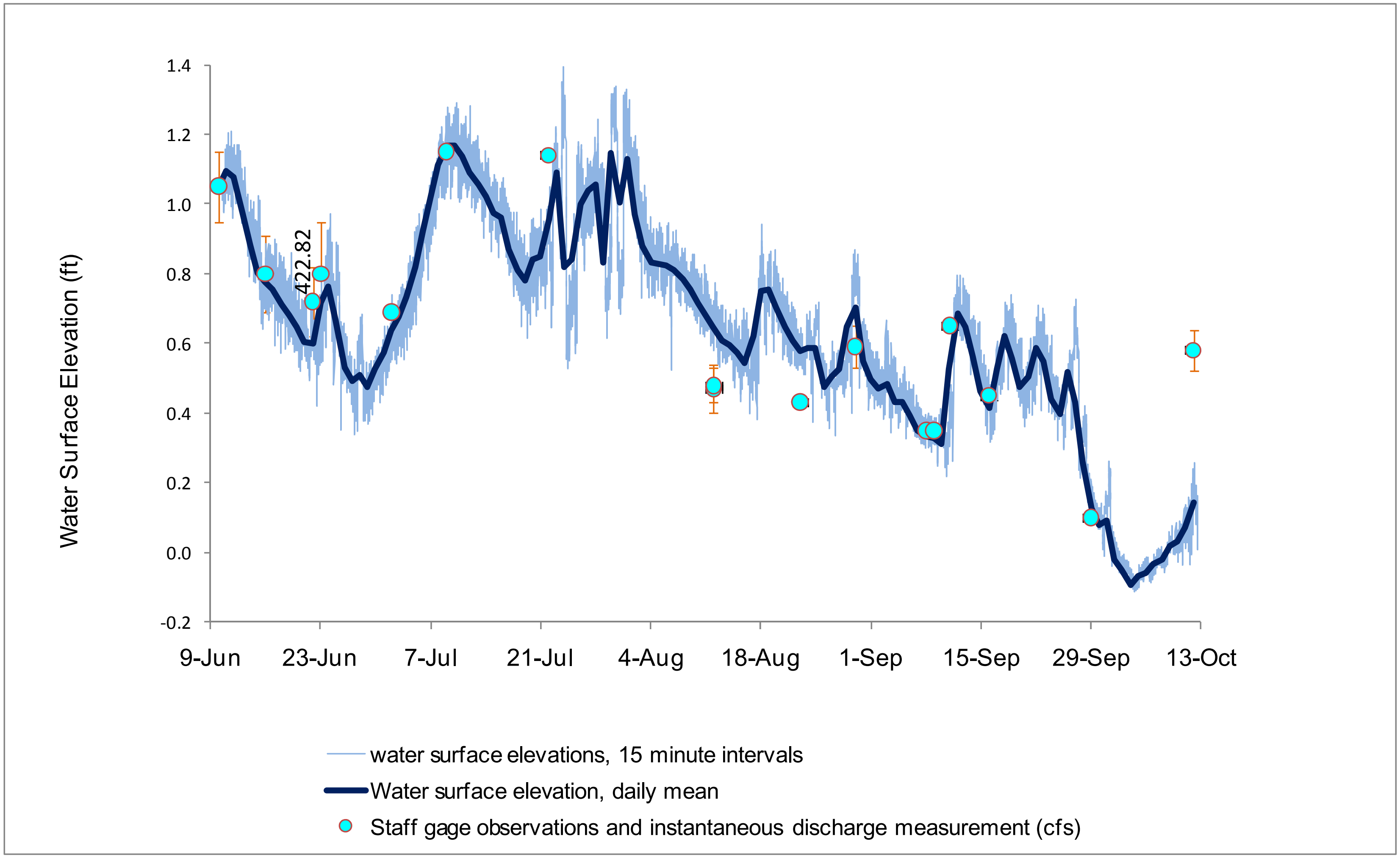


Figure 4.5.2-1. Continuous and observed water surface elevation at GC200

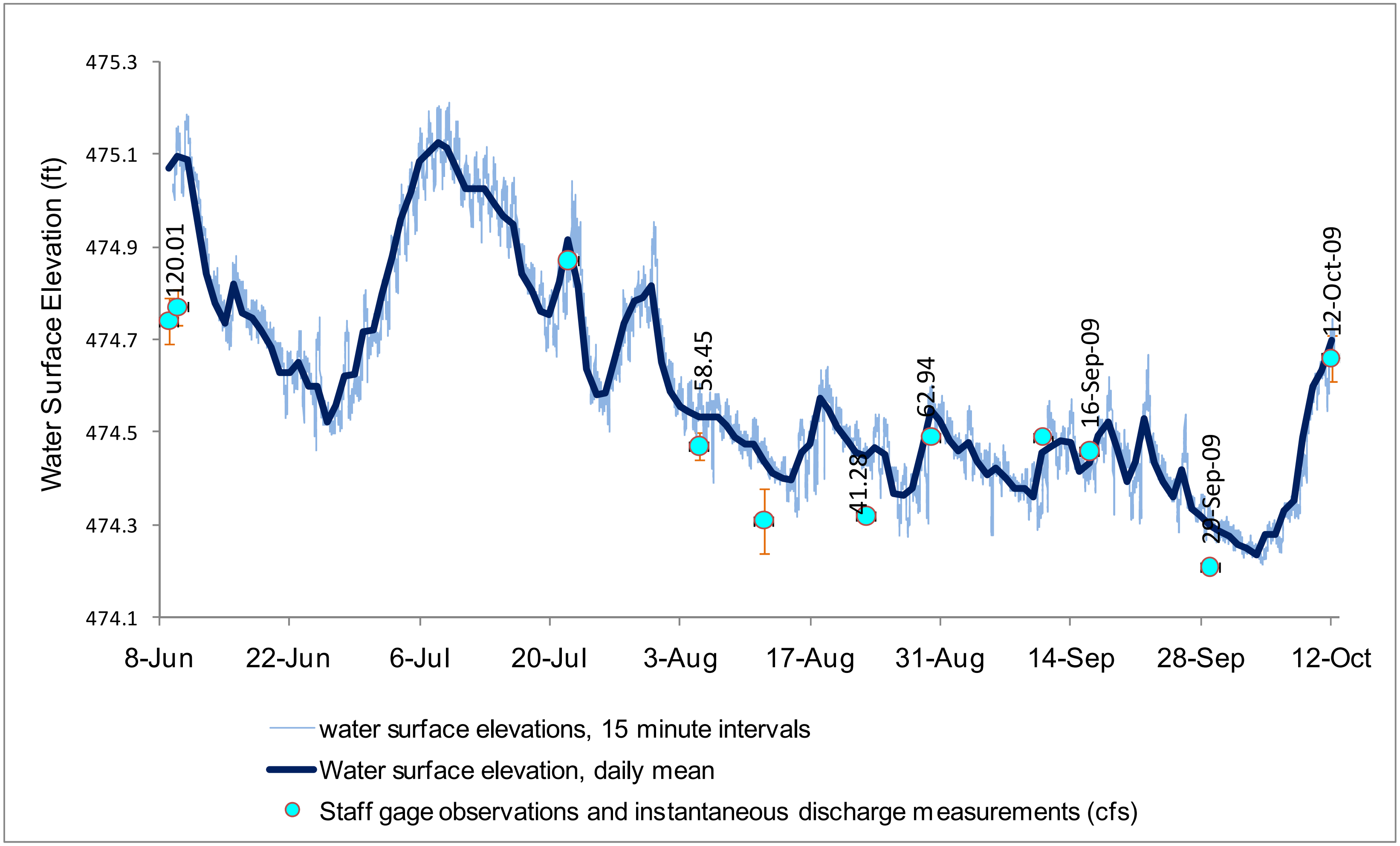


Figure 4.5.2-2. Continuous and observed water surface elevation at FC100

9 Appendices

Appendix A

HDR | ONE COMPANY *Many Solutions*℠

Memo

To:	Grant Lake/Falls Creek Hydroelectric TWG		
From:	Jason Kent	Project:	*Grant Lake/Falls Creek Hydroelectric*
Copy:	Brad Zubeck, Kenai Hydro LLC		
Date:	September 9, 2009	Job No:	*91437*
Re:	***Review of 1986-1987 Grant Lake FERC Application Documents for Instream Flow Considerations***		

Introduction

During drafting of the Pre-Application Document (PAD), Kenai Hydro, LLC conducted due diligence contacts to agencies and Tribes to collect existing information. During this information gathering effort, some additional instream flow and environmental analysis conducted in the 1980s by Kenai Hydro, Inc. (unrelated to Kenai Hydro, LLC) in support of a license application for hydropower development on Grant Creek was provided to KHL.

The documents are an assemblage of reports and written communications between Kenai Hydro Inc. (KHI) and state and federal agencies in 1986 and 1987 relative to a Federal Energy Regulatory Commission (FERC) license application for the proposed Grant Lake Hydroelectric Project (FERC No. 7633-002). The documents include draft and final reports of a limited but complete IFIM investigation and negotiated minimum instream flows (MIF) and ramping rates.

Summary of Kenai Hydro Inc. Documents

Originally, KHI's proposal was to route flow from Grant Lake to a powerhouse off Grant Creek, effectively removing a large portion of the flow from the creek. An initial license application included an instream flow proposal that was based on a Tennant Method book analysis and negotiated with the agencies in 1982. The proposal was based on Tennant's classification system and the assumption that "base flows of 40-60% would be outstanding and the optimum range would be 60-100% of average flow."

After two years of negotiations with the agencies, Kenai Hydro Inc. determined that the resulting loss of habitat would be considered unacceptable by the agencies and went forward with a new alternative that returned water to the creek at the downstream end of the "canyon reach." This new alternative was investigated in the 1987 instream flow study, and is similar to the approach being proposed by Kenai Hydro LLC today.

KHI suggested the following proposed MIF regime:

October – May	50 cfs
May - October	100 cfs

The agencies (led by USFWS) countered with a proposal favorable to both parties that featured a step increase with the purpose of limiting potential stranding.

November 1 – April 30	50 cfs
May 1-31	75 cfs
June 1 – October 15	100 cfs
October 16-31	75 cfs

The KHI proposal included load following as an important component. To offset the potential impacts of load following on redd dewatering and stranding of fish, the USFWS suggested the following ramping rate:

Increasing flow	• Not to exceed 100 cfs/hr
Decreasing flow	• 10%/hr at flows above 100 cfs • 10 cfs/hr at flows below 100 cfs

KHI anticipated that the project would impart a temperature effect on Grant Creek. The maximum expected change would be -1℃ in the summer and +2℃ in the winter. The USFWS stated that this change in temperature regime would impact fisheries by increasing the time to button-up stage for Chinook fry. To mitigate these impacts, USFWS asked KHI to construct a a multi-level intake structure in Grant Lake and operate the structure to draw water from the uppermost levels of the lake.

In addition, USFWS recommended monitoring of post-operation thermal regime in Grant Creek and evaluation of the changes from the pre-project conditions for a minimum of 6 years after commencement of project operations. NMFS requested a verification study of the instream flow study that included a weekly census of adult Chinook and sockeye salmon in August and September during construction and for a ten-year period thereafter.

Report Details

Document 1. Kenai_Hydro_Inc_Grant_Lake_Hydro_Project_Addtl_Info_2-15-1987.pdf

The revised project, with the powerhouse at the bottom of the canyon reach and flows diverted from Grant Lake, is discussed in this document. Proposed project flows are presented in Figure 1.

On October 21-23, 1986, a meeting and site visit was held at the USFWS office in which an alternate analysis method was selected. The discussion was centered on results of a stream survey conducted by Kenai Hydro Inc. (KHI) on June 26, 1986 (Figure 2). The work group determined the "most critical reach of the stream" that contained the highest amount of spawning activity was near the mouth of Grant Creek between stations 4-8 as shown on Figure 2. The work group selected a method that included the collection of 3 transects at stations 5 and 6 (Figure 3), and analysis using the computer model WSP/IFG-2, a precursor to the PHABSIM suite of models that is used today. Later that month, a consulting firm collected the stream surveys. The work group attendees included:

KHI – Dick Poole, Jonathan Hanson

ADFG – Don McKay, Christopher Estes

USFWS – Lenny Corin, Steven Lyons, George Elliott

NMFS – Brad Smith

The work group determined that "spawning is the most critical factor since rearing occurs mainly in the associated lakes." This assumption led to a study design that included one transect flow measurement at three transects. KHI determined that one set of measurements was justified because "conflicts are low and the stream is a simple stable channel." KHI characterized Grant Creek as "a simple stream with steep gradients, minimal side channels, few pools, and a rough bottom with a minimum of spawning gravel." The selected study area where spawning was determined to occur the most, stations 4-8, was considered the "the most sensitive to changes in stream flow due to the elevated gravel bar and riffles that are present." Typical PHABSIM-style transect measurements were taken during the field work conducted on October 24, 1986 (Figure 3).

KHI provides the following information regarding icing and winter flows:

"On a month by month basis, flows are lowest in the months of January, February, March and April. During this period minimum daily flows of 11 cfs occur with the stream icing up. Flows across the ice affecting stage-discharge relationships are recorded indicating anchor ice and solid freezing are occurring.

“During this period egg incubation is occurring and for the four month period the eggs are essentially in a holding phase due to the low temperatures which limit development. Stream flow is restricted to the bottom of the channel and eggs which have been spawned on the upper gravel bars freeze or depend on the availability of ground water for survival. Juvenile rearing would be restricted to the channel and limited pools during winter. Ice cover may or may not occur to protect the exposed eggs. Dewatering of alevins would of course cause 100 percent mortality.”

The original KHI proposal included reservoir management regimes (reservoir filling in off-peak months for use during the peak energy demand months of November through February) and proposed ramping rates. KHI reports daily changes of 185 cfs/day were observed during the period of record. KHI proposed a 100 cfs/hr rate of change for Grant Creek.

Figure 4 presents the projected project temperature discharges in Grant Creek. The project was projected to slightly flatten the temperature curve, warming the discharged water in the winter and cooling it in the summer. The reason for this difference is that the water intake in Grant Lake is below the surface, and the natural discharge is surface water that is exposed to ambient air temperatures. Due to this impact, USFWS asked KHI to include a multi-level intake structure in Grant Lake (this is discussed in the details of Document 3).

<u>Details of Envirosphere’s February 1987 Instream Flow Study Report</u>

The objectives of Envirosphere’s instream flow study were to quantify the relationship between habitat and flow for trout and salmon, to identify the physical habitat type that is limiting production in Grant Creek, and to determine how daily flow fluctuations from load following may potentially strand juvenile fish.

The report included a summary of existing data including fish resources of Grant Creek. Summary of that summary:

- Chinook
    - Adults
        - spawn in August and September.
        - Based on surveys (ADFG 1952-1981 and APA 1984), average peak salmon spawning ground count was 19 fish. Weir counts by Cook Inlet Aquaculture Association indicated that this number may be somewhat larger but generally less than 50 returning adults each year.
    - Juveniles
        - Age 1+ observed year round (APA 1984), but low numbers observed during March, May & June suggest they are either inactive or migrated elsewhere.
        - Natural emergence may be later than June because no observation in minnow traps until August (APA 1984). Some were observed during electrofishing in May, but may have been stimulated from the gravel.
- Sockeye
    - Adults
        - Spawn in August and September.

        - Based on surveys (ADFG 1952-1981 and APA 1984), average peak salmon spawning ground count was 61 fish. Weir counts by Cook Inlet Aquaculture Association show higher numbers – 400 in 1985 and 675 in 1986.
    - Juveniles
        - Likely rear in the downstream lake system and not in Grant Creek.
- Coho
    - Adults
        - No observations (ADFG 1952-1981 and APA 1984). However, very small (<40 mm) coho fry were trapped in August 1984 (APA 1984), indicating some natural spawning.
        - Returns were observed in 1985 and 1986 by CIAA weir counts; these fish were returns from the coho introduction program in Grant Lake that has since been discontinued.
    - Juveniles
        - Previous studies (APA 1984) show some coho rear in the lower reaches of Grant Creek but were less abundant and not as widely distributed as juvenile Chinook.
- Rainbow Trout
    - Spawning
        - No spawning adults were observed, but small juveniles (45-50 mm) were observed in October 1982, indicating some natural spawning (APA 1984).
    - Rearing
        - RBT are evenly distributed in Grant Creek, and are found in most habitat types. RBT captured in 1982 ranged in length from 43-106 mm (APA 1984).
- Dolly Varden
    - Spawning
        - No spawning adults were observed (APA 1984).
    - Rearing
        - Larger fish may move into Grant Creek during the late summer to feed and avoid the high turbidity of the Trail Lakes.
        - DV observed ranged in length from 55-300 mm.

Envirosphere analyzed the data and determined that "as a result of the similarities among the salmonid species present in Grant Creek…an analysis of Chinook and sockeye salmon will provide a relatively good indicator of the habitat relationships for coho, rainbow trout, and Dolly Varden char...therefore the stranding analysis in this study can be broadly applied, even though it is targeted on Chinook." They selected as the evaluation species for the instream flow study the spawning and rearing lifestages of Chinook and the spawning lifestage of sockeye.

Suitability curves "were developed from information found in the literature. This was believed to be a reasonable approach because a considerable amount of information is available in Alaska on suitability and some is directly available from the Kenai River system (e.g., Burger et al. 1982)." The HSC used for this study are presented in Figures 5 through 7. Details on the studies used to develop these criteria are given on pages 10-16 of the Envirosphere report.

Timing of life history phases for Chinook and sockeye are presented in Table 1. Envirosphere characterizes the incubation phase as “somewhat more difficult; however, inferences have been made from observations of the appearance of small juveniles (less than 50 mm) in the summer.”

Table 1. Life history phases of Chinook and sockeye salmon in Grant Creek.

Stage	When Present
Chinook	
Adults	August-September
Egg incubation and early intragravel	August-May/June
Juveniles	All year
Sockeye	
Adults	August-September
Egg incubation and early intragravel	August-May/June
Juveniles	Move downstream and rear elsewhere

Field data were collected on October 24, 1986 by KHI. Information collected on three transects included depth, velocity, and substrate. Vertical intervals were 2-4 feet, and velocities were measured at 0.2, 0.6, and 0.8 * depth. The calibration flow was approximately 246 cfs.

The model was calibrated and flow simulations were run for 50-450 cfs using WSP (Bovee and Milhous 1978). Stranding potential was examined using the methodology described by Prewitt and Whitmus (1986). This methodology uses information on cross slope, substrate, and discharge to determine stranding potential.

Results of Weighted Usable Area (WUA) are presented in Figures 8 through 11. In general, flows greater than 100 cfs cover a majority of the stream bed. Chinook spawning area peaks around 350 cfs, with about 70% of maximum spawning area available at 150 cfs. Sockeye spawning area peaks between 50 and 175 cfs and drops off sharply at flows greater than 175 cfs.

Chinook <50mm fry rearing peaks around 150 cfs, and for Chinook 50-100mm fry the peak habitat is somewhat steady between 100 and 350 cfs. For both sizes of Chinook juveniles, habitat drops sharply at flows less than 100 cfs.

The change in rate of stranding is relatively steady throughout the simulated flow range of 50-450 cfs with the exception of the range 50-120 cfs; in this flow range, stranding area rate was very high. Incremental changes in flow greater than 350 cfs impart a large increase in stranding area; the effect is lower for increments smaller than 350 cfs.

Document 2.

Kenai_Hydro_Inc_Grant_Lake_Hydro_Project_FERC_No_7633-002_Instream_Flow_Study_5-4-1987.pdf

This document includes the final instream flow report and comments from the resource agencies (USFWS, ADFG, NMFS) on the draft report.

Three agencies – ADFG, USFWS, and NMFS, provided KHI technical comments and concerns with the instream flow study. These comments are summarized below relative to the limitations of the study.

- The model (WSP) assumes steady flow during data collection. Flow measurements show that the flow rate dropped 51.5 cfs (21%) during the field study.
- USFWS applied a rule of thumb that flow simulations should not be applied to flows less than 40% of the lowest calibration flow. In this case, 40% of 246 cfs is 98 cfs.
- The study would be more credible if data had been collected at flows between 100-125 cfs.
- The model cannot be extrapolated upwards if the end of the cross sections were at the water's edge.
- Habitat suitability criteria are questionable (multiple concerns – see original letter).
- Stranding analysis is unclear because the method used is unpublished and unknown.
- The Tennant Method was presented improperly and it is unclear how it fits into the report.

Document 3.

Kenai_Hydro_Inc_Grant_Lake_Hydro_Project_Addtl_Info_Final_Report_with_Agency_T_Cs_9-4-1987.pdf

This document includes the communication between KHI and the agencies regarding negotiated minimum instream flows and ramping rates. The key documents are letters to KHI Vice President Richard Poole dated July 14, 1987 from USFWS and July 1, 1987 from NMFS. The letters suggest modifications to KHI's proposed minimum instream flows, thermal impacts, and ramping rates.

Instream Flows

USFWS determined the instream flow study "inadequate for the purpose of evaluating the fishery habitat currently available in Grant Creek, and the impacts (both positive and negative) which would result from the current proposal. The basic and most important concern with the study is poor data." USFWS interpreted the raw velocity data for transect T1 as having errors of greater than 20% for 8 of 16 verticals. Considering this error, they questioned the ability of the model to extrapolate to 100 cfs and beyond.

USFWS and NMFS suggested the following MIF regime:

November 1 – April 30	50 cfs
May 1-31	75 cfs
June 1 – October 15	100 cfs
October 16-31	75 cfs

USFW also suggested installing a continuous flow recording gage at or downstream of the tailrace.

Ramping Rates

Although the USFWS doubted the validity of the instream flow model, they acknowledged the increased potential for stranding at flows below 100 cfs. To address this concern, they recommended the following ramping rates:

Increasing flow	• Not to exceed 100 cfs/hr
Decreasing flow	• 10%/hr at flows above 100 cfs • 10 cfs/hr at flows below 100 cfs

Temperature

KHI anticipated that the project would impart a temperature effect on Grant Creek. The maximum expected change would be -1°C in the summer and +2°C in the winter (Figure 4). USFWS voiced concern that the change in the project temperature regime would affect the time for Chinook fry to reach the button-up stage. “In consideration of temperature-related concerns, Kenai Hydro, Inc., has agreed to utilize a multi-level intake structure. To minimize adverse impacts to the fishery resources we recommend that the intake structure be operated to draw water from the uppermost levels of Grant Lake.”

Monitoring

USFWS also recommended monitoring of post-operation thermal regime in Grant Creek and evaluation of the changes from the pre-project conditions for a minimum of 6 years after commencement of project operations.

NMFS requested a verification study of the instream flow study that included a weekly census of adult Chinook and sockeye salmon in August and September during construction and for a ten-year period thereafter.

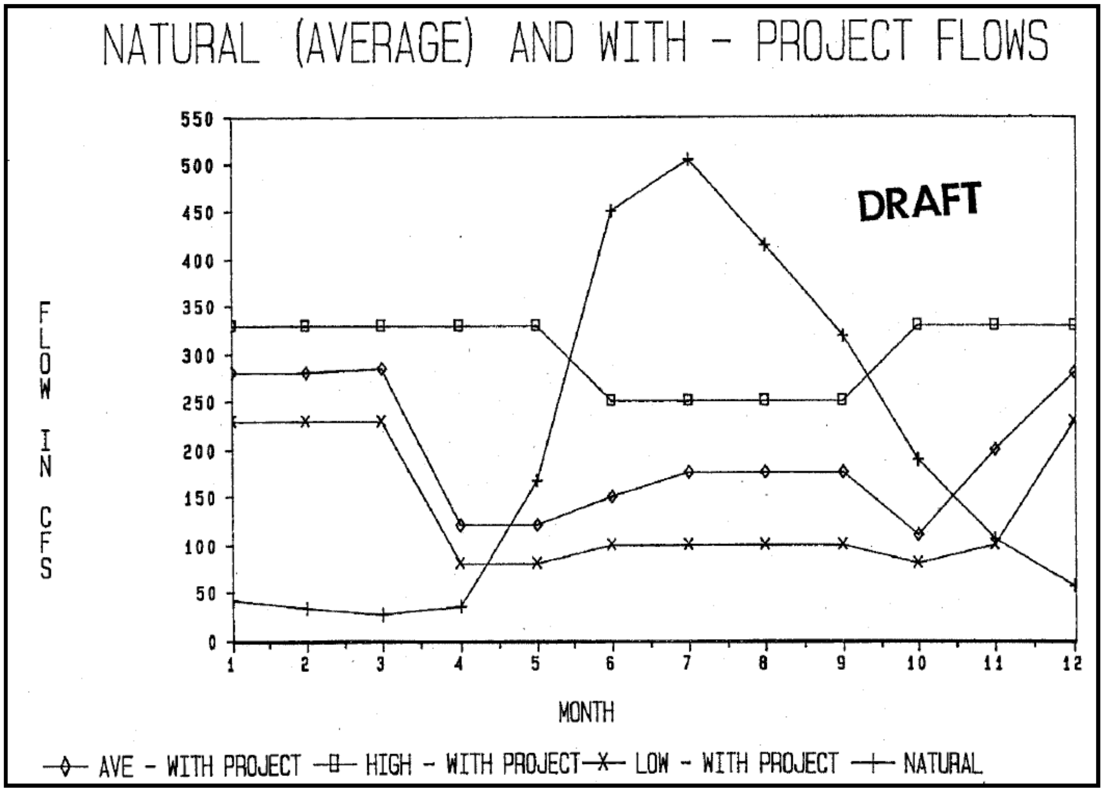


Figure 1. Proposed project flows in Grant Creek

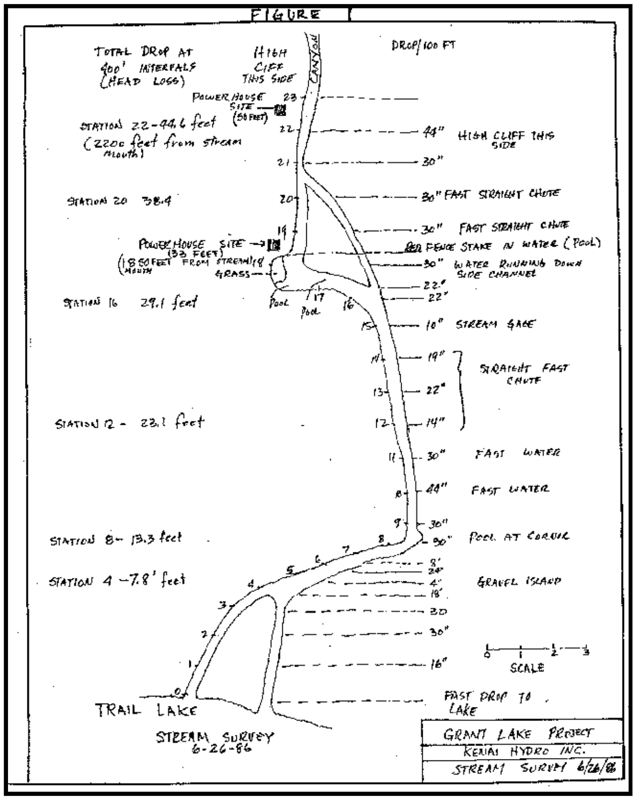


Figure 2. KHI stream survey June 26, 1986

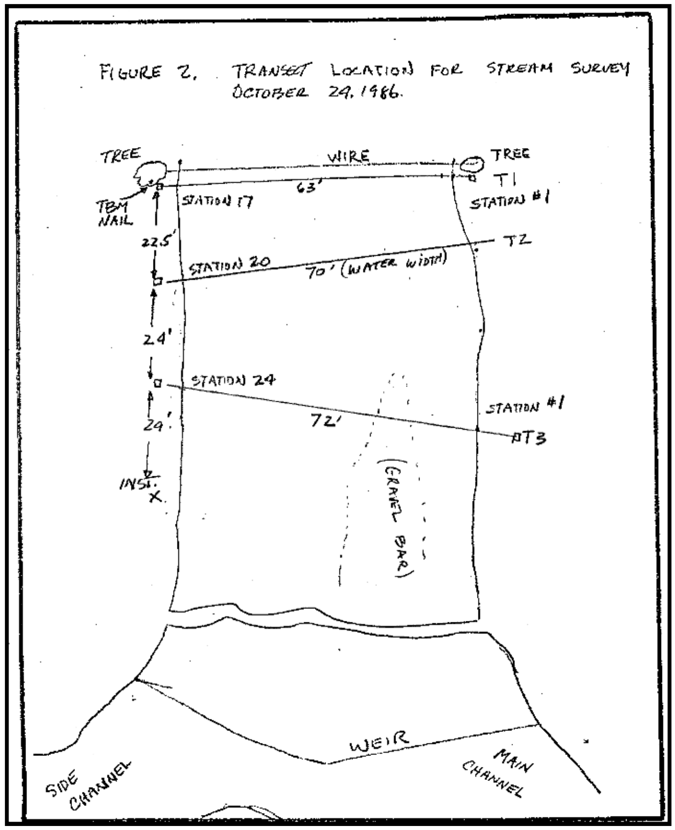


Figure 3. Transect locations for KHI stream survey, October 24, 1986

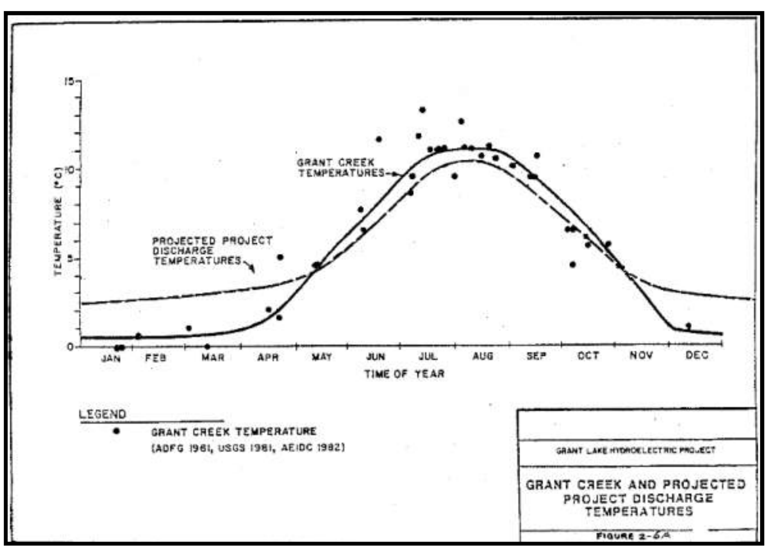


Figure 4. Anticipated post-project temperature regime in Grant Creek

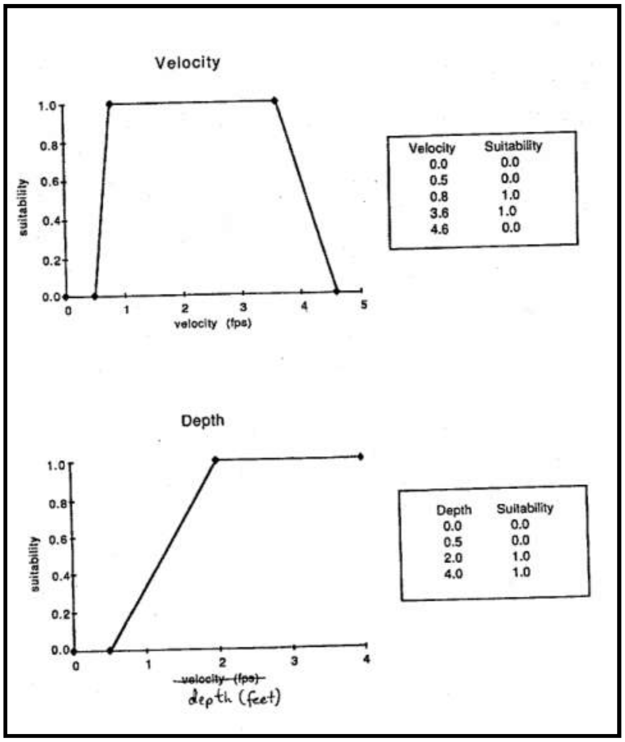


Figure 5. Habitat Suitability Criteria for adult Chinook salmon

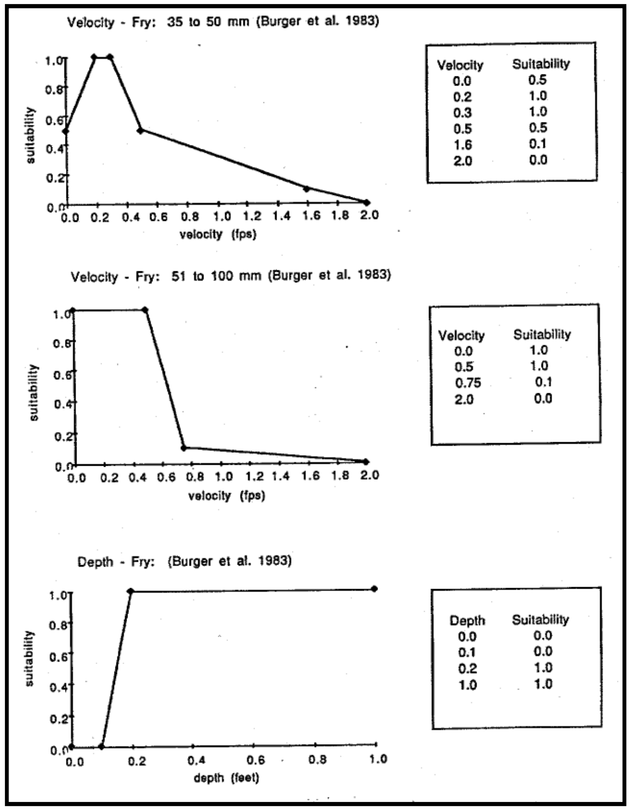


Figure 6. Habitat Suitability Criteria for juvenile Chinook salmon

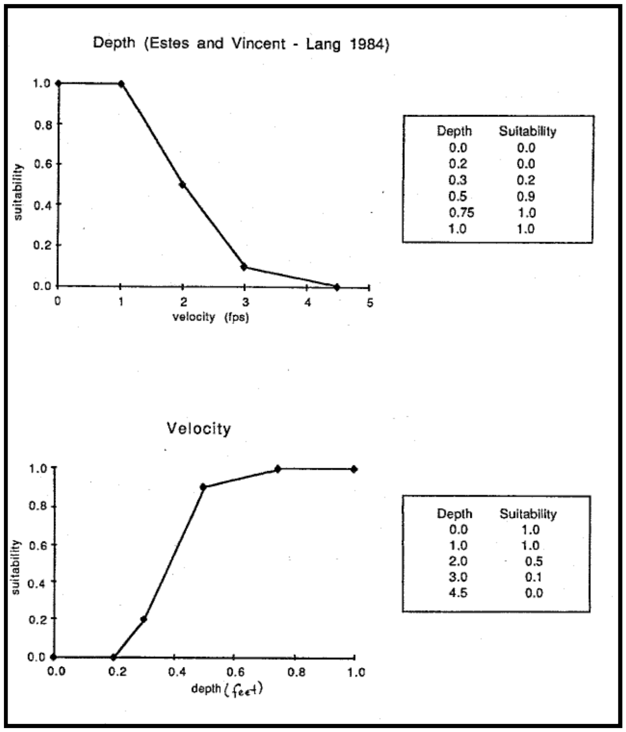


Figure 7. Habitat Suitability Criteria for adult sockeye salmon

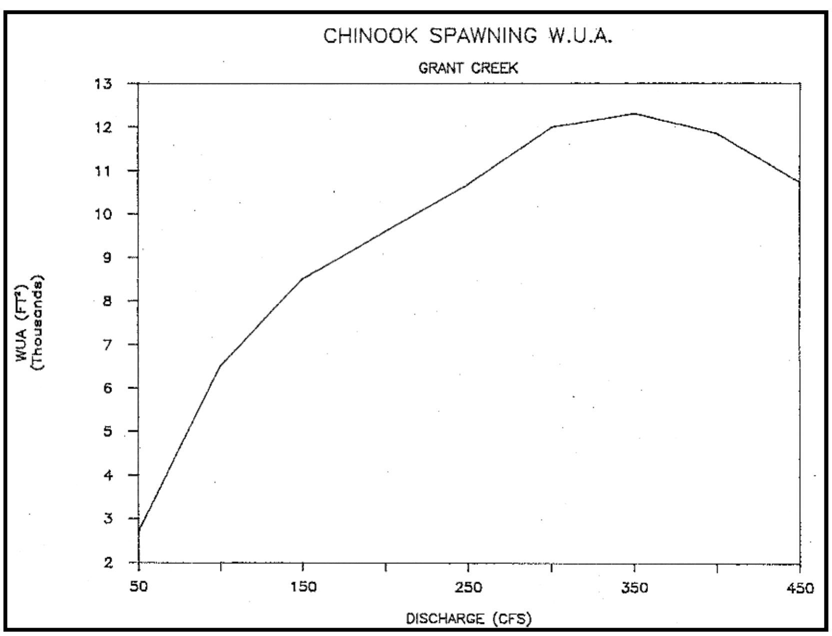


Figure 8. Weighted Usable Area for spawning adult Chinook salmon

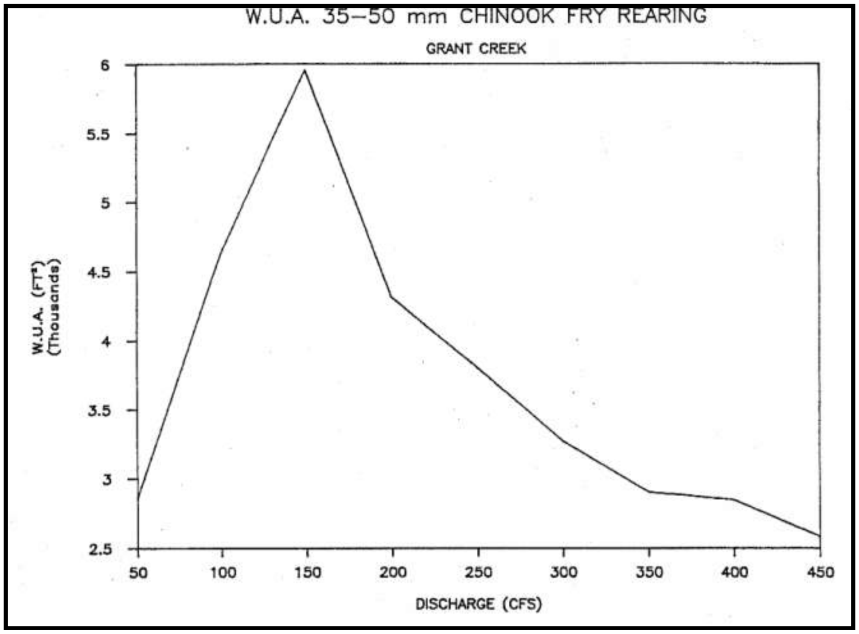


Figure 9. Weighted Usable Area for juvenile rearing Chinook salmon 35-50 mm

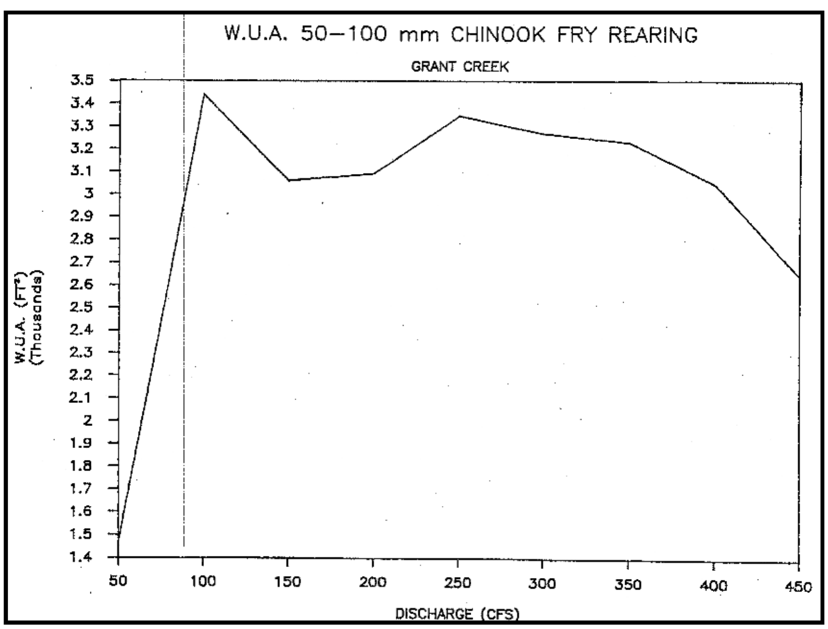


Figure 10. Weighted Usable Area for juvenile rearing Chinook salmon 50-100 mm

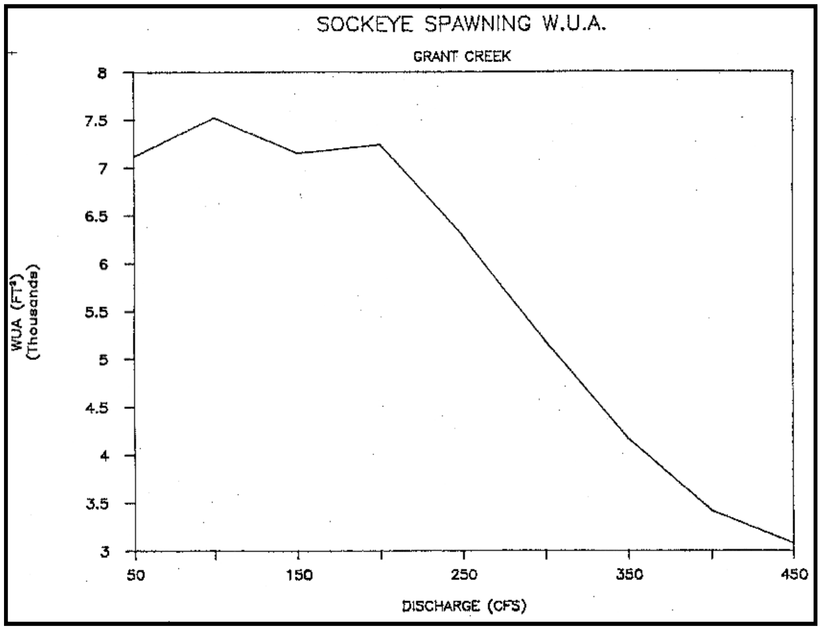


Figure 11. Weighted Usable Area for adult spawning sockeye salmon

Appendix B

Photo 1. Reach 1 looking upstream on the right bank during June, 2009.

Photo 2. Grant Creek Reach 2 during June, 2009.

Photo 3. Grant Creek Reach 3 during June, 2009.

Photo 4. Grant Creek Reach 4 looking upstream during June 2009.

Photo 5. Grant Creek in Reach 5 looking downstream from the right bank during May, 2009.

Photo 6. Reach 6 looking upstream during June, 2009.

Photo 7. Measuring the discharge on Grant Creek in Reach 2 during June, 2009.

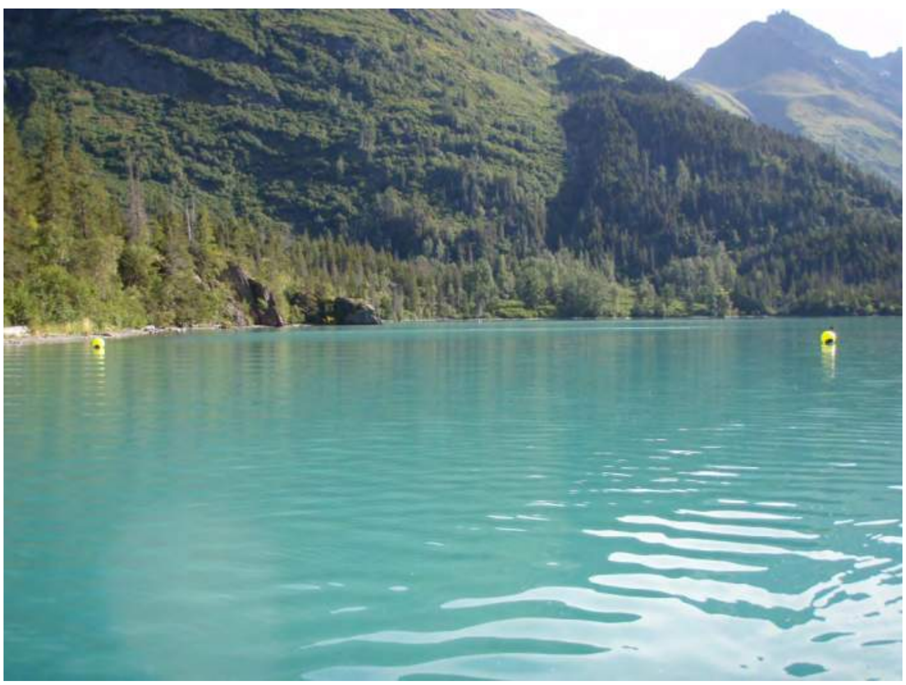


Photo 8. A gill netting set in the narrows of Grant Lake during August 2009.

Photo 9. A gill net set in the front basin of Grant Lake during June, 2009.

Photo 10. Falls Creek looking upstream from the mouth during July, 2009.

Photo 11. Falls Creek below the canyon looking downstream during July, 2009.

Photo 12. Discharge measurement taken on Falls Creek during June, 2009.

From: William Coulson [mailto:william@alaskanscooperlanding.com]
Sent: Sunday, January 03, 2010 7:47 AM
To: Zubeck, Brad
Subject: Power project.

The only thing that matters is that this project absolutely does not happen. The cost vs. benefit is ridiculous.
Bill Coulson

From: Zubeck, Brad [BZubeck@HomerElectric.com]
Sent: Friday, January 08, 2010 4:18 PM
To: 'Brita Mjos'
Cc: Jenna Borovansky
Subject: RE: Grant Creek Hydro Proposal Comments

Ms. Mjos,

Thank you for your comments. Kenai Hydro will include them in a summary that will be sent to FERC.

Sincerely,
Brad Z.

From: Brita Mjos [mailto:britamjos@care2.com]
Sent: Friday, January 08, 2010 3:05 PM
To: Zubeck, Brad
Subject: Grant Creek Hydro Proposal Comments

Mr. Zubeck,

I am writing to share my opposition to the proposed Grant Creek/Falls Creek hydro project. Alternatives exist that would have a significantly lighter impact on the environment. The proposed project woul disturb salmon streams and lakes and introduce intrusive pipes to a popular and scenic recreation area. A hydroelectric system on Lowell Creek in Seward, or windmills closer to utility lines would be much more economical and have an ecologically lighter footprint. Please consider these comments along with the public meeting next week.

Sincerely,

Brita Mjos
1725 E. 24th Ave.
Anchorage, AK 99508


Kenai Hydro, LLC
Grant Lake Hydro Project
ADF&G Advisory Committee
January 11, 2010

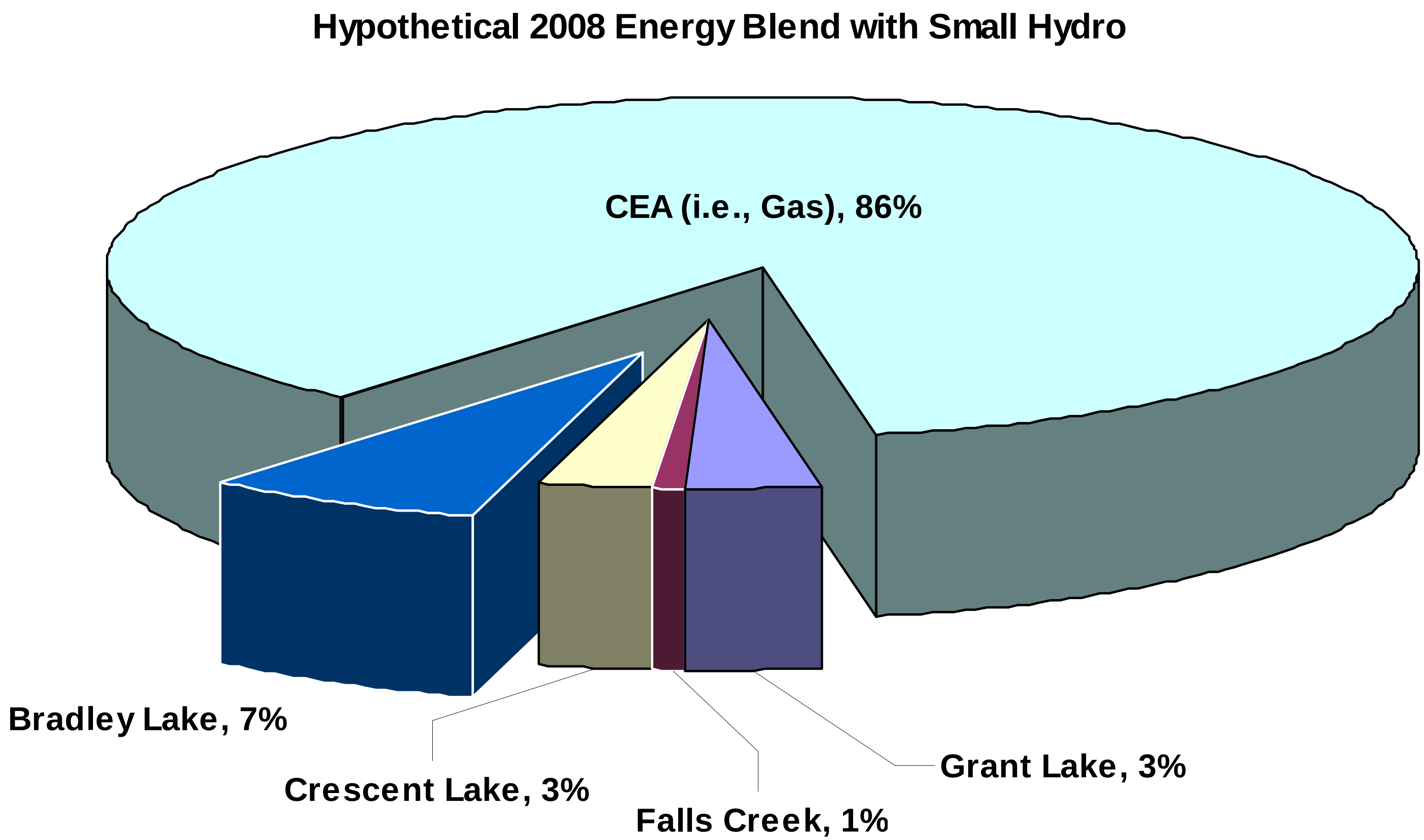
Presentation Overview

- Project Drivers
- Proposed Project Facilities
- Proposed Study Plans
- Next Steps

Project Drivers

- Diversify HEA’s Generation Portfolio
- Desire to Add Renewable Generation
  - Wind and Hydro – reliable, utility-ready technologies
  - Displaces fossil fuels
  - Reduces carbon emissions
  - Stabilize energy prices, near & long term

Why bother with Small Hydro?



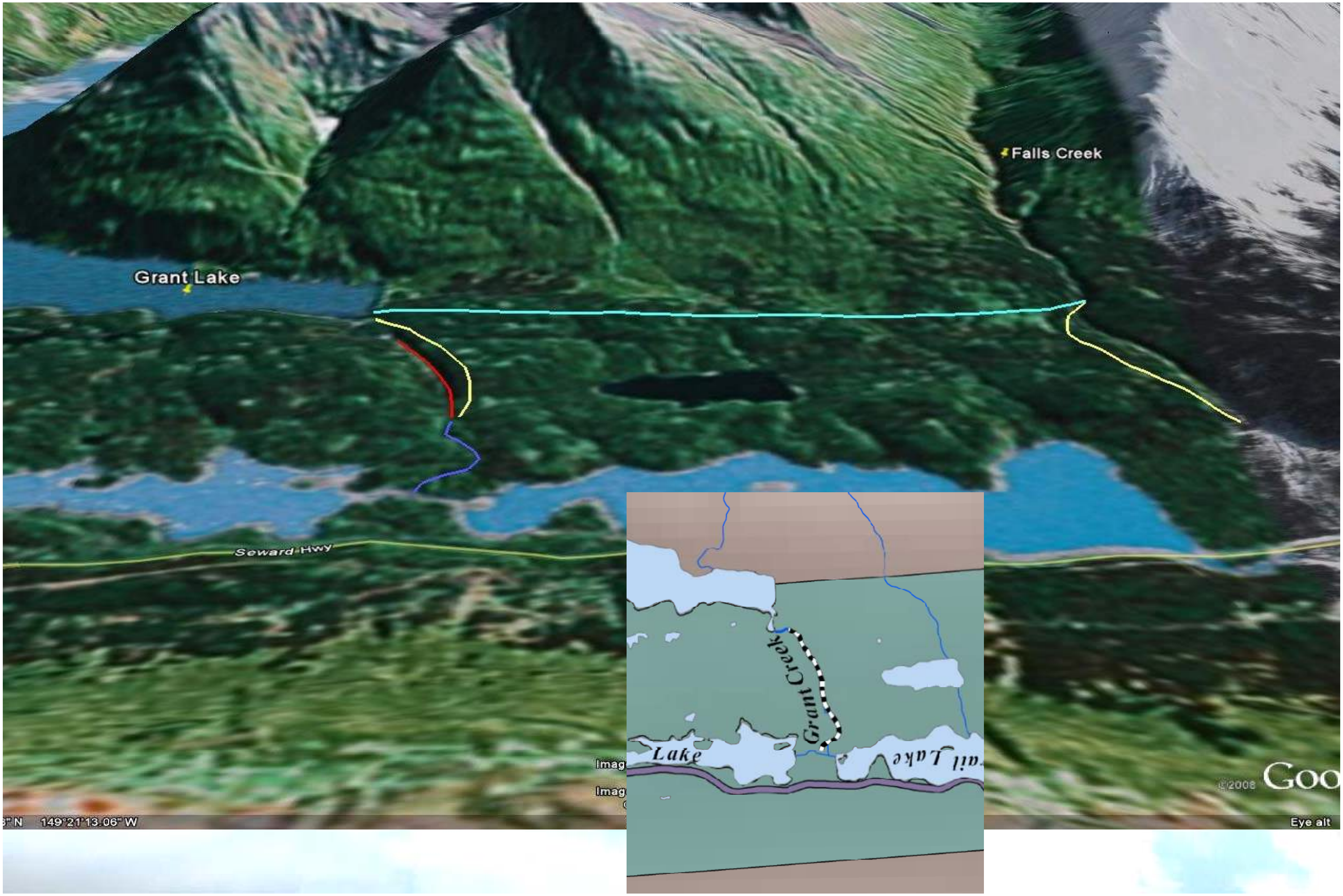
Benefits of Small Hydro

- Hydro energy displaces fossil fuels & associated emissions
  - Could displace 182,000 to 225,000 Mcf of gas per year
  - Could save ~$760,000 to $1,870,000 (w/gas at $4 to $8/Mcf)
  - Could offset the equivalent of 12,000 - 15,000 tons per year of CO_2
- With Storage (i.e., Ability to fluctuate the lake level)
  - HEA can provide more power when needed during winter months
  - Provide consistent and increased winter stream flows to potentially benefit aquatic life
- Strategic Benefit – When debt is retired, it is the cheapest power available (< $0.05/kWh).

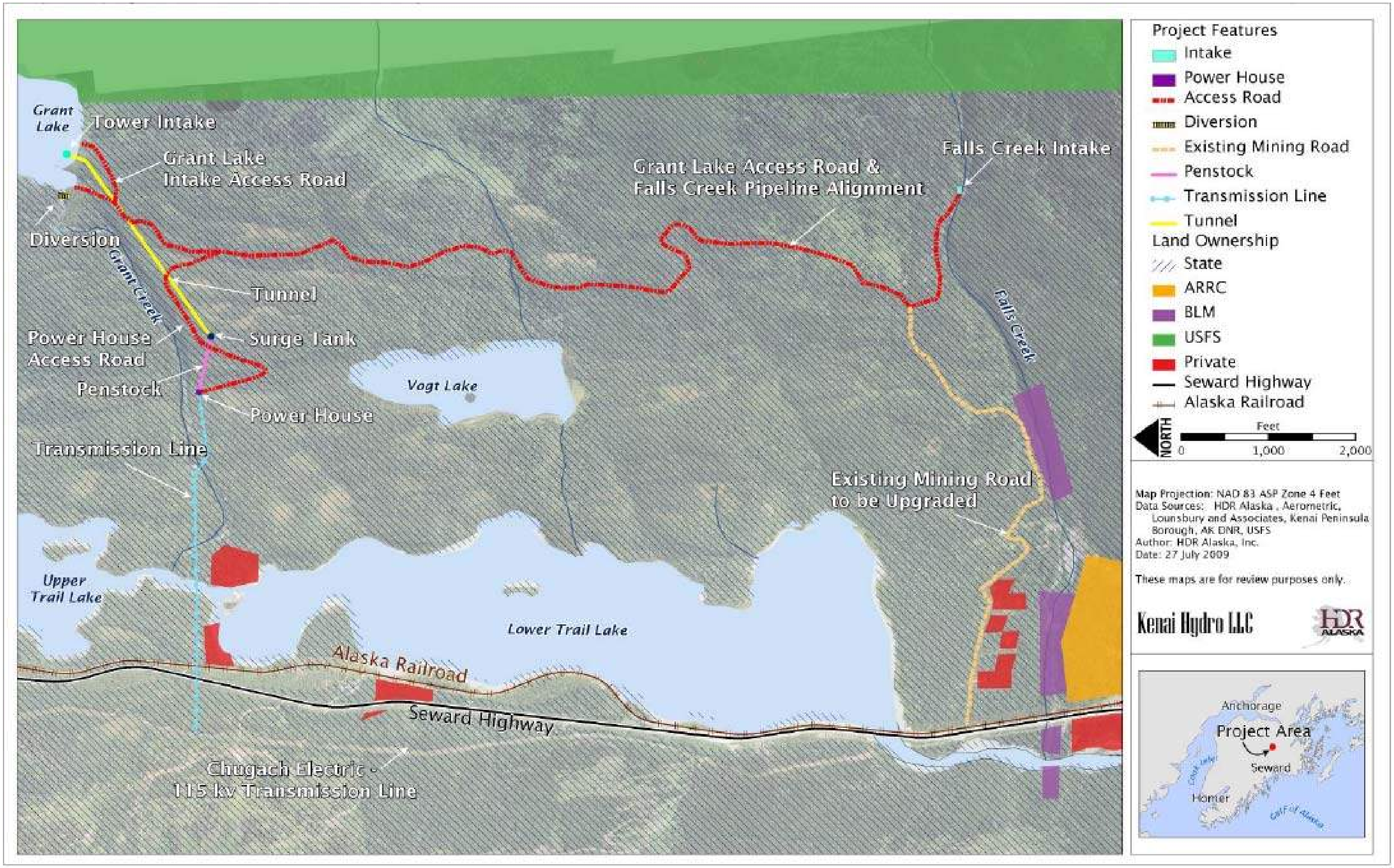
Why Moose Pass?

- Simply, that's where the resource is…
- Bradley Lake Comparison
  - Located at the head of Kachemak Bay near Homer
  - Serves all Railbelt Utilities: Anchorage (CEA, ML&P), Valley (MEA), Fairbanks (GVEA), and the Peninsula (HEA and Seward)

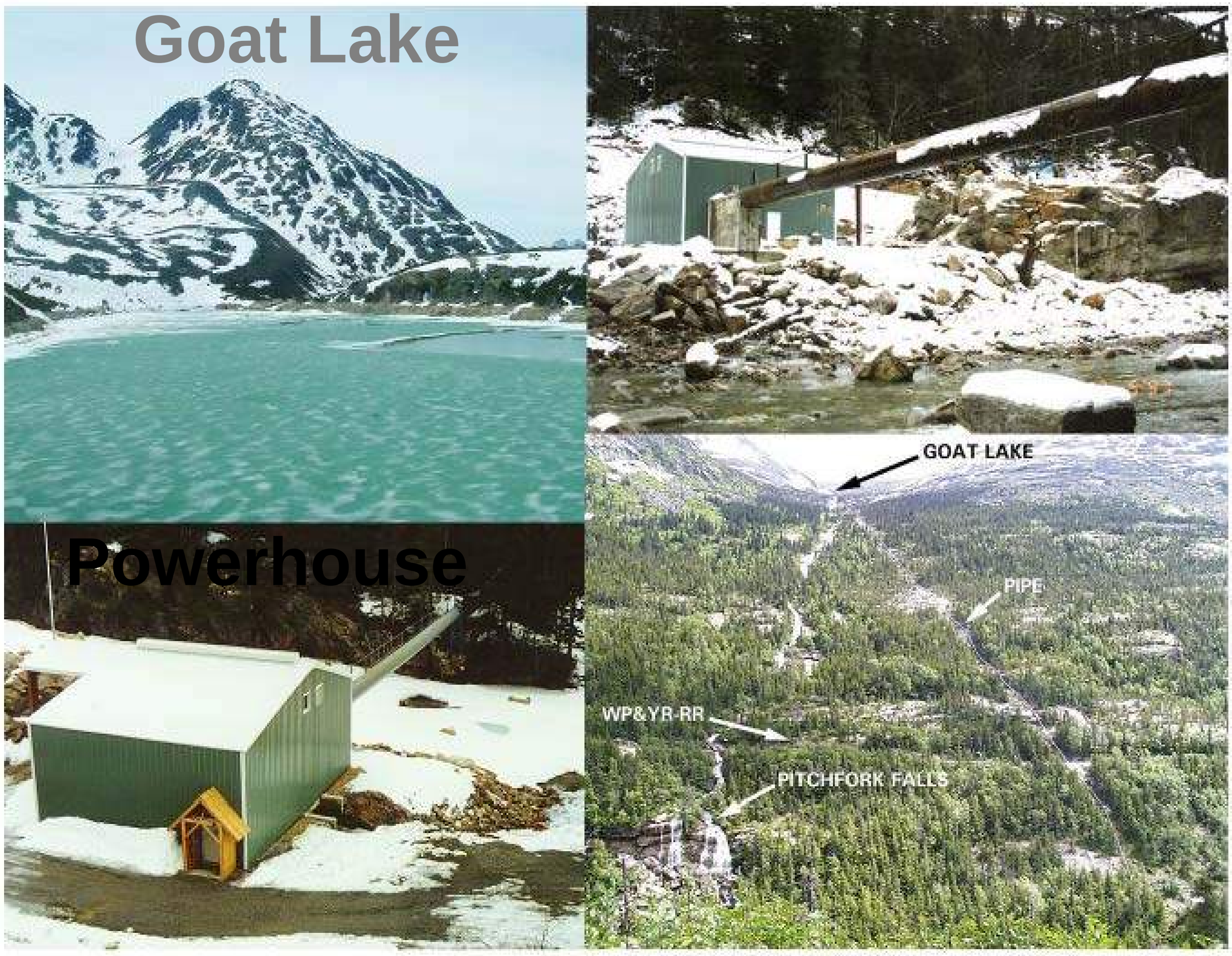
Grant Lake/Falls Creek



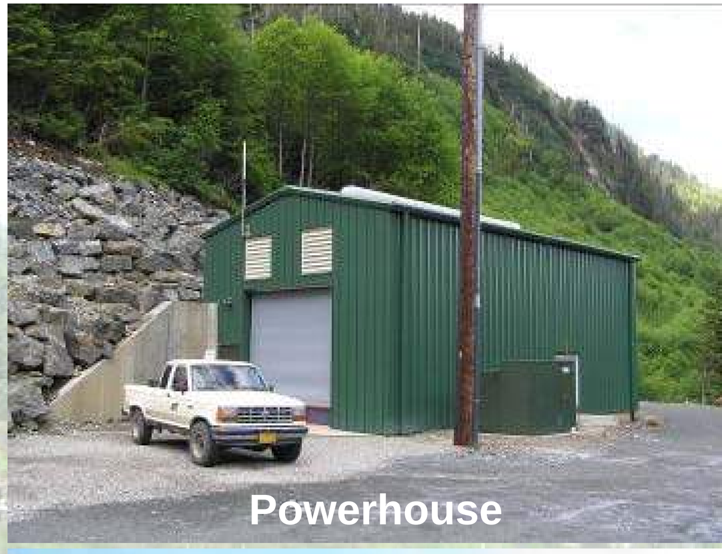
Proposed Project Facilities



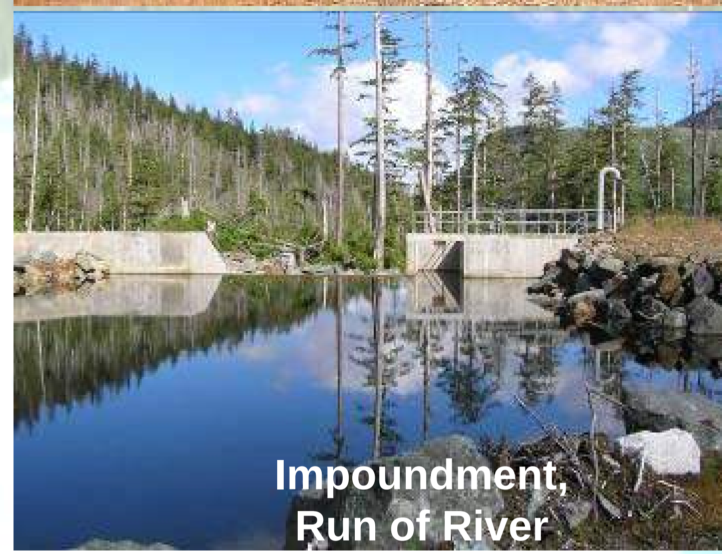
Goat Lake Hydro 4MW



South Fork Hydro 2MW



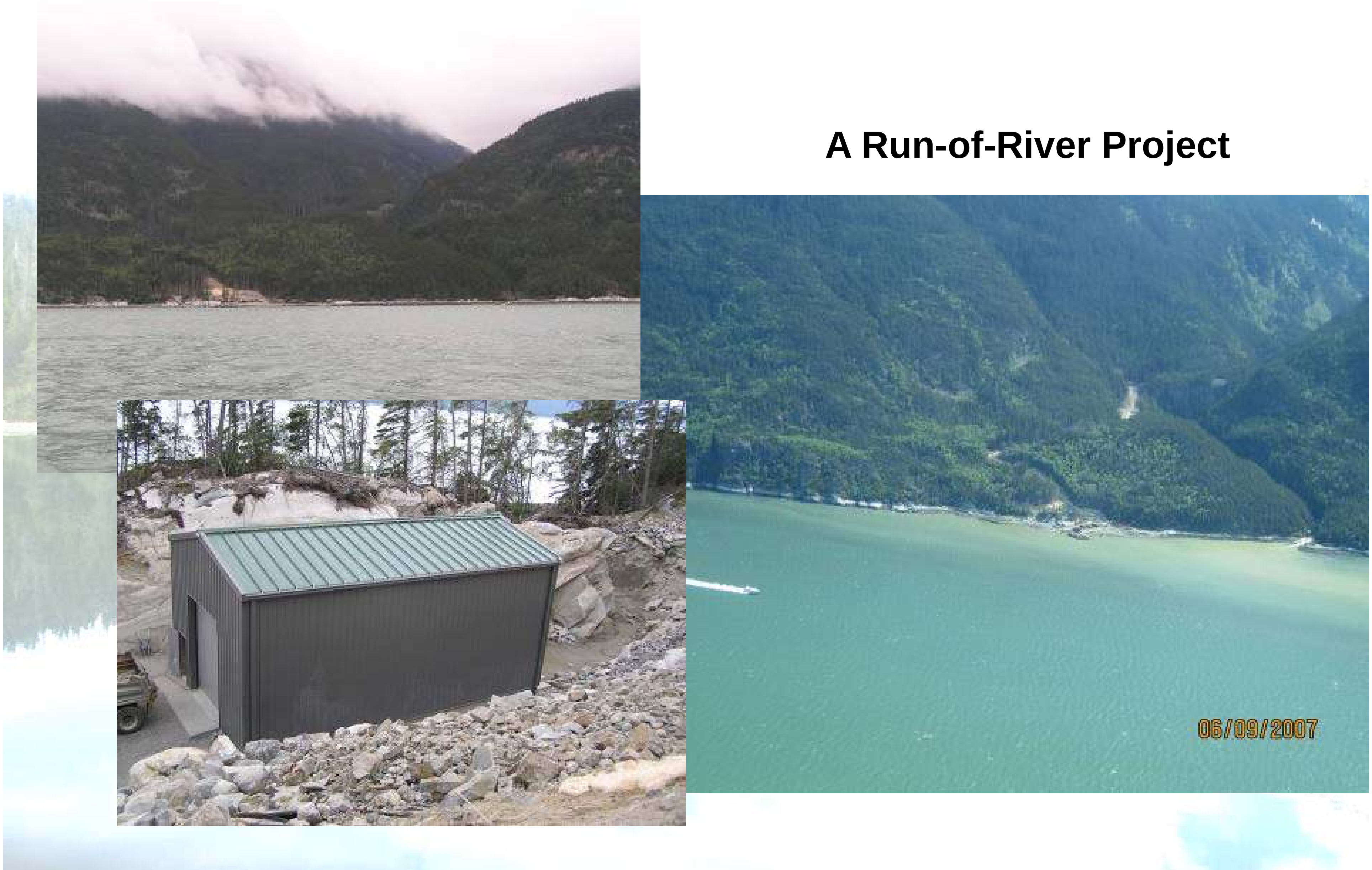
Powerhouse



Impoundment,
Run of River

Kasidaya Creek Hydro 3MW

A Run-of-River Project



2009 Progress

- Obtained Baseline Environmental Data
- Filed PAD & NOI
- FERC approved a Traditional License Process (TLP) with early scoping by FERC
- Developed Proposed Study Plans
- Reevaluated Projects

Proposed Studies for Grant Lake/Falls Creek

- **Fish and Aquatic Resources**
  - Resident and anadromous fish species composition, distribution, and abundance for all life stages
  - Aquatic habitat mapping and critical factors analysis
  - Instream Flow Study
  - Baseline study of Benthic Invertebrates and Periphyton in Grant Creek
  - Baseline study of Zooplankton and Phytoplankton in Grant Lake
- **Water Resources – Water Quality & Hydrology**
  - Continue stream gaging data collection, increasing the period of record
  - Provide input to instream flow study
  - Continue collection of water quality data (temp., susp. solids, dissolved oxygen, conductivity, etc.) in streams and lake.

Proposed Studies for Grant Lake/Falls Creek

- **Terrestrial Resources** – Plants, Birds & Wildlife
  - Refine existing vegetation mapping
  - Conduct a timber stand survey in areas not previously surveyed
  - Conduct a sensitive & invasive plant survey to produce a Biological Evaluation for Plants
  - Conduct wetlands delineations
  - Quantify the distribution and abundance of target wildlife species during key seasons of activity in the Project area
  - Conduct a bear denning survey

Proposed Studies for Grant Lake/Falls Creek

- **Recreational and Visual Resources**
  - Determine level of recreational use and predict trends
  - Understand public use and perception of recreational opportunities
  - Determine recreational opportunities in terms of USFS designations and plans
  - Determine the visual quality of the Project area in terms of USFS Scenic Integrity Values

- **Cultural and Historical Resources**
  - Determine presence and inventory historic properties or sites in the proposed Project area
  - Determine if the Project will have an affect on identified historic properties and whether additional investigations may be necessary
  - Determining recommendation on potential mitigation and consultation strategies in resolving potential adverse affects
  - Determine if the Project will have an affect on either sites of cultural significance or subsistence activity

Next Steps

- Seek Additional Funding
- Pending Funding
  - Further Refine Project Concept
  - Implement Proposed Study Plans and Early Scoping pursuant to TLP Process

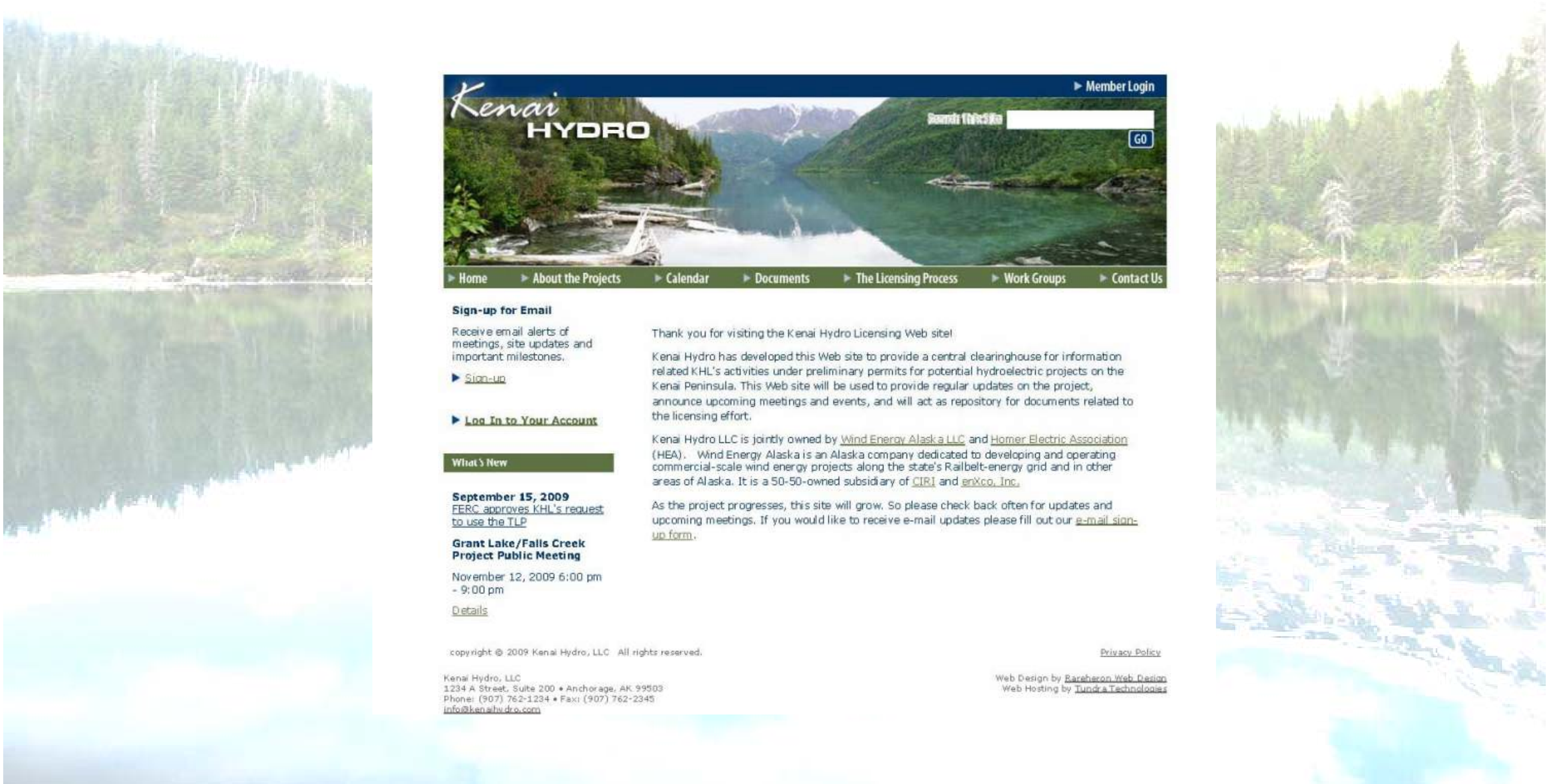
Tracking Project Progress and Comments

Kenai Hydro, LLC website

(www.kenaihydro.com)

FERC E-Subscription Service

(www.ferc.gov)



Thank you!

Questions?

From: Valerie Connor [valerie@akcenter.org]
Sent: Monday, January 11, 2010 2:10 PM
To: comments@kenaihydro.com
Cc: 'bzubeck@homerelectric.com.'
Subject: PAD comments
Attachments: PAD comments.doc

Dear Jenna and Brad,

Attached please find my comments regarding the PAD for Grant Lake/ Falls Creek.

Thank you.

Valerie Connor
Conservation Director
Alaska Center for the Environment
807 G Street, Suite 100
Anchorage, Alaska 99501
*(907)274-3632*** NEW PHONE NUMBER*
valerie@akcenter.org

ALASKA CENTER *for the* ENVIRONMENT

807 G Street, Suite 100 Anchorage, Alaska 99501
907-274-3632 valerie@akcenter.org www.akcenter.org

January 8, 2010

Re: Pre-application document for Grant Lake and Falls Creek

To whom it may concern,

Thank you for the opportunity to comment on Kenai Hydro's pre-application document for Grant Lake and Falls Creek. The Alaska Center for the Environment (ACE) is a non-profit environmental education and advocacy organization, whose mission is to enhance Alaskans' quality of life by protecting wild places, fostering sustainable communities and promoting recreational opportunities. ACE advocates for sustainable policy on behalf of nearly 7,000 Alaskan members.

Though we are generally supportive of renewable energy projects, ACE believes that these locations are inappropriate for dams and roads and that the Kenai River watershed and the life it sustains is too valuable to risk for such a small output of energy.

The bottom line is that these projects are high-impact, low- output proposals that will adversely affect the Kenai River watershed by interrupting flows and industrializing the area. The costs of losing fish and wildlife habitat in one of Alaska's favorite and most productive local watersheds is too high of a price to pay for the small amount of power which will be generated as a result of these dams.

We wish to go on the record that we oppose the building of these dams and that by submitting these comments we do not in any way endorse the building of these projects.

The PAD relies heavily on past studies, however many of those are over fifty years old and many changes have occurred in the area since then. More current data is needed to fully understand what the impacts of these proposals will have on the area.

As a result of reviewing the PAD, I have identified some additional topics that deserve investigation and studies that need to be conducted to have a full understanding of the social and economic impacts to the surrounding communities, the dynamics of the watershed, fish and wildlife habitat, and a comprehensive cost/benefit analysis.

Socioeconomic studies

- Forest-related industries-how much income and investment is currently generated by forest-related industries including the non-consumptive values of the forest economy including: Direct use, human development, community benefits, scientific values, off-site benefits, ecosystem services, and passive uses and then assigning a dollar value to each.

- Value of wild salmon watersheds-the PAD acknowledges (p61) that the Kenai River system is one of the most productive salmon rivers ***in the world.*** No mitigation is proposed as a result of the proposed projects because wild salmon are impossible to replace. Is 4.5 MW (actually the reality is much less) of power worth sacrificing the viability of one of the most productive salmon streams in the world? It would be helpful to see a completed cost/benefit analysis that examines what will be lost and gained if this project was to move forward.

- Motorized vs. non-motorized – what happens to the value of recreational lands when access by motorized vehicles is introduced? What additional maintenance and enforcement will be needed with the introduction of new roads? What precautions will be taken to minimize poaching, litter, fire, illegal camping, invasive species, erosion?

- Carrying capacity-how many more people, and what type of uses will occur in the area if access is improved?

- Commercial Fishing-how will these projects impact commercial fishing interests downstream?

- Recreation-one of the region's top sectors of employment and economic development this topic needs to be evaluated in more depth by a qualified consultant who has an understanding of the intrinsic and off-site benefits of recreation. The PAD claims (p108) no adverse impacts have been identified on recreation resources, illustrating that this is an area that needs further study.

- Tourism- what do people who visit the area do now? What draws them here? How might this change with increased development in the area? The PAD implies that activities such as scuba diving occur in the area. Obviously the information needs some refinement and updating.

- Community Quality of Life Values-what do people most appreciate about living/working/playing in the area?

- Economic Impacts-who benefits and who pays?

- Community Identity, Subsistence and Environmental Justice

- National Interests-the Chugach is a federally-owned forest known for its recreational values and surrounds the project area. The Black Mountain Research Natural Area is in close proximity to the project area and there should be some research completed about if the development could have impacts to the area.

- Potential Conflicts with Goals or Objectives of Other Agencies and Landowners

- Irreversible and Irretrievable Commitment of Resources

Watershed and water studies

- Water quantity-there is not enough data on how downstream water quantity will be impacted. Falls Creek has not been studied long enough to determine a solid baseline for data, and most of the studies done at Grant Lake are over 50 years old.

- The PAD on p71 states that "It is unknown whether alteration of streamflow in Falls Creek as the result of potential project operations, i.e., water diversion to Grant Lake, could affect conditions in Falls Creek." If the stream is dewatered as proposed then we can be relatively certain that conditions downstream will be impacted. This is certainly an area that needs to be investigated further. An instream flow study should be done on Falls Creek as well as Grant Creek.

- Climate change-there should be some discussion about how water flows will change as a result of climate change

- Identify cumulative impacts to the watershed-there is currently no discussion of this in the PAD.

- Increased erosion from roads and cleared areas. What will the results be? Fish are very sensitive to increases in suspended solids and turbidity.

Fish and wildlife studies

- Determine the value of the fish habitat that will be lost.

- Identify denning and foraging habitat for the Kenai Brown Bear in and adjacent to the project area. Recognize that this is a species of special concern and that reducing the number of fish available is going to impact the species. More access to the area will open it up for more disturbances and the possibility of out-migration of bears to other areas of higher densities of both people and bear which always lead to a higher mortality rate for the bears. The number of kills in defense of life and property always goes up along roadsides, so we can easily predict that bears will be impacted. The wildlife corridors need to be identified, and every effort made to avoid contributing to the decline of this species. There needs to be a scientific study to determine more about this species, and not rely on anecdotal evidence.

- Grant Lake shoreline, outlet and the head of Grant Lake are all significant habitat for birds and further studies need to be done to identify specific species and numbers of birds who are using the lake to feed and nest.

We realize this is a long list, and we thank you for your consideration. Protecting the Kenai River watershed is worthy of the extra scrutiny. We sincerely hope that Homer Electric Association will diversify its portfolio to include renewable projects in the future, and that the Alaska Center for the Environment will have the opportunity to work with you as we explore new clean technologies that will help us move into a brighter future.

Sincerely,

Valerie Connor
Conservation Director

FOCL

Established 1996

Friends of Cooper Landing, Inc.
P.O. Box 815
Cooper Landing, Alaska 99572-0815

907-595-2129
kenailake@arctic.net

January 11, 2010

Brad Zubeck
Project Engineer
Kenai Hydro, LLC
280 Airport Way
Kenai, Alaska 99611

Transmitted electronically
<bzubeck@homerelectric.com>

Subject: Review of Grant Lake and Falls Creek (P-13212, P-13211) PAD

Dear Mr. Zubeck:

The Kenai Hydro, LLC (KHL) proposed Grant Lake-Falls Creek Pre-Application Document (PAD) has been carefully reviewed. The PAD basically consists of a historical literature review, dating to 1953, utilized to favorably enable these proposals. This outdated material questionably represents the current natural setting, let alone this century's public value system. The PAD avoids mention of the multiple adverse impacts the concerned public has repeatedly highlighted.

The PAD is significantly deficient, relative to local values, vague proposed studies and impact assessments. The PAD contains other misrepresentations, which will be addressed. Although the following comments are necessarily focused on non-specific study plans and inadequate impact assessments, a critique of study techniques is also planned at a future date.

Additionally, the PAD is outdated relative to organizational changes in KHL ownership. The latter misrepresentation remains posted on the KHL Project Licensing Web Site, regardless of the formal protest filed with FERC and KHL. We continue to believe this type of misrepresentation in a federal regulatory process is disqualifying.

Controversy in this matter is greatly under stated by KHL. We are very displeased that the integrity of one of Alaska's most important river systems and natural areas, and additionally the economic stability of an entire economic region of Alaska, has been placed in the hands of a private business interest. The highest public interest is not served by this convoluted process. Our repeatedly stated, strong concerns have simply been glossed over or ignored.

This joint proposal amounts to a precedent setting industrialization of the Kenai River Watershed, impacting the natural area, and river ecology and hydrology. The Kenai River is acknowledged in the PAD, to be one of the most productive salmon rivers in the world. The applicant's original plan, apparently changed due to great public outcry, was to industrialize the Kenai River Watershed with five clustered hydro projects, stream by stream. That concept is considered reprehensible.

Additional Insufficiently Addressed Adverse Impacts (following the format of the PAD)

4.3.10. Geology and Soils

- Thirty-one foot Grant Lake water level fluctuation will produce a gray-area dead zone varying with shore line topography. The “bath-tub” ring around the reservoir will be most prominent on gradual slopes.
- Road building will result in erosion
- Mountain sides in the Kenai Mountains can be inherently unstable and a poor basis for road building.
- Road building will result in new and uncontrolled ATV access to roadless areas.
- Construction of infrastructure will result in erosion.

4.4.6. Environmental

- Dewatering Falls Creek relative to local and watershed ecology
- Dewatering of Falls Creek relative to residential property water
- Dewatering of Falls Creek relative to mining activities
- Change of water temperatures in Grant Lake and Grant Creek could negatively impact ecology.
- Thirty-one foot Grant Lake water level fluctuation will negatively impact habitat and shore-line ecology, e.g., nesting waterfowl.
- Disturbance of wildlife by construction and future uncontrolled ATV access.
- Mechanized destruction of wetlands
- Fragmentation of wildlife habitat
- Noise during construction, in a narrow mountain valley
- Noise from power plant operation, in a narrow mountain valley
- Impact of related, clustered projects in a watershed known for its importance and sensitivity
- Impact of industrialization on the undeveloped natural setting
- Impact on ecology of the Kenai River, especially the world-class salmon and rainbow trout fisheries.
- Impact on hydrology of the Kenai River
- Impact on commercial fisheries
- Cumulative impacts
- Lack of recognition or concern about two decades of public planning to protect the integrity of the Kenai River.

4.6.2. Animals

- Application of outdated references
- Disruption of the Trail Lakes Valley immigration corridor for large mammals between Interior Alaska and the Kenai Peninsula
- Fracturing of transition routes and isolation of large mammal populations
- Insufficient emphasis on Brown Bears, a species of concern on the Kenai Peninsula
- Insufficient emphasis on martins, red fox, and wolverines
- Insufficient emphasis on eagles, hawks, and owls

4.6.3. Botanical

- Application of outdated references
- Poorly inventoried bogs and wetland areas

4.7.2. Wetlands

- Change of drainage patterns
- Loss of entire wetland areas
- Grant Lake level fluctuations impacting wetland areas, especially Inlet Creek

4.8.9. Recreation

- Industrial disruption of a natural area
- Impact on natural experience of outdoor recreation: hikers, mountain bikers, skiers, birders, photographers, wildlife viewers
- Impact on tourism
- Impact on marginal local economies based on outdoor recreation and tourism

4.9.2. View Shed Aesthetics

- Clearing to build a dam, roads, pipeline, power plant, and transmission lines greatly degrades the view shed in a narrow mountain valley
- Close proximity projects in a narrow mountain valley result in much more impact than those on flatland.
- The major influence of change upon a narrow mountain valley.
- Permanent impact on world-class scenic landscape
- Permanent loss of natural view shed from Scenic Byway and All-American Road
- Permanent loss of natural view shed from Iditarod National Historic Trail
- Permanent loss of natural view shed from Alaska Railroad
- Permanent loss of natural view shed for local residents
- Degraded quality of life for local residents
- Loss of property value for local residents

- Loss of property resale value for Kenai Peninsula Borough
- Loss of property tax income for Kenai Peninsula Borough

4.10. Historic Properties and Archaeological sites

The PAD poorly addresses cultural values, and is unacceptably deficient in that important regard. Federal, state, local governments, and citizen's initiatives have long recognized the cultural values impacted by the proposed Grant Lake and Falls Creek hydropower projects. This is a cultural area of great importance. Turning it into an industrial zone is not acceptable.

It is very important for a comprehensive, highly-qualified cultural values study to be performed. Insufficiently addressed impacts include the following.

- Lack of emphasis on historic structures located on Grant Lake
- Lack of concern about impact on Grant Lake historic structures by lake level fluctuations
- Lack of recognition of potential for prehistoric barabaras along an important hunting, fishing, and trade route within the project area.
- Lack of recognition of a narrow, natural trade and transportation corridor, active and important from prehistory to present
- Lack of emphasis on a transportation corridor serving mines and mining communities, the military, the U.S. Mail.
- Lack of emphasis on the Alaska Railroad right-of-way.
- Lack of emphasis on the cultural and economic value of the Iditarod National Historic Trail
- Lack of emphasis on the cultural and economic value of the Seward Highway National Scenic Byway
- Lack of emphasis on the cultural and economic value of the Seward Highway All-American Road
- Lack of emphasis on the cultural and economic value of the Kenai Mountains-Turnagain Arm National Heritage Area.

4.10.7. Misrepresentation—Affected Tribes

- The Cook Inlet Region, Inc. (CIRI), is not a tribe, but a business organization, which has publicly stated it no longer supports KHL projects, having determined them to be impractical and not locally supported.
- CIRI has also publicly stated it is no longer partnered with Enxco, resulting in disruption of Alaska Wind Energy, LLC ownership.
- The foregoing changes in the ownership of KHL are misrepresented in the PAD

4.11.6. Misrepresentation—Electricity

- It is falsely stated that the proposed project will supply electricity to Homer Electric

Association (HEA) Customers. The projects are distant from the HEA service area. This is a speculative business enterprise intended to sell the small amounts of power generated to a passing grid owned by another utility. If net income is produced, HEA could improve its bottom line.

4.11.7. Socio-Economic Impacts

- Disregarded impacts on private land owners
- Local economic impacts from negative impacts on outdoor recreation and tourism
- Local impact from loss of property value
- Local impact on quality of life from negative environmental factors
- Local government loss of sales and property tax revenues
- Regional economic impacts from degraded Kenai River sport fisheries
- Regional economic impacts from degraded commercial fisheries

This concludes FOCL PAD comments.

Sincerely,

/s/ Robert L. Baldwin
President

Cc: Jenna Borovansky, Long View Associates, <comments@kenaihydro.com>

Also filed in FERC dockets P-13211 and P-13212

RESURRECTION BAY
CONSERVATION
ALLIANCE

BOX 1092
SEWARD, ALASKA 99664
907 224 4621
RBCA-ALASKA.ORG

On behalf of the Resurrection Bay Conservation Alliance (RBCA), an advocacy group of 250 Alaskan residents and non residents, please accept these comments on the adequacy of Kenai Hydro LLC's Pre-Application Document (PAD) filed with the Federal Energy Regulatory Commission (FERC) regarding permit applications Grant Lake/Falls Creek Project (FERC No. 13211/13212).

Study Plan Suggestions Specific to Cultural Resources

The suggestions that follow are meant to help KHL mitigate impact to cultural resources should KHL receive permissions to convert Grant Lake into a fluctuating reservoir. Even the best mitigation efforts will have negative impacts on cultural resources, though and our strong preference is that the FERC permit applications be withdrawn.

The PAD sets a weak tone with this statement: "No potential adverse impacts on cultural resources are known at this time. The impact of project construction and operation on the APE will be evaluated during licensing studies." (4.10.5. Potential Adverse Impacts).

There are known historic sites on Grant Lake. There are known adverse effects. A 10 foot rise in lake level will destroy parts of at least two historic sites.

RBCA hopes that as KHL develops its study plans, it will give more weight to cultural resources.

Here are some of the actions we suggest KHL take to protect cultural resources.

- Perform a thorough literature search.

- Conduct a pedestrian and boat-based reconnaissance of the entire area of potential effect (APE) which includes: access roads, turnarounds, transmission corridors, pipelines corridors, dam sites, surge tank, power plant, staging areas, fill areas, and other buildings.

- Do not rely on existing cultural resource inventories. The USFS studies focused on selected areas in conjunction with proposed prescribed burning. The EBASCO study didn't address the shoreline of Grant Lake. Plus in the 26 years since the EBASCO study was conducted, sites have deteriorated. For example, the cabin standing at SEL-285 in 1984 has collapsed.

- Because the rising lake levels <u>will</u> have an adverse effect on cultural resources, KHL should begin planning immediately on how to address the impact. The cultural resource technical working group should have been formed months ago.

- RBCA suggests planning on a 100% excavation (see discussion below) of the portions of the site directly impacted by rising water levels (Grant Lake elevation plus 10 feet vertical).

- RBCA suggests KHL assess the threat to the stability of the log cabin at SEL-659 by higher water levels and if necessary develop a rehabilitation program.

- Intact subsurface deposits exist within the 10 foot level at SEL-659 (see figure 1). Because the site area is large (approximately an acre) and located at the shoreline, it is reasonable to expect that this deposit is extensive horizontally, potentially as much as 200 feet. Intact subsurface deposits exist

Figure 1. Intact subsurface deposits consisting of glass bottles and metal cans exist within the area of potential effect at SEL-659.

Figure 2. Intact subsurface deposits consisting of ceramics, metal sheeting and cans exist within the area of potential effect at SEL-285.

at SEL-285 (see figure 2) though they appear to be much less extensive than at SEL-659. KHL should be aware of the cost and complexity of site excavation in its study plans and budgeting for the proposals.

- Should construction of the Grant Lake dam occur, KHL should inventory newly exposed shoreline for artifacts and features, especially, but not limited to, near known historic sites. Water bodies provide an attractive place to dispose of trash historically and currently.

- Increased access to Grant Lake and other known and not yet discovered sites within the APE will subject them to the threat of vandalism. KHL should assess the threat of vandalism and develop a plan for mitigation.

The Cost and Complexity of Archaeological Excavation

The following information is provided as an illustration of the costs and complexity associated with site excavation. RBCA hopes that this will help KHL understand the expense and uncertainties involved and the need for KHL to elevate the significance of cultural resources.

Here are some parameters that must be considered:

- administration planning staff time for a scope of work document, initial literature review, background research, and later data recovery efforts,
- site size in square meters,
- logistics,
- housing,
- archaeologist availability and costs (some principle investigators charge $120/hour; crew chiefs, $100/hour; excavators, $60/hour),
- staff time for permits,
- travel to and from Moose Pass,
- transportation to Grant Lake,
- lab costs (like faunal analysis. Often a additional 75% of excavation costs)
- equipment like generators, laptops, water pumps,
- Reporting,
- curation (physical location, database development).

Sincerely,

Mark Luttrell, President

From: mike cooney [mcooney@arctic.net]
Sent: Tuesday, January 12, 2010 3:56 PM
To: Zubeck, Brad; Jenna Borovansky
Subject: Re: Cooney PAD and Study Plan Comments Document

Brad,
Thanks for answering, and I'll see you Wednesday night.
Mike

> ----- Original Message -----
> **From:** Zubeck, Brad
> **To:** 'mike cooney' ; Jenna Borovansky
> **Sent:** Tuesday, January 12, 2010 2:21 PM
> **Subject:** RE: Cooney PAD and Study Plan Comments Document
>
> Hi Mike & Jenna,
>
> This meeting will not be transcribed, however comments will be noted during the meeting on a flip-chart and a summary of these comments will be filed with FERC. We will also be encouraging the public to file written comments directly with FERC and we will be telling people how to do this at the meeting. Thanks Mike for filing your comments on the project.
>
> Regards,
> Brad Z.
>
> **From:** mike cooney [mailto:mcooney@arctic.net]
> **Sent:** Monday, January 11, 2010 2:51 PM
> **To:** Jenna Borovansky
> **Cc:** Zubeck, Brad
> **Subject:** Cooney PAD and Study Plan Comments Document
>
> Jenna,
> Please find attached my letter to KHL with CC distribution list containing my comments regarding the PAD and Study Plans for KHL's proposed dams at Grant and Falls Creeks. I look forward to the meeting in Moose Pass this wednesday - will a transcript of the meeting be provided to the public and filed with the FERC to document the proceedings?
> Thanks, Mike

Michael Cooney

Forestry Consultant - Registered Guide No. 1162

mcooney@arctic.net

907 288 5022

P.O. Box 169

Moose Pass, Alaska 99631

January 11, 2010 Filed Electronically

Kenai Hydro LLC
C/O CIRI Land Development Corp.
2525 C Street, Suite 500
Anchorage, Alaska 99501
ATTN: Project Manager/Responsible Corporate Officer

RE: COMMENTS: Grant/Falls Dams PAD Deficiencies and,
Project Impact Issues and Study Plans

FERC Project Dockets P-13211/13212, Grant/Falls Creek Dams

Dear Project Manager or Responsible Corporate Officer,

Thank you for the opportunity to comment on Kenai Hydro LLC's (KHL) Pre-Application Document (PAD), Issues, and Study Plans related to its proposed Grant/Falls Creeks hydropower dams. This letter identifies PAD deficiencies, and project impact issues and related studies not previously identified by KHL or its consultants.

PAD DEFICIENCIES

Identified deficiencies in the PAD for the Grant/Falls hydropower project include, but are not limited to the following.

Outdated Studies, Data, Information and Conclusions

By KHL's own admission, the bulk of environmental and engineering data and information contained in the PAD results from studies that are currently at least 20 years out of date, and some data and information compiled in the PAD dates to as long ago as the 1940s and 50s.

What is worse, project related feasibility conclusions based on outdated information that were used to obtain public funding for the proposed project do not reflect the vast body of more current and progressive public policy established since the construction of the Cooper Lake dam. Since the extinction of Cooper Creek's stocks of pacific salmon and rainbow trout as a direct result of construction and operation of the Cooper Lake dam, regional resource management policy, established through extensive public involvement, has responsibly advocated for increasingly more not less protection for the entire Kenai River watershed and its public resources. Provisions of current regional resource management plans strongly discourage and even prohibit the dams proposed for Grant and Falls Creeks; KHL must recognize that the rationale for and the feasibility of building dams at Grant and Falls Creeks was at best poorly supported during the 1980s and is now completely without merit. The current controversy surrounding the project may be fairly characterized as Homer Electric Association vs. the Kenai River.

<u>Kenai River Comprehensive Management Plan</u>
The following passages, excerpted from the Plan, should be specifically included and emphasized in the text of the PAD:

> **4.5.5.2. Impoundment Structures.** (Implementing Agency: DNR)
> Recommendation 4.5.5.2:
> The construction of new dams or diversions on the Kenai River or its fish bearing tributaries, which block fish movements, or reduce essential stream flows for spawning, rearing, or migration, will be prohibited. This recommendation is to be included in the Kenai Area Plan for State Lands (KAP).
>
> **Problem Statement:** Additional impoundment structures are not considered appropriate because of their fundamental, usually irreversible affect upon the river's hydrology.
>
> **Background:** There are very few existing impoundment structures along the Kenai River; the exception being the Cooper Landing Hydroelectric Facility.

<u>Kenai Area Plan</u>
The following passages, excerpted from the Plan, should be specifically included and emphasized in the text of the PAD:

> **Specific Instream Flow Reservations.** Instream flow reservations should be established for the entire Kenai River and its tributaries that are consistent with the purposes for which the Kenai River Special Management Area was established.
>
> **F. In-Stream Flow Reservation for the Kenai River**
> In-stream flow reservations should be established on the Kenai River or its fish-bearing tributaries that are consistent with the purposes for which the KRSMA was established. [4.5.5.1 pg. 82].
>
> **G. Impoundment structures**
> The construction of new dams or diversions on the Kenai River or its fish-bearing tributaries that impede fish movements or reduce essential stream flows for spawning, rearing or migration will be prohibited. [4.5.5.2 page 82]
>
> **B. Alteration of the Riverine Hydrologic System.** To the extent feasible and prudent, channelization, diversion, or damming that will have a significant adverse impact on anadromous and high-value resident fish streams will be avoided.

Chugach Forest Plan
The following passage, excerpted from the Plan, should be specifically included and emphasized in the text of the PAD:

> **Ecological Systems Desired Condition –**
> …Management of fish and wildlife habitats will emphasize the maintenance of genetic diversity of fish and wildlife, the enhancement of fish and wildlife habitat important to sport, commercial, or subsistence fisheries, watchable wildlife, hunting, and subsistence opportunities that may exist.

Moose Pass Comprehensive Plan
The Moose Pass Comprehensive Plan is currently undergoing revision. When the Plan revision is complete, it should be included and referenced in the PAD text.

PROJECT IMPACT ISSUES and STUDY PLANS
KHL and its consultants - HDR Alaska Inc. (KHL's environmental and engineering consultant) and Long View Associates (KHL's FERC hydropower licensing consultant) - have failed to develop study plans necessary to investigate socio-economic and fisheries issues identified and requested by the public and detailed below.

This lack of responsiveness in the public process is especially troubling in view of the fact the project relies on public funding, proposes to develop public resources, and because the public has clearly requested study of these specific issues to investigate, determine and disclose negative project impacts.

Socio-Economic Impacts and Study
Issue(s) and related studies necessary to investigating, determining and disclosing negative socio-economic project impacts are detailed below.

Issue
The unique, remote, largely natural and relatively undeveloped Kenai River headwaters settings of Moose Pass, Cooper Landing, Crown Point and Primrose all support a quality of life that is highly valued by local residents. This unique natural setting also provides the critical basis for the area's only major industry; tourism that is highly dependent on the natural environment and the associated high quality outdoor recreational opportunities not found elsewhere in the region.

Project area communities are virtually surrounded by public lands managed by federal, state and local government agencies. Due to land and resource management regimes in place on these public lands currently and for the foreseeable future, tourism is the only industry, which can sustain these forest-dependent communities.

Project area residents and business owners are concerned that construction and operation of dams at Grant and Falls Creeks, including appurtenant infrastructure, will permanently and significantly damage both the quality of life and the already marginal tourism-dependent economies of local communities to an extent that presently viable communities may eventually cease to exist.

Study
Due to potentially serious and irreversible negative impacts of the project to area residents and communities, study of socio-economic impacts must not be accomplished peripherally, or as a by-product of other studies as currently proposed by KHL.

KHL should be compelled to establish a stand-alone Technical Working Group (TWG) to design and conduct socio-economic studies, independent of other project studies, and that will investigate, determine and disclose:

- Negative project impacts to the local quality of life enjoyed by residents of project area communities.
- Negative project impacts to project area businesses and to the tourism-dependent economies of project area communities.

<u>Fisheries Impacts and Study</u>
Issue(s) and related studies necessary to investigating, determining and disclosing negative project impacts to fisheries are detailed below.

In filing its PAD and TLP request with the FERC, and despite stating the Kenai River is *"one of the most productive salmon rivers in the world"*, KHL incorrectly and disingenuously suggested that potential project impacts would be limited in their geographic scope.

In fact, Grant and Falls Creeks are critical hydrological and biological tributaries to the 1.4 million acre Kenai River watershed. Grant and Falls Creeks annually contribute pacific salmon and non-anadromous fish to the full reach of the Kenai River drainage; approximately 106 lake meander and river miles from the outflow of Grant Lake to saltwater at Cook Inlet and including Lower Trail, Kenai and Skilak Lakes. The proposed dams at Grant and Falls Creeks have the potential to negatively impact the distribution and population of both pacific salmon and non-anadromous fish over at least the entire downstream portion of the Kenai River system.

By proposing to study only the populations of fish found in Grant and Falls Creeks, including both rearing juvenile and spawning escapement of returning adult salmon, KHL is ignoring the overall biological and genetic fisheries contribution of Grant and Falls Creeks to the Kenai River system. A scientifically correct assessment of Grant and Falls Creek fisheries values would be study and analysis to quantify annual production of pacific salmon and non-anadromous fish that originate at, but migrate out of Grant and Falls Creeks into the larger Kenai River system and thus provide both ecosystem values and contribute to vitally important commercial, sport and subsistence fisheries. Bluntly, the number of spawning adult salmon, rainbow trout and other fish species that utilize Grant and Falls Creeks each year represents only a fraction of the total fishery value - the unknown number of fish that do not return to these creeks each year because they have otherwise contributed to the ecosystem and to various sectors of the fishing industry - represent the greatest biological value of these streams.

Study
Due to potentially serious and irreversible negative impacts of the project to the fisheries of Grant Creek, Falls Creek and to the larger Kenai River system, KHL should be compelled to establish stand-alone fisheries studies that will investigate, determine and disclose:

- Annual fisheries production of Grant and Falls Creeks; the estimated annual population of juvenile anadromous and non-anadromous fish, by species, that originate at, but migrate from Grant and Falls Creeks into the greater Kenai River system.
- Annual population estimates of pacific salmon smolts, by species that originated in Grant and Falls Creeks and enter saltwater at Cook Inlet.
- Annual population estimates of adult pacific salmon that originated at Grant and Falls Creeks that return from Cook Inlet and enter the Kenai River system.
- Potential negative impacts to the Kenai River watershed and to local and regional fisheries, including population losses, habitat losses, and losses of genetic diversity in the fisheries of Grant Creek, Falls Creek and the Kenai River system due to construction and operation of the project.

I look forward to continued participation with the Fisheries TWG and to being included in the future TWG to design studies to investigate and disclose negative socio-economic project impacts to project area residents, communities and local economies.

Sincerely,

Mike Cooney

CC:

Ms. Kimberly D. Bose, FERC
Mr. Jim Ferguson, ADFG
Mr. Jason Mouw, ADFG
Mr. Lee McKinley, ADFG
Mr. Jack Sinclair, DOPOR
Ms. Pam Russell, DOPOR
Mr. Joe Meade, USDA FS
Mr. Roger Birk, USDA FS
Ms. Karen O'Leary, USDA FS
Mr. Eric Johanson, USDA FS
Ms. Susan Walker, NOAA/NMFS
Ms. Lesil McGuire, Alaska Legislature
Mr. Bill Wielechowski, Alaska Legislature
Mr. Steven H. Haagenson, AEA
Mr. Robert Ruffner, KWF
Ms. Deborah Debnam, HEA
Mr. Brad Zubeck, HEA
Ms. Jenna Borovansky, LVA
Mr. Jason Kent, HDR Alaska, Inc.
Ms. Jenny Neyman, Redoubt Reporter
Ms. Cinthia Ritchie, Seward Phoenix Log

-----Original Message-----
From: Bruce Jaffa [mailto:jaffa@eagle.ptialaska.net]
Sent: Wednesday, January 13, 2010 10:17 PM
To: Zubeck, Brad; Janorschke, Brad; Ambrose, Harvey
Subject: Grant Lake

Thanks to you all for a honest presentation. Good luck with this and when there is some place to invest in this project let me know where.

Bruce Jaffa

Jaffa Construction, Inc.
P.O. Box 107 Moose Pass, Alaska 99631
Jaffa@Eagle.PTIAlaska.net
907-224-8002


3899P

-----Original Message-----
From: Bruce Jaffa [mailto:jaffa@eagle.ptialaska.net]
Sent: Thursday, January 14, 2010 12:09 PM
To: Zubeck, Brad
Cc: Janorschke, Brad; Ambrose, Harvey
Subject: Re: Grant Lake

Brad,

I wish I knew the full history. Maybe Jeff or Lee Estes know more. This is an old and crude shack at the end of the lake. We used to have "poker" runs up to it in the winter. The walls are chinked with old Harper Bazarre magazines and I have found as many as a half dozens novels along with abandoned tools and misc. I think someone may have wintered there one year. I have stayed over nite only once but there are usually new signs of people coming and going. I do go up there summer and winter because, frankly its beautiful and very peaceful and just by chance out of cell phone range. There is no question this cabin would be impacted by raising the lake.

The 4th photo is several years ago (before KHL) in the inlet stream area at the head of the Lake. This is a large fairly flat area that is slightly above the lake. Certainly there will need to be clearing in the area, but boat access may not be extended with the the higher lake level. Maybe some type of landing will need to be created for summer use. I would expect that there would be a increase in use if only due to the notoriety. This may also suggest the intake structure will need some thought paid to safety.

I will ask around when I can and give you more on what I can learn.

BJaffa

Jaffa Construction, Inc.
P.O. Box 107 Moose Pass, Alaska 99631
Jaffa@Eagle.PTIAlaska.net
907-224-8002

Zubeck, Brad wrote:
> Tell me more about the "Social Club" cabin... I'm guessing that we'll
> be looking at it in our studies, but some background on use would be
> good to know. Thanks! BZ
>
> -----Original Message-----
> From: Bruce Jaffa [mailto:jaffa@eagle.ptialaska.net]
> Sent: Thursday, January 14, 2010 11:14 AM
> To: Zubeck, Brad
> Cc: Janorschke, Brad; Ambrose, Harvey
> Subject: Re: Grant Lake
>
> Yup,
>
> Eastern Grant Lake near the Grant Lake "Social Club" cabin.
>
>
> Jaffa Construction, Inc.
> P.O. Box 107 Moose Pass, Alaska 99631
> Jaffa@Eagle.PTIAlaska.net
> 907-224-8002
>
>
>
>
>
> Zubeck, Brad wrote:
>
>> Hi Bruce,
>>
>> You are welcome. Thanks for your participation, comments last night, and follow-up email & photo. I'm pretty sure that it is photo of Carole alongside your plane on Grant Lake! We will capture your related comment in our summary when we send it to FERC.
>>
>
>
>> Thanks again and best wishes for a prosperous New Year!
>> Brad Z.
>>
>> -----Original Message-----
>> From: Bruce Jaffa [mailto:jaffa@eagle.ptialaska.net]
>> Sent: Wednesday, January 13, 2010 10:17 PM
>> To: Zubeck, Brad; Janorschke, Brad; Ambrose, Harvey
>> Subject: Grant Lake
>>
>> Thanks to you all for a honest presentation. Good luck with this and
>> when there is some place to invest in this project let me know where.
>>
>> Bruce Jaffa
>>
>> Jaffa Construction, Inc.
>> P.O. Box 107 Moose Pass, Alaska 99631 Jaffa@Eagle.PTIAlaska.net
>> 907-224-8002

From: Zubeck, Brad [BZubeck@HomerElectric.com]
Sent: Thursday, January 14, 2010 1:41 PM
To: 'David Lindquist'
Cc: Jenna Borovansky
Subject: RE: Comments on Grant/Falls

Hi Irene,

Thanks again for comments on the project. Your comments will be included on our summary that will be filed with FERC.

Regards,
Brad Z.

From: David Lindquist [mailto:toshi@arctic.net]
Sent: Thursday, January 14, 2010 12:13 PM
To: Zubeck, Brad
Cc: Lindquist Irene & Dave
Subject: Comments on Grant/Falls

Hi Brad,

Please include my comments in your file for Grant Lake/Falls Creek Hydro project. After your presentation last night for Grant Lake and Falls Creek Hydro project I have come to the conclusion that the scope of this project is tremendous, much more than should be put upon any community in such close proximity to a Hydro project.

While a person on the Seward Hwy might not see the footprints of all that's proposed, the visual impact is not reasonable for a person in the immediate area to have to see. Most of the project area is easily reached on foot and is in an area that is valued for hiking, hunting, berry picking, birding, canoeing, fishing, sight seeing and ice skating. I was there 4 days ago and enjoyed the wonderful ice skating on Grant Lake

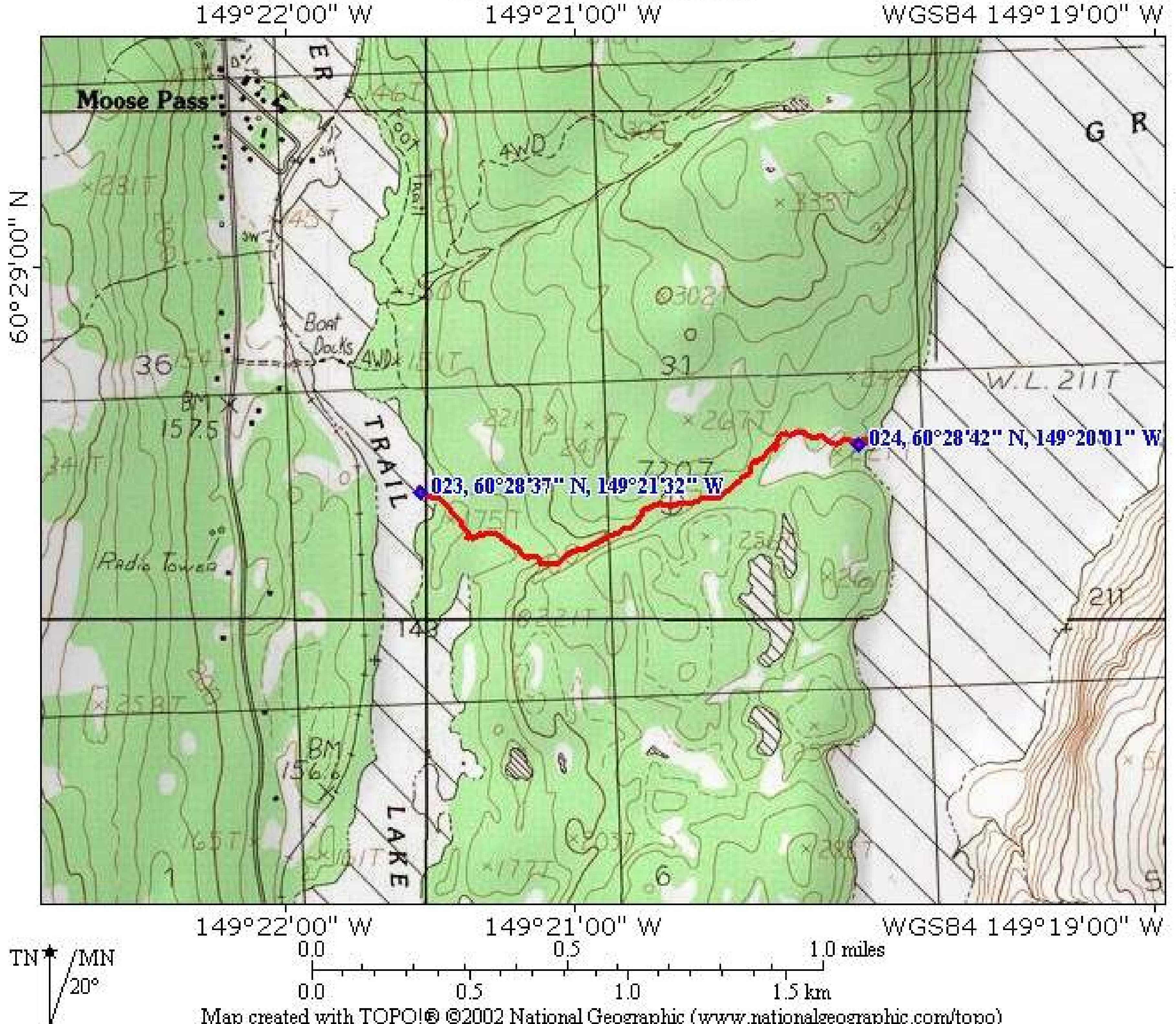
I have traveled the project area on many occasions over the past 28 years. I do not support this proposal and wish you luck in other areas. Much of the project area is easily accessible within an hours hike.

In addition to the visual and recreational impacts I am concerned for to the wildlife/fish/terrestrials/avian this project WILL have.

Please direct any funding in other directions that may be more appropriate and have less impact on local communities.

Sincerely,
Irene Lindquist
PO Box 63
Moose Pass, Alaska 99631

Grant Lake Portage Trail



Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)

Kenai Hydro, LLC
2525 C Street, Suite 500
Anchorage, AK 99503

February 8, 2010

Ms. Kimberly Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

FILED ELECTRONICALLY

Subject: Summary of comments received on the PAD and proposed studies for the Grant Lake/Falls Creek Project (FERC Project No. 13212/13211)

Dear Secretary Bose,

On August 6, 2009, Kenai Hydro, LLC (KHL) submitted its Pre-Application Document (PAD) and Notice of Intent to file a License Application for the Grant Lake/Falls Creek Hydroelectric Project. The Commission approved the use of the Traditional Licensing Process, with early scoping, on September 15, 2009. Pursuant to 18 CFR §4.38, KHL held a Joint Meeting to discuss the proposed Grant Lake/Falls Creek Project with the public, agencies, and Tribes on November 12, 2009 in Seward, Alaska. The Joint Meeting initiated a 60-day comment period on the PAD and proposed studies for the licensing process. The meeting was attended by local resource agency representatives and the public, and comments received are captured in the transcript of the meeting filed with the Commission on December 4, 2009.

A summary of the potential resource issues that have been identified by KHL taking into consideration existing information summarized in the PAD and comments received at public meetings is included as **Attachment A**. This issues list also takes into consideration consultation with an Instream Flow Technical work group and fisheries and water quality baseline study report results from 2009 work, and will inform the draft study plans to be developed by KHL as the next step in the Traditional Licensing Process consultation. KHL has committed to establishing resource specific work groups to review draft study plans for the identified issue areas.

In response to requests received at the November 12, 2009 meeting, KHL held an additional public meeting in the community of Moose Pass on January 13, 2010. KHL shared the materials presented at the November Joint Meeting and accepted additional public comment on the proposed studies. A summary of questions and comments received, a copy of the sign-in sheet, and the presentation from the January 13 meeting in Moose Pass are included with this letter (**Attachment B**). KHL also met with and provided a summary of Project information and study issues to the Kenai-Soldotna Alaska Department of Fish and Game Advisory Committee Meeting on January 11, 2010 and the Kenai River Special Management Area Board Meeting on January 14, 2010.

In response to KHL's PAD and proposed study issues, the U.S. Army Corps of Engineers, Alaska Center for the Environment, the Resurrection Bay Conservation Alliance, Friends of Cooper Landing, Mike Cooney, the Aigeldnger Family, Adrienne Meretti, Marion Glaser, and William Brennan have provided comments to KHL on the Project proposal, and filed these comments directly with the Commission. In addition, KHL received comments and additional information on the proposed Project area from the City of Seward, William Coulson, Brita Mjos, Bruce Jaffa, and Irene Lindquist. Copies of the comments provided to KHL that have not been filed with the Commission are included with this letter (**Attachment C**).

At this time, KHL is suspending major activities to consider how best to proceed with its schedule and scope of work given its financial constraints and reorganization. KHL will continue to keep the Commission apprised of its plans, progress and timeline for developing draft study plans, so that the Commission may plan and schedule its early scoping meeting.

If you have questions about this filing, please contact Brad Zubeck, Kenai Hydro (907.335.6204, bzubeck@homerelectric.com).

Sincerely,

/s/ Brad Zubeck

Brad Zubeck
Project Engineer
Kenai Hydro, LLC

Enclosures

Attachment A

Potential Resource Impacts – Grant Lake/Falls Creek Project (FERC No. 13211/13212)

Geology and Soils

- Impact of Project construction and operation on possible erosion and sedimentation in the zone above normal full pool in Grant Lake.
- Impact of Project operation (changes in Grant Lake levels) on the Inlet Creek delta.
- Impact of Project construction on sediment releases into Grant Lake, Grant Creek, and Falls Creek, Trail Lake and Trail Creek.
- Impact of Project road and transmission line construction and operation on erosion in the Project area.

Water Resources

- Impact of Project construction and operation (lake level fluctuations, changes in flow) on Grant Lake, Grant Creek, and Falls Creek water quality, hydrology, and water temperature.
- Impact of Project construction and operation on water quality, hydrology, and ice conditions of Lower Trail Lake and Trail Creek.
- Impact of Project operation (changes in flows) on domestic water use in Falls Creek.

Fish and Aquatic Resources

- Impact of Project operation on sediment transport (relative to the availability of spawning gravels) due to changes in flow in Grant Creek.
- Impact of Project operation (fluctuating flows in Grant Lake, changes in seasonal flow on Grant and Falls Creek, reduced flows between the dam and powerhouse on Grant Creek, reduced flows below the Falls Creek diversion) on fish abundance and distribution
- Impact of Project construction and operation on biological productivity and abundance of fish food organisms in Grant Creek and Grant Lake.
- Impact of Project intake structure operation on fish populations.
- Impact of Project construction on fish habitat in Grant Creek.
- Impact of Project facilities (increased access) on fish populations due to potential increased recreational fishing.
- Impact of Project construction and operation on commercial, sport, and subsistence fisheries supported by the Kenai River watershed.

Botanical, Wildlife, and Wetland Resources

- Impact of Project studies, construction and operation (including potential disturbance to wildlife) on wildlife distribution and abundance.
- Impact of Project construction and operation on wildlife during critical life stages.
- Impact of Project construction and operation (lake level fluctuations) on Grant Lake shoreline vegetation and/or habitats used by wildlife species.
- Impact of Project construction and operation (lake level fluctuations, Project roads and facilities) on distribution and abundance of invasive plant species
- Impact of Project construction and operation (lake level fluctuations, Project facilities) on distribution and abundance of rare plant species.
- Impact of Project operation on abundance and distribution of fish used by wildlife species.
- Impact of Project construction and operation on breeding and rearing habitat and nesting success of waterbirds in Grant Lake and Inlet Creek.
- Impact of Project construction and operation (lake level fluctuations, hydrologic changes in Grant and Falls Creek, road and facilities construction and maintenance) on wetland, forest/scrub, riparian, and littoral habitats on Grant Lake (including at Inlet Creek), Grant Creek, and Falls Creek.
- Impact of Project construction and operation on wildlife use of wetland, riparian, and littoral habitats.
- Impact of Project operation on littoral habitats at the narrows between Upper and Lower Trail Lakes.
- Impact of Project construction and operation on wildlife movement across the bench between Grant Lake and Trail Lake.
- Impact of Project transmission lines on bird populations (potential collision deaths).

Quality of Life, Recreation, Land Use, and Visual Resources

- Impacts of Project construction and operation on distribution of local and tourist recreational use, access, and experience on Grant Lake, Grant Creek, Vagt Lake, and Falls Creek.
- Impacts of Project construction and operation on the distribution and abundance of fish and wildlife for anglers and hunters.
- Impacts of Project construction and operation (including facilities) on visual quality in the area.

- Impacts of Project roads and transmission line corridors on aesthetic and visual resources (including impacts on Scenic Byway viewpoints and views from existing recreational trails and use areas).
- Impacts of Project construction and operation on local and regional recreation resources.
- Impacts of Project facilities and operation (including road access, safety, and use) on local residential land use on Grant Creek and Falls Creek.
- Impact of Project construction and operation on quality of life characteristics of the area (i.e., noise, changed access to remote area, light pollution).
- Socioeconomic overview of potential effects of Project construction and operation on the area economy.

Cultural Resources

- Impacts of Project construction and operation (including changes in flows and lake level fluctuation and potential for increased recreational use and access in the area) on cultural resources in the Grant Lake, Grant Creek, and Falls Creek area.
- Assessment of existing subsistence use, and impacts of Project construction and operation on subsistence use in the area.

Attachment B - Materials from January 13, 2010 Meeting in Moose Pass, Alaska

- **Summary of Issues**
- **Power Point Presentation**
- **Sign-In Sheet**

KHL Grant Lake/Falls Creek Hydro Project
Public Meeting, Moose Pass Community Center, Moose Pass, Alaska
1-13-10

1. Transmission Line underground option? Consider an underground transmission line between the powerhouse and the grid intertie.
2. Visual-aesthetic study.
3. Will an in-stream flow study be performed for Falls Creek?
4. When will comments/issues be addressed?
5. Will there be follow-up studies, assuming the project is constructed, that will verify study impacts or predicted results/trends?
6. Will the studies or project address Kenai River Special Management Restrictions?

Fish, Aquatics & Water Resources

7. What affect will the project have on Vagt Lake?
8. What affect will the project have on water temperature, changes?
9. Water quantity study out of Grant Lake/Falls Creek? (i.e., how much does Grant Creek contribute to the water flowing out of Lower Trail Lake?)
10. Who quantifies parameters of flow studies?
11. Concern about Falls Creek resources?
12. What remediation/reclamation would be required if project is decommissioned?
13. Water quality certification – would KHL consider obtaining a 404(??) water quality certification?
14. Relationship of AEA Hydro projects to KHL project?

Terrestrial/Plant Resources

15. Will trees be cleared on the banks of Grant Lake due to raising the lake level, what affect will this have?
16. How do you mitigate loss of habitat due to raising level of Grant Lake (e.g., nesting bird habitat in particular)?
17. How will the project affect brown bears (Brown Bear Denning Study)?
18. Are lynx being studies for impact from project?
19. What affects on Ptarmigan (birds)?

Recreational/Visual Resources

20. How will the project affect access by Airplane, ski-planes, hiking? What affect or impact to Grant Lake Portage Trail?
21. How will the project affect the active mining claim on north side of Grant Lake, the "Case" mine and cabin.
22. What affect would project traffic noise have on recreation at Vagt Lake?
23. Value: Public integrity values considered… Residents would like to see scenic integrity values put in terms of local residents.
24. Impact of road construction of Falls Creek residents (e.g., dust, noise, increased traffic, etc)?
25. Studies address local interests in balance with overall project.

26. Look at existing amount of public use in area.
27. Consider giving increased weight to localized interests and opinions.
28. Could the dam structure be designed to look “natural”?

Cultural Resources

29. Be aware that a group has received grant monies to designate or recommend sites in the area for a National Heritage Site. The group is call “Community Corridor Association” (see Bruce Jaffa).
30. Look at easements south of Falls Creek. Re-route access south of Falls Creek (rather than the north side of the creek where it is currently proposed).
31. Possibly deal directly with Falls Creek Road residents (i.e., consider individual negotiations with each resident along Falls Creek).
32. Electrical Conservation (i.e., demand-side management) needs to be a priority.

Agenda

- Goals for Joint Meeting & Project Progress & Status
- Project Drivers
- FERC Traditional Licensing Process (TLP) & Early Scoping
- Filing Comments with FERC
- Project Description
- Resource Area Existing Information and Potential Effects
  - Fish and Aquatic Resources
  - Water Resources
- Break
  - Terrestrial Resources
  - Visual and Recreation Resources
  - Cultural Resources
- Wrap-Up and Additional Time for Additional Public Comments

Goals for the Meeting

- Summarize Existing Information
- Review & Identify Study Topics
  - Studies and information gathering efforts will focus on information needed to assess potential resource impacts of the proposed Project in a license application to FERC
- Gather Feedback on Identified Study Topics

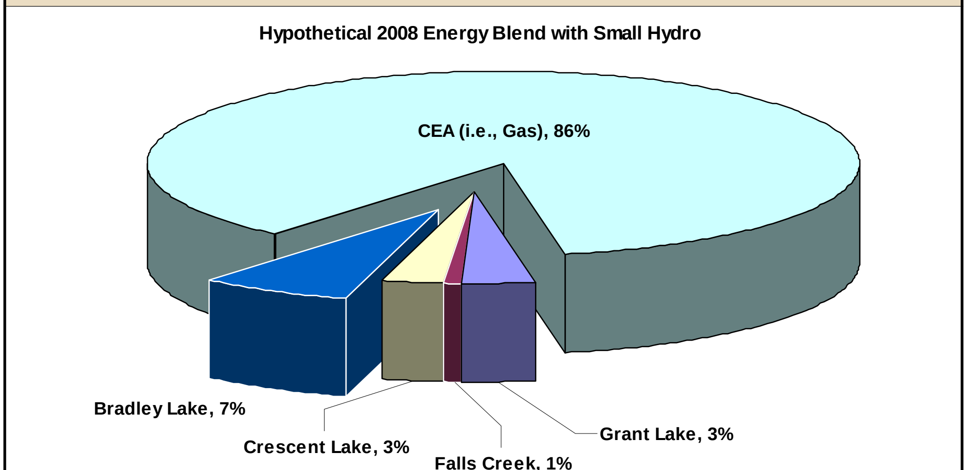
Project Progress & Status

- Finalize 2009 Baseline Study Work & Report
- Receive, Summarize and File Public Comments
- Schedule beyond tonight is tentative and dependent on obtaining additional funds to implement studies
  - Wind Energy Alaska is in the process of withdrawing from the KHL partnership

Project Drivers

- Diversify HEA's Generation Portfolio
- Desire to Add Renewable Generation
  - Wind and Hydro – reliable, utility-ready technologies
  - Displaces fossil fuels
  - Reduces carbon emissions
  - Stabilize energy prices, near & long term

Why bother with 4.5MW?



Benefits of Small Hydro

- Hydro energy displaces fossil fuels & associated emissions
  - Could displace 182,000 to 225,000 Mcf of gas per year
  - Could save ~$760,000 to $1,870,000 (w/gas at $4 to $8/Mcf)
  - Could offset the equivalent of 12,000 - 15,000 tons per year of CO2
- With Storage (i.e., Ability to fluctuate the lake level)
  - HEA can provide more power when needed during winter months
  - Provide consistent and increased winter stream flows to potentially benefit aquatic life… without storage this is *not* possible
- Strategic Benefit – When debt is retired, it is the cheapest power available (< $0.05/kWh).

Why Moose Pass?

- Simply, that's where the resource is…
- Bradley Lake Comparison
  - Located at the head of Kachemak Bay near Homer
  - Serves all Railbelt Utilities: Anchorage (CEA, ML&P), Valley (MEA), Fairbanks (GVEA), and the Peninsula (HEA and Seward)

Meeting Process and Comments

- Please hold questions until the end of each resource segment
- Please be concise
- Please focus comments on identifying or clarifying potential issues that should be studied
- If you have extensive additional existing information on the Project area please submit in writing

FERC Process

- Federal Energy Regulatory Commission (FERC) has jurisdiction over hydroelectric development, guided by the Federal Power Act
- FERC outlines detailed licensing processes for applicants to use that include opportunities for agency, tribal, and public input throughout the Project development
  - Kenai Hydro requested, and received authorization from FERC to use the Traditional Licensing Process (TLP) with early scoping
  - TLP has three stages of consultation

TLP: First Stage Consultation

File Notice of Intent and Pre-Application Document (PAD)	**August 6, 2009**
Public and Agency Comments on Use of the TLP	**August 6 - September 6, 2009**
FERC approval of request to use TLP	**September 15, 2009**
Joint Meeting	**November 12, 2009**
Public Comment on Study Issues and Available Information • Parties provide comments on study determination on necessary studies, and additional study requests with explanation how the studies and information requested will be useful to the agency, Tribe, or member of the public in furthering its resource goals and objectives	**November 12, 2009 – January 11, 2010**
Dispute Resolution Process • This is a formal step in the TLP regulations for the applicant or other parties to request FERC input if there is disagreement over which studies should be conducted. • FERC has committed to Early Scoping for this Project, so FERC will engage in reviewing the range of issues to be studied whether dispute resolution is requested or not.	**Following end of comment period**

FERC Early Scoping

- Timing - Prior to initiation of study program
- FERC issues Scoping Document 1 and Meeting Notice at least 30-days prior to public meeting date
- Two meetings to be held (at least one will be held in close proximity to the Project area)
- An environmental site review will be scheduled in coordination with the early scoping meeting
- 60-day Comment Period follows scoping meeting
- If necessary, Scoping Document 2 with expanded range of studies to be conducted will be issued by FERC within 45-days following close of public comment

TLP Second Stage Consultation (Tentative Schedule)

KHL Files Summary Response to Comments on Study Requests	January 2010
KHL Issues Draft Study Plans for Agency and Public Review	February - March 2010
Public Workgroup Meeting(s) to discuss 2010 draft study plans	March - April 2010
KHL Issues final study plans	May 2010
Conduct studies per study plans and provide updates to workgroups	May 2010 – January 2011
Consultation with workgroups regarding development of Draft License Application	January – April 2011
File Draft License Application • Includes study results to date • Include response to study requests received at Joint Meeting	May 2011
Public Comment Period on Draft License Application	May – July 2011 [90-days following filing of draft license application]
FERC Dispute Resolution Process	As requested

TLP Third Stage Consultation (Tentative Schedule)

File Final License Application	September 29, 2011
Expiration of Preliminary Permit	September 30, 2011
FERC Dispute Resolution Process and Requests for Additional Information	As requested

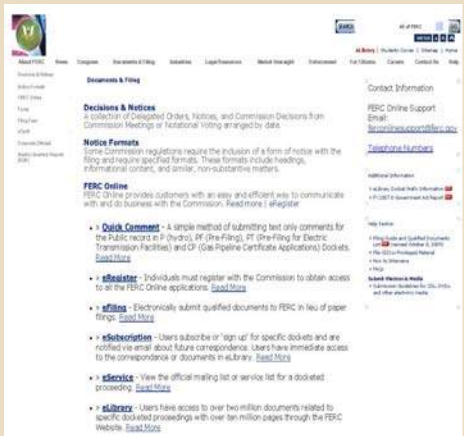
Proposed Work Groups

- Fish and Aquatics, Water Quality and Hydrology
  - Includes water quantity
- Human Environment
  - Recreation
  - Land use
  - Socioeconomics
  - Aesthetics
  - Quality of Life
- Cultural Resources
- Terrestrial Environment
  - Wildlife
  - Vegetation
  - Wetlands

Purpose of Work Groups

- KHL will engage work groups during the development and implementation of study plans
- Draft study plans will be discussed with the work groups prior to study implementation
- Study results will be provided to the work groups
- Once study information is available, potential Protection, Enhancement, and Mitigation Measures for the License Application will be discussed with the work groups

Filing Comments with FERC
Use P-13211 and P-13212



- FERC e-filing at www.ferc.gov
- Three ways to comment:
  - Written correspondence
  - Electronic “Quick Comment” [limited to 6,000 characters]
  - Register on ferc.gov to e-file longer documents
- Copy comments to applicant (KHL)
- Questions?
  - FERC’s Project Manager is Joe Adamson (joseph.adamson@ferc.gov)

Tracking Project Progress and Comments

Kenai Hydro, LLC website

(www.kenaihydro.com)

FERC E-Subscription Service

(www.ferc.gov)

Summary of Comments Rec'd after Nov. 12th Public Meeting

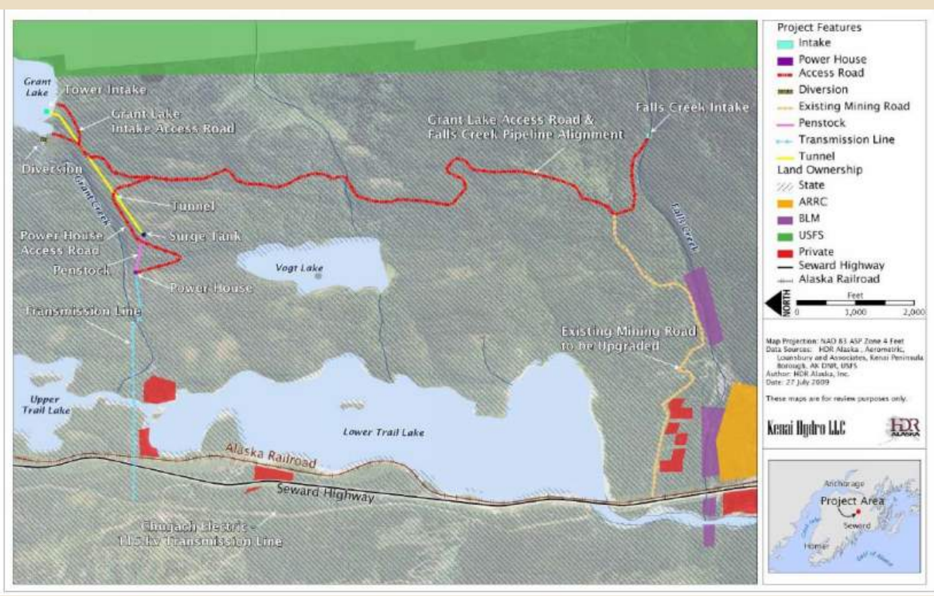
- Potential impacts of Project facilities and construction on traffic, access road alignment, and potential road improvements on residents along Falls Creek
- Potential impacts of Project operation on local domestic water use in/near Falls Creek (wells and surface water use)
- Potential impacts of noise (e.g., change in Creek sounds and masking of traffic noise) due to changes in flow in Falls Creek
- Potential impacts of Project construction and operation of facilities on dark skies/potential light pollution from Project facilities
- Potential impacts of Project construction and operation on quality of life in Moose Pass and surrounding socioeconomic considerations – impacts on local business, tourism, and resident use of area
- Potential impacts and changes in accessibility to Falls Creek, Grant Creek, and Grant Lake (roads, trails, etc)

Summary of Comments Rec'd after Nov. 12th Public Meeting (continued)

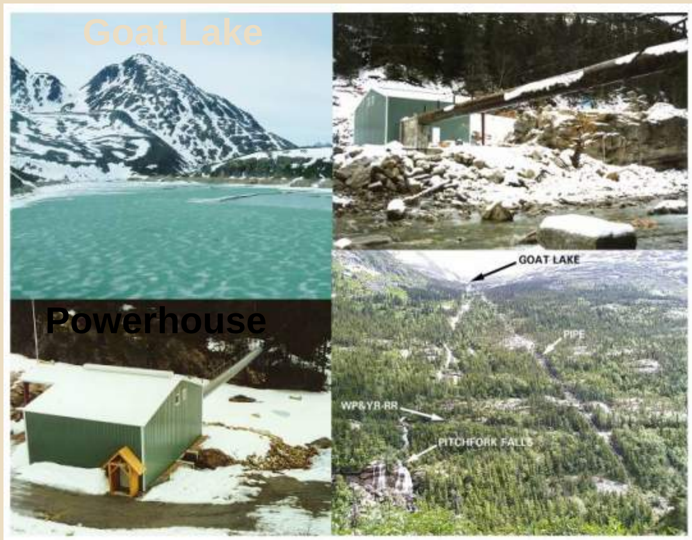
- Potential impacts of Project operation on ice formation in Grant Lake and Trail Lake
- Potential impacts on commercial fisheries resources in the local area and in the Kenai River watershed
- Potential impacts of Project construction and operation on wild fish production and the Grant Creek/Falls Creek population contribution to the Kenai River watershed
- Potential aesthetic impacts of Project facilities (including transmission line placement [location and above vs. underground], road alignment, and Falls Creek to Grant Lake diversion pipe)
- Potential impact of Project construction activities (i.e., lowering of lake level for dam construction purposes; construction of a temporary coffer dam) on Grant Lake outlet and wildlife and wetland habitat
- Potential for residential service expansion in the local area and/or grid connection benefits from the Project
- (Note: A full transcript of the November 12 meeting was filed with FERC, and individuals and organizations have also filed written comments with FERC that are not included in this summary.)

Project Area

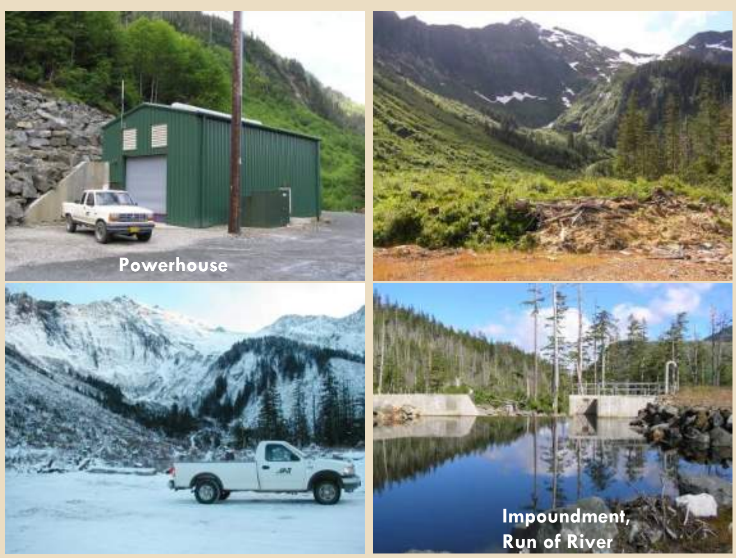
Proposed Project Facilities



Goat Lake Hydro 4MW



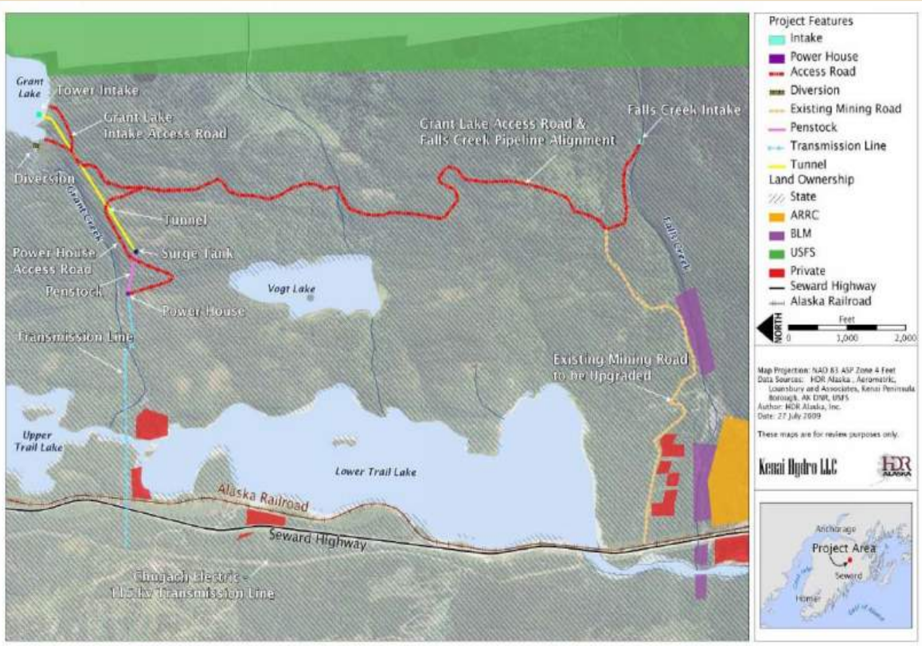
South Fork Hydro 2MW



Kasidaya Creek Hydro 3MW

A Run-of-River Project

Questions and Comments?



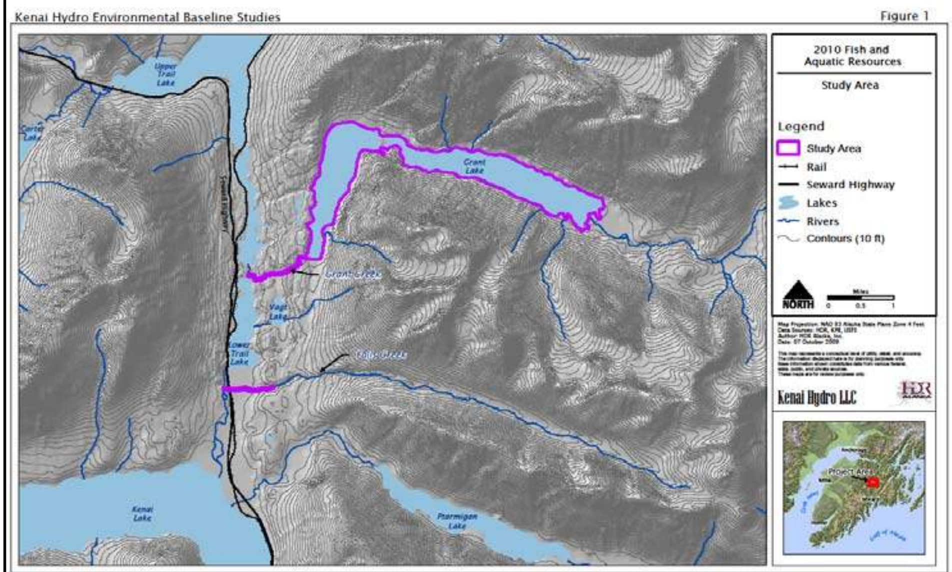
Fish and Aquatic Resources

Fish and Aquatic Resources
Existing Information

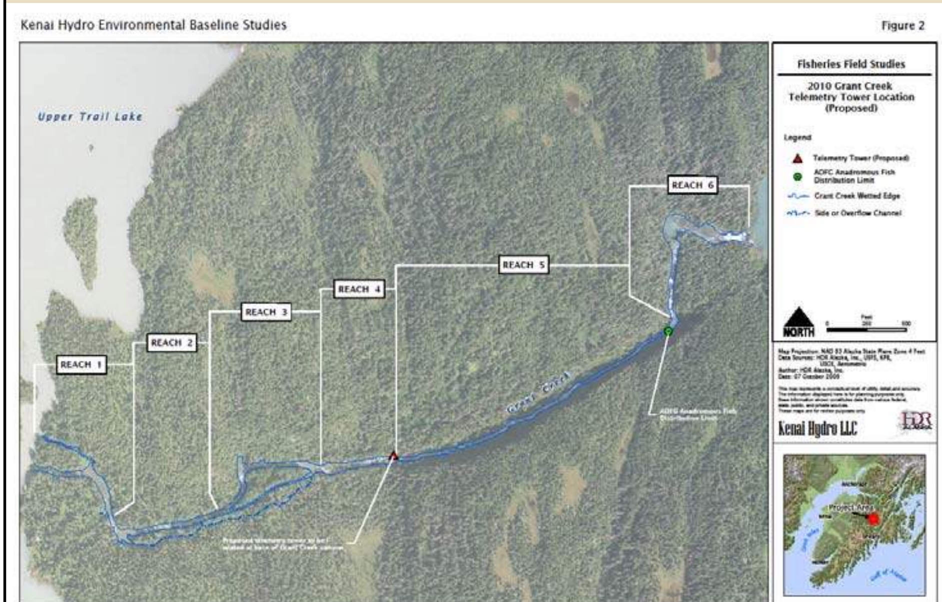
Sources of existing information

- Fish and aquatic habitat data were collected in Grant Lake and Grant Creek as part of various studies in the 1960’s and 1980’s by USGS, USFS, USFWS, ADFG, and AEIDC
- Resource information derived from the above studies has been summarized in the Preliminary Application Document (PAD)
- Pre-licensing study program conducted by HDR in 2009
- A final report of the 2009 studies should be available on the KHL web site soon.
- Information sources are available on the Kenai Hydro Project web site (www.kenaihydro.com)

Study Areas



Grant Creek



Fish and Aquatic Resources
Summary of Habitat Values

Grant Lake

Sticklebacks and sculpins present. No salmon, trout, or Dolly Varden have been captured in the lake or its tributaries.

Grant Creek

Adult Salmon

- Lower 0.8 miles mapped as anadromous fish habitat by ADF&G; upstream passage blocked by an impassable waterfall
- Sockeye Salmon – Escapement estimates have ranged from 400 to 2,500 adult spawners
- Chinook Salmon – Escapement estimates have ranged from 33 to 230 adult spawners
- Coho – Count numbers have ranged from 55 to 300 adult spawners

Fish and Aquatic Resources
Summary of Habitat Values (cont.)

Grant Creek (cont.)

Juvenile Salmon

- Lower reach of Grant Creek contains limited scattered slow water habitats suitable for juvenile salmon rearing
- Rearing habitats consist mainly of undercut bank, side channel and backwater areas
- Chinook and coho fry abundant within limited available habitats
- Most juvenile salmon are fry suggesting limited use by older juveniles

Resident Fish

- Dolly Varden most abundant fish in stream. All size classes present.
- Adult and subadult Rainbow trout also common

Fish and Aquatic Resources
Summary of Habitat Values (cont.)

Falls Creek

- Lower 1/3 mile mapped as anadromous habitat by ADF&G
- 2009 minnow trapping captured Dolly Varden only
- Spawning surveys in 2009 found no adult salmon present

Fish and Aquatic Resources
Issues

- What are the potential effects of increased lake level fluctuation on Grant Lake fish resources?
- What are the potential effects of the project intake structure on Grant Lake fish resources?
- What are the potential effects of changes to the seasonal flow regime on the abundance and distribution of fish in Grant Creek?
- What are the potential effects of changes to Grant Creek flows on the availability of spawning gravels and/or sediment deposition rates in Grant Creek?

Fish and Aquatic Resource Issues (cont.)

- What are the potential effects of project construction or operation on the overall productivity of Grant Creek as determined by the abundance of aquatic insects (macroinvertebrates) and/or algae (periphyton)?
- What are the potential effects of project construction activities on fish habitats in Grant Creek, Falls Creek, or Grant Lake?
- What are the potential effects of reduced flow in lower Falls Creek on the abundance and distribution of fish in the creek?
- What are the potential effects of increased access resulting from project roads on fish resources through increased recreational fishing opportunities?

Fish and Aquatic Resources Proposed Studies

- Grant Creek Salmon Spawning Distribution and Abundance
- Grant Creek Resident and Rearing Fish Distribution and Abundance
- Grant Creek Aquatic Habitat Mapping and Critical Factors Analysis
- Grant Creek Instream Flow Study
- Falls Creek Fish Distribution and Abundance
- Baseline Study of Benthic Invertebrates and Periphyton in Grant Creek
- Baseline Study of zooplankton and phytoplankton in Grant Lake

Other Issues and Comments

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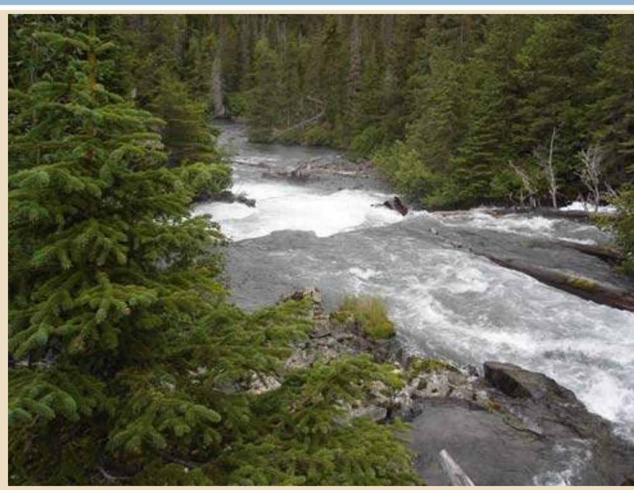
Water Resources



Water Resources
Hydrology

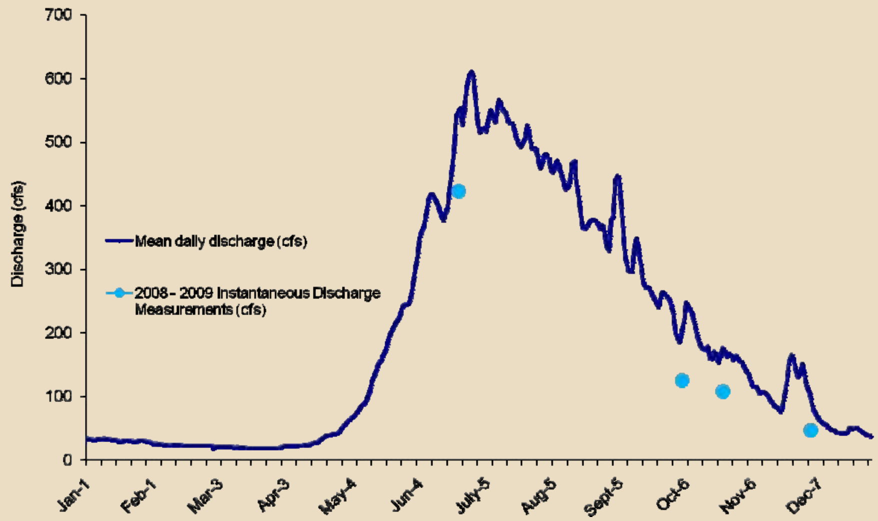
Sources of Existing Information

- Historical Grant Creek stream gage data (USGS 15246000) – 11 years of continuous stream gage data from 1947-1958.
- Grant Lake Hydroelectric Project Detailed Feasibility Analysis, EBASCO, 1987, that includes modeled Falls Creek data.
- Historical Falls Creek discharge data includes continuous measurements during one summer in the mid-1980s and several instantaneous discharge measurements made over various years including 1963-70, 1976, and 2007- 2008.
- HDR Stream Gage data at USGS Station - 2009

Water Resources
Hydrologic Characteristics

- Grant Lake fed by several tributary streams, most of which terminate at glaciers
- Grant Lake water level fluctuates naturally over a several foot range
- Seasonal flow characteristics typical of glacial systems
- Most summer flow derived from snow and glacial melt
- Most winter flow derived from ground water

Historical Grant Creek (GC200) Hydrograph (1947 -1958)



Water Resources
Water Quality

Sources of existing information

- Water chemistry and temperature data collected in Grant Lake and Grant Creek as part of various studies in the 1960's and 1980's by USGS, USFS, USFWS, ADFG, and AEIDC

- HDR's ongoing 2009 study has collected seasonal water chemistry data and continuous temperatures in Grant Creek and Grant Lake at several stations

Water Resources
Water Quality Characteristics

- Water quality typical of cold Alaska drainages with glacial input
- Nutrient levels are generally low, indicating low biological productivity
- Turbidity varies with the season – moderately high in the summer during glacier melt and low during winter and spring
- No indication of water pollution or other unusual conditions

Water Resources
Issues

- What are the potential effects of Project construction and operation on Grant Lake, Grant Creek, and Falls Creek water quality, hydrology, and water temperature?

- What are the potential effects of Project construction and operation on water quality and hydrology of Lower Trail Lake and Trail Creek?

- How will physical changes to Grant Creek, Falls Creek, and downstream water bodies affect fish resources?

Water Resources
Proposed Studies

Hydrology

- Continue the ongoing stream gaging in lower Grant Creek to increase the period of record, confirm earlier data, and provide essential input to the instream flow study

- Continue the ongoing stream gaging of Falls Creek

Water Resources
Proposed Studies

Water Quality

- Collect water chemistry data in Grant Creek, Falls Creek, and Grant Lake to define baseline water quality conditions.

- Continue the collection of continuous water temperature data in Grant Creek, Falls Creek, and Grant Lake to provide input to aquatic resource impact assessment models.

Other Issues and Comments

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Terrestrial Resources

Existing Information:

- Previous studies and agency surveys
- AEIDC, APA, US Forest Service, ADF&G
- Summarized in PAD

Terrestrial Resources
Plant Community Characteristics

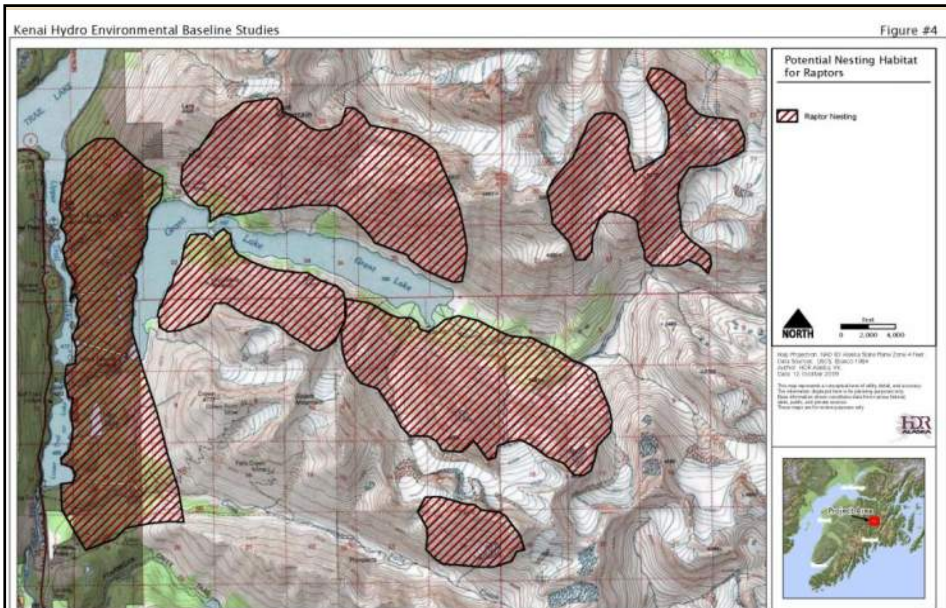
- Wide range of plant communities represented in Project area
  - Coniferous, deciduous, and mixed forest
  - Shrublands, grasslands, and alpine tundra
  - Muskeg, wetlands, and riparian areas
- Spruce bark beetle has affected spruce in the past 15 years
  - Areas of dead trees are in or near the Project area
- Plant communities of special interest include:
  - Forested areas with harvestable timber
  - Wetland and riparian communities
  - Rare or sensitive plant habitats

Project Area: Grant Lake, Vagt Lake, Trail Lakes

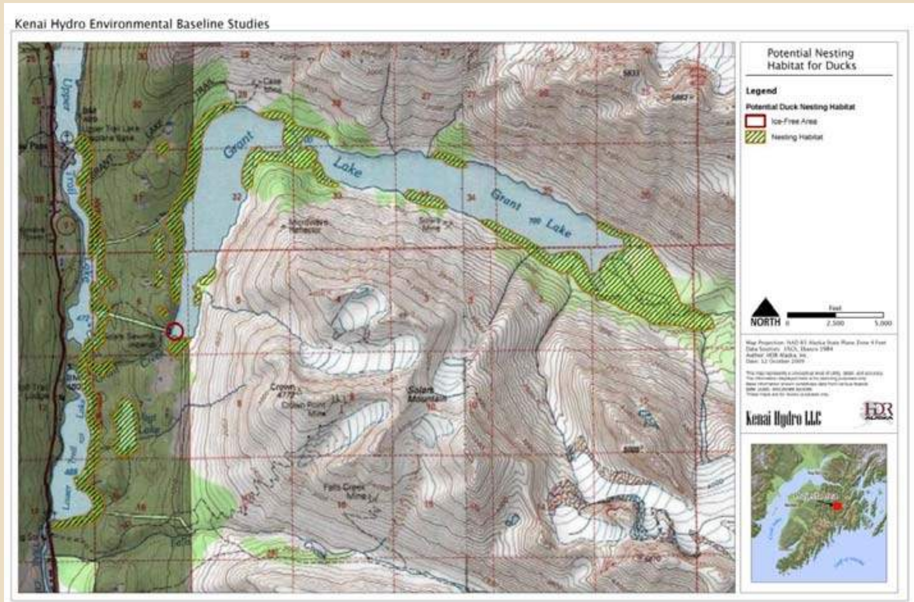
Terrestrial Resources
Wildlife Community Characteristics

- Studies from the 1980's estimated 108 bird species, 34 mammal species, and one amphibian
- Habitats of interest: inlet delta, outlet area, bear use habitats, moose range, raptor nesting areas, and potential waterbird nesting areas

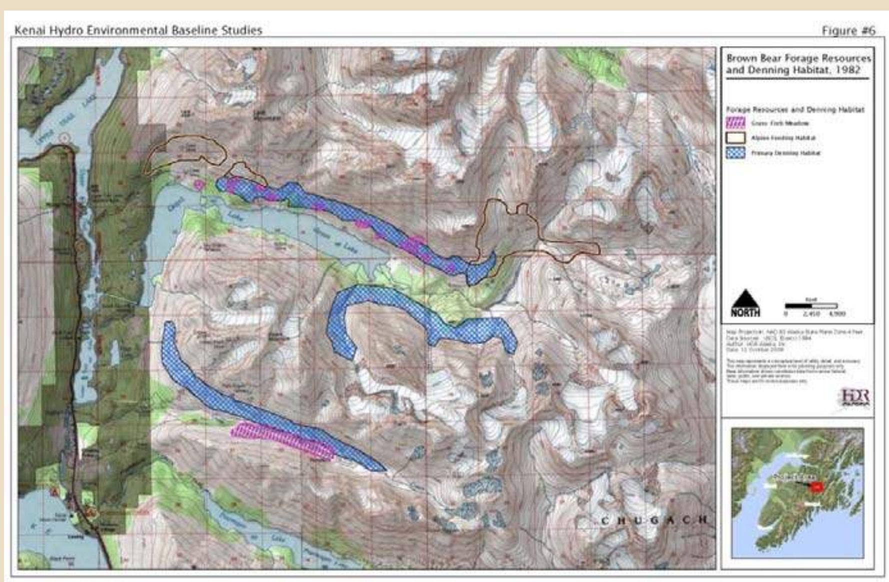
Grant Lake Outlet



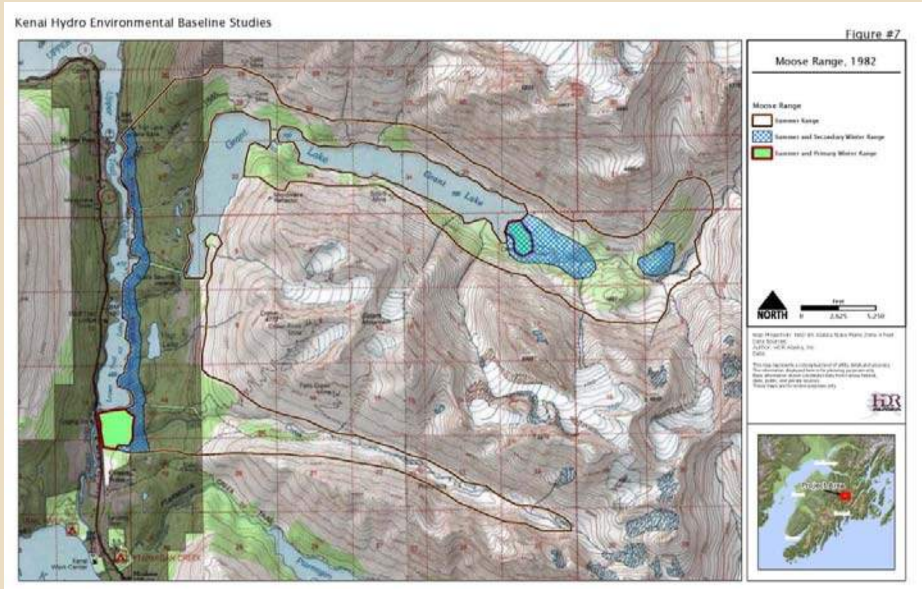
Potential Raptor Nesting Habitat, 1982



Potential Waterbird Nesting Habitat, 1982



Brown Bear Foraging and Denning Habitats, 1982



Moose Range, 1982

Terrestrial Resources
Special Status

- USFS has identified two sensitive plant species that may be present in the Project area, but no sensitive, rare, threatened or endangered plants have been documented in Project area.
- No threatened or endangered animals occur in the Project area.
- The USFS identifies three management indicator species: brown bear, moose, and mountain goat; and eight species of special interest.
- The state list of Species of Special Concern has several species that may occur in the Project area(e.g., Brown Bear).

Terrestrial Resources Issues

- What are the potential effects on wildlife from general disturbance associated with studies, construction, and operation?
- What are the potential effects of increased water level fluctuation in Grant Lake?
- What are the potential effects of changes in flow in Grant Creek and Falls Creek?

Terrestrial Resources Issues (cont.)

- What are the potential effects of construction of the Project facilities?
- What are the potential effects on wildlife if the distribution and/or abundance of salmon changes?
- What are the potential effects of construction and maintenance of access roads and transmission lines?

Terrestrial Resources Proposed Studies: Plants

Studies will be designed to gather information for accurate evaluation of how the Project will affect terrestrial resources.

Study topics:

- Refining existing vegetation mapping
- Conducting a timber stand survey in areas not previously surveyed
- Conducting a sensitive plant survey to produce a Biological Evaluation for Plants
- Conducting an invasive plant survey (concurrent with sensitive plant survey)
- Conducting wetland delineations
  - The wetland survey will include a detailed survey of Project activity areas and a general survey of the larger Project area.

Terrestrial Resources Proposed Studies: Wildlife

Study topics:

- Quantifying the distribution and abundance of target wildlife species during key seasons of activity in the Project area
  - Documenting the species composition of avian communities, particularly landbirds, shorebirds, and waterbird
  - Classifying and mapping wildlife habitat in the Project area in conjunction with the Botanical Resources Study
- Conducting bear denning survey

Other Issues and Comments

?????????????????

Recreational and Visual Resources

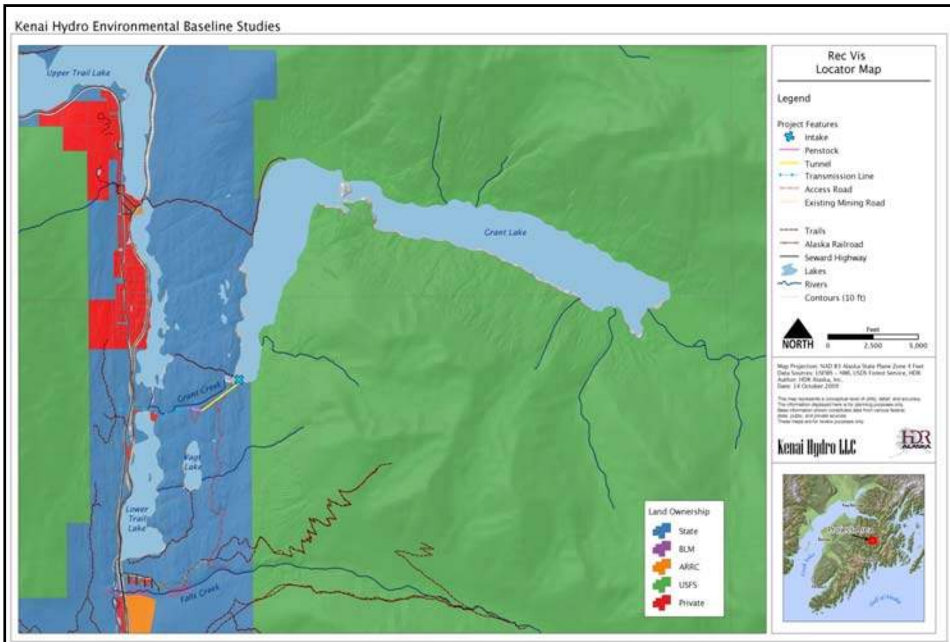
Recreational and Visual Resources

Existing Information:

- Previous studies and agency surveys
  - ADNR, KPB, AEIDC, APA, USFS, ADF&G
- Summarized in PAD

Recreational and Visual Resources: Land Use

- **USFS Land Use Designation** (USFS Plan)
  - Most of Project area watershed is on USFS land
  - Grant Lake area (within FS boundaries) is Fish, Wildlife, and Recreation Prescription
  - East end of Grant Lake is Backcountry Prescription
- **State lands** on either side of Trail Lakes
  - includes locations of tunnel, penstock, powerhouse, access roads, and transmission line
- **KPB** has selected lands between Grant Lake and Upper Trail Lake
  - Use to be determined by KPB
- **Private property** in Moose Pass, and along shores of Upper and Lower Trail Lakes



Project Area Land Ownership

Recreational and Visual Resources: Recreation

- **Trails**
  - Iditarod National Historic Trail traverses the Project area
  - Grant Lake Trail, Falls Creek Road, Vagt Lake Trail, and Crown Point Mine Road and Trail
- **Access**
  - Boat in summer
  - Snowmachine or cross-country ski in winter
  - No developed trailhead or signs
- **Use Level –** currently, both summer and winter use is light

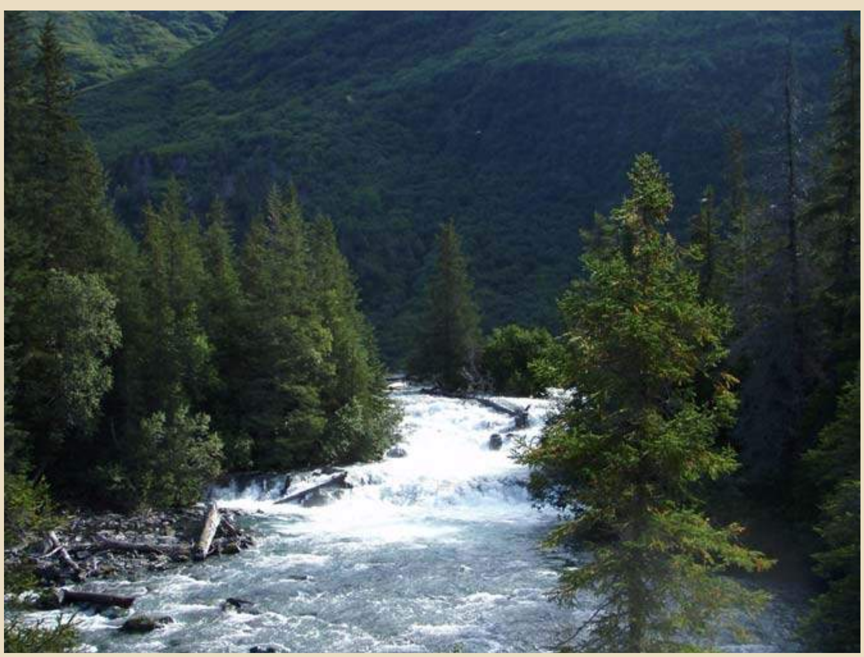
Falls Creek Area Hiking Trail

Recreational and Visual Resources: Recreation

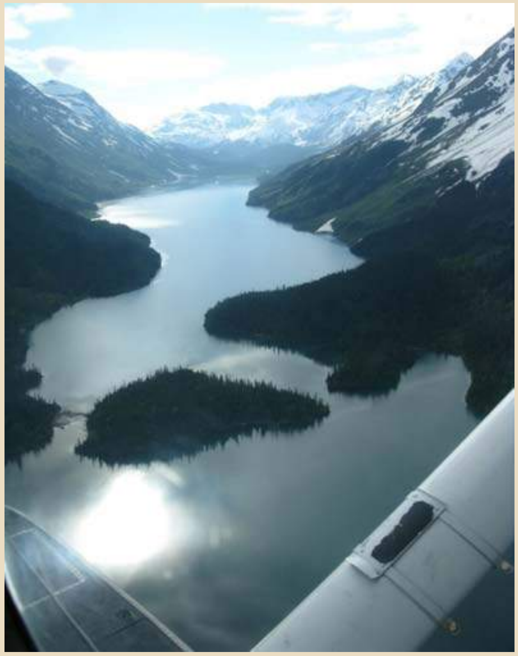
- **Hunting and Fishing**
  - No game fish in Grant Lake
  - Some hunting and fishing in area
- **Mining**
  - Abandoned mine in the area
  - Active mining claims near Falls Creek
  - Area designated for mining use with approved plan near Falls Creek Road
- **Access Type**
  - Motorized travel in winter permitted, except in Backcountry area where only helicopters are approved
  - Limited motorized travel during summer on Falls Crk/Crown Pt mining trail
  - Helicopter use permitted all year

Recreational and Visual Resources: Visual and Aesthetics

- Scenic designation by USFS
  - Scenic Integrity Values are "moderate" except in eastern Backcountry Prescription area where values are "high"
- Scenic features described by ADNR
  - Waterfall at the outlet of Grant Lake
  - High mountain walls surround lake on east shore
- Visibility
  - Project area not visible from Seward Highway, ARRC line, or other easily accessible vantage points



Cascade Below Outlet of Grant Lake



Grant Lake Looking East to Backcountry

Recreational and Visual Resources Issues

- What are the potential effects of increased water level fluctuation in Grant Lake?
- What are the potential effects of changes in flow in Grant Creek and Falls Creek?
- What are the potential effects of construction of the intake, sluiceway, penstock, tunnel, and powerhouse?
- What are the potential effects on recreation if the distribution and/or abundance of fish changes?
- What are the potential effects of construction and maintenance of access roads and transmission lines?

Recreation and Visual Resources Proposed Studies

- Studies will be planned to gather information for accurate evaluation of how the Project will affect recreational and visual resources
- Study Topics
  - Determine level of recreational use, and predict trends
  - To understand public use and perception of recreational opportunities
  - To determine recreational opportunities in terms of the USFS Recreational Opportunity Spectrum (ROS) and other designations as defined by the Chugach National Forest Plan (2005)
  - To determine the visual quality of the Project area in terms of the USFS Scenic Integrity Values
  - To understand public perception of the visual and aesthetic quality of the area

Other Issues and Comments

????????????????

Cultural Resources

Existing information:

- Thirteen previous cultural resource surveys in general project area
- AEIDC, APA, USFS, State Historic Preservation Office (SHPO)
- Summarized in PAD

Cultural Resources

- Kenai Peninsula occupied prehistorically and historically by Eskimo and Dena'ina Athapaskan groups.
- Historic mining, logging, and settlement in Project area.
- Nine historic properties in Project area; several on the shores of Grant Lake.
- One site determined eligible for listing in the NRHP: the Solars Sawmill on Grant Lake at head of Grant Creek.
- No prehistoric archaeological sites recorded in Project area.

Cultural Resources Issues

- Are there any cultural sites that may be affected by Project activity, construction, or operation?
- Are there any cultural sites that may be affected by the construction and maintenance of access roads and transmission lines?
- Are there any cultural sites that may be affected by increased lake level fluctuation?
- Do subsistence activities occur in the Project area and will there be any effects on subsistence?

Cultural Resources
Proposed Studies

The Project must meet the requirements of the National Historic Preservation Act and consult with tribal entities with interest in the Project.

Study topics:

- Determining if historic properties are present in the proposed project Area of Potential Effect (APE)
- Determining if the Project will have an effect on identified historic properties (those cultural resources evaluated and recommended eligible for listing in the NRHP)

Cultural Resources
Proposed Studies

Study topics continued:

- Determining if additional investigations are necessary for evaluation historic properties, and determining a recommendation on potential mitigation and consultation strategies in resolving any possible adverse effects
- Determining if the Project will have an effect on either sites of cultural significance or subsistence activity

Other Issues and Comments

????????????????

Filing Comments with FERC
Use P-13211 and P-13212

- FERC e-filing at www.ferc.gov
- Three ways to comment:
  - Written correspondence
  - Electronic “Quick Comment” [limited to 6,000 characters]
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- Questions?
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Tracking Project Progress and Comments

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Thank You!

- Comments and Questions?

KENAI HYDRO, LLC. MOOSE PASS PUBLIC MEETING SIGN IN SHEET LOCATION: MOOSE PASS DATE: 1-13-2010 PAGE# 1/2

N	Signature	FirstName	LastName	Email	Company/Agency	Division	Title	Address	City	St	Zip
1		James	Ambrose	hambrose@homerelectric.com	AE+EC	PP&T	Director	1013 Alaska Ave. #45	Kenai	AK	99611
2		Ian	Blake	tele-skier@hotmail.com				1746 Logan St.	Anchorage	AK	99508
3	Mark Stauble	Mark	Stauble	Stauble@arctic.net							
4		JOHN	EAVIS	JAE@ACTICT.NEC							
5		TOM	BARNETT	kailuafour@gmail.com							
6		Jason	Aigeldinger	jasonaigeldinger@mac.com							
7	Mike Cooney	MIKE	COONEY	mcooney@arctic.net				P.O. BOX 169	MOOSE PASS	AK	99631
8	Paula Moseley	Paula	Moseley	pjmoseley@mac.com				POBox 238	Moose Pass	AK	99631
9	Valerie Conn	Valerie	Connor	valerie@akcenter.org	ACE		Conservation Director	807 G St Suite 100 Anchorage		AK	9950[illegible]
10	Jeff Estes	Jeff	Estes	JE@cityofseward.net	City of Seward		oper super	Box 167 Seward		AK	99664
11		JJH	Hetrick	jjh2 seward.net	citizen						
12		SHAWN	MCDONALD	AKBRONZE@ARCTIC.NET				P.O. Box 74 M.P.	MOOSE PASS	"	99631
13	Mary McDonald	MARY	MCDONALD	"				"			
14		ADRIENNE	MORETTI	adrienne.moretti@gmail.com				PO Box 204 MOOSE PASS →		AK	99631
15		Will	Brennan	wbrennan@gmail.com				"	"	"	"
16		Julie	Lindquist	jraelindquist@hotmail.com				31087 Seward Hwy, Sew	SEWARD	AK	99664
17	David Pearson	David	Pearson	davidelipearson@gmail.com							
18	Russell Burnard	Russell	Burnard	Mi 24.5 Seward Hwy				39201 Sew Hwy	Crown Point	AK	99664
19	David E Shafer	David	Shafer	hoper@arctic.net				30519 Toklat way	Moose Pass	AK	99631
20		TODD	PETERSEN	Todd@sewardrealestate.com				11694 Seward Hwy	Seward	AK	99664

KENAI HYDRO, LLC. MOOSE PASS PUBLIC MEETING SIGN IN SHEET LOCATION: MOOSE PASS DATE: 1-13-2010 PAGE# 2/2

N	Signature	FirstName	LastName	Email	Company/Agency	Division	Title	Address	City	St	Zip
1	JJ Kaiser	JJ	KAISER	jj-KAISER@yahoo.com				29800 SEWARD Hwy	Seward	AK	99664
2	[illegible]	Russ	Maddox	russmaddox@yahoo.com				3385 Nash Rd	Seward		
3	[illegible]	BRUCE	JAFFA	JAFFA@EAGLE.PTIALASKA.NET				POB 101	MOOSE PASS	AK	99631
4	[illegible]	Laura	Aigeldinger	burungia@yahoo.com				PO BOX 207	Moose Pass	AK	99631
5	[illegible]	Irene	Lindquist	toshi@arctic.net				PO Box - 63	MP	AK	99631
6	Travis C Mosley	Travis	Mosley	tmosley@fs.fed.us				P.O. Box 238	MP	AK	99631
7	W M Luttrell	Mark	Luttrell	prufrock@arctic.net	RBCA			Box 5K	Seward	"	99664
8	[illegible]	JAN	ODHNER	JJODHNER@ARCTIC.NET				BOX 176	MP		99631
9	M Glaser	Mike	Glaser	glaser@seward.net				34270 Lakestar	Seward		
10	CJaffe	Carole	Jaffe	jaffa@ptialaska.net				PO Box 107	Moose Pass	AK	99631
11	[illegible]	BRAD	ZUBECK		KHL/HEA						
12	[illegible]	BRAD	JANORSCHKE		HEA						
13		JOE	GALLAGHER		HEA						
14											
15											
16											
17											
18											
19											
20											

Attachment C – Comments Received on PAD and Study Issues Not Filed with the Commission

From: Zubeck, Brad [BZubeck@HomerElectric.com]
Sent: Tuesday, November 24, 2009 3:16 PM
To: 'Jeff Estes'
Cc: Jenna Borovansky
Subject: RE: Grant Lake comment.ppt
Attachments: 2009-11-24 City of Seward-Jeff Estes Grant Lake comment.ppt

Hi Jeff,

Thanks for the information. I agree, the best place to connect may be the City of Seward's Lawing substation. The t-line directly out to the highway may still be a possibility and is a place-holder at this time, but I understand that you and others in the Moose Pass community would not like to see an overhead line passing through the "rapids" section as currently shown on the Project Features figure in our PAD. Kenai Hydro (KHL) will consider bring the power out to interconnect at the substation using a low voltage line, possibly underground. As you note, there are several voltage levels present at the Lawing substation: 12.5kV, 24.9kV, 69kV & 115kV, with the two lower voltages available via a load-tap changer. The transformer is currently rated at 10MVA, but with forced cooling, is rated up to 18MVA.

I'll look further into the location of the proposed phased residential development on the bench area up Crown Point Mine road. I wrote down that this is included as part of the Moose Pass Comprehensive Plan on file at the Borough. If this is incorrect, send me a note correcting the source document.

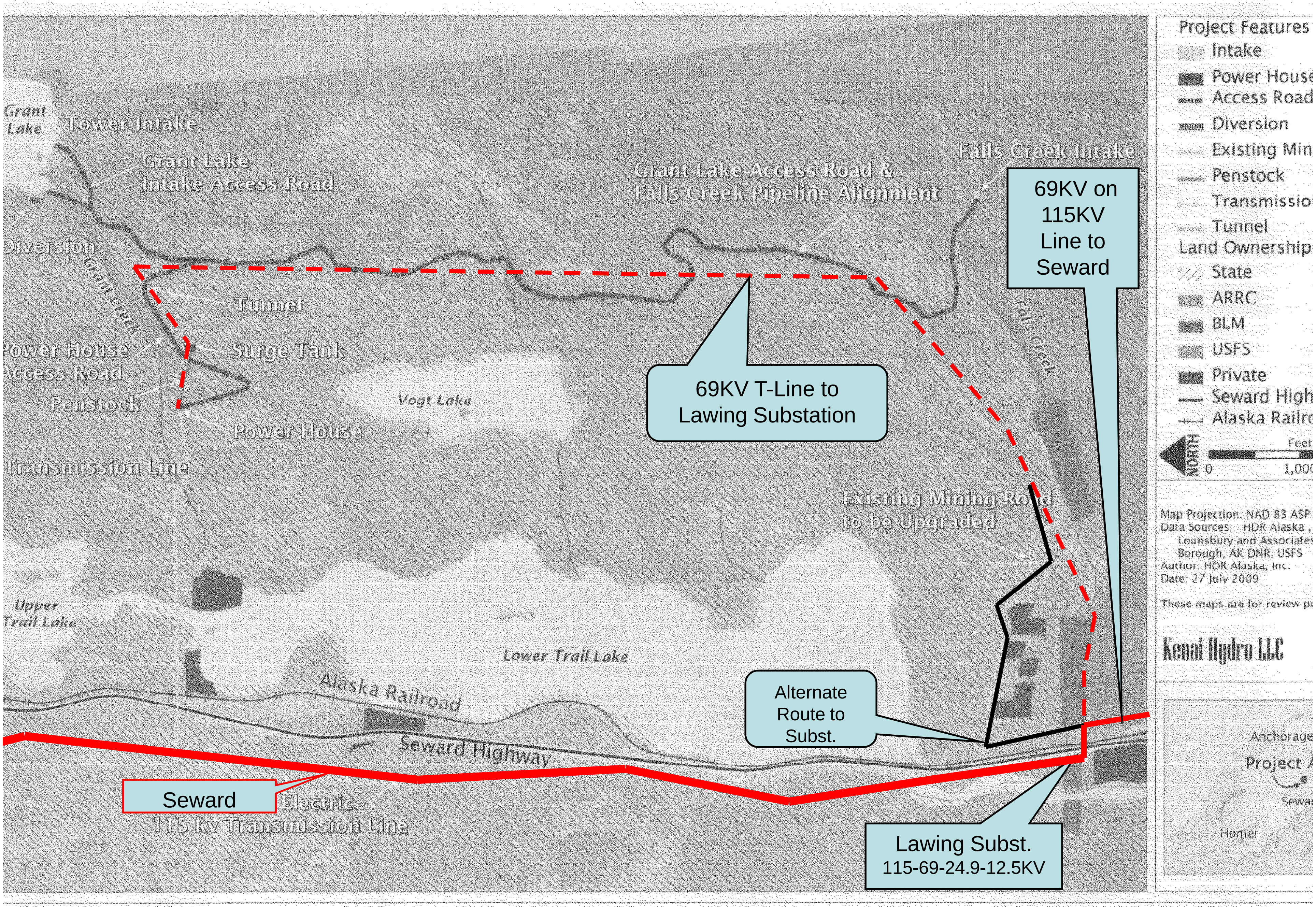
Thanks again for the information and willingness to work with Kenai Hydro as the concept develops. Have a Happy Thanksgiving!

Best Regards,
Brad Z.

From: Jeff Estes [mailto:jestes@cityofseward.net]
Sent: Tuesday, November 24, 2009 2:02 PM
To: Zubeck, Brad
Subject: Grant Lake comment.ppt

Please call with questions, and excuse my ineptness in power point.

...oposed project facilities and land ownership



From: William Coulson [mailto:william@alaskanscooperlanding.com]
Sent: Sunday, January 03, 2010 7:47 AM
To: Zubeck, Brad
Subject: Power project.

The only thing that matters is that this project absolutely does not happen. The cost vs. benefit is ridiculous.
Bill Coulson

From: Zubeck, Brad [BZubeck@HomerElectric.com]
Sent: Friday, January 08, 2010 4:18 PM
To: 'Brita Mjos'
Cc: Jenna Borovansky
Subject: RE: Grant Creek Hydro Proposal Comments

Ms. Mjos,

Thank you for your comments. Kenai Hydro will include them in a summary that will be sent to FERC.

Sincerely,
Brad Z.

From: Brita Mjos [mailto:britamjos@care2.com]
Sent: Friday, January 08, 2010 3:05 PM
To: Zubeck, Brad
Subject: Grant Creek Hydro Proposal Comments

Mr. Zubeck,

I am writing to share my opposition to the proposed Grant Creek/Falls Creek hydro project. Alternatives exist that would have a significantly lighter impact on the environment. The proposed project woul disturb salmon streams and lakes and introduce intrusive pipes to a popular and scenic recreation area. A hydroelectric system on Lowell Creek in Seward, or windmills closer to utility lines would be much more economical and have an ecologically lighter footprint. Please consider these comments along with the public meeting next week.

Sincerely,

Brita Mjos
1725 E. 24th Ave.
Anchorage, AK 99508

-----Original Message-----
From: Bruce Jaffa [mailto:jaffa@eagle.ptialaska.net]
Sent: Thursday, January 14, 2010 12:09 PM
To: Zubeck, Brad
Cc: Janorschke, Brad; Ambrose, Harvey
Subject: Re: Grant Lake

Brad,

I wish I knew the full history. Maybe Jeff or Lee Estes know more. This is an old and crude shack at the end of the lake. We used to have "poker" runs up to it in the winter. The walls are chinked with old Harper Bazarre magazines and I have found as many as a half dozens novels along with abandoned tools and misc. I think someone may have wintered there one year. I have stayed over nite only once but there are usually new signs of people coming and going. I do go up there summer and winter because, frankly its beautiful and very peaceful and just by chance out of cell phone range. There is no question this cabin would be impacted by raising the lake.

The 4th photo is several years ago (before KHL) in the inlet stream area at the head of the Lake. This is a large fairly flat area that is slightly above the lake. Certainly there will need to be clearing in the area, but boat access may not be extended with the the higher lake level. Maybe some type of landing will need to be created for summer use. I would expect that there would be a increase in use if only due to the notoriety. This may also suggest the intake structure will need some thought paid to safety.

I will ask around when I can and give you more on what I can learn.

BJaffa

Jaffa Construction, Inc.
P.O. Box 107 Moose Pass, Alaska 99631
Jaffa@Eagle.PTIAlaska.net
907-224-8002

Zubeck, Brad wrote:
> Tell me more about the "Social Club" cabin... I'm guessing that we'll
> be looking at it in our studies, but some background on use would be
> good to know. Thanks! BZ
>
> -----Original Message-----
> From: Bruce Jaffa [mailto:jaffa@eagle.ptialaska.net]
> Sent: Thursday, January 14, 2010 11:14 AM
> To: Zubeck, Brad
> Cc: Janorschke, Brad; Ambrose, Harvey
> Subject: Re: Grant Lake
>
> Yup,
>
> Eastern Grant Lake near the Grant Lake "Social Club" cabin.
>
>
> Jaffa Construction, Inc.
> P.O. Box 107 Moose Pass, Alaska 99631
> Jaffa@Eagle.PTIAlaska.net
> 907-224-8002
>
>
>
>
>
> Zubeck, Brad wrote:
>
>> Hi Bruce,
>>
>> You are welcome. Thanks for your participation, comments last night, and follow-up email & photo. I'm pretty sure that it is photo of Carole alongside your plane on Grant Lake! We will capture your related comment in our summary when we send it to FERC.
>>
>
>
>> Thanks again and best wishes for a prosperous New Year!
>> Brad Z.
>>
>> -----Original Message-----
>> From: Bruce Jaffa [mailto:jaffa@eagle.ptialaska.net]
>> Sent: Wednesday, January 13, 2010 10:17 PM
>> To: Zubeck, Brad; Janorschke, Brad; Ambrose, Harvey
>> Subject: Grant Lake
>>
>> Thanks to you all for a honest presentation. Good luck with this and
>> when there is some place to invest in this project let me know where.
>>
>> Bruce Jaffa
>>
>> Jaffa Construction, Inc.
>> P.O. Box 107 Moose Pass, Alaska 99631 Jaffa@Eagle.PTIAlaska.net
>> 907-224-8002


MK

From: Zubeck, Brad [BZubeck@HomerElectric.com]
Sent: Thursday, January 14, 2010 1:41 PM
To: 'David Lindquist'
Cc: Jenna Borovansky
Subject: RE: Comments on Grant/Falls

Hi Irene,

Thanks again for comments on the project. Your comments will be included on our summary that will be filed with FERC.

Regards,
Brad Z.

From: David Lindquist [mailto:toshi@arctic.net]
Sent: Thursday, January 14, 2010 12:13 PM
To: Zubeck, Brad
Cc: Lindquist Irene & Dave
Subject: Comments on Grant/Falls

Hi Brad,

Please include my comments in your file for Grant Lake/Falls Creek Hydro project. After your presentation last night for Grant Lake and Falls Creek Hydro project I have come to the conclusion that the scope of this project is tremendous, much more than should be put upon any community in such close proximity to a Hydro project.

While a person on the Seward Hwy might not see the footprints of all that's proposed, the visual impact is not reasonable for a person in the immediate area to have to see. Most of the project area is easily reached on foot and is in an area that is valued for hiking, hunting, berry picking, birding, canoeing, fishing, sight seeing and ice skating. I was there 4 days ago and enjoyed the wonderful ice skating on Grant Lake

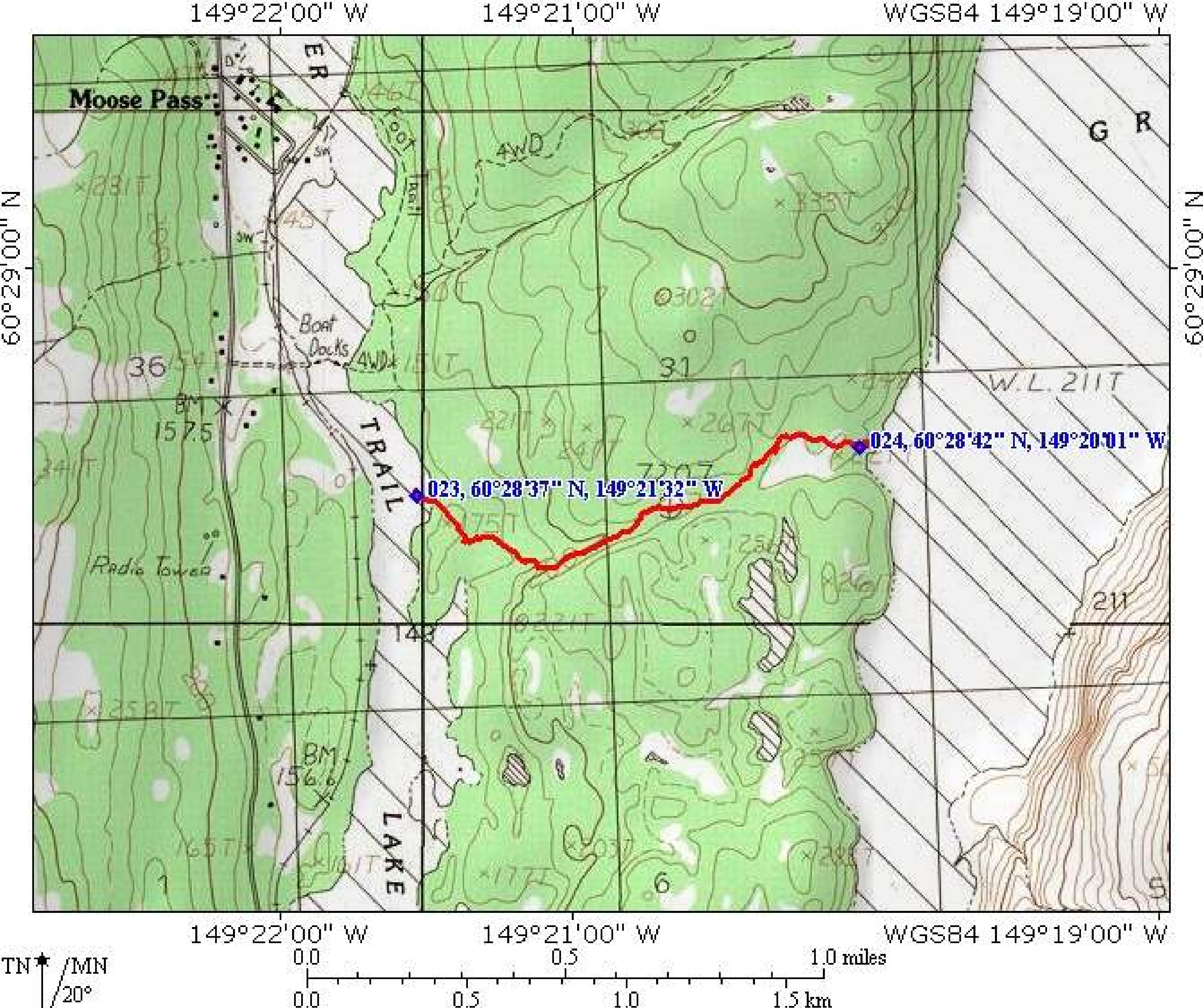
I have traveled the project area on many occasions over the past 28 years. I do not support this proposal and wish you luck in other areas. Much of the project area is easily accessible within an hours hike.

In addition to the visual and recreational impacts I am concerned for to the wildlife/fish/terrestrials/avian this project WILL have.

Please direct any funding in other directions that may be more appropriate and have less impact on local communities.

Sincerely,
Irene Lindquist
PO Box 63
Moose Pass, Alaska 99631

Grant Lake Portage Trail



Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

March 1, 2010

Secretary Kimberly D. Bose
Federal Energy Regulatory Commission
ATTN: DHAC, PJ-12.2
888 First Street, NE
Washington, DC 20426

- FILED ELECTRONICALLY -

RE: Updated Applicant Contact Information for Falls Creek (Project No. 13211) and Grant Lake (Project No. 13212) Hydroelectric Projects

Dear Secretary Bose:

Kenai Hydro, LLC (KHL) recently finalized the reorganization of its partnership and this letter is to inform FERC of this change and update the Applicant contact information. KHL will be updating its web site (www.kenaihydro.com) to reflect this update.

KHL requests that all correspondence and service documents related to Preliminary Permits and the Notice of Intent to File an Application for an Original License for Project No. 13211 and 13212 be addressed to:

Mr. Brad Zubeck
Project Engineer
Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603
907-335-6204
BZubeck@homerelectric.com

With a copy sent to:
Jenna Borovansky
Long View Associates, Inc.
P.O. Box 3844
Coeur d'Alene, Idaho 83816
Or by email to comments@kenaihydro.com

Please remove Mr. Steve Gilbert as a contact for KHL and from the service list for these projects.

Please feel free to contact me with any questions regarding this filing.

Sincerely,

/s/ Brad Zubeck

Brad Zubeck
Project Engineer
Kenai Hydro, LLC

cc: Service List for Project Nos. 13211 and 13212

From: Jenna Borovansky
Sent: Thursday, March 04, 2010 12:03 PM
To: 'comments@kenaihydro.com'
Bcc: 'DOtt@aidea.org'; 'rroys@me.com'; 'jason.mouw@alaska.gov'; 'thomas.cappiello@alaska.gov'; 'toshi@arctic.net'; 'mcooney@arctic.net'; 'jrwerner@mtaonline.net'; 'jeffry_anderson@fws.gov'; Jenna Borovansky; 'jaffa@eagle.ptialaska.net'; 'bzubeck@homerelectric.com'; 'Heidi.Weigner@hdrinc.com'; 'prufrock@arctic.net'; 'katherine.a.mccafferty2@usace.army.mil'; 'valerie@akcenter.org'; 'jason.kent@hdrinc.com'; 'susan.walker@noaa.gov'; 'kimberly.sager@alaska.gov'; 'douglas_palmer@fws.gov'; 'ginny.litchfield@alaska.gov'; 'mtracy@homerelectric.com'; 'mikeo@cosmichamlet.net'; Finlay Anderson; 'berungia@yahoo.com'; 'ricky@kenairiversportfishing.com'; 'kaoleary@fs.fed.us'; 'alecl@arctic.net'; 'caesar.kortuem@kiewit.com'; 'tkerns@tundratech.net'; 'cassie_thomas@nps.gov'; Steve Padula; 'robert.begich@alaska.gov'; 'dave.c.casey@usace.army.mil'; 'gfandrei@ciaanet.org'; 'jim.ferguson@alaska.gov'; 'jjh@seward.net'; 'lynnda_kahn@fws.gov'; 'lee.mckinley@alaska.gov'; 'north.phil@epamail.epa.gov'; 'gary.prokosch@alaska.gov'; 'ronaklo@att.net'; 'robert@kenaiwatershed.org'; 'rspangler@fs.fed.us'; 'ejohansen@fs.fed.us'; 'wamacfarlane@fs.fed.us'; 'paul.mclarnon@hdrinc.com'; 'jmorsell@northernecological.com'; 'jglaser@stanford.edu'; 'caitlin@akvoice.org'; 'akbronze@arctic.net'; 'jason.pawluk@alaska.gov'; 'Pamela.Russell@alaska.gov'; 'stauble@arctic.net'; 'jack.erickson@alaska.gov'; 'jeavis@fs.fed.us'; 'douglas_mutter@ios.doi.gov'; 'joseph.adamson@ferc.gov'; 'todd.bethard@hdrinc.com'; 'smorsell@northernecological.com'; 'bstanley@fs.fed.us'; 'andrea@rareheron.com'; 'Mary.King@alaska.gov'; 'youth@qutekcak.net'; 'bluewagon82@yahoo.com'; 'jasonaigeldinger@mac.com'; 'dave@renewableresourcescoalition.org'; 'gbaker2@arctic.net'; 'kenailake@arctic.net'; 'rwbarnwell@yahoo.com'; 'jhpbt@yahoo.com'; 'mbest@borough.kenai.ak.us'; 'broncobwl@yahoo.com'; 'tbristol@tu.org'; 'mlbrittain@ak.net'; 'phil_brna@fws.gov'; 'info@ciri.com'; 'nwad20@yahoo.com'; 'info@salamatof.com'; 'susan.chihuly@alaska.gov'; 'jczarn@borough.kenai.ak.us'; 'js2dixon@hotmail.com'; 'kdoroff@princesstours.com'; 'jletma@arctic.net'; 'epfisheads@yahoo.com'; 'jgabler@borough.kenai.ak.us'; 'glaser@seward.net'; 'mgrayrbca@gmail.com'; 'lance@lancehankins.com'; 'nhardigg@akcf.org'; 'info@riverwranglers.com'; 'alli@akcenter.org'; 'khelgren@princesstours.com'; 'sondrakey8@msn.com'; 'hgrandella@hotmail.com'; 'hotbanana76@hotmail.com'; 'ikerdhome@gmail.com'; 'joe_klein@fishgame.state.ak.us'; 'kolodziejski@yahoo.com'; 'dwimar@gci.net'; 'kkromrey@fs.fed.us'; 'mk2l@arctic.net'; 'lavin@nwf.org'; 'adele.lee@alaska.gov'; 'jraelindquist@hotmail.com'; 'DMahalak@borough.kenai.ak.us'; 'jmohorci@borough.kenai.ak.us'; 'sunrise@arctic.net'; 'tmoseley@fs.fed.us'; 'niceinalaska@yahoo.com'; 'dnelson@borough.kenai.ak.us'; 'redoubtreporter@alaska.net'; 'mnovy@fs.fed.us'; 'jjodhner@arctic.net'; 'melinda.odonnell@alaska.gov'; 'painter@arctic.net'; 'mightykenai@arctic.net'; 'todd@sewardrealestate.com'; 'montesfishing@alaska.net'; 'gydaric@yahoo.com'; 'jseebach@americanrivers.org'; 'keeper@inletkeeper.org'; 'benbo61@gmail.com'; 'rlsimmons@fs.fed.us'; 'bobbiejoskibo@yahoo.com'; 'ace@akcenter.org'; 'info@kenailake.com'; 'bstock@arctic.net'; 'moosepassrosie@yahoo.com'; 'pdt205@nyu.edu'; 'qenqay@arctic.net'; 'jmtjohnt@yahoo.com'; 'btrefon@kenaitze.org'; 'rebew@att.net'; 'willie9470@hotmail.com'; 'gwilliams@borough.kenai.ak.us'; 'russianriv@yahoo.com'; 'sherry.wright@alaska.gov'; 'zengobys@hotmail.com'; 'kenairivcenter@borough.kenai.ak.us'; 'jack.sinclair@alaska.gov'; 'dawn.germain@ogc.usda.gov'; 'rbirk@fs.fed.us'; 'dmichels@princesstours.com'; 'scott.maclean@alaska.gov'; 'davidwerner74@gmail.com'; 'cohare@popud.org'; 'rdw1@gci.net'; 'jan@hydroreform.org'; 'dwellinsecretplace@yahoo.com'; 'kmushovi@blm.gov'; 'stetsonj@americanfast.com'; 'jestes@cityofseward.net'
Subject: New Information on Grant Lake/Falls Creek Hydroelectric Project Web-site

Dear interested parties,

Kenai Hydro, LLC has recently filed several documents with FERC to provide additional information on the Grant Lake/Falls Creek Project (FERC Project No. 13211 and 13212). You may find the following documents posted on the KHL website (www.kenaihydro.com):

- 2009 Environmental Baseline Study Report for Fish and Aquatics and Water Quality
- Summary of issues identified at public meetings (November 12, 2009 in Seward and January 13, 2010 in Moose Pass)
- Updated Applicant contact information for Kenai Hydro, LLC

If you have any questions about these documents, or have trouble accessing anything on the web, please contact me or Brad Zubeck (bzubeck@homerelectric.com).

Thank you for your continued interest in the Grant Lake/Falls Creek Project.

Jenna Borovansky
Long View Associates, Inc.
On behalf of Kenai Hydro, LLC
208.765.1413

From: Jenna Borovansky
Sent: Thursday, March 04, 2010 9:35 AM
To: 'comments@kenaihydro.com'
Bcc: Jenna Borovansky; Steve Padula; 'bzubeck@homerelectric.com'; 'robert.begich@alaska.gov'; 'dave.c.casey@usace.army.mil'; 'mcooney@arctic.net'; 'gfandrei@ciaanet.org'; 'jim.ferguson@alaska.gov'; 'ricky@kenairiversportfishing.com'; 'jjh@seward.net'; 'lynnda_kahn@fws.gov'; 'ginny.litchfield@alaska.gov'; 'lee.mckinley@alaska.gov'; 'north.phil@epamail.epa.gov'; 'douglas_palmer@fws.gov'; 'gary.prokosch@alaska.gov'; 'ronaklo@att.net'; 'robert@kenaiwatershed.org'; 'rspangler@fs.fed.us'; 'ejohansen@fs.fed.us'; 'wamacfarlane@fs.fed.us'; 'thomas.cappiello@alaska.gov'; 'susan.walker@noaa.gov'; 'kimberly.sager@alaska.gov'; 'jason.kent@hdrinc.com'; 'paul.mclarnon@hdrinc.com'; 'jason.mouw@alaska.gov'; 'jeffry_anderson@fws.gov'; 'jmorsell@northernecological.com'; Finlay Anderson
Subject: 2009 Baseline Environmental Study Report Available

Hello Grant Lake/Falls Creek TWG,

The 2009 Baseline Environmental Study Report for the Grant Lake/Falls Creek Hydroelectric Project was recently posted to the Kenai Hydro, LLC website (www.kenaihydro.com).

Thank you for your continued interest in the Grant Lake/Falls Creek Hydroelectric Project.

From: Jenna Borovansky
Sent: Friday, March 05, 2010 7:15 AM
To: 'Bruce Jaffa'
Cc: 'bzubeck@homerelectric.com'
Subject: RE: New Information on Grant Lake/Falls Creek Hydroelectric Project Web-site

Mr. Jaffa,
The written comments received at the meeting in Moose Pass are posted on the website in a document called, "summary of written comments". This entire packed of comments was filed with FERC on 2/8/10 for the project record. Note that only those records not already filed directly with FERC were included. Please let me know if there are additional comments that were inadvertently missed in the filing.

You can find a pdf of this filing on the page below:

http://www.kenaihydro.com/documents/index.php

Page down to the bullet titled: "KHL files Summary of comments received on the PAD and proposed studies for the Grant Lake/Falls Creek Project, FERC Project No. 13212/13211 (filed 2/8/10)"

Best,
Jenna Borovansky
208.765.1413

-----Original Message-----
From: Bruce Jaffa [mailto:jaffa@eagle.ptialaska.net]
Sent: Thursday, March 04, 2010 9:44 PM
To: Jenna Borovansky
Subject: Re: New Information on Grant Lake/Falls Creek Hydroelectric Project Web-site

Dear Ms. Borovansky,

Written comments were presented at the 1-13-10 Moose Pass meeting. I do not see any listing of these. We were assured these comments were to be included with project documents. Where should I look for these records?

Bruce Jaffa

P.O. Box 107 Moose Pass, Alaska 99631
Jaffa@Eagle.PTIAlaska.net
907-224-8002

Jenna Borovansky wrote:
>
> Dear interested parties,
>
>
>

> Kenai Hydro, LLC has recently filed several documents with FERC to
> provide additional information on the Grant Lake/Falls Creek Project
> (FERC Project No. 13211 and 13212). You may find the following
> documents posted on the KHL website (www.kenaihydro.com
> <http://www.kenaihydro.com>):
>
>
>
> -   2009 Environmental Baseline Study Report for Fish and
> Aquatics and Water Quality
>
> -   Summary of issues identified at public meetings (November
> 12, 2009 in Seward and January 13, 2010 in Moose Pass)
>
> -   Updated Applicant contact information for Kenai Hydro, LLC
>
>
>
> If you have any questions about these documents, or have trouble
> accessing anything on the web, please contact me or Brad Zubeck
> (bzubeck@homerelectric.com <mailto:bzubeck@homerelectric.com>).
>
>
>
> Thank you for your continued interest in the Grant Lake/Falls Creek
> Project.
>
>
>
> Jenna Borovansky
>
> Long View Associates, Inc.
>
> On behalf of Kenai Hydro, LLC
>
> 208.765.1413
>
>
>

From: Zubeck, Brad [BZubeck@HomerElectric.com]
Sent: Monday, March 15, 2010 4:21 PM
To: 'tom harkreader'
Cc: Jenna Borovansky
Subject: RE: Harkreader Mining Claims on Grant Lake

Hi Tom,

Thanks for the information about your mining interests on Grant Lake & for signing up on our web site. Keep watching the site and look for email updates from the project related to your area(s) of interest.

Best Regards,
Brad Z.

From: tom harkreader [mailto:harkfamily@yahoo.com]
Sent: Thursday, March 11, 2010 8:13 AM
To: Zubeck, Brad
Subject:

Brad
Here is the area of interest Lat.60 29' 50" and 60 30' 30" Long. -149 19' 130" and -149 18' 0'
this is within the section of the claims. If the upper boundary Line can be relocated (lowered) so we can continue following the Quartz vein.
I did sign up on the web site and found that your company has a map of our claims on file in documents dated 2008 Grant lake information packet-final Author HDR Engineering Inc.
Since our phone conversation the one concern would be if the lake water rises--will the water level cover our access trail along the lake shore to reach our upper claims? If this is the case then a new atv trail would have to be relocated.
When it comes time for your company to evalute and study the north shore of Grant Lake Please keep me in mind so I can assist you where needed. Our lower claim consist of all the cabins and the trail along the lake.
Tom Harkreader
7400 Clairborne Circle
Anchorage Alaska 99502
907 248-3259
harkfamily@yahoo.com

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

March 31, 2010

The Secretary
Federal Energy Regulatory Commission
ATTN: DHAC, PJ-12.2
888 First Street, NE
Washington, DC 20426

- FILED ELECTRONICALLY -

RE: Third Six Month Progress Report for the Falls Creek (Project No. 13211) and Grant Lake (Project No. 13212) Hydroelectric Projects, October 2009 – March 2010

Dear Secretary:

Kenai Hydro, LLC (KHL) hereby submits its third six month report for the period of October 1, 2009 to March 31, 2010 for the Falls Creek and Grant Lake hydroelectric projects, pursuant to Article 4 of the Preliminary Permits issued on October 7, 2008.

ACTIVITIES DURING THE REPORTING PERIOD

Engineering and Environmental Studies
The following reconnaissance level engineering and environmental efforts were initiated:
- Prepared draft study plans for the various resource areas
- Finalized the 2009 Baseline Environmental Field Study Report

Stakeholder Outreach and Consultation
KHL held its joint meeting of agencies, public and tribes on November 12, 2009 and invited public comment on the project. This meeting was held in Seward, Alaska approximately 25-miles from the project site.

KHL also held a meeting in Moose Pass on January 13, 2010 to invite public comment on the project. The content of this meeting was identical to the November 12 presentation with additional slides detailing comments already received from the public.

Comments received as a result of the November 12, 2009 and January 13, 2010 meetings have been summarized and filed with FERC.

KHL provided presentations at the following public meetings:
- Alaska Department of Fish & Game Advisory Committee Meeting, January 11, 2010 at the Central Peninsula Sports Center in Soldotna, Alaska.

- Kenai River Special Management Area Board Meeting, January 14, 2010 at the Kenai River Center, Soldotna, Alaska.
- National Hydropower Association, Alaska Regional Meeting, March 11, 2010 in Juneau, Alaska.

KHL Partnership Update
Alaska Wind Energy withdrew from the Kenai Hydro, LLC partnership in early February 2010, leaving Homer Electric Association as the sole owner of the business entity. KHL updated contact information with FERC following this change.

KHL actively maintains a web site to facilitate the exchange and update of information and calendar related to the project(s). The domain name registered for the site is www.kenaihydro.com.

ACTIVITIES PROPOSED FOR THE NEXT REPORTING PERIOD

Engineering and Environmental Studies
KHL will be determining what field studies to conduct during the 2010 field season. Funding constraints may limit the scope of studies this year. If KHL can afford the full scope of study work, KHL will notify FERC so that it may begin the Early Scoping process.

Stakeholder Outreach and Consultation
KHL will continue consultations as necessary with agencies, tribes and the public.

License Application Determination
KHL will endeavor to file a license application before the preliminary permit expires in October 2011.

Please feel free to contact me with any questions regarding this report or for additional information as needed.

Sincerely,

Brad Zubeck
Project Engineer

KENAI HYDRO COMMUNICATION RECORD

DATE: April 16, 2010

TO: Consultation file

FROM: Sirena Brownlee, HDR Alaska

SUBJECT: 2010 Bear Den survey Timing, Call to Jeff Selinger, ADF&G Area Biologist Kenai, (907-262-9368)

I called Jeff to discuss the timing for the spring 2010 bear den emergence surveys conducted as part of the Grant Lake Project studies. Jeff reported that as of last week (April 8) no bears were observed when biologists were out near Grant Lake. Jeff suggested that we conduct the surveys the first or second week of May. Historically, leaf out occurs the 2nd or 3rd week of May on the Kenai and Jeff though the Grant Lake are would likely be the 3rd week of May. He suggested that we make sure and do the surveys before leaf out so that we can see the den holes at the base of alders or other shrubs. Sows with cubs may emerge a bit later and will go back and forth from den to feeding areas. Jeff mentioned that we should make sure and search the lower areas along the lakeshore because ADF&G found a brown bear den a couple hundred feet from the lakeshore in the forested area years ago. He said this area will be tough to spot a den but that if conditions are right we should be able to see black dirt and trails from the den.

Jeff is going to try and accompany me on the bear den survey and he suggested the date of May 6 and a back up date of May 11.

From: Brownlee, Sirena
Sent: Friday, April 16, 2010 2:36 PM
To: 'jeff.selinger@alaska.gov'
Subject: Grant Lake bear den surveys

Hi Jeff,

Thanks for providing me information on bear den timing windows for the Grant Lake study area. Please pencil in May 6 as the first date to conduct the bear den surveys, if this date does not work for weather reasons I will postpone until May 11. If your schedule allows, it would be great if you could join me for the survey. We will have another HDR person on the helicopter also but there is room for one more person. I'll touch base with you on May 3 to confirm your availability. If conditions change in the Kenai area and you think we should get out there earlier please let me know. Thanks!

Sirena T. Brownlee

Biologist/Planner

HDR ONE COMPANY | **Many Solutions**

2525 C. Street, Suite 305 | Anchorage, AK | 99503

Direct: 907.644.2070 | Fax: 907.644.2022

Sirena.Brownlee@hdrinc.com

Kenai Hydro, LLC Communication Record
Grant Lake/Falls Creek Project (FERC No. 13211/13212)

DATE: April 20, 2010 (9:30 – 10:05 am AKDT)

TO: Consultation file

FROM: Jenna Borovansky, Long View Associates

SUBJECT: Phone Conversation with FERC regarding timeline for upcoming study season and early scoping

Call Participants

Brad Zubeck and Mike Salzetti, Kenai Hydro, LLC (Kenai Hydro) and Homer Electric Association (HEA)
Jenna Borovansky, Long View Associates (LVA), on behalf of Kenai Hydro
Joe Adamson, Federal Energy Regulatory Commission (FERC)
Jennifer Hill, FERC
Kim Nyguen, FERC

Brad Zubeck (Kenai Hydro) contacted FERC via email April 8th and voice mail on April 9th in order to schedule a conference call to discuss the upcoming study season, project description updates for the Grant Lake/Falls Creek Project (FERC No. 13211/13212), and a schedule for FERC's early scoping meeting. Brad Zubeck spoke with Joe Adamson (FERC) on April 13th and Joe requested that the call be scheduled for April 20 in order for FERC to work on staff reassignments to the project.

Call Agenda

- Project Status
- Updated Project Description
- Updated Issues List
- Updated Study Plans & Schedule
- Near Term Activities & Schedule
- FERC Early Scoping
- Site Visit Hosting & Logistics

Call Summary

Brad Zubeck noted the purpose of the call was to update FERC staff that the Grant Lake/Falls Creek Project was moving forward as scheduled in order to file a License Application prior to the expiration of the Preliminary Permits in September 2011.

Several changes to the Project description will be made, including removal of the Falls Creek diversion. The proposed transmission line location has changed and Kenai Hydro will be studying two potential alternatives, either above ground or underground following the access road to the powerhouse and interconnecting at the Lawing substation.

Brad Zubeck and Jenna Borovansky explained that Kenai Hydro will be retaining the Falls Creek Preliminary Permit since the proposed access road and transmission line locations still run through the Falls Creek permit area. Jennifer Hill noted that since Kenai Hydro already held the permit, that seemed an appropriate action, but that she would get back Kenai Hydro on this issue if FERC has additional input. She noted that Kenai Hydro will need to continue to file 6-month progress reports with the Commission on both preliminary permits.

Kenai Hydro representatives summarized information on licensing activities progress in response to questions from FERC, including:

- Kenai Hydro plans to release draft study plans for public and agency review and comment within the next two weeks. These draft plans take into account the revised Project description.
- HEA is now the sole partner in Kenai Hydro. On April 6, the HEA board voted to fully fund the licensing effort through submittal of a License Application in September 2011. HEA still has some matching funds available from a State of Alaska grant and may pursue additional grant funding as well.
- Kenai Hydro has received public comment at public meetings on November 12 in Seward, and on January 13 in Moose Pass, Alaska. Comments received have been submitted to FERC previously, and Kenai Hydro has revised its list of issues to be studied based on this input, in addition to taking comments into consideration during development of the draft study plans.
- Agency feedback has been incorporated into the aquatics draft study plan based on Aquatics Technical Workgroup meetings held in summer and fall 2009. The Alaska Department of Fish and Game, Alaska Department of Natural Resources, NOAA Fisheries, U.S. Fish and Wildlife Service, U.S. Forest Service, and several other local participants have been active participants in site visits and review of 2009 aquatics field studies.
- For the terrestrial studies, study leads have begun to contact agencies about immediate needs, and will take comments on the draft study plans.
- Removal of the Falls Creek diversion does not impact the economic viability of the Project and the change in potential energy generation was taken into account by Kenai Hydro in its decision to move forward with the revised Project proposal.
- Kenai Hydro has reviewed SHPO records for existing cultural resources sites, and will be contacting the SHPO regarding review of the draft cultural resources study.
- Kenai Hydro has provided Project information to local tribes and will continue to solicit feedback during its Section 106 consultation efforts and cultural resources study development and implementation.
- Kenai Hydro requested a contact for the archeologist to be assigned by FERC to this Project.
- Kenai Hydro has already initiated study efforts to gather critical data in May, including planning with agencies for bear denning and raptor surveys, as well as submitting permit applications to conduct rainbow trout surveys.
- Kenai Hydro requested that FERC consider scheduling its scoping meeting and site visit in early-June.

Action Items and Follow-up

- Kenai Hydro will file with the FERC a revised issues list and Project description accounting for the removal of the Falls Creek diversion and changes in the proposed transmission line location. These proposed changes will also be provided to stakeholders and agencies and Kenai Hydro will provide a distribution list with the filing.
- Kenai Hydro will determine agency availability for a FERC scoping meeting and site visit in June.
- FERC will provide feedback to Kenai Hydro on possible dates for a scoping meeting and site visit by April 30.
- FERC will provide staff contacts to Kenai Hydro for the Project, including an archeologist.
- Joe Adamson contacted Brad Zubeck by phone following the meeting to request that Kenai Hydro include property owners along the proposed transmission line corridor in the notice of the change of the Project description.

From: Jenna Borovansky
Sent: Friday, April 23, 2010 8:49 PM
To: jason.mouw@alaska.gov; thomas.cappiello@alaska.gov; jeffry_anderson@fws.gov; katherine.a.mccafferty2@usace.army.mil; susan.walker@noaa.gov; kimberly.sager@alaska.gov; douglas_palmer@fws.gov; ginny.litchfield@alaska.gov; kaoleary@fs.fed.us; cassie_thomas@nps.gov; Mary.King@alaska.gov; youth@qutekcak.net; robert.begich@alaska.gov; mbest@borough.kenai.ak.us; phil_brna@fws.gov; dave.c.casey@usace.army.mil; susan.chihuly@alaska.gov; jim.ferguson@alaska.gov; joe_klein@fishgame.state.ak.us; lynnda_kahn@fws.gov; adele.lee@alaska.gov; lee.mckinley@alaska.gov; tmoseley@fs.fed.us; north.phil@epamail.epa.gov; mnovy@fs.fed.us; melinda.odonnell@alaska.gov; jason.pawluk@alaska.gov; gary.prokosch@alaska.gov; Pamela.Russell@alaska.gov; rlsimmons@fs.fed.us; rspangler@fs.fed.us; btrefon@kenaitze.org; jack.sinclair@alaska.gov; dawn.germain@ogc.usda.gov; rbirk@fs.fed.us; ejohansen@fs.fed.us; wamacfarlane@fs.fed.us; jack.erickson@alaska.gov; bstanley@fs.fed.us; jeff.selinger@alaska.gov
Cc: bzubeck@homerelectric.com; MSalzetti@HomerElectric.com; Steve Padula; Jenna Borovansky
Subject: Request for Availability for FERC Scoping Meeting and Site Visit - June 1-3

Dear Agency Representatives,

As detailed in our email to all stakeholders below, Kenai Hydro is proceeding with the complete study program for the proposed Grant Lake Hydroelectric Project in 2010. As a result, FERC will be scheduling its early scoping meeting as soon as staff resources are available. While FERC has not yet identified its staff availability, Kenai Hydro has recommended early-June as a good time to gather feedback and conduct the site visit in the Project area. Kenai Hydro would like to provide FERC with information on the agencies' availability in this time frame for the scoping meeting and site visit. The site visit will be one-full day to allow for viewing both the Grant Lake outlet and Grant Creek. FERC will also hold two scoping meetings - an evening meeting in the Moose Pass area, and a day-time meeting targeted for agencies (location tbd). In addition, Kenai Hydro will be issuing its draft study plans in parallel with the FERC early scoping process, and hopes to schedule time with stakeholders/agencies, as necessary, to discuss the draft study plans in conjunction with the FERC scoping meeting.

Please reply as soon as possible, preferably by Wednesday, April 28, with your availability on the following dates:

Tuesday, June 1
Wednesday, June 2
Thursday, June 3

Thank you for your assistance. Please contact me or Brad Zubeck (bzubeck@homerelectric.com) if you have any questions.

Best wishes,
Jenna Borovansky
Long View Associates, Inc. (On Behalf of Kenai Hydro, LLC)
208.765.1413

From: Jenna Borovansky
Sent: Friday, April 23, 2010 8:39 PM
To: Jenna Borovansky
Subject: Grant Lake/Falls Creek Hydroelectric Project Update

Dear Interested Parties,

Kenai Hydro, LLC would like to update you on the status of the proposed hydroelectric Project at Grant Lake and Falls Creek (FERC Project No. 13211/13212). The decision has been made by the Homer Electric Association Board (now the sole partner in Kenai Hydro, LLC) to proceed with the full 2010 study program in support of a License Application filing by September 2011, as detailed in the Project schedule submitted with the Pre-Application Document (PAD) for the Project in August 2009.

As discussed at Kenai Hydro's November and January public meetings, before proceeding with the full study program, a revised Project description and draft study plans will be posted on the website (www.kenaihydro.com) and an email notice will be provided when the plans are available within the next two weeks. Comments will be taken for 30-days and workgroup meetings/conference calls will be scheduled to introduce and discuss the draft plans.

The primary revisions to the Project description are that the Falls Creek diversion to Grant Lake will be removed from the proposed Project. In addition, different transmission line options (overhead and underground) will be added to the Project description and study of these options will be included in the study program. Use of the mining road near Falls Creek as a Project access road is still a component of the proposed Project.

Finally, Kenai Hydro has notified FERC that the complete study program will be proceeding this summer, and FERC staff are currently reviewing their resources and availability to schedule an early scoping meeting in the Project area.

Thank you for your continued interest in the Project. Feel free to contact me or Brad Zubeck (bzubeck@homerelectric.com) with any questions.

Sincerely,
Jenna Borovansky
Long View Associates, Inc. (On Behalf of Kenai Hydro, LLC)
jborovansky@longviewassociates.com
208.765.1413

From: Jenna Borovansky
Sent: Friday, April 23, 2010 8:24 PM
To: Jenna Borovansky
Subject: Grant Lake/Falls Creek Hydroelectric Project Update

Dear Interested Parties,

Kenai Hydro, LLC would like to update you on the status of the proposed hydroelectric Project at Grant Lake and Falls Creek (FERC Project No. 13211/13212). The decision has been made by the Homer Electric Association Board (now the sole partner in Kenai Hydro, LLC) to proceed with the full 2010 study program in support of a License Application filing by September 2011, as detailed in the Project schedule submitted with the Pre-Application Document (PAD) for the Project in August 2009.

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Finally, Kenai Hydro has notified FERC that the complete study program will be proceeding this summer, and FERC staff are currently reviewing their resources and availability to schedule an early scoping meeting in the Project area.

Thank you for your continued interest in the Project. Feel free to contact me or Brad Zubeck (bzubeck@homerelectric.com) with any questions.

Sincerely,
Jenna Borovansky
Long View Associates, Inc. (On Behalf of Kenai Hydro, LLC)
jborovansky@longviewassociates.com
208.765.1413

From: Schick, Lesli J (DNR) [mailto:lesli.schick@alaska.gov]
Sent: Friday, April 30, 2010 2:09 PM
To: Wolfe, John
Subject: Iditarod Trail maps in the Grant Lake area

Hi John,
Attached are a couple maps of the Iditarod Trail in the Trail Lake/Grant Lake area. The two trails that are CNF Roads (the Grant Lake Road and Crown Point Mine Road are both 60' in width, reserved to the United States). Only the federal roads and trails that cross the commemorative Iditarod easement (ADL 228890) are depicted on the attached map, so there could be others in your project area.

I do have other aerial close-ups like the Vagt Lake one in the attached pdf, but the database that contains the imagery is down for maintenance at the moment. I can get them for you on Monday if you want them.

If you have any additional questions, please let me know.
-lesli

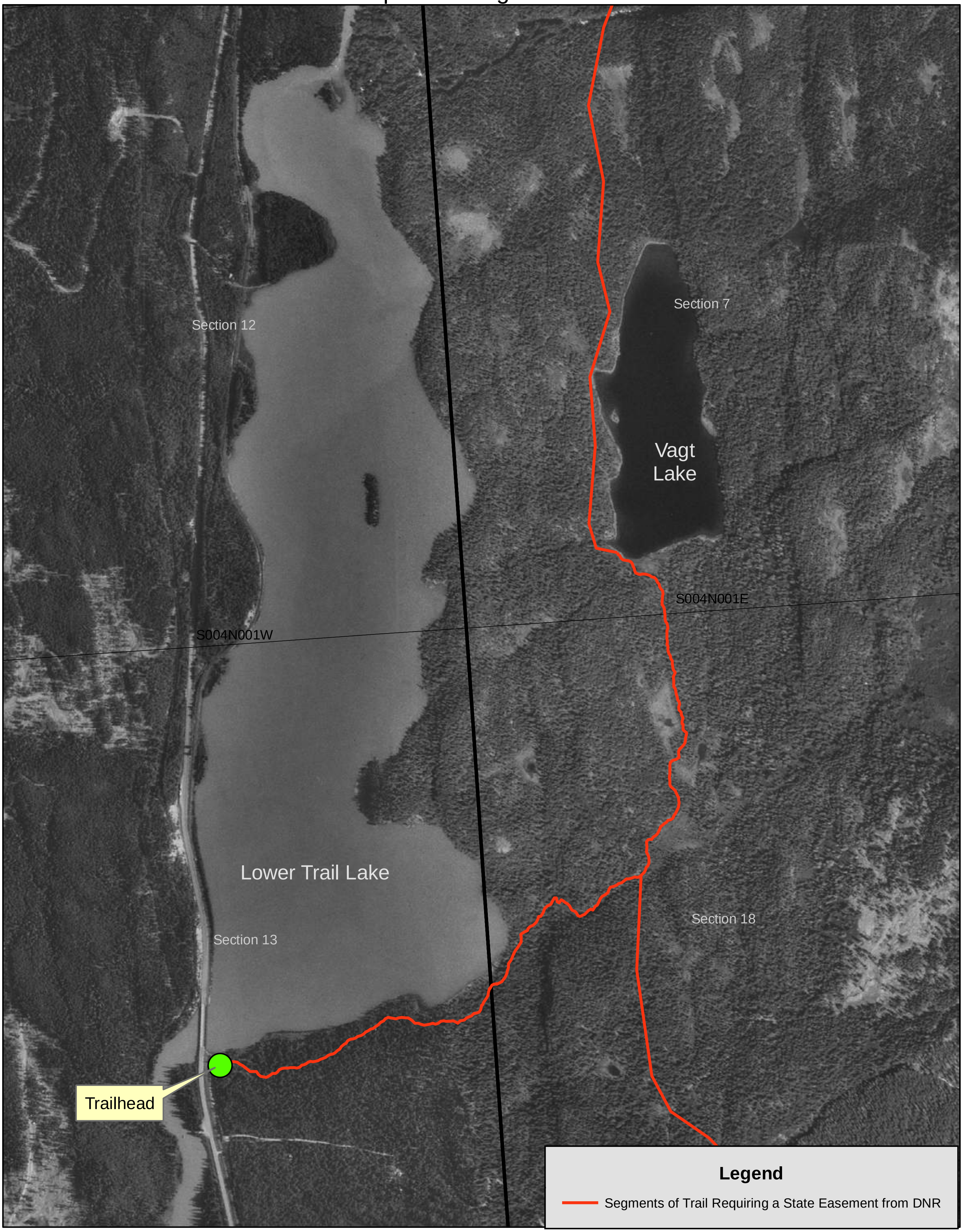
____

Lesli Schick
Iditarod Trail Easements
Department of Natural Resources
550 W 7th Ave, Suite 900C
Anchorage, AK 99501
Phone: (907) 334-2679
Email: lesli.schick@alaska.gov

Forest Service Iditarod Trail Route

ADNR, Iditarod Trail Easements, 01/12/2010

Closeup of the Vagt Lake Trailhead



From: Jenna Borovansky
Sent: Monday, May 03, 2010 8:27 AM
To: 'kim.nguyen@ferc.gov'
Cc: 'mark.ivy@ferc.gov'; 'Zubeck, Brad'; 'MSalzetti@HomerElectric.com'
Subject: KHL - agency availability for scoping meeting
Attachments: GrantLake_Scoping_RSVPs.doc

Hi Kim and Mark,

Attached is a summary of responses from agency representatives regarding their availability for the proposed June scoping dates for the Kenai Hydro, LLC Grant Lake Project that we discussed on Friday. We will have the revised Project description and issues list to you shortly.

Thanks,
Jenna Borovansky
Long View Associates, Inc.
208.765.1413

Individual (Agency)	June 1 (T)	June 2 (W)	June 3 (Th)
Barbara Stanley (USFS)	X	?	X
Karen O'Leary (USFS)	X		X
Travis Moseley (USFS)	X		X
Pam Russell/Jack Sinclair (ADNR)	X	X	X
Phil North (EPA)	X	X	X
Jason Mouw* (ADFG) – lead for ADFG, does not need site visit		X	X
Ginny Litchfiled* (ADFG)	X (best)		
Sue Walker* (NOAA)	X	Travel day only	
Other NOAA rep (potentially as available)	?	?	?
Cassie Thomas (NPS)	X	X	X
Jeffry Andersen* (USFWS)	X	X	X
Katherine McCafferty (Army Corps)	X	X	X (preferred)
Gary Prokosh* (ANDR)	X	X	X

X = responded that they were available on that day

* = have already visited site at least once with KHL

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 3, 2010

Secretary Kimberly D. Bose
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

- FILED ELECTRONICALLY -

RE: Updated Project Description and Issues List for the Falls Creek (Project No. 13211) and Grant Lake (Project No. 13212) Hydroelectric Project

Dear Secretary Bose:

On August 6, 2009, KHL filed a Pre-Application Document (PAD), along with a Notice of Intent to file an application for an original license for a combined Grant Lake/Falls Creek Project (FERC No. 13211/13212 ["Project" or "Grant Lake Project"]) under Part I of the Federal Power Act. On September 15, 2009, FERC approved the use of the Traditional Licensing Process for development of the License Application and supporting materials. KHL is planning to file a License Application for the Project in September 2011.

The PAD identified a preliminary Project facilities proposal, which includes a diversion dam at the outlet of Grant Lake, and a powerhouse along Grant Creek. The PAD Project proposal also included diverting water from Falls Creek into Grant Lake to provide additional flows and power generation at the Grant Creek powerhouse. The Falls Creek diversion has been removed from the Project proposal and associated impacts will not be studied. Portions of the Falls Creek preliminary permit area will continue to be studied for access and transmission routes associated with the Grant Lake Project. A more detailed description of the revised Project facilities proposal is included as Attachment 1.

On February 8, 2010, KHL filed a list of potential Project impacts that summarized issues identified for analysis by KHL in the PAD and in public comment meetings. KHL has revised this issues list to reflect the revised Project description (Attachment 2).

Please feel free to contact me with any questions regarding this filing.

Sincerely,

/s/ Brad Zubeck

Brad Zubeck
Project Engineer
Kenai Hydro, LLC

cc: Service List and Mailing List for Project Nos. 13211 and 13212
Kim Nguyen, FERC
Mark Ivy, FERC
Property owners adjacent to proposed Project area and transmission line corridor

Attachment 1
Revised Section 3.1 – Section 3.3 of Pre-Application Document
(Originally Submitted August 6, 2009, revised May 3, 2010)

The following pages are complete replacements of Sections 3.1 through 3.3 in the PAD document filed with FERC on August 6, 2009 to reflect an updated Project description.

3 PROJECT LOCATIONS, FACILITIES, AND OPERATIONS

3.1. Authorized Agent for the Applicant

The name, business address, and telephone number of each person authorized to act as agent for the Applicant is as follows:

Brad Zubeck
Project Engineer
Kenai Hydro, LLC
3977 Lake Street
Homer, Alaska 99603
907-335-6204
bzubeck@homerelectric.com

3.2. Project Location

The proposed Grant Lake Hydroelectric Project would be located near the community of Moose Pass, Alaska (pop. 206), approximately 25 miles north of Seward, Alaska (pop. 3,016), just east of the Seward Highway (State Route 9); this highway connects Anchorage (pop. 279,671) to Seward. The Alaska Railroad parallels the route of the Seward Highway, and is also adjacent to the Project area. The community of Cooper Landing (pop. 369) is located 24 miles to the northwest and is accessible via the Sterling Highway (State Route 1) which connects to the Seward Highway approximately 10 miles northwest of Moose Pass. The proposed Project location is in the mountainous terrain of the Kenai Mountain Range.

Land ownership and the proposed locations for Project facilities are shown in Figure 3.2-1.

3.2.1. Grant Lake and Grant Creek Development

KHL was issued a preliminary permit to investigate a proposed hydropower development on Grant Creek near the outlet of Grant Lake. Several potential alternatives were reviewed for this project; the most promising alternative would use approximately 48,000 acre-feet of storage during operations between pool elevations of 675 and 709 feet. Storage would be obtained by raising the natural level of Grant Lake using a low diversion at the outlet and drawing down Grant Lake below its natural water level. The proposed lake level would range from approximately 9 feet above up to 25 feet below the natural lake elevation. A multi-level intake would be constructed near the diversion structure. An approximately 2800-foot-long, 10-foot diameter tunnel will convey water from the intake to directly above the powerhouse at about elevation 650 from mean sea level (MSL). At the outlet to the tunnel a 650-foot-long section of penstock will convey water to the powerhouse located at about elevation 518-foot MSL. The tailrace would be located in order to minimize impacts to fish habitat by returning flows to Grant Creek upstream of the most productive fish habitat.

3.2.2. Falls Creek Development

KHL was issued a preliminary permit to investigate a proposed hydropower project on Falls Creek. The PAD filed with FERC on August 6, 2009 contemplated combining the Falls Creek development with the Grant Lake/Grant Creek development, to divert water from Falls Creek via an approximately 13,000-foot-long pipe into Grant Lake to create increased generation capability at the proposed generation facility located on Grant Creek. This diversion and associated facilities are no longer being considered as a part of the proposed Project.

3.3. Proposed Project Facilities

The Project will consist of the Grant Lake/Grant Creek development, including an access road near Falls Creek and an underground or overhead transmission line from the powerhouse, paralleling the access roads, that interconnects at or near Lawing substation. The Grant Lake/Grant Creek development is comprised of a diversion dam at the outlet to Grant Lake, an intake structure in Grant Lake, a tunnel, a potential surge tank, a penstock, a powerhouse, access roads, a step-up transformer, a breaker, an overhead or underground transmission line, and a switchyard. The powerhouse will contain two Francis turbine generating units with a combined rated capacity of 4.5 MW with a total design flow of 350 cfs.

Conceptual drawings of proposed Project facilities are included in Appendix 2 of the PAD.

3.3.1. Summary of Project Features

The proposed Project features have been developed based upon existing physical and environmental information and are conceptual in nature. As part of the pre-filing consultation process additional information will be obtained through technical and environmental studies, research and consultation with equipment manufacturers and resource agencies. As new information becomes available, the design features presented below can be expected to be refined and/or modified to accommodate any changed conditions, including maintenance of instream flow requirements.

Project features as currently envisioned are summarized in Table 3.3-1 and described in this section.

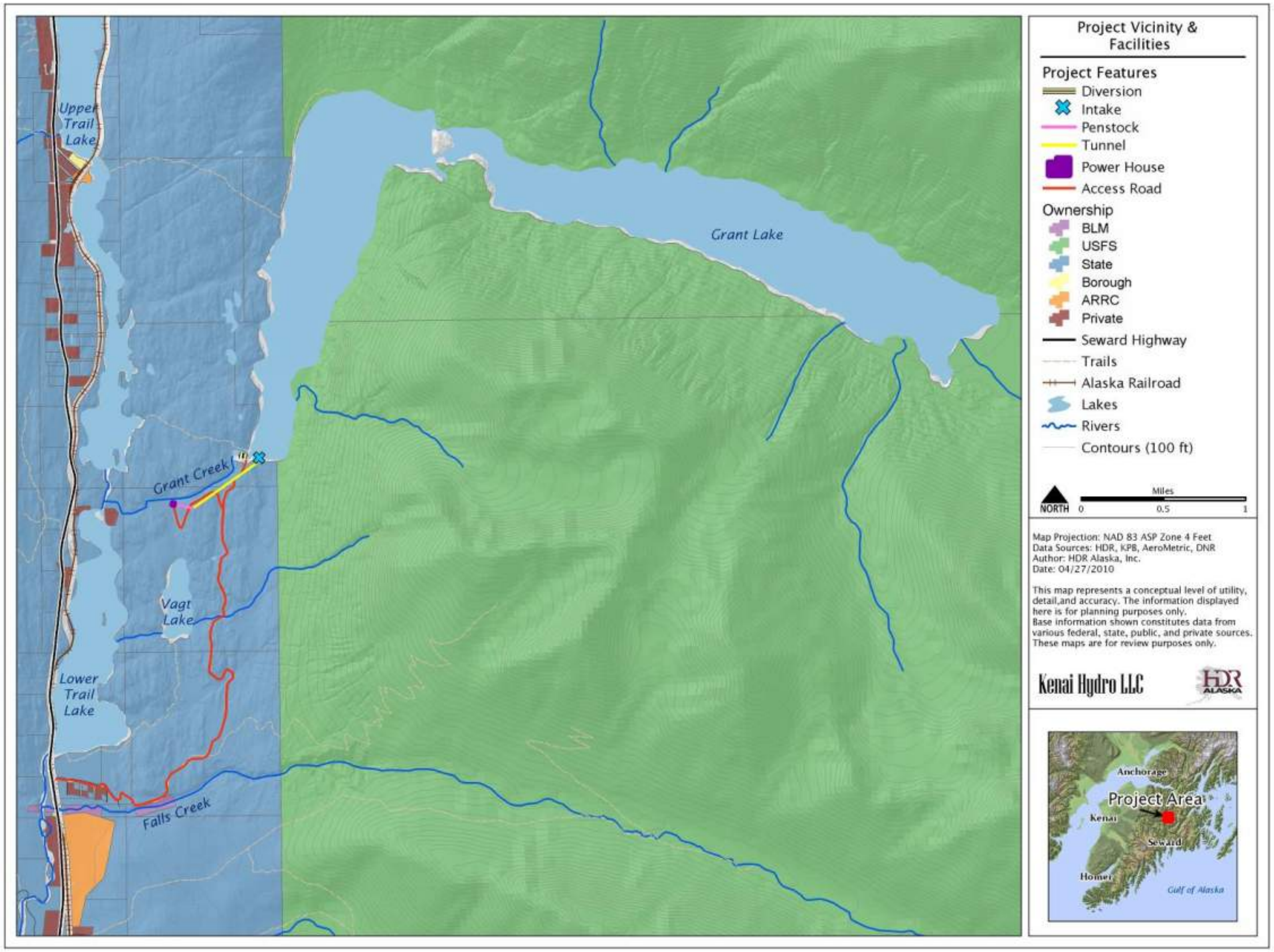


Figure 3.2-1. Proposed Project facilities and land ownership (Revised May 3, 2010).

SUMMARY OF PROJECT FEATURES	
Number of Generating Units	2
Turbine Type	Francis
Rated Generator Output	
Unit 1	1.2 MW
Unit 2	3.3 MW
Maximum Rated Turbine Discharge	
Unit 1	100 cfs
Unit 2	250 cfs
Turbine Centerline Elevation	521.0
Normal Tailwater Elevation	
Minimum	512.0
Maximum	515.0
Average Annual Energy	19,000 MWh
Normal Maximum Reservoir Elevation	709.0
Normal Minimum Reservoir Elevation	675.0
Gross Head	191.0 feet
Net Head at Maximum Rated Discharge	170.4 feet
Grant Lake	
Drainage Area	44.0 sq. mi.
Surface Area at Elevation 709.0	1,790 acres
Active Storage Volume	48,000 acre feet (Elevation 709.0 to 675.0)
Average Annual Natural Outflow	139,650 acre feet
Average Annual Natural Outflow	192.9 cfs
Grant Creek Diversion	
Type	Concrete Gravity Dam
Maximum Height	10 feet
Overall Width	120 feet
Spillway Crest Length	60 feet
Crest Elevation	709
Water Conveyance	
Intake	Tower
Invert Elevation	660
Lower Pressure Pipeline	
Type	Welded Steel
Length	200 feet
Diameter	96 inches
Pressure Tunnel	
Type	10-foot Horseshoe
Length	2,800 feet
Velocity at Maximum Turbine Discharge	3.9 fps
Surge Tank	
Diameter	96 inches
Base Elevation (Preliminary)	650
Top Elevation (Preliminary)	760

Penstock	
Type	Welded Steel
Length	650 feet
Diameter	66 inches
Powerhouse	
Approximate Dimensions	45 feet x 60 feet x 30 feet high
Finished Floor Elevation	518
Tailrace	
Type	Open Channel
Length	200 feet
Transmission Line	
Type	Overhead or Underground
Length	Approximately 3.5 miles
Voltage	115 kV/69kV/24.9kV or 12-15kV
Access Roads	
Type	Single lane gravel surfacing with turnouts
Length	Approximately 3.4 miles (portions will be new road)

Table 3.3-1. Summary of proposed Project features. (Revised May 3, 2010)

3.3.1.1. Grant Creek Diversion

A concrete gravity diversion structure will be constructed near the outlet of Grant Lake. The dam will have a maximum height of approximately 10 feet and will have an overall width of approximately 120 feet. The center 60 feet of the dam will have an uncontrolled spillway section with a crest elevation at approximately 709 MSL. The abutments will have a top elevation of 716 MSL. The spillway will have a flood capacity of 4,200 cfs with 3 feet of freeboard.

A low level outlet will be constructed on the north abutment of the diversion dam. The outlet works will be contained in a valve house constructed integral with the diversion structure. This outlet will be used during the construction of the intake on Grant Lake. The valve house will contain a regulating valve, controls, and associated monitoring equipment. The outlet will discharge into Grant Creek immediately below the diversion. This low level outlet will aid in construction of the intake by lowering the lake level. The outlet will also be available to provide instream flow to the reach of Grant Creek between the diversion structure/intake and the powerhouse tailrace. The potential need for instream flow in this reach of Grant Creek will be examined during licensing studies.

3.3.1.2. Grant Lake Intake

The water intake will be a free-standing concrete tower structure located approximately 500 feet east of the natural outlet of Grant Lake and approximately 120 feet off-shore. The intake structure will have base dimensions of approximately 20 feet by 20 feet. At the top of the intake will be a small gate house to contain the gate hoist mechanism and controls. The intake will be connected to the shore by a narrow access bridge at elevation 720 MSL.

The intake will allow for drawdown of Grant Lake to elevation 675 MSL thereby creating 48,000 acre-feet of active storage for the project between elevations 709 MSL and 675 MSL. The invert of the intake will be at elevation 660 to provide for adequate submergence. The intake will consist of multiple levels to allow the Project to draw water near the surface during all seasons of operation. The front of the intake will be protected by a steel trashrack. Downstream of the trashracks will be a shut-off gate. A 200-foot-long, 8-foot diameter steel pipeline section will connect the intake to the power tunnel.

3.3.1.3. Tunnel

An approximately 2,800-foot-long, 10-foot diameter horseshoe tunnel will convey water from the intake to directly above the powerhouse at about elevation 650 MSL. It is expected that the tunnel will be supported with rock bolts and shotcrete. It may be partially lined depending upon the geotechnical conditions encountered during excavation.

3.3.1.4. Penstock and Surge Tank

At the outlet to the tunnel a short section of penstock will convey water to the powerhouse. The penstock will be constructed of welded steel and will be approximately 650-feet-long and will have an outside diameter of 66 inches. Additional engineering work will be done to determine the feasibility of utilizing a surge tank located at the beginning of the penstock. Preliminary designs propose an 8-ft diameter by 110-ft high structure, however the height could be reduced depending on alternative generator design, constructing this tank into the slope or integral to the tunnel, or using a synchronous bypass valve. The surge tank will have a base elevation of 650 MSL with a top elevation of 760 MSL, if built to maximum height proposed. The penstock will bifurcate to the two turbines immediately upstream of the powerhouse.

3.3.1.5. Tailrace

The tailrace will be an open channel approximately 200-feet-long and will convey water back to Grant Creek at approximately elevation 508 MSL. The tailrace will be excavated from in-situ material and armored with riprap to prevent erosion.

3.3.1.6. Powerhouse

The powerhouse will be located on the south bank of Grant Creek near the end of the canyon section of the creek. The powerhouse will be approximately 45 feet by 60 feet by 30 feet high and will have a finished floor elevation of 518 MSL. The powerhouse will be a pre-engineered metal building on a concrete foundation.

The powerhouse will contain two horizontal Francis type turbine/ generator units with a rated total capacity of 4,500 kW, guard valves, and associated switchgear and controls. Unit 1 will have a design flow of 100 cfs and a rated capacity of 1,200 kW. Unit 2 will have a design flow of 250 cfs and a rated capacity of 3,300 kW. Centerline of the turbine and generator units will be approximately 521 MSL. Tailwater elevation at the powerhouse will range from approximate elevations 512 MSL to 515 MSL depending upon output level. The turbines could operate over a range of flows from the maximum of 350 cfs to a minimum of around 30 cfs depending on conditions. The powerhouse will also contain a bypass valve to release flows during power generation outages.

3.3.1.7. Transmission Line/Switchyard

KHL will be evaluating both underground and overhead transmission lines to deliver energy from the Project to the grid. In addition to the transmission structures, the facilities will include a switchyard at the powerhouse or Lawing substation and will consist of a disconnect switch, and/or a breaker, as well as a step-up transformer. The transmission line would run from the powerhouse parallel to the access road, and connect to the grid at or near Lawing substation. At the grid interconnection a switchyard would be constructed in consultation with the existing transmission line owner. The route would attempt to incorporate setbacks to minimize visual impacts as viewed from the Seward Highway.

If utilized, the poles would be designed as tangent line structures on about 250 foot centers. Design of the line will also incorporate the latest raptor protection guidelines. Collision avoidance devices will be installed on the line at appropriate locations to protect migratory birds.

3.3.2. Proposed Project Boundary

The proposed Project Boundary will encompass each of the Project features described above in the Grant Creek and Falls Creek drainages, and the area of Grant Lake up to approximately contour elevation 720. The corridors for the access roads, penstock and transmission line will be approximately 50-75 feet from each side of the centerline. The specific delineation of the proposed Project Boundary, in terms of survey coordinates, will be made after study work has been completed and will be included as part of the License Application.

3.3.3. Proposed Construction and Development Schedule

The Project will be constructed over a 30-36 month timeframe after the issuance of the License. Construction will begin in the April timeframe with the construction of access roads. Construction of the Grant Lake diversion dam and intake will be performed by first drawing down the lake elevation using a pair of diversion trenches cut through the outlet of the lake. This method will allow the lake to be drawn down to approximately elevation 680 MSL over the winter. Next the intake will be constructed behind an in-situ rock cofferdam. Once the intake and tunnel are complete the in-situ cofferdam will be removed by blasting. The Grant Lake diversion dam will be constructed at the same time in parallel. The construction schedule and methods will be described further in the License Application.

Attachment 2
Potential Resource Impacts – Grant Lake Project (FERC No. 13211/13212)
(Originally Submitted February 8, 2010, Revised May 3, 2010)

Geology and Soils

- Impact of Project construction and operation on possible erosion and sedimentation in the fluctuation zone in Grant Lake (including the Inlet Creek delta).

Water Resources

- Impact of Project construction and operation (lake level fluctuations, changes in flow) on Grant Lake and Grant Creek water quality, hydrology, and water temperature.
- Impact of Project construction and operation on water quality, hydrology, and ice conditions of Lower Trail Lake and Trail Creek.

Fish and Aquatic Resources

- Impact of Project operation on sediment transport (relative to the availability of spawning gravels) due to changes in flow in Grant Creek.
- Impact of Project operation (fluctuating levels in Grant Lake, changes in seasonal flow in Grant Creek, reduced flows between the dam and powerhouse on Grant Creek) on fish abundance and distribution.
- Impact of Project construction and operation on biological productivity and abundance of fish food organisms in Grant Creek and Grant Lake.
- Impact of Project intake structure operation on fish populations.
- Impact of Project construction on fish habitat in Grant Creek.
- Impact of Project facilities (increased access) on fish populations due to potential increased recreational fishing.
- Impact of Project construction and operation on commercial, sport, and subsistence fisheries supported by the Kenai River watershed.

Botanical, Wildlife, and Wetland Resources

- Impact of Project construction and operation on wildlife distribution and abundance.
- Impact of Project construction and operation on wildlife during critical life stages.
- Impact of Project construction and operation (lake level fluctuations) on Grant Lake shoreline vegetation and/or habitats used by wildlife species.
- Impact of Project construction and operation (lake level fluctuations, Project roads, and facilities) on distribution and abundance of invasive plant species.

- Impact of Project construction and operation (lake level fluctuations, Project facilities) on distribution and abundance of rare plant species.
- Impact of Project operation on abundance and distribution of fish used by wildlife species.
- Impact of Project construction and operation on breeding and rearing habitat and nesting success of waterbirds in Grant Lake and Inlet Creek.
- Impact of Project construction and operation (lake level fluctuations, hydrologic changes in Grant Creek, road and facilities construction and maintenance) on wetland, forest/scrub, riparian, and littoral habitats on Grant Lake (including at Inlet Creek) and Grant Creek.
- Impact of Project construction and operation on wildlife use of wetland, riparian, and littoral habitats.
- Impact of Project operation on littoral habitats at the narrows between Upper and Lower Trail Lakes.
- Impact of Project construction and operation on wildlife movement across the bench between Grant Lake and Trail Lake.
- Impact of Project transmission lines (if not buried in road grade) on bird populations (potential collision deaths).

Quality of Life, Recreation, Land Use, and Visual Resources

- Impacts of Project construction and operation on distribution of local and tourist recreational use, access, and experience on Grant Lake, Grant Creek, and Vagt Lake.
- Impacts of Project construction and operation on the distribution and abundance of fish and wildlife for anglers and hunters.
- Impacts of Project construction and operation (including roads and facilities) on visual quality in the area.
- Impacts of Project roads and transmission line corridors (if not buried in road grade) on aesthetic and visual resources (including impacts on Scenic Byway viewpoints and views from existing recreational trails and use areas).
- Impacts of Project construction and operation on local and regional recreation resources.
- Impacts of Project facilities and operation (including road access, safety, and use) on local residential land use on Grant Creek and along the Falls Creek road corridor.
- Impact of Project construction and operation on quality of life characteristics of the area (i.e., noise, changed access to remote area, light pollution).

- Socioeconomic overview of potential effects of Project construction and operation on the area economy.

Cultural Resources

- Impacts of Project construction and operation (including changes in flows and lake level fluctuation and potential for increased recreational use and access in the area) on historic resources in the Grant Lake and Grant Creek area.
- Assessment of existing subsistence use and impacts of Project construction and operation on subsistence use in the area.

From: Jenna Borovansky
Sent: Tuesday, May 04, 2010 3:56 PM
To: comments@kenaihydro.com
Subject: Grant Lake Project Draft Study Plans and Project Update available

Dear Interested Parties,

Kenai Hydro has several updates to share with you on the Grant Lake Project:

1) A revised Project description removing the Falls Creek diversion was filed with FERC on May 3, 2010 and can be found on the KHL website at: www.kenaihydro.com/documents/index.php
2) Under the Traditional Licensing Process, the second stage of consultation (following issuance of the Pre-Application Document [PAD] and comment period) requires a Project applicant to consult with agencies and conduct necessary studies to assess resource impacts. To facilitate this consultation, KHL is providing draft study plans based on the PAD, comments received to date, and consultation with resource agencies and stakeholders . Per the communications protocol outlined in the PAD, KHL is requesting comments within 30-days. KHL will be providing five separate study plans:
    a. Aquatic Resources Draft Study Plan –now available at www.kenaihydro.com [Written comments requested by June 4.]
    b. Water Resources Draft Study Plan – now available at www.kenaihydro.com [Written comments requested by June 4.]
    c. Cultural Resources Draft Study Plan - to be posted to the website by the end of this week [Written comments request by June 7.]
    d. Terrestrial Resources Draft Study Plan – to be posted to the website by the end of this week [Written comments requested by June 7.]
    e. Recreation and Visual Resources Draft Study Plan – to be posted to the website by the end of this week [Written comments requested by June 7.]
3) KHL spoke with FERC staff and agencies regarding their availability for a scoping meeting and site visit the first week in June. FERC will be communicating its plans soon, but pending confirmation of logistics, the tentative date for a site visit and an evening public scoping meeting in Moose Pass is Wednesday, June 2 with a second scoping meeting the morning of Thursday, June 3.
4) Once the details of the FERC scoping meetings are confirmed, FERC will be providing formal notice and KHL will forward the information to this distribution list. KHL also plans to provide additional information on opportunities for discussion of study plans in conjunction with the scoping meeting and site visit.

Written comments may be emailed to: comments@kenaihydro.com .

Thanks for your continued interest in the Grant Lake Project.

Sincerely,
Jenna Borovansky
Long View Associates, Inc.
On behalf of Kenai Hydro, LLC
208.765.1413

KENAI HYDRO COMMUNICATION RECORD

DATE: May 4, 2010

TO: Consultation file

FROM: Brad Zubeck, Kenai Hydro, LLC

SUBJECT: Phone conversation with Mark Ivy, FERC

Mark Ivy (FERC) and I had a phone conversation regarding logistics for the scoping meeting. In addition, he noted that Kenai Hydro will need to provide a plan for the removal of timber from the perimeter of Grant Lake in the area impacted by lake level fluctuations in an area designated at “roadless”, if removal is necessary. He mentioned that if such work is necessary, it will require a special use permit from the Forest Service.

From: Wolfe, John [John.Wolfe@hdrinc.com]
Sent: Tuesday, May 04, 2010 5:32 PM
To: Jaime T Schmidt
Cc: Travis Moseley; Jenna Borovansky; Sally Morsell; Brady, James
Subject: Grant Lake hydro and Iditarod Trail

Jamie

I hope you got my earlier email OK there in Juneau. John Eavis called me from the Seward District this morning after I had spoken with you, and he indicated he would be trying to touch base on this topic with Travis Moseley this afternoon. I know you are all in different places and that all of this is short-notice, but I hope you might have found a moment to converse on the Iditarod Trail topic. If you could give me a call or email with an update of what the Forest Service may be thinking, that would be great. As I said earlier, we're hoping mostly for a first reaction and some basic guidance, not a full-blown formal response. The FERC licensing process for this is just starting. and there will be opportunity for further discussion and refinement. Thank you!

John Wolfe
Environmental Planner

HDR ONE COMPANY | *Many Solutions*
2525 C Street, Suite 305 | Anchorage, AK | 99503-2632
Phone: 907.644.2076 | Fax: 907.644.2022 | john.wolfe@hdrinc.com
www.hdrinc.com

From: Wolfe, John [John.Wolfe@hdrinc.com]
Sent: Tuesday, May 04, 2010 10:53 AM
To: jtschmidt@fs.fed.us
Cc: tmoseley@fs.fed.us; Jenna Borovansky; Sally Morsell; Butera, Bob; Brady, James
Subject: FW: Iditarod Trail maps in the Grant Lake area
Attachments: IditarodTrail_TrailLakesArea.pdf

Jamie

Thank you for your time on the phone this morning as you were preparing to go to Juneau. I hope this attachment, at 2 MB, comes through OK. The attachment is the maps of the iditarod Trail alignment, including spur trails, in the project vicinity as sent to me by DNR.

The following link will take you to the project web site and a FERC document dated yesterday wth a basic project description and map. The acces road route shown on the map is a 'placeholder.' Current efforts are underway to get a better handle on the likely best route for such an access road. The link:
http://www.kenaihydro.com/documents/050310_revised_proj_desc.pdf

We are hoping to get a quick "gut check" from the Forest Service today or tomorrow morning on the basic issues associated with the potenetial paralleling or overlap of the proposed Iditarod Trail and this access road.

The access road as I understand it is proposed to have a top width 12-14 ft wide (single lane) with occasional turnouts. It would be used during construction but then would be used for occasional access only, with visits to check on the facilities anticipated about once per month year round. The road likely would be plowed in winter. After construction, no regular access to the intake area would be necessary at all. A transmission line likely would be associated with the road. Homer Electric is evaluating both overhead and buried options for the transmission line. A buried line would include green plastic junction boxes on the surface at intervals.

The topography east of Vagt Lake apparently is very convoluted and the elevation is such that access to the lake and intake area is OK but the road would have to switchback down to the powerhouse, which is where long-term access is needed. Also, to gain elevation through tricky topography, the existing Falls Creek Road/Trail alignment is needed for the access road. An alignment west of Vagt Lake appears favorable from topography/construction/length of transmission line/access to powerhouse standpoints. Because of topographic pinch points near the southern end of Trail Lake, the road would want to follow the Vagt Lake Trail alignment closely in that area at least.

Here are the main questions as I understand them:
1. In general, what are the top issues the Forest Service sees with the Iditarod Trail and other Forest trails in this area?
2. What is the Forest Service's gut feel or initial preference for (a) using the Vagt Lake Trail/Iditarod Trail alignment and having it end up being the trail when complete; (b) making the access road parallel to the Vagt Lake Trail and Iditarod Trail with crossings and overlap areas; (c) re-routing the Iditarod Trail, possibly to the east side of Vagt Lake, to minimize contact with the acces road. (I'm sure there are other permutations of these ideas as well).

My sense is that Homer Electric is willing to work with the land managers on features of road design that would make it reasonably 'park-like' and compatible with existing and planned trails. The engineers would just like some guidance at this point. There is an entire FERC licensing and NEPA process coming up in the future (scoping June 2-3, I believe), so there will be ample opportunities to finesse the details. Any input now will help us get started into the process as smoothly as possible.

Please note the project for a while included diverting Falls Creek north to Grant Creek. That concept is NOT part of the project concept any longer.

FYI, I am tasked with initial studies of the recreation and visual effects of the project and expect to be talking further with the Forest Service on these topics this spring and summer.

I look forward to talking with you later today once you are in Juneau.

HDR ALASKA, INC.

John Wolfe
Environmental Planner

644-2076 (desk)
279-4663 (sometimes working at home; feel free to try this number)

From: Schick, Lesli J (DNR) [lesli.schick@alaska.gov]
Sent: Friday, April 30, 2010 2:09 PM
To: Wolfe, John
Subject: Iditarod Trail maps in the Grant Lake area

Hi John,
Attached are a couple maps of the Iditarod Trail in the Trail Lake/Grant Lake area. The two trails that are CNF Roads (the Grant Lake Road and Crown Point Mine Road are both 60' in width, reserved to the United States). Only the federal roads and trails that cross the commemorative Iditarod easement (ADL 228890) are depicted on the attached map, so there could be others in your project area.

I do have other aerial close-ups like the Vagt Lake one in the attached pdf, but the database that contains the imagery is down for maintenance at the moment. I can get them for you on Monday if you want them.

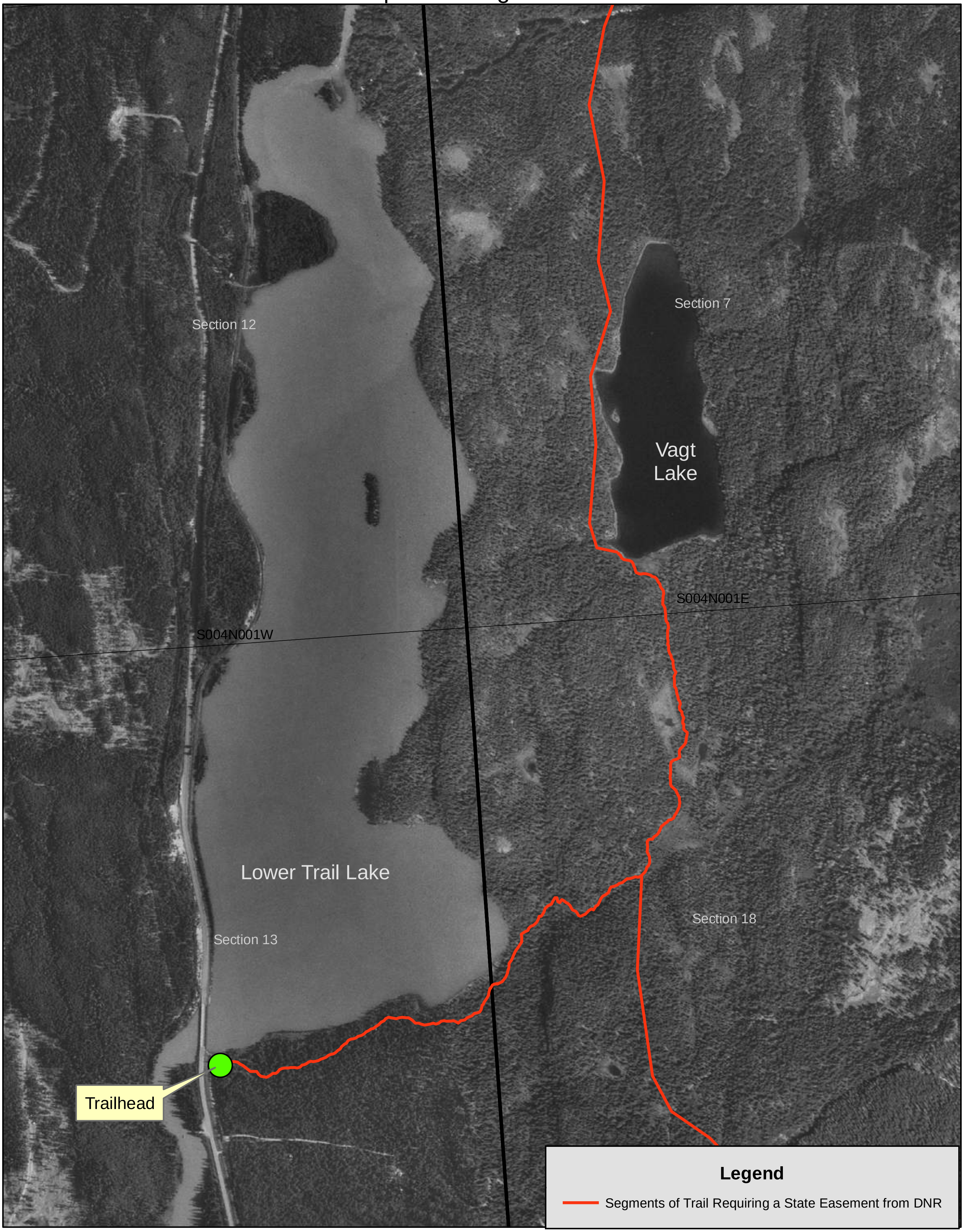
If you have any additional questions, please let me know.
-lesli

____
Lesli Schick
Iditarod Trail Easements
Department of Natural Resources
550 W 7th Ave, Suite 900C
Anchorage, AK 99501
Phone: (907) 334-2679
Email: lesli.schick@alaska.gov

Forest Service Iditarod Trail Route

ADNR, Iditarod Trail Easements, 01/12/2010

Closeup of the Vagt Lake Trailhead



From: Andrew J Schmidt [mailto:ajschmidt@fs.fed.us]
Sent: Tuesday, May 04, 2010 9:04 AM
To: Wolfe, John
Subject: ADL228890 - INHT

Andrew Schmidt
Alaska Lands Team Leader
Chugach and Tongass National Forests
(907) 743-9555, ajschmidt@fs.fed.us

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINING, LAND AND WATER
550 W. 7th Avenue, Suite 900C
Anchorage, Alaska 99501-3557

PRELIMINARY DECISION
for PUBLIC NOTICE ADL 228890
Iditarod National Historic Trail

GENERAL INFORMATION

The USFS has applied for a 1000-foot easement across state land to "construct, operate, manage and maintain the Iditarod National Historic Trail". The State will reserve a 1000-foot-wide conservation easement which will provide a corridor with enough width to a) conserve the historic and natural characteristics of the Iditarod Trail, b) provide enough width to separate conflicting uses such as motorized and non-motorized uses in areas where multiple uses are recommended, and c) allow for development of future compatible trail facilities.

A 1000-foot-wide corridor was identified in the 1986 Comprehensive Plan for the Iditarod National Historic Trail (INHT) and in the states' Kenai Area Plan (2000). The Comprehensive Plan identifies "Trail Corridor Guidelines" which state "A 1000-foot-wide corridor will be established on federally managed Trail segments which are recommended for both Active Management and National Register nomination... For Trail segments on: 1) State patented lands, 2) lands tentatively approved for patent under the Alaska Statehood Act, or 3) patented local government lands, rights-of-way consistent with those on federally managed lands are recommended". The Kenai Area Plan states that...."the authorization or conveyance will be subject to the route (or alternate route) and a buffer along the route that ensure continuous trail links along the INHT. The route will be protected by a 1,000-foot-wide corridor (500 feet on each side of the centerline)".

The USFS will receive a 100-foot-wide easement within the 1000-foot-wide conservation easement to construct and maintain the trail, trailheads and any necessary bridges, as well as interpretive signing. All management within the conservation easement corridor would be consistent with the Iditarod National Historic Trail Comprehensive Plan and approved by the Department of Natural Resources (DNR).

An amended Comprehensive Plan (Public Law 98-11, the National Trails System Act Amendments of 1981) includes the following passage: "Potential trail uses allowed on designated components of the national trails system may include, the following: bicycling, cross-country skiing, day hiking, equestrian activities, jogging or similar fitness activities, trail biking, overnight and long–distance backpacking, snowmobiling, and surface water and underwater activities. Vehicles which may be permitted on certain trails may include, motorcycles, bicycles, four-wheel-drive or all-terrain off-road vehicles."

REQUESTED ACTION: Subject to the provisions of AS 38.05 and pursuant to the regulations promulgated there under, the Division of Mining, Land and Water is asking for public comment on a proposal to reserve a 1000-foot-wide public easement across state lands, of which a 900-foot-wide conservation easement will be reserved to the DNR and a 100-foot-wide easement will be granted to the Department of Agriculture, United Stated Forest Service (USFS), Chugach National Forest. The purpose for the easement is to map, construct and maintain a trail network and trailheads to connect the Iditarod National Historic Trail between Seward to Girdwood. The proposed public easement will establish legal public access to and along the trail at all points where the trail crosses state-owned lands.

In late January, 2004, the USFS completed a Decision Notice and Finding of No Significant Impact for the Seward to Girdwood Iditarod National Historic Trail. Trail plans were identified in the final decision. A 45-day public comment period regarding the Decision Notice ended in March, 2004. The next step in the process of actual upgrading, realignment or construction of the trail that crosses state lands is to establish legal easements. That process, outlined herein, follows the trail plans set forth by the USFS in the Decision Notice.

The 1000-foot-wide conservation easement will encompass the trail. Within the 1000-foot-wide corridor, the state proposes to enter into a management agreement with the USFS. The agreement will describe USFS management responsibilities such as signing, enforcement, maintenance, allowed uses, prohibited uses and garbage removal. The trail easement will be located across State lands adjacent to and roughly parallel to the Seward Highway from the City of Seward to the Winner Creek area near Girdwood. The USFS has submitted an application requesting the widening of existing trail easements, re-alignments of existing trail easements as well as new trail easements and the upgrading and construction of access trails and parking areas at trailheads along the Seward Highway. All of these activities will occur within the easements issued to the USFS. Construction is slated to begin in the autumn of 2004 and continue through 2008. Any uses of the easement outside the 100-foot-wide trail easement but still within the 1000-foot-wide easement will be subject to the approval of the DNR. In some areas along the trail on state-owned land, the USFS has an existing public easement. If the width of the existing easement is less than 100-feet the width will be widened to 100-feet. Existing easements over 100-feet-wide will not be reduced

If the State determines to proceed with the easement after the public comment period an easement with a preliminary plat will be issued to begin site preparation and construction. A full as-built survey will be completed for platting purposes as various trails and trailheads are completed.

LEGAL AUTHORITY: AS 38.05.850, 11 AAC 55.040 and 11 AAC 53.300 → 51.015

ADMINISTRATIVE RECORD: The administrative record for the easement application submitted is ADL 228290.

LOCATION: The proposed public easement will be located across a discontinuous patchwork of state-owned land beginning just north of Seward, Alaska continuing to the Winner Creek area near Girdwood, Alaska.

The following is an overview of the easement request:

At Nash Road, mile 2.1 Seward Highway, just north of Seward, the USFS will upgrade and reconstruct the Nash Road Trailhead to accommodate up to 20 vehicles, vault toilets, a kiosk and trash container. The Iditarod trail will lead from the parking area across state lands on an existing trail and a relocated trail alignment across Kenai Borough Lands continuing north, entering state lands on an existing 1000' wide easement in section 18 and 7, and then continuing to the Bear Lake Road trailhead. The Bear Lake Road trailhead will be located at the south end of Bear Lake and will consist of a parking area of 1 acre to accommodate up to 5 vehicles, a vault toilet, and an information/interpretive kiosk and trash container. The trail from Nash Road to the Bear Lake trailhead will be a single, 3-foot wide trail within a 10-foot cleared width for year-round, multiple-use. The trail will be reconstructed utilizing small mechanized trail building equipment and hand tools. Any necessary bridges will be fully-engineered and built to meet USFS safety standard requirements. Trail and trailhead construction is anticipated to be started in 2005.

From the Bear Lake Trailhead the trail easement will continue along the east side of Bear Lake. The existing 60-foot-wide easement width, reserved to the U.S. in the conveyance to the state, will be widened to 100-feet within the 1000-foot reservation. A winter snowmachine "trail" will be marked along the length of Bear Lake from south to north during safe ice conditions. The Management Agreement will provide that in summer months all-terrain vehicles are allowed on the trail from Nash Road to Bear Lake but prohibited along the east side of Bear Lake. The trail continues on an existing easement and then onto USFS land until it forks to the west and enters (S002N001E) back onto state land in the western half of section 20 and then across section 19 and into section 18 before coming to the Seward Highway at approximately Mile 12.

Just south of the trail on the western side of the Seward Highway at mile 11.6 the USFS is requesting a 1.5 acre easement for the existing Goldenfin Lake Trailhead and an easement for the existing trail from the parking area across State land to the boundary of Federal land near Goldenfin Lake and then travels north onto USFS land. Interpretive signs will be added to the existing trailhead parking area. The trail continues north across federal lands to Rocky Creek where the trail passes over state land on an existing 20-foot easement through the western half of section 6 (T 04 N, R 01 E, S.M.) The trail continues north across federal land through section 31 until it reaches the southern boundary of Section 30. Here the Iditarod Trail connects with the Ptarmigan Creek trail and campground at Seward Highway Mile 23. The trail then travels north across state-owned lands for approximately 1.5 miles to the Crown Point Road. The 9 acre trailhead for this portion of the trail is located at Seward Highway, mile 25. The trailhead will be upgraded to hold up to 50 vehicles of which 2/3 will be accommodated in the paved area and 1/3 in an overflow area. The trailhead is used to access the Iditarod Trail along the existing Vagt Lake trail continuing north to a side trail to access Grant Lake. The main Iditarod trail will continue north to the northeast tip of Upper Trail Lake where the trail crosses back onto federal land. A winter motorized trail is planned to run from south to north across Kenai Lake and both Lower Trail Lake and Upper Trail Lake when ice conditions are safe.

At Seward Highway, mile 32.6, the Johnson Pass trailhead on the north side of the highway begins and travels across state-owned land northeast on an existing 25-foot wide easement that will be increased to 100-feet within the 1000-foot reservation.

The next segment of the Iditarod Trail that crosses state-owned land is in the Ingram Creek (ADL 225618), Turnagain Pass area. The trail will traverse state-owned land north of the existing power line easement and will be a winter-only motorized trail as permitted in the Management Agreement. The trail will be brushed only to a width of 20-feet. The trail will begin to cross state land in the east half of section 6 (T 08 N, R 02 E, S.M.) and travel through portions of sections 31, 32, 33, 28 27 and 26 (T 09 N, R 02 E, S.M.). The trail is slated to be brushed in the autumn of 2004.

Winner Creek / Crow Pass Area (Girdwood). The Iditarod National Historic Trail continues on federal land until it begins to cross Anchorage Municipal land and some State-owned land in Girdwood. A small section of the trail crosses the eastern portion of section 9, the western half of section 10 and traverses across section 11 (T 10 N, R 02 E, S.M.). The trail connects to the Crow Pass trail leading into the Eagle River Valley. The Winner creek trail is located on a an existing 25-foot wide easement that would be widened to 100-feet.

In addition to the easement request for the Iditarod National Historic Trail, the USFS is requesting a 25-foot-wide easement, reserved to the U.S., across state lands at mile 5.2 of the Seward Highway be widened and relocated to improve access for snowmachiners traveling to Lost Lake.

The following has been taken from the USFS easement application which has been divided into segments as follows:

ADL 228890-A: Part "A" is specific for the purpose of expanding existing easements in Township 1 North, Range 1 East, S.M., in portions of Sections 18, 7 and 6; Township 2 North, Range 1 East, portions of Sections 31, 32, and 29. The USFS plans to re-construct one trail that will be brushed to a width of 10-feet with a 3-foot wide gravel or boardwalk tread surface using small mechanized trail building equipment and hand tools. Any necessary bridges will be fully-engineered and built to USFS specifications. The existing trail currently has a 60-foot easement reserved to the U.S. in the conveyance to the state. The remaining easement in this section is 1000-foot wide. The USFS is requesting to enlarge the 60-foot easement to 1000-feet. Construction is slated to begin in 2004. In addition, a one acre trailhead at the end of Bear Lake Road will be constructed and maintained in Township 1 North, Range 2 East, in a portion of Section 7, Seward Meridian. The parking area will be will hold a maximum of 5 vehicles, a kiosk, toilet and trash container. Construction of the trailhead is slated to begin in 2005.

ADL 228890-B: No trails exist in the following area. The original trail parallels the Alaska Railroad outside of the Alaska Rail Road Right-of-way. The proposed trail will be separated from the Alaska Railroad. No trail heads or connecting trails are proposed. The trail will be built in the Seward Meridian, Township 4 North, Range 1 East, in portions of Sections 30, 19, 7 and, 6; Township 5 North, Range 1 East, in portions of Sections 31, 30, 19, 18, 7; and, Township 5 North, 1 West, in portions of Sections 36, 25 and 24. The USFS plans to construct one trail that will be brushed to a width of 10-feet with a 3-foot wide gravel or boardwalk tread surface using small mechanized trail building equipment and hand tools. Any necessary bridges will be fully-engineered and built to USFS specifications. Construction is slated to begin in 2006.

ADL 228890-C: The USFS is requesting a wider easement across the following sections where a trail and easement currently exist. The USFS is requesting to enlarge the existing easement reserved to the U.S. in the conveyance to the state to 1000-feet. Construction is slated to begin in 2004 and continue through 2008.

Township 1 North, Range 1 West, in a portion of Section 14; Township 2 North, Range 1 East, in a portion of Section 7; Township 3 North, Range 1 East, in a portion of Section 6; Township 4 North, Range 1 East, in a portion of Section 30; Township 5 North, range 1 West, in portions of Sections 22, 23, 24, 13; Township 5 North, Range 1 East, in portions of Sections 7 and 5. Township 10 North, range 2 East, in a portion of Sections 9, 10, 3, 2, 11; Trailheads will be constructed in Township 2 North, Range 1 East, Section 7 and, Township 5 North, Range 1 West, Section 22. The existing trail currently has a 25-foot easement.

ADL 228290-D: Existing trails are to be upgraded and a 1000-foot easement established in Township 1 North, Range 1 West, in a portion of Section 36; township 1 North, range 1 East, in a portion of Sections 30, 19; Township 2 North, Range 1 West, in a portion of Section 24; Township 4 north, Range 1 West, in a portion of Section 13; Township 4 North, range 1 East, in a portion of Section 18; Township 5 north, range 1 West, in a portion of Section 12. With the exception of section 12, an existing 25-foot easement, reserved to the U.S. in the conveyance to the state is to be expanded to 1000 feet.

Three trailheads at Goldenfin Lake, Vagt Lake and Nash Road will be upgraded and reconstructed. The Nash Road Trailhead will hold 20 vehicles, toilet facilities, a kiosk and a trash container. The Vagt Lake Trailhead will include a parking area to accommodate 25 vehicles with trailers up to 30-feet in length plus 25 additional vehicles, two vault toilets, a boat launch, trail information and interpretive signs. Goldenfin Lake Trailhead will be upgraded to add interpretive signage.

Construction of the trail will begin in 2004 through 2008 with construction of the trailheads in 2005.

ADL 228290-E: There are no existing trails and no existing easements for this part of the trail. A 1,000-foot-wide easement is proposed. The trail will be constructed in Township 2 North, Range 1 East, in portions of Sections 20, 19 18; Township 4 North, Range 1 East, in portion of Section 31; Township 9 North, Range 2 East, in portions of Section 32. In addition, a site easement at Mile 12 Hill will continue to be used for trail maintenance on an existing site easement. This existing site easement would be perfected in Township 2 North, Range 1 East, in portions of Section 18. Construction for the trail will begin in 2005 and continue through 2006.

ADL 228290-F: (Turnagain Pass Snowmachine Route) There are no existing trails and no existing easements for this portion of the trail. A 1,000-foot-wide easement is proposed. The proposed trail will be used as a snowmachine route for winter use only as provided in a separate Management Agreement. The trail will be brushed to a maximum width of 20 feet in Township 8 North, Range 2 East, in portions of Section 6: Township 9 North, Range 2 East, in portions of sections 31, 32, 33, 28, 27, and 26. Brushing of this trail is slated to begin in 2004. An existing pullout will be used as the trailhead. An upgraded trailhead will be built in the future when highway reconstruction is done. Trail brushing is slated to be completed by the winter of 2004.

POLITICAL INFORMATION / THIRD PARTY INTERESTS:

BOROUGH / MUNICIPALITY: Portions of the trail are proposed to cross both Kenai Peninsula Borough and Municipality of Anchorage lands.

Easements across municipal lands are not part of this easement application.

REGIONAL CORPORATION / NATIVE VILLAGES AND TRIBES: Chugach Alaska Corporation. Any easement reserved under this application and preliminary decision does not affect lands owned by the Chugach Alaska Corporation.

TITLE:

LEGAL AUTHORITY: AS 38.05.850, 11 AAC 55.040 and 11 AAC 53.300

TITLE REPORT: A title report was requested on August 5, 2004.

PLANNING AND CLASSIFICATION:

LAND MANAGEMENT PLANS: Turnagain Arm Management Plan, Kenai River Comprehensive Management Plan

AREA PLAN: Kenai Peninsula Borough Area Plan

ALASKA COASTAL MANAGEMENT PROGRAM: The USFS Environmental Assessment for the Iditarod National Historic Trail has been evaluated by the Office of Project Management and Permitting. The Alaska coastal management Program has determined that "Based on an evaluation of the project by the Alaska Departments of Fish and Game and Natural Resources and the Kenai Peninsula Borough coastal resource district, the OPMP concurs with (the USFS) certification and the project, described in the Environmental Assessment (EA), is consistent with the ACMP and affected coastal district's enforceable policies to the maximum extent practicable".

The application is within both the Kenai Peninsula and the Anchorage Municipal coastal districts. The USFS Environmental Assessment has gone through proper coastal district review and is not subject to a second review.

SURVEY: GPS data tied to existing U.S. survey monuments will be used to locate and mark the trail until the various trail segments are completed at which time an As-built Survey will be completed according to the Division of Mining, Land and Water requirements.

PUBLIC / AGENCY NOTICE AND COMMENTS: Public notice of the easement request has been sent to various newspapers, post offices, agencies, borough/cities, native corporations/village/tribes, land owners, and valid third party interests. Public and agency comments regarding the easement request are encouraged during the comment period August 9, 2004 through September 8, 2004. The final decision will consider and address all comments related to the proposal that were submitted timely.

THE IDITAROD NATIONAL HISTORIC TRAIL COMPREHENSIVE MANAGEMENT PLAN SPECIFIC TO THIS REQUEST: The National Trails System Act, Public Law 90-543, was approved on October 2, 1968. The Act states: In order to provide for the ever increasing outdoor recreation needs of an expanding population and in order to promote public access to, travel within, and enjoyment and appreciation of the outdoor areas of the Nation, trails should be established (i) primarily, near the urban area as the Nation, and (ii) secondarily, within established scenic areas more remotely located. The original Act instituted a national system of recreation and scenic trails and prescribed methods by which, and standards according to which, additional components may be added to the system. The Iditarod trail became one of the first National Historic Trails selected when Public Law 95-625 (The National Parks and Recreation Act) was signed into law in 1978. This Act, amending the National Trails System Act, provided for and specifically named the Iditarod as a national Historic Trail. Regarding Trail corridor guidelines on federally managed lands a 1000-foot-wide corridor will be established on Trail segments which are recommended for both Active Management and National Register nomination. For Trail segments on State patented lands, lands tentatively approved for patent under the Alaska Statehood Act, or patented local government lands, rights-of-way consistent with those on federally managed lands are recommended.

USFS DECISION NOTICE AND FINAL FINDING OF NO SIGNIFICANT IMPACT: An Environmental Assessment was completed by the USFS and four alternatives for uses of the trail were presented to the public for comment. In late January, 2004, the USFS selected an alternative with minor modifications to manage approximately 186 miles of trail as part of the Iditarod National Historic Trail. Of the 186 miles of trail, approximately 44% (82 miles) consists of reconstructing existing trail. New trail construction would occur on 77 miles, of which 15 miles are over-snow trails with no tread. The remaining 25 miles include winter trails over frozen lakes, water trail, and existing trails with no reconstruction proposed. The finding determined that the trail would not have a significant effect on the quality of human environment considering the context and intensity of impacts.

The State agrees with the USFS that the trail would not have a significant effect on the quality of human environment. The trail will give both residents of Alaska as well as visitors a year-round trail experience utilizing both motorized and non-motorized opportunities.

KENAI AREA PLAN INFORMATION SPECIFIC TO THIS REQUEST: The Kenai Area Plan addressed the Iditarod National Historic Trail by noting the memoranda of understanding (MOU) between the Bureau of Land Management

(BLM) and the State of Alaska as well as between the BLM and the Kenai Peninsula Borough. It provides management guidance for instances when the DNR conveys lands or issues authorizations along the INHT, the authorization or conveyance will be subject to the route (or alternate route) and a buffer along the route that ensures continuous trail links along the INHT. The plan recommends the route be protected by a 1000-foot-wide corridor (500 feet on each side of the centerline). The rerouting of trails for a short distance may be permitted to minimize land use conflicts or to facilitate use of a trail if alternate routes provide opportunities similar to the original. If trails are rerouted, provision should be made for construction of new trail segments if warranted by type of use.

TURNAGAIN AREA MANAGEMENT PLAN SPECIFIC TO THIS REQUEST: In Chapter 2, Area wide Land management Policies of the Turnagain Area Management Plan, under Management Guidelines the plan states the Iditarod National Historic Trail System will be managed consistent with the Memorandum of Agreement between the State of Alaska and the BLM covering the INHTS. For permits and leases along the INHTS, the State Office of History and Archaeology will be consulted. It also notes, rerouting trails may be authorized to minimize land use conflicts or to facilitate use of a trail if alternate routes provide opportunities similar to the original. If trail are rerouted, provision should be made for construction of new trail segments if warranted by type of use. Rerouting trails should be done in consultation with local trail committees and the Municipality of Anchorage. Historic trails that follow well-established routes should not be rerouted unless necessary to maintain trail use.

FEES, BONDING AND INSURANCE: Under a reciprocal agreement with the USFS, the Department of Natural Resources will waive all fees associated with this public easement. In addition, the state will waive all bonding, under 11AAC 96, as well as Insurance.

EASEMENT REVOCABILITY: The easement will not be revocable unless the land becomes used for purposes other than those compatible with the Iditarod National Historic Trail Comprehensive Plan. If in the future development of the land which has been determined, through a public process to have a higher economic benefit to the state consistent with the public interest the 100-foot-wide easement may be reduced and/or relocated within the corridor and/or the corridor width may be reduced by mutual agreement of the parties or the easement and corridor would be relocated to a mutually agreeable location consistent with AS 38.05.850. The USFS will participate in the decision and is eligible to appeal any decision in accordance with state regulations.

TERM: The easement would be granted for an indefinite period so long as the land is used for purposes compatible with the Iditarod National Historic Trail.

CONSIDERATIONS: The following criterion was considered and represents current land status and land management.

Land Management: There are no known land management policies or designations, other than those in the Alaska Coastal Management Program, the Kenai Area Plan, the Turnagain Arm Management Plan or the Kenai River Comprehensive Management Plan, that impact this proposal. Measures taken to mitigate impacts on the resources identified in the above mentioned plans are listed below.

Pending / Existing Uses: There are no known pending applications, land use conflicts or potential impacts to nearby communities or residential land due to the construction, re-alignment or upgrading of the trail system through the easement.

Based on information available at this time the DNR concludes that placement of the trail on state land would not disrupt the traditional and existing uses of the land.

Public Access: Public access will be protected in accordance with 11 AAC 63.050(b)(6) and 11 AAC 51 and will be addressed in any resultant management agreement with the USFS.

Mitigation Measures: There are no known conflicts or potential impacts that can be ascertained at this time that might result from the placement of the proposal. However, if conflicts or potential impacts are identified during the public/agency comment period that can be mitigated by special stipulation(s), these special stipulation(s) will be included in the final decision and the resulting easement document.

Social, Economic, and Environmental Concerns: There are no known significant social, economic, or environmental impacts from this project.

Historic and Cultural Resources: If cultural or paleontological resources are discovered as a result of the construction or maintenance of the trail, work that would disturb such resources must be stopped and the Alaska Office of History and Archaeology shall be contacted immediately at (907) 269-8721.

ECONOMIC DEVELOPMENT: ADVANTAGES / DISADVANTAGES: Article VIII, 1 of the Alaska Constitution states, "It is the policy of the State to encourage the settlement of its land and the development of its resources by making them available for maximum use consistent with the public interest." An easement reserved to the USFS will provide a seamless trail system connecting segments that cross from federal land to state land from Seward to Girdwood, providing a variety of year-around, outdoor recreation opportunities for both Alaskan's and visitors. The INHT easement provides the advantage of allowing recreational opportunities across state-owned lands has the potential of creating employment through tourism and businesses such as transportation, outfitters and off-site support facility development.

When completed, the Iditarod National Historic Trail will become recognized worldwide, as is the Iditarod Dog Sled Race, and could become a major tour destination for people from across the globe. Because of the trails location its use could have the future benefit from the creation of service jobs, local spending and taxes for Anchorage, Girdwood, Moose Pass and Seward and additionally bring added business to the lower portion of the Kenai Peninsula Borough

In issuing an easement under AS 38.05.850, subsection (a) states that, "(DNR) shall give preference to that use of the land that will be of greatest economic benefit to the state and the development of its resources" In making this greatest economic benefit determination, DNR reviews its land use planning documents for initial direction, and considers the direct economic benefits to the State, the indirect economic benefits and whether the project encourages the development of State resources. DNR also examines the potential negative and positive economic impacts of this proposal and compares them with the economic benefit of a no action option. Taking all of this information into consideration DNR then determines whether the proposed easement provides an economic benefit to the State and the development/uses of its resources (as opposed to leaving the land undeveloped or allowing another use of that land).

Potential negative impacts to trail uses in the area may include additional noise pollution from motorized use of the trail, up-keep and maintenance of the trail and access areas and possible trespass of trail users on adjacent private land outside of the 1000-foot-wide conservation corridor.

Viewed in its entirety, the economic benefits of issuing an easement substantially outweigh any potential negative effects. The potential negative impacts to local residents will be limited and are not expected to be significant. These factors support DNR's determination that this public easement provides the greatest economic benefit to the state and the development of its resources.

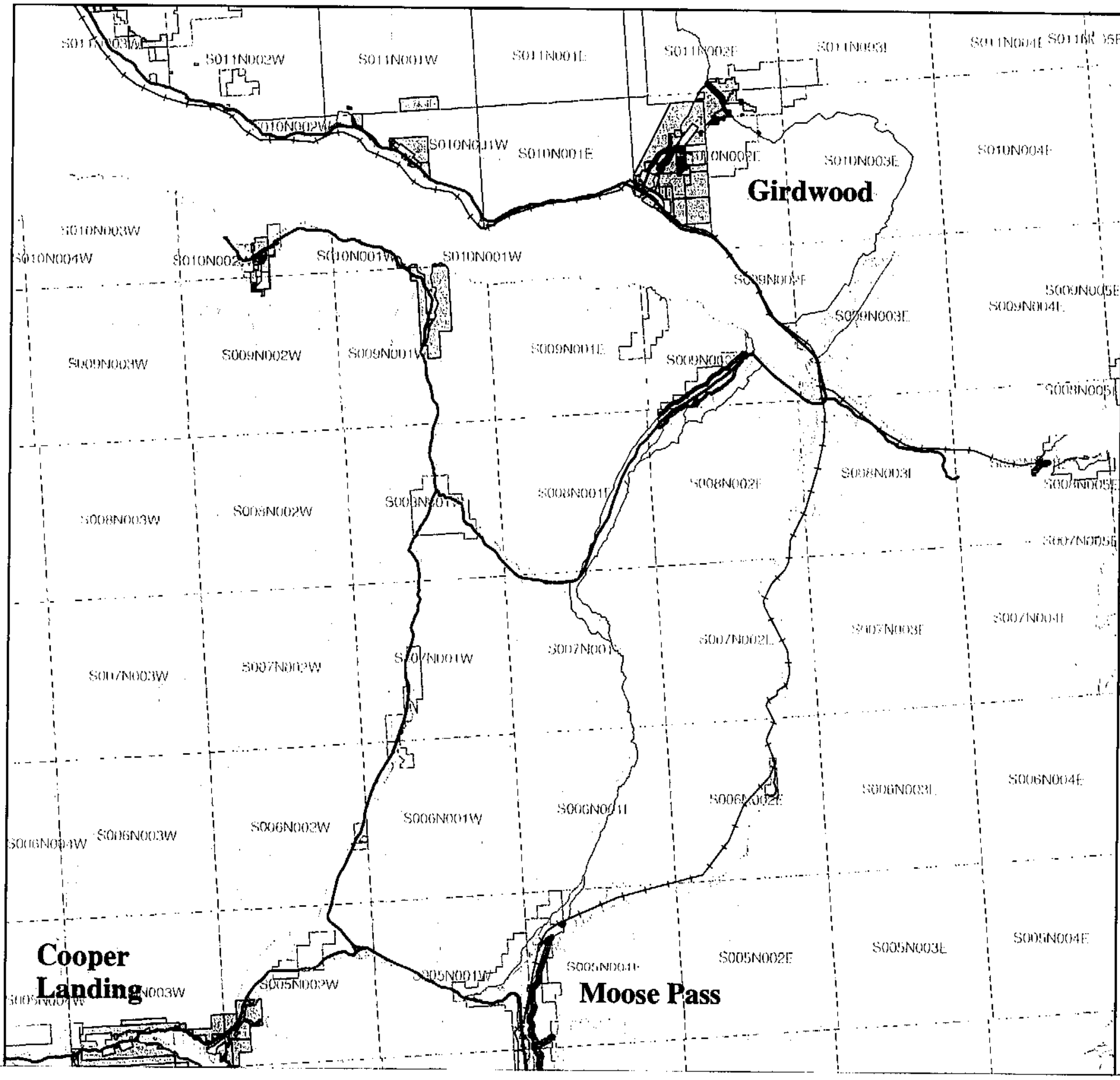
RECOMMENDATION: Considering the information presently available, it is determined to be in the state's best interest to proceed with the granting of an easement to the USFS, across all state land to connect a seamless trail system for the Iditarod National Historic Trial from Seward to Girdwood. The easement will include the attached stipulations plus any other stipulations as a result of public comments, and any modifications necessary to complete trail and trailhead work within the easement.

John S. Thiede — August 6, 2004

John S. Thiede
Natural Resource Manager

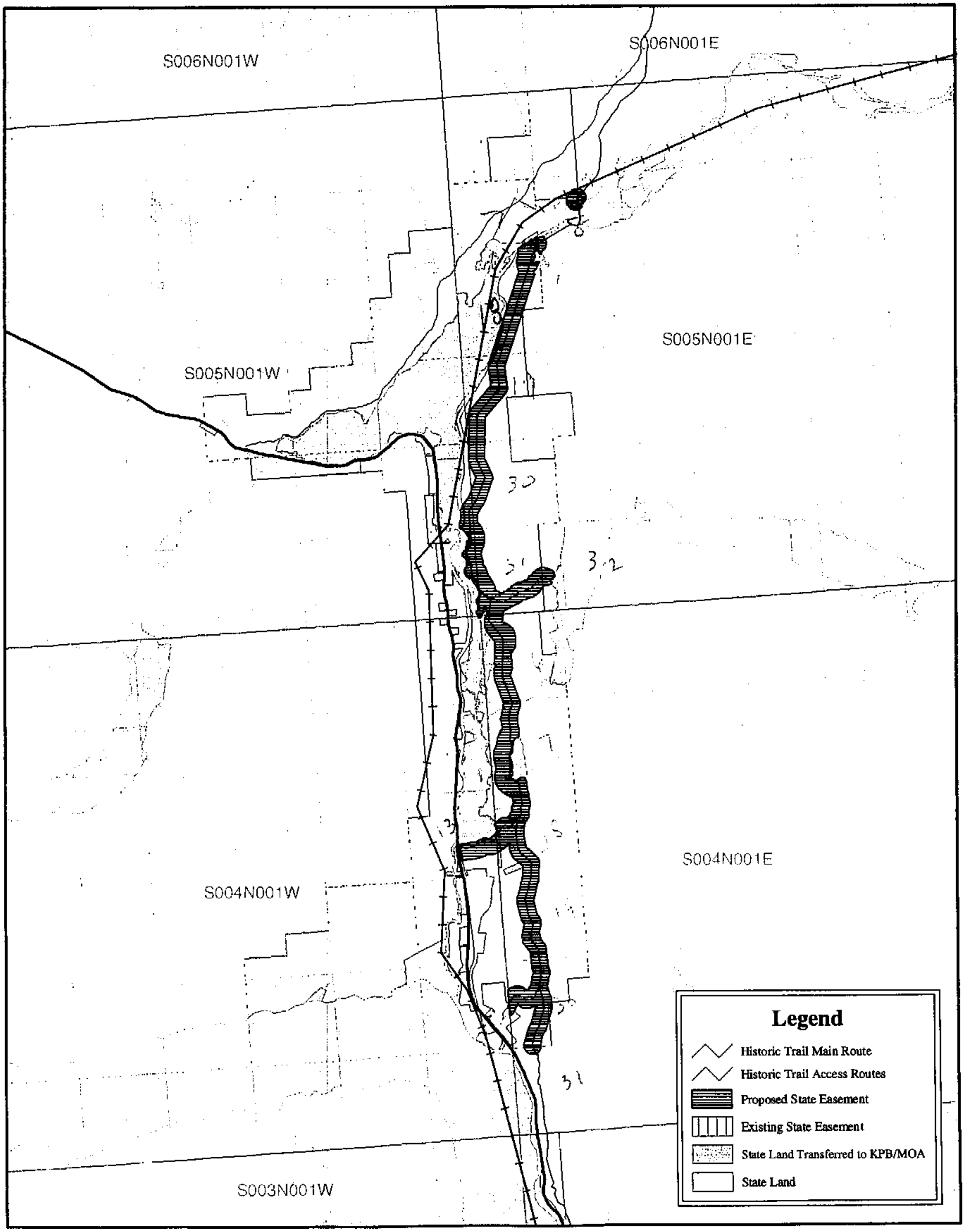
Date

Iditarod National Historic Trail



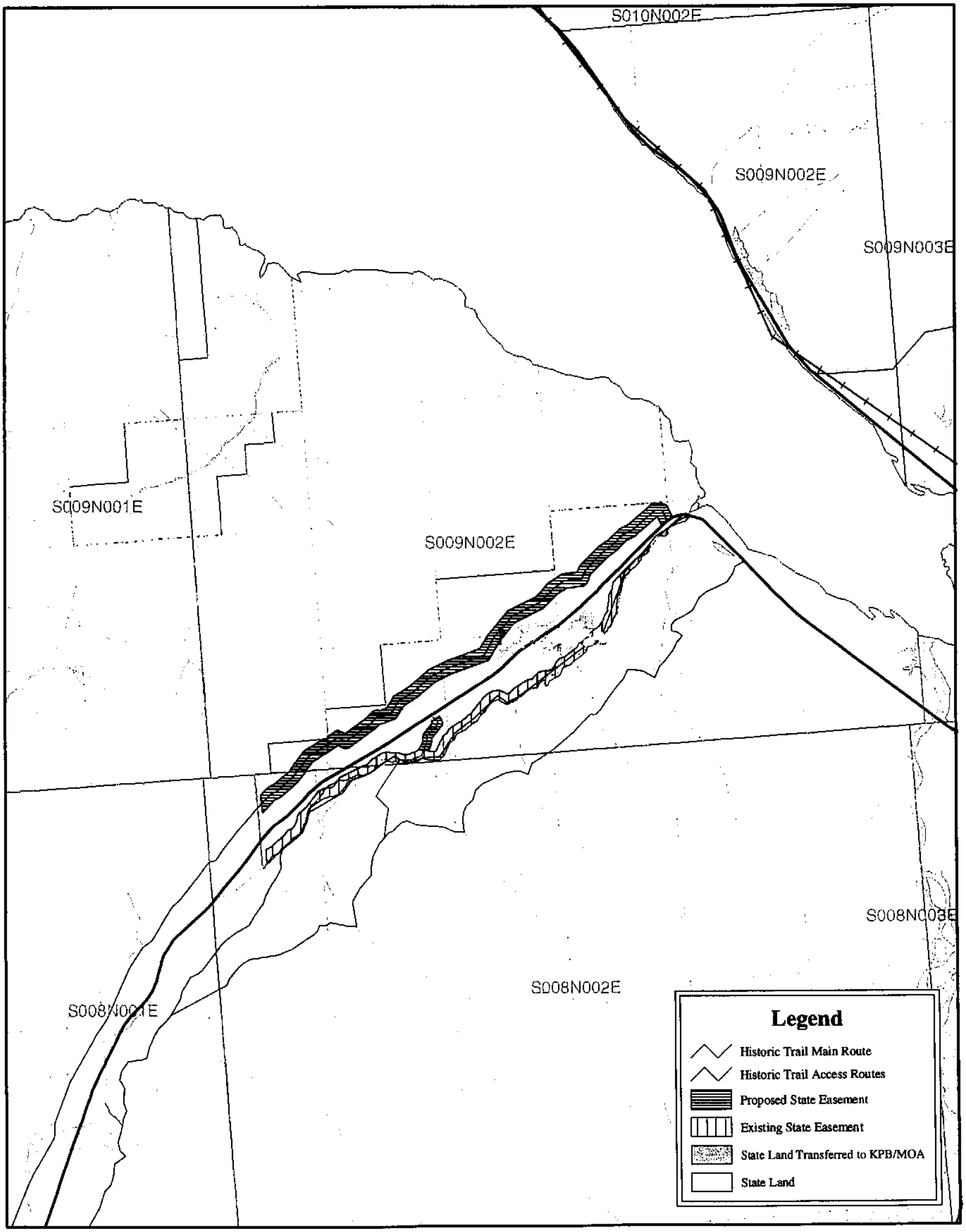
Iditarod National Historic Trail

Moose Pass



Iditarod National Historic Trail

Turnagain Arm Area

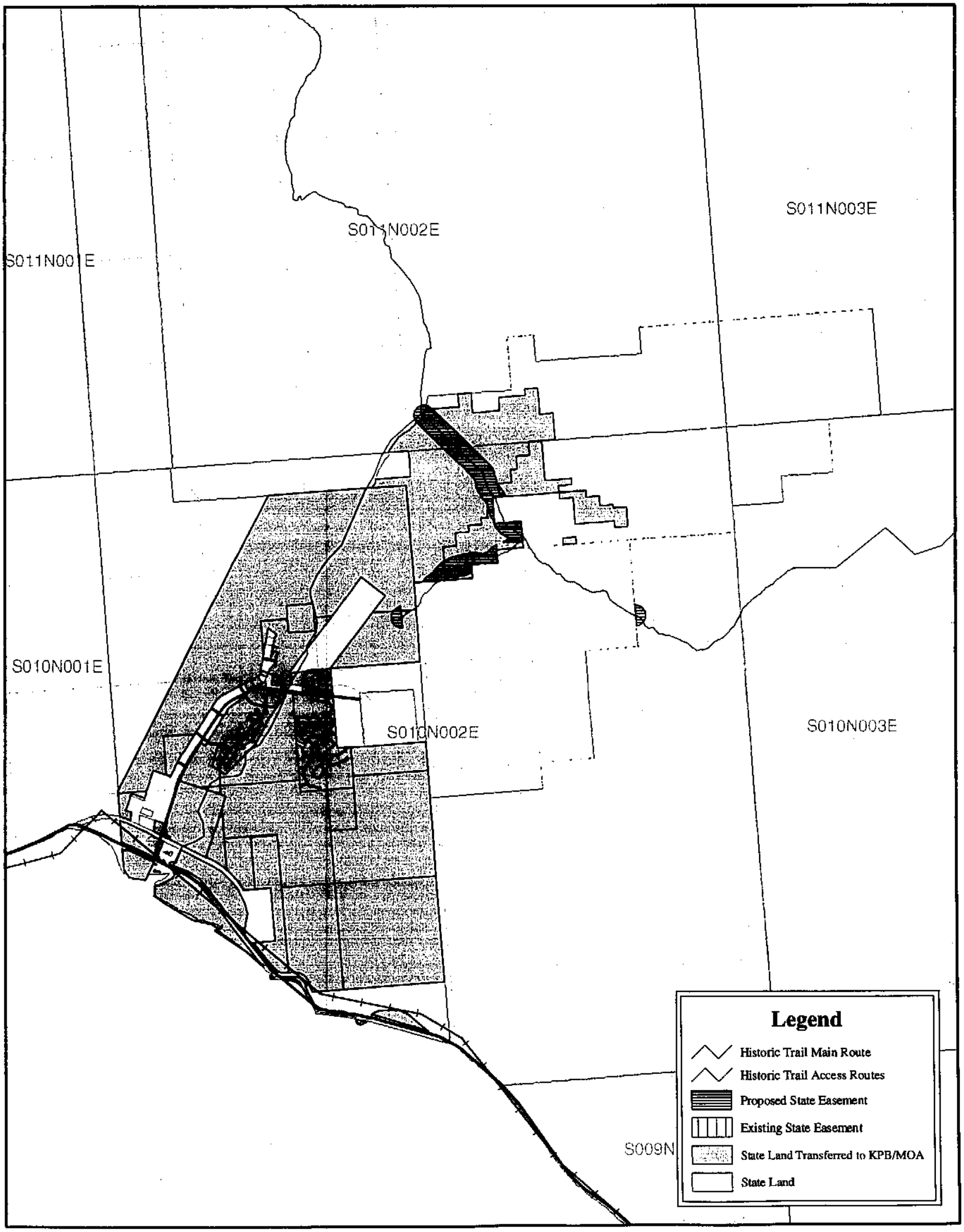


Alaska Department of Natural Resources

Date Printed: June 15, 2004

Iditarod National Historic Trail

Girdwood to Crow Pass



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINING, LAND AND WATER
550 W. 7th Avenue, Suite 900C
Anchorage, Alaska 99501-3557

FINAL FINDING AND DECISION
ADL 228890
Grant of Public Easement
Iditarod National Historic Trail
Seward to Girdwood

This final finding and decision is intended to compliment and update the respective preliminary finding dated August 6, 2004. The State received one written comment regarding the preliminary decision document. The comment stated that a 1000-foot-wide easement may be somewhat excessive and that a 100-foot-wide easement may be too small and that buffer zones should be maintained along the trail corridor. In addition, the commenter feels the state should consider developing routes to allow the use of snowmobiles in the Winner Creek area if it is developed as a ski resort.

When addressing the 1,000-foot-wide reservation which encompasses the 100-foot-wide easement which will be granted to the United States Forest Service, acting by and through the USDA Forest Service (USFS), the term "corridor" or "buffer" will be used. The term, "corridor" and/or "buffer" is the terminology used in both the 1986 Comprehensive Plan for the Iditarod National Historic Trail and in the Department of Natural Resources Kenai Area Plan.

GENERAL INFORMATION

The USFS has applied for a 1000-foot easement across state-owned land to "construct, operate, manage and maintain the Iditarod National Historic Trail". The State will reserve a 1000-foot-wide corridor which will provide a buffer with enough width to, a) conserve the wilderness characteristics of the Iditarod Trail, b) provide enough width to separate conflicting uses such as motorized and non-motorized uses in areas where multiple uses are recommended, and c) allow for development of future compatible trail facilities.

A 1000-foot-wide corridor was identified in the 1986 Comprehensive Plan for the Iditarod National Historic Trail (INHT) and in the States' Kenai Area Plan (2000). The Comprehensive Plan identifies "Trail Corridor Guidelines" which provide that "A 1000-foot-wide corridor will be established on federally managed Trail segments which are recommended for both Active Management and National Register nomination... For Trail segments on: 1) State patented lands, 2) lands tentatively approved for patent under the Alaska Statehood Act, or 3) patented local government lands, rights-of-way consistent with those on federally managed lands are recommended". The Kenai Area

Plan states that...."the authorization or conveyance will be subject to the route (or alternate route) and a buffer along the route that ensure continuous trail links along the INHT. The route will be protected by a 1,000-foot-wide corridor (500 feet on each side of the centerline)".

The USFS will be granted a 100-foot-wide easement within the 1000-foot-wide corridor to construct and maintain the trail, trailheads and any necessary bridges, as well as interpretive signing. All trail and trail associated development within the 1000-foot-wide corridor will be consistent with the Iditarod National Historic Trail Comprehensive Plan and approved by the Department of Natural Resources (DNR). The State reserves the right to reduce the buffer width and/or relocate the trail should unforeseen future circumstances arise. Any relocation in size or relocation of the trail easement would be done in consultation with the USFS and at the sole expense of the party requrewsting the relocation. Any relocation shall provide a continuous uninterrupted trail easement consistent with the 1986 Comprehensive Plan for the Iditarod national Historic Trail and protect the capitol investment of trail construction and facilities should relocation be needed.

PROPOSED ACTION: Subject to the provisions of AS 38.05 and pursuant to the regulations promulgated there under, the Division of Mining, Land and Water is proposing to reserve a 1000-foot-wide corridor across state lands, of which a 100-foot-wide easement will be granted to the USFS. The purpose for the easement is to map, construct and maintain a trail network and trailheads to connect the Iditarod National Historic Trail between Seward to Girdwood. The proposed public easement will establish legal public access to and along the trail at all points where the trail crosses state-owned lands.

In late January, 2004, the USFS completed a Decision Notice and Finding of No Significant Impact for the Seward to Girdwood Iditarod National Historic Trail. Trail plans were identified in the final decision. A 45-day public comment period regarding the Decision Notice ended in March, 2004. The next step in the process of actual upgrading, realignment or construction of the trail that crosses state lands is to establish legal easements. This process follows the trail plans set forth by the USFS in the Decision Notice.

The 1000-foot-wide corridor will encompass the trail. Within the 1000-foot-wide corridor, the state will enter into a Management Agreement with the USFS. The agreement will describe USFS responsibilities for signing, enforcement, maintenance, allowed uses and garbage removal within the corridor. The trail easement will be located across State lands adjacent to and roughly parallel to the Seward Highway from the City of Seward to the Winner Creek area near Girdwood. Construction is slated to begin in the autumn of 2004 and continue through 2008. Any uses outside the 100-foot-wide trail easement but still within the 1000-foot-wide corridor must be consistent with the Kenai Area Plan. In some areas along the trail on state-owned land, the USFS has an existing public easement. If the width of the existing easement is less than 100-feet the width will be widened to 100-feet. Existing easements over 100-feet-wide will not be reduced.

A Temporary Easement Authorization (TEA) will be issued to allow immediate site preparation and construction. A permanent trail easement will be granted when an as-built survey is submitted by the USFS and approved by DNR for platting purposes as various sections of the trail and trailheads are completed.

LEGAL AUTHORITY: AS 38.05.850, 11 AAC 55.040 and 11 AAC 51.015

ADMINISTRATIVE RECORD: The administrative record for the easement application submitted is ADL 228890.

LOCATION: The public easement will be located across a discontinuous patchwork of state-owned land beginning just north of Seward, Alaska continuing to the Winner Creek area near Girdwood, Alaska.

The following is an overview of the easement application:

At Nash Road, mile 2.1 Seward Highway, just north of Seward, the USFS will upgrade and reconstruct the Nash Road Trailhead to accommodate up to 20 vehicles, vault toilets, a kiosk and trash container. The Iditarod trail will lead from the parking area across state lands on an existing trail and a relocated trail alignment across Kenai Borough Lands continuing north, entering state lands on an existing 100' wide easement in section 18 and 7, then continuing to the Bear Lake Road trailhead. The trailhead will be located at the south end of Bear Lake and will consist of a parking area of 1 acre to accommodate up to 5 vehicles, a vault toilet, and an information/interpretive kiosk and trash container. The trail from Nash Road to the Bear Lake trailhead will be a single, 3-foot wide trail within a 10-foot cleared width for year-round, multiple-use. The trail will be reconstructed utilizing small mechanized trail building equipment and hand tools. Any necessary bridges will be fully-engineered and built to meet USFS safety standard requirements. Trail and trailhead construction is anticipated to be started in 2005.

At mile 5.2 Seward Highway the first ½ mile of the Lost Lake winter trail, located on a 25-foot-wide easement, reserved to the U.S., across state lands will be relocated to improve access for snowmachiners. The USFS will be granted a 100-foot wide easement.

From the Bear Lake Trailhead the trail easement will continue along the east side of Bear Lake. The existing 60-foot-wide easement width, reserved to the U.S. in the conveyance to the state, will be widened to 100-feet within a 1000-foot-wide corridor. A winter snowmachine "trail" will be marked along the length of Bear Lake from south to north during safe ice conditions. Planned management will provide that in summer months all-terrain vehicles are allowed on the trail from Nash Road to Bear Lake but prohibited along the east side of Bear Lake. The trail continues on an existing easement and then onto USFS land until it forks to the west and enters (S002N001E) back onto state land in the western half of section 20 and then across section 19 and into section 18 before coming to the Seward Highway at approximately Mile 12.

Just south of the trail on the western side of the Seward Highway at mile 11.6 the USFS will be granted a 1.5 acre easement for the Goldenfin Lake Trailhead and a 100-foot-wide easement for the existing trail from the parking area across State land to the boundary of Federal land near Goldenfin Lake and then travels north onto USFS land. Interpretive signs will be added to the existing trailhead parking area. The trail continues north across federal lands to Rocky Creek where the trail passes over state land on an existing 20-foot easement through the western half of section 6 (T 04 N, R 01 E, S.M.) The existing 20-foot-wide easement will be widened to 100-feet. The trail continues north across federal land through section 31 until it reaches the southern boundary of Section 30. Here the Iditarod Trail connects with the Ptarmigan Creek trail and campground at Seward Highway Mile 23. The trail then travels north across state-owned lands for approximately 1.5 miles to the Crown Point Road. The 9 acre trailhead for this portion of the trail is located at Seward Highway, mile 25. The trailhead will be upgraded to hold up to 50 vehicles of which 2/3 will be accommodated in the paved area and 1/3 in an overflow area. The trailhead is used to access the Iditarod Trail along the existing Vagt Lake trail continuing north to a side trail to access Grant Lake. The main Iditarod trail will continue north to the northeast tip of Upper Trail Lake where the trail crosses back onto federal land. A 100-foot-wide easement will be granted for this section, along with a site easement for the trailhead at mile 25. A winter motorized trail is planned to run from south to north across Kenai Lake and both Lower Trail Lake and Upper Trail Lake when ice conditions are safe.

At mile 32.6 the Johnson Pass trailhead on the north side of the highway begins and travels across state-owned land northeast on an existing 25-foot wide easement. The USFS easement will be widened to 100-foot.

The next time the Iditarod Trail crosses state-owned land is in the Turnagain Pass area. The trail will traverse state-owned land north of the existing power easement and is currently planned to be a winter-only motorized trail. The trail will be brushed only to a width of 16-feet within a 100-foot-wide easement. The trail will begin to cross state land in the east half of section 6 (T 08 N, R 02 E, S.M.) and travel through portions of sections 31, 32, 33, 28 27 and 26 (T 09 N, R 02 E, S.M.). The trail is slated to be brushed in the autumn of 2004.

Winner Creek / Crow Pass Area (Girdwood). The Iditarod National Historic Trail continues on federal land until it begins to cross Anchorage Municipal land and some state-owned land in Girdwood. A small section of the trail crosses the eastern portion of section 9, the western half of section 10 and traverses across section 11 (T 10 N, R 02

E, S.M.). The trail connects to the Crow Pass trail leading into the Eagle River Valley. The Winner creek trail is located on an existing 25-foot wide easement that will be widened to 100-feet.

PUBLIC NOTICE: Formal public notice of the easement under AS 38.05.945 was published in the following southcentral and statewide Alaska newspapers:

Newspaper	Public Notice Publish Date
Anchorage Daily News	August 11, 2004
Seward Phoenix Log	August 19, 2004

Copies of the notice were also sent to the following post offices:

Girdwood, Hope, Moose Pass, Seward and Copper Landing.

The public and agency comment period began on August 11, 2004 and ended on September 10, 2004. No public hearings were requested.

PUBLIC COMMENTS: One written comment was received in favor of the state granting the easement to the USFS. The commenter thought a 1000-foot-wide easement was excessive and might allow the USFS to much control of state land that a 100-foot-wide easement might be to small to allow room for seasonal variations of snowmobile routes will be marked, groomed, or ridden to 16-feet or wider; that buffer zones should be maintained along the trail corridor; and, that the state should consider developing routes to allow the use of snowmobiles in the Winner Creek area if there is a Ski Area expansion because the area would be suitable for snowmobile tours.

RESPONSES TO COMMENTS: The DNR is in agreement with the comment that a 1000-foot-wide easement may be excessive and therefore has recommended a 100-foot-wide easement. A 1000-foot-wide corridor was identified in the 1986 Comprehensive Plan, for the INHT and in the states' Kenai Area Plan (2000). Therefore, the state is reserving a 1000-foot-wide buffer to adhere to both the Kenai Area Plan and the Comprehensive Plan for the Iditarod National Historic Trail.

The USFS has identified the trail plan in the Environmental Assessment (EA). These trail plans are part of the right-of-way application to the DNR. Additional trails will not be considered unless another application is submitted to the DNR and goes through the formal public process.

TEMPORARAY EASEMENT STIPULATIONS: The following stipulations will be incorporated in the temporary easement authorization as "Attachment A". The Regional manager reserves the right to modify the following stipulations or include additional stipulations as necessary prior to the final grant of the easement.

GENERAL STIPULATIONS

1. **Authorized Officer**

The Authorized Officer (AO) for the State of Alaska (Grantor), Department of Natural Resources is the Southcentral Regional Manager or designee of the Division of Mining, Land and Water. The AO may be contacted at 550 W. 7th Avenue, Suite 900 C, Anchorage, AK 99501-3577 or (907) 269-8503.

2. **Reservation and Grant of Rights**.

   A. Grantor reserves the right to grant additional authorizations to third parties for compatible uses on or adjacent to the land encumbered by this easement only so long as the grant does not unreasonably interfere with the rights granted to the United States (Grantee), acting by and through the USDA Forest Service, by this easement.

   B. Grantor may require authorized concurrent users of state land to enter into an equitable operation or maintenance agreement.

   C. Authorized concurrent users of such State land, their agents, employees, contractors, subcontractors, and licensees shall not interfere with the operation or maintenance activities of each user.

   D. The administration of the easement granted herein shall be in the Grantee, including the right to regulate the occupancy and use of the easement and any acts or omissions occurring on or within the easement.

3. **Assignment**

This easement may be transferred or assigned with prior written approval from the AO.

4. **Maintenance**.

Grantor assumes neither responsibility for maintenance of improvements constructed on Grantor's land nor liability for injuries or damages attributable to that construction.

5. **Destruction of Markers**

All survey monuments, witness corners, reference monuments, mining claim posts, bearing trees, and unsurveyed lease corner posts shall be protected against damage, destruction, or obliteration. The Grantee shall notify the AO of any damaged, destroyed, or obliterated markers and shall reestablish the markers at the Grantee's expense in accordance with accepted survey practices of the Grantor.

6. **Site Maintenance**

The area subject to this easement shall be maintained in a neat, clean and safe condition, free of any solid waste, debris or litter.

7. **Site Restoration**

The area subject to this easement shall be restored to the same or similar condition as it was upon the grant of this easement.

8. **Inspection.**

Authorized representatives of the State of Alaska shall have reasonable access to the subject parcel for purposes of inspection.

9. **Compliance with Governmental Requirements; Recovery of Costs**

Grantee shall, at its expense, comply with all applicable laws, regulations, rules and orders, and the requirements and stipulations included in this easement. To the extent authorized by law, the Grantee shall ensure compliance by its employees, agents, contractors, subcontractors, licensees, or invitees.

10. **Other Authorizations**

The issuance of this easement does not alleviate the necessity of the Grantee to obtain other applicable authorizations required by other agencies for this activity.

11. **Violations**

In the event the AO becomes aware of an event or circumstance of non-compliance with the terms and conditions of this easement, the AO shall give written notice to the USFS of such event or circumstance of non-compliance. If the event or circumstance of non-compliance is not corrected as quickly as feasible, the AO is entitled to enforce any term or condition and require that the land encumbered by this easement be restored promptly to substantially the same condition that existed prior to the event or circumstance of non-compliance. If the easement is not restored to substantially the same condition the AO may revoke the easement for non-compliance with the stipulations. A decision to revoke would be appealable.

12. **Change of Address**

Any change of address must be submitted in writing to the Authorized Officer.

13. **Federal, State and Local Laws and Regulations**

A. The USFS shall comply with all applicable federal, state and local laws and regulations, existing or hereafter adopted, affecting in any manner, construction of this project.

B. Should the USFS or its contractors require any water use for construction purposes from area streams, lakes, or wells, a temporary water use permit will be required. Contact the Public Information Center at (907) 269-8400.

C. The USFS shall utilize the lands herein granted consistent with the purposes of the proposed use, as revealed by the application therefore, and shall maintain the premises in a neat and orderly manner and shall adopt and apply such safety measures as shall be necessary, proper and prudent with respect to the use to which the land is subjected.

E. The USFS shall take all reasonable precaution to prevent and suppress brush and forest fires during construction and maintenance. No material shall be disposed of by burning in open fire during the closed season unless a permit therefore has first been obtained from the agency empowered by law to issue such permits.

14. **Indemnification**

The Grantee shall be responsible for any claim or demand for loss or damage, including property damage, personal injury, wrongful death, and wage or employment claims, arising out of or in connection with the use or occupancy of the easement area only to the extent provided by and in accordance with the Federal Tort Claims Act.

15. **Changes in Conditions**

Unforeseen conditions arising during construction of the project may make it necessary to revise or amend these stipulations. In this event, the AO and the Grantee will attempt to agree as to what revision or amendments shall be made. If the parties are unable to agree to resolve the matter in dispute informally, the matter shall be elevated to the Commissioner of Department of Natural Resources (DNR) and the Regional Forester to resolve jointly. The Commissioner of DNR will reserve the right to revise or amend stipulations during the construction phase of the project should he be unable to come to agreement with the Regional Forester. The decision(s) are appealable.

16. **Valid Existing Rights**

This easement, and the rights and privileges granted by it, is subject to all valid existing rights in and to the land that is the subject to this easement. Grantor makes no representations or warranties either expressed or implied as to the existence, number or nature of any valid existing rights.

17. **Request for Data**

For purposes of information and review, the Grantor at any time during normal business hours, may require data related to preconstruction or construction activities undertaken in connection with the project. To the extent authorized by applicable law, the Grantee shall furnish to the State, within a reasonable time after it makes its request, data related to pre-construction or construction activities undertaken within the easement area:

18. **Proper Location**

Issuance of this easement is only for authorization to enter onto Grantor's land and does not authorize any activities on private, trust, municipal or native lands. The Grantee is responsible for proper land ownership verification on site.

19. **Survey**

A. The USFS shall submit an as-built survey for the entire trail route located on state land, utilizing the minimum mapping requirements for trail location maps (Attachment "B") on DNR managed lands, on or before the expiration date of the TEA. The as-built survey must be completed by September 1, 2009, one year after the anticipated completion of the last segment of trail construction as noted in the original DNR easement application. An extension may be granted by the DMLW. The as-built survey should depict the centerline of the 100' permanent easement and will also serve as the center line for the 1000' buffer. With final approval of the as-built survey by DMLW the Public Access Easement will be issued.

B. All survey monuments, witness corner, reference monuments, mining claims posts, bearing trees and un-surveyed lease corner posts shall be protected against damage, destruction or obliteration. Any damaged, destroyed or obliterated markers shall be re-established in accordance with accepted survey practices of the division at the expense of the Grantee.

20. **Fine Tuning / Easement Revocability**

Any changes in the alignment of the project area will require the prior written approval of the AO. The AO reserves the discretionary authority to require a re-determination of the Grantor's best interest for any significant proposed changes.

The easement shall not be revocable unless the land becomes used for purposes other than those compatible with the Iditarod National Historic Trail Comprehensive Plan. If in the future development of the land encumbered by this easement has been determined, through a public process to have a higher economic benefit to the Grantor, consistent with the public interest the 100-foot-wide easement may be reduced and/or relocated within the corridor and/or the corridor width may be reduced by mutual agreement of Grantor and Grantee or the easement and corridor may be relocated to a mutually agreeable location consistent with AS 38.05.850. Any reduction in size or relocation of the trail easement shall be undertaken in consultation with the Grantee and at the sole expense of the party requesting the relocation. Any relocation shall continue to provide a continuous uninterrupted trail easement consistent with the 1986 Comprehensive Plan for the Iditarod National Historic Trail and protect Grantee's capital investment of trail construction and facilities should relocation be needed. Grantee shall participate in the decision and is eligible to appeal any decision in accordance with Grantor's regulations.

21. **Termination, Abandonment, or Revocation**

Upon abandonment, termination, revocation or cancellation of this indenture, the Grantee shall within 90 days to remove all structures and improvements from the area herein granted, except those owned by the Grantor, and shall restore the area to the same or similar condition as the same was upon the issuance of this temporary easement. Should the Grantee fail or refuse to remove said structures or improvements, within the time allotted, they shall revert to and become the property of the Grantor. However, the Grantee shall not be relieved of the cost of the removal of the structures, improvements and/or the cost of restoring the area. The Grantor, in his discretion, may alter or modify the requirements contained in this provision if it is to the best interest of Grantor to do so.

In case the necessity for the temporary easement shall no longer exist, or the Grantee should abandon the project, this temporary easement authorization shall terminate.

22. **Fees, Bonds and Performance Guarantees**

Under a reciprocal agreement with the Grantee, Grantor shall waive all fees associated with this public easement. In addition, the Grantor will waive all bonding, under 11 AAC 96.

23. **The Alaska Coastal Management Program**

The Grantee is responsible for complying with the advisories that were identified in the ACMP Final Consistency Determination, State ID No. AK 0307-08AA, dated November 24, 2003.

24. Miscellaneous Stipulations

Project construction should be consistent with the Kenai Area Plan. Chapter 2 – Trails and Access, page 59, which states "No permanent structures or equipment should be placed within the trail corridor if they could adversely affect the trail experience unless the management intent, for the unit specifically allows for it. Where necessary, trail crossings may be permitted to allow access to lands on both sides of the trail."

25. ENVIRONMENTAL PROTECTION

A. Erosion Control/Water Quality

(1) Grantee shall conduct all operations in a manner which will prevent unwarranted erosion. Any erosion shall be repaired to the extent possible, to its original condition, at the expense of the Grantee.

(2) Grantee shall install silt fences or implement other methods as necessary to filter or settle suspended sediment from drainage wastewater from the roadway construction prior to direct or indirect discharge into surface waters or wetlands for protection against water quality or wetlands degradation. Any structure shall be maintained until disturbed or deposited material has been stabilized against erosion.

B. Oil Changes, Fueling and Storage

Oil changes and fueling operations for construction and maintenance shall not occur within the annual floodplain (vegetation to vegetation line) or within 100 feet from any river, stream, drainage channel or waterbody. All petroleum products and hazardous materials shall not be placed within 100 feet of water bodies and must be within an impermeable, diked area at 110 percent capacity of the largest independent fuel container. Manifolded tanks or bladders must be considered as a container.

C. Oil Spills

Grantee shall comply with all applicable state and federal laws relating to oil spills and hazardous materials.

D. Waste Disposal

All waste generated during construction activities under this easement shall be removed or otherwise disposed of as required by applicable state and federal law.

E. Antiquities and Historical Sites

Should archaeological, historical or paleontological resources be discovered as a result of or during the activities authorized by this easement, all activities that would disturb such resources must be stopped and the State Historical Preservation Officer at Division of Parks and Outdoor Recreation, Office of History and Archaeology be contacted immediately at 269-8721. Any field activities shall not resume without the approval in writing by the AO.

F. Vegetation

Clearing shall be performed in a manner that will maximize preservation of natural beauty, conservation of natural resources and minimize marring and scarring of the landscape or silting of streams. All reasonable precautions shall be taken during operations to prevent unnecessary damage to residual trees.

G. Access - Limits of Authorization

(1) This easement only grants access to the project on the routes described in this easement. All other access to the easement shall be on existing rights acquired or reserved by the Grantee.

(2) No additional access trails or roads are authorized on state lands without the express permission of the AO.

FINAL FINDING AND DECISION:

The Southcentral Regional Land Office of the Division of Mining, Land and Water recommends approval of a 100-foot-wide temporary easement to the SDA Forest Service subject to the terms, conditions and general stipulations within this Final Finding and Decision. A 1000-foot-wide buffer will be reserved to the state. The final finding presented above has been reviewed and considered. The case file has been found to be complete and the requirements of all applicable statutes and regulations have been satisfied. It is the finding of the Regional Manager that it is in the best interest of the state to grant this easement, under the authority of AS 38.05.850.

Richard B Thompson 11/10/04

Richard B. Thompson, Regional Manager
Southcentral Regional Land Office

Date

APPEAL PROVISION:

A person who is affected by this decision and who provided timely written comment or public hearing testimony on this decision may appeal it, in accordance with 11 AAC 02. Any appeal must be received by **December 13, 2004** and may be mailed or delivered to Thomas E. Irwin, Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501-3561; faxed to 1-907-269-8918; or sent by electronic mail to dnr_appeals@dnr.state.ak.us. An eligible person must first appeal this decision in accordance with 11 AAC 02 before appealing this decision to Superior Court. A copy of 11 AAC 02 is enclosed for your information.

KENAI HYDRO COMMUNICATION RECORD

DATE: May 5, 2010

TO: Consultation file

FROM: Sirena Brownlee, HDR Alaska

SUBJECT: Forest Service request re: bear den surveys in the Project area

Mary Ann Benoit at the Forest Service Seward Ranger district called me to discuss the planned bear den survey for the Project. I have been working with her on the development of the wildlife draft study plan for the Grant Lake Project.

She called to tell me that she is flying near our study area tomorrow to conduct a bald eagle survey of several locations in the Seward Ranger district (including our study area). She said the Forest Service has extra air time tomorrow and suggested that she should conduct the bear den survey for us tomorrow since they will be in the area. She said that the Forest Service prefers to do the surveys themselves and avoid extra flights in the area. She said she understood we already had flights scheduled, but that there was no need to have additional flights out there since they will thoroughly cover our study area.

She will provide me with the GPS points of any bear den or bald eagle nests or trumpeter swan locations in our study area. She is planning to fly Grant Lake, Grant Creek and Falls Creek and areas in between that contain our project components. Therefore, we do not need to conduct an aerial bear den or Raptor survey of the study area. Mary Ann said the data she collects will be sufficient for any Forest Service review of impacts.

From: tom harkreader [harkfamily@yahoo.com]
Sent: Tuesday, May 11, 2010 3:00 PM
To: Jenna Borovansky
Subject: Re: Grant Lake Project Draft Study Plans and Project Update available

Jenna
I am the stake holder (we have spoke on the phone in the past) with the mining claims on the north end of Grant lake including the area where the cabins are, this lower claim extends into the water, the upper claims extend up the mountain side. I see that there may be a site visit in June, I will be in the area prospecting at that time. I would be interested in visiting with the person in charge of the evaluation to answer any questions, I don't for see any major problems or conflicts with your project at this time, although our approved trail does follow the lake shore. Hopefully your site crew will refrain from taking pictures of our upper case mine which is very high on the mountain well above the 1000 foot level. We do have a trail up the mountain with a good veiw of the lake. Also we do have some mineral material stockpiled on the lower claim, please refrain from disturbing this. At this time we are doing limited prospecting on the lower claim near the cabin and lake.
Any questions or concerns please feel free to get in touch with me.
Tom Harkreader

--- On **Tue, 5/4/10, Jenna Borovansky <*jborovansky@longviewassociates.com*>** wrote:

From: Jenna Borovansky <jborovansky@longviewassociates.com>
Subject: Grant Lake Project Draft Study Plans and Project Update available
To: "comments@kenaihydro.com" <comments@kenaihydro.com>
Date: Tuesday, May 4, 2010, 3:56 PM

Dear Interested Parties,

Kenai Hydro has several updates to share with you on the Grant Lake Project:

1) A revised Project description removing the Falls Creek diversion was filed with FERC on May 3, 2010 and can be found on the KHL website at: www.kenaihydro.com/documents/index.php

2) Under the Traditional Licensing ~~Process, the second stage of consultation (fo~~llowing issuance of the Pre-Application Document [PAD] and comment period) requires a Project applicant to consult with agencies and conduct necessary studies to assess resource impacts. To facilitate this consultation, KHL is providing draft study plans based on the PAD, comments received to date, and consultation with resource agencies and stakeholders . Per the communications protocol outlined in the PAD, KHL is requesting comments within 30-days. KHL will be providing five separate study plans:

   a. Aquatic Resources Draft Study Plan –now available at www.kenaihydro.com [Written comments requested by June 4.]

b. Water Resources Draft Study Plan – now available at www.kenaihydro.com [Written comments requested by June 4.]

c. Cultural Resources Draft Study Plan - to be posted to the website by the end of this week [Written comments request by June 7.]

d. Terrestrial Resources Draft Study Plan – to be posted to the website by the end of this week [Written comments requested by June 7.]

e. Recreation and Visual Resources Draft Study Plan – to be posted to the website by the end of this week [Written comments requested by June 7.]

3) KHL spoke with FERC staff and agencies regarding their availability for a scoping meeting and site visit the first week in June. FERC will be communicating its plans soon, but pending confirmation of logistics, the tentative date for a site visit and an evening public scoping meeting in Moose Pass is Wednesday, June 2 with a second scoping meeting the morning of Thursday, June 3.

4) Once the details of the FERC scoping meetings are confirmed, FERC will be providing formal notice and KHL will forward the information to this distribution list. KHL also plans to provide additional information on opportunities for discussion of study plans in conjunction with the scoping meeting and site visit.

Written comments may be emailed to: comments@kenaihydro.com .

Thanks for your continued interest in the Grant Lake Project.

Sincerely,

Jenna Borovansky

Long View Associates, Inc.

On behalf of Kenai Hydro, LLC

208.765.1413

From: Jenna Borovansky
Sent: Tuesday, May 11, 2010 12:51 PM
To: comments@kenaihydro.com
Subject: Grant Lake Project: Draft Study Plans Available and FERC Scoping Meeting Notice

Dear Interested Parties,

The remaining three draft study plans (Recreation/Visual Resources, Cultural Resources, and Terrestrial Resources) for Kenai Hydro, LLC's proposed Grant Lake Hydroelectric Project (FERC No. 13211/13212) have been posted to the Kenai Hydro website, and can be accessed on the work group pages via the following links:

- Recreation and Visual Resources (http://www.kenaihydro.com/work_groups/human_environment.php)
- Terrestrial Resources (http://www.kenaihydro.com/work_groups/terrestrial_environment.php)
- Cultural Resources (http://www.kenaihydro.com/work_groups/cultural_resources.php)

Written comments are requested on these plans by June 7, and may be emailed to comments@kenaihydro.com. The water resources and aquatic resources draft study plans were posted last week, with written comments requested by June 4.

Please note the Project vicinity figures in the three study reports posted today have been revised to reflect a refined proposed road and transmission line alignment based on ongoing engineering work. While the aquatic and water resources study programs are not directly affected by this alignment change, the Project vicinity figures in the water resources and aquatic resources study plans will be updated to reflect these changes when finalized after the comment period.

FERC has released its scoping notice regarding the upcoming scoping meetings. The scoping notice also includes a list of issues for consideration and a draft schedule for FERC's analysis of the license application. The full document is available at www.ferc.gov, and has been posted at: http://www.kenaihydro.com/documents/index.php . A summary of the meeting logistics are below:

- Wednesday, June 2: FERC Environmental Site Review (8 am – 5 pm) – RSVP required to jborovansky@longviewassociates.com no later than May 23, 2010 (Meet at the boat launch at 31702 Depot Road [Scenic Mountain Air], Moose Pass)
- Wednesday, June 2: FERC Public Scoping Meeting (7 pm – 10 pm) – Moose Pass Community Hall
- Thursday, June 3: FERC Agency/Public Scoping Meeting (10 am – 2 pm) – Moose Pass Community Hall
- Thursday, June 3 (tentative): Kenai Hydro, LLC hosts Draft Study Plan Comment/Discussion for all resource areas following FERC scoping meeting (early afternoon)

Thank you for your continued interest in the Grant Lake Project.

Sincerely,
Jenna Borovansky
Long View Associates, Inc.
On behalf of Kenai Hydro, LLC
208.765.1413

From: David Pearson [davidelipearson@gmail.com]
Sent: Monday, May 17, 2010 11:42 PM
To: comments@kenaihydro.com
Cc: claire shipton
Subject: comments

Dear Kenai Hydro LLC

Looking at the Human Environment Working Group's 2010 Draft Recreation and Visual Resources Study Plan there is only mention of recreation and visual resources and not any mention of loss of standard of living by those who live off of Lower Trail Lake Rd (Mine Rd). Heavy equipment, freight trucks, and construction workers will use the road that is currently seldom used. If the dam road becomes a public road with facilities on the lake side it would increase traffic on the road greatly after the construction project ends. How will this new use effect the lifestyles of those who live on the road and will it increase crime in the area?

--
David E. Pearson
907-288-4111

From: Zubeck, Brad [BZubeck@HomerElectric.com]
Sent: Tuesday, May 18, 2010 4:25 PM
To: Valerie Connor
Cc: Gallagher, Joe; Jenna Borovansky
Subject: RE: Grant Lake

Hi Valerie,

Thanks for your note and concerns. Let me address your main concern first… As soon as possible following our Board's decision to proceed with the Grant Lake project, KHL consulted with agencies regarding their availability for the FERC scoping meetings during the first week of June, and they responded favorably.

Remember that agencies and the public have already filed formal comments on the project and told us what issues they believe should be studied. These comments were filed at a time when agency personnel and the public should have had the most time available to them to consider and develop such comments. Consultation with agencies also took place during the development of the KHL's draft study plans that are available now for review. As a result, one could expect that the agencies and public have already provided most, if not all, of their comments. The FERC scoping process will provide an extra opportunity for public and agencies to consider the project and file comments on the scope of issues to be considered in the licensing process. Again, FERC's involvement and the scoping process is not normally part of the TLP process. The fact that FERC is involved at this time should build the public's trust in the process.

Another thing to consider is that the 3+week notice is only the notification for the meeting itself. Comments on the scoping document will be taken by FERC for 30-days following their meeting. With respect to comments you may have on KHL study plans, we are willing to consider comments that you may file within a reasonable time after the posted deadline, giving due consideration to study elements that may be time sensitive.

The project schedule is in keeping with that presented to the public at our meetings last fall and winter, with adjustments to accommodate recent changes. KHL staff have been directed to develop a license application within the term of the existing permit. At this time, KHL has not received any grant monies in addition to those already awarded and, of course, it intends to fund the work necessary to accomplish its objective. KHL does plan to pursue additional grant funding as grant opportunities become available.

I hope this response will enhance your confidence in our study plans and the process. We look forward to your review comments.

Sincerely,
Brad Z.

From: Valerie Connor [mailto:valerie@akcenter.org]
Sent: Tuesday, May 11, 2010 12:43 PM
To: Zubeck, Brad
Subject: Grant Lake

Hi Brad,

I spoke with Joe this morning and he let me know that you are out of town but willing to address my questions and concerns about HEA's decision to hold a scoping meeting in three weeks for the Grant Lake project.

First I have to say that this abrupt change of plans has taken everyone by surprise, including many of the agency staff that I have contacted. At the January meeting, HEA indicated that the field studies for 2010 were on hold due to a lack of funds, and now 3 months later HEA announces that a scoping meeting for the project will occur in 3 weeks time. My main concern is that this short notice puts a tremendous strain on agency personnel, who the public is counting on to be fully engaged and knowledgeable about the issues and the process. Many of them have other priorities and will not be fully prepared due to HEA's surprise announcement. Additionally, as you well know, summertime is traditionally a very busy time for the average Alaskan, and many of us will be hard pressed to study the pertinent documents, prepare testimony and attend meetings.

1. So what changed since January? Has HEA secured additional funding for the project? And if so was it private or public money, or is HEA footing the bill?
2. How much money will be needed to complete the studies?
3. How does HEA justify this modification given its potential impacts to the public process?
4. Is HEA surrendering the preliminary permit for Falls Creek, or are you still considering that as a stand alone project?
5. The timing is awkward for submitting written comments on the draft study plans. Recreation and Visual Resources, Terrestrial Resources, and Cultural Resources are requested by June 7. The written comments for water resources and aquatic resources, were requested by June 4. Given the compressed timeline, I would like to request an extension for comments.

This decision by HEA to move forward this year after telling us the project was on hold is very disappointing and has damaged the public trust. I would have preferred a more forthcoming explanation.

Thanks for taking the time to answer my questions. I appreciate it.

Sincerely,

Valerie Connor
Conservation Director
Alaska Center for the Environment
807 G Street, Suite 100
Anchorage, Alaska 99501
(907)274-3632
valerie@akcenter.org

From: Jenna Borovansky
Sent: Tuesday, May 18, 2010 9:09 AM
To: 'betty'
Subject: RE: Grant Lake Study Plan

I am sorry you are having problems with the website, try to direct link to a pdf below, and if that does not work, I will email you the pdf.

http://www.kenaihydro.com/work_groups/studyplans/Aquatic_Resources_Draft_Study_Plan_April2010.pdf

http://www.kenaihydro.com/work_groups/studyplans/Water_Resources_Draft_Study_Plan_April2010.pdf

Jenna Borovansky
208.765.1413

From: betty [mailto:songbird2@alaska.net]
Sent: Tuesday, May 18, 2010 8:30 AM
To: Jenna Borovansky
Subject: Grant Lake Study Plan

We have not been able to access the study plan with the website that is given. All we get is something that says you must have a password and join something to access.

Could you provide the draft study plan as word, pdf, etc. or send a copy of the Fish & Aquatics Draft Study Plan via snail mail? Thanks.

Jack Dean
PO Box 428
Sterling, AK 99672
songbird2@alaska.net

From: Jenna Borovansky
Sent: Thursday, May 20, 2010 1:13 PM
To: ricky@kenairiversportfishing.com; ginny.litchfield@alaska.gov; douglas_palmer@fws.gov; kimberly.sager@alaska.gov; susan.walker@noaa.gov; Jenna Borovansky; mcooney@arctic.net; jason.mouw@alaska.gov; bzubeck@homerelectric.com; thomas.cappiello@alaska.gov; jeffry_anderson@fws.gov; Steve Padula; robert.begich@alaska.gov; dave.c.casey@usace.army.mil; gfandrei@ciaanet.org; jim.ferguson@alaska.gov; jjh@seward.net; lynnda_kahn@fws.gov; lee.mckinley@alaska.gov; north.phil@epamail.epa.gov; gary.prokosch@alaska.gov; ronaklo@att.net; robert@kenaiwatershed.org; rspangler@fs.fed.us; wamacfarlane@fs.fed.us; paul.mclarnon@hdrinc.com; jmorsell@northernecological.com; joe_klein@alaska.gov; bstanley@fs.fed.us; Eric.Rothwell@noaa.gov; jslang@fs.fed.us; sstash@fs.fed.us; donald.barclay@hdrinc.com; james.brady@hdrinc.com; Cunningham, Erin E.
Cc: 'mark.ivy@ferc.gov'; 'kim.nguyen@ferc.gov'; ryan.hansen@ferc.gov
Subject: Grant Lake Instream Flow TWG Meeting Announcement and Agenda

Greetings Grant Lake Instream Flow Technical Work Group Members,

Kenai Hydro, LLC (KHL) is proceeding with its full study program this summer to support the development of a license application filing for the Grant Lake Project in the fall of 2011. (Note, as described in earlier emails, the Falls Creek diversion is no longer being considered for the Project.) A draft study plan for the aquatics resources is available at: http://www.kenaihydro.com/work_groups/fish_hydrology.php . You can also find a link to the 2009 baseline study report on that web-page. The draft study plan is based on input received from the Technical Work Group (TWG) last summer and fall. We have requested written comments by June 4, 2010 (to comments@kenaihydro.com) and will discuss any comments at our next TWG meeting (details below). We greatly appreciate your participation to date and hope you will be able to attend.

A meeting of the Instream Flow TWG for the proposed Grant Lake Hydroelectric Project will be held on **Tuesday, June 22, 2010 in Anchorage, Alaska**. The meeting location will be at the CIRI Building (hosted by HDR, 208.644.2000), in the 1st floor meeting room at **2525 C. Street, Anchorage.** Meeting time will be from **10:00 am until about 3:30 pm** to allow time for travel from the Kenai Peninsula. Teleconferencing will be available for those unable to make it to Anchorage. Lunch will be provided.

A draft meeting agenda is:

- Summary of the TWG Process to Date – Where we are and how we got here (John Morsell)
- Introduction to Michael Barclay, new instream flow coordinator for the project (John Morsell)
- Presentation of current study methodology (Michael Barclay)
    - Field work completed to date
    - Examples of analytical methods
- Questions, Comments, and Discussion Regarding the Instream Flow Study Plan (Group)
- Questions, Comments, and Discussion Regarding other Aspects of the Aquatic Resources Study Plan (Group)
- Summary of 2010 Field Work Conducted to Date Relative to Fish Resources (John Morsell/James Brady)

Work has already begun on time sensitive components of the study plan (e.g., rainbow trout surveys) and initial instream flow measurements have been taken, so we will be able to discuss examples of the proposed instream flow analyses with you at the meeting.

Please reply to Jenna Borovansky (jborovansky@longviewassociates.com) prior to June 8 if you plan to attend the TWG meeting. Let us know whether you will be attending in person or by teleconference. You may address technical questions to John Morsell (360.592.4267, jmorsell@northernecological.com).

If you did not have an opportunity for a site visit during the September, 2009 TWG meeting, there will be another opportunity on June 2, 2010 associated with the FERC Scoping meeting. Please contact Jenna Borovansky (jborovansky@longviewassociates.com) by May 23, 2010 to RSVP for the site visit, if you have not already done so.

Thank you,
Jenna Borovansky
Long View Associates, Inc.
On Behalf of Kenai Hydro, LLC
208.765.1413

From: Zubeck, Brad [BZubeck@HomerElectric.com]
Sent: Friday, May 21, 2010 9:13 AM
To: Douglas_Palmer@fws.gov; jason.mouw@alaska.gov; Jenna Borovansky; mark.ivy@ferc.gov
Cc: jim.ferguson@alaska.gov; susan.walker@noaa.gov; kaoleary@fs.fed.us; valerie@akcenter.org; Phil_Brna@fws.gov; Lynnda_Kahn@fws.gov; Jeffry_Anderson@fws.gov; Klein, Joseph P (DFG); Phil_Brna@fws.gov
Subject: RE: Grant Lake Project Draft Study Plans

Doug, Jason, Karen and Agencies Representatives,

Thanks for sharing your current and potential staffing demands and need or support for an extension of the comment period. Our April 24th notice was sent out as soon as possible following our Board's decision to proceed with the Grant Lake project in order to get the project back in front of agencies and interested parties. The overall project schedule is in keeping with that presented to the public at our meetings last fall and winter, with adjustments to accommodate recent changes. Kenai Hydro LLC (KHL) staff have been directed to develop a license application within the term of the existing permit, as such we will continue to proceed with studies on the timelines identified in the study plans in order to support a timely license application.

KHL appreciates and has incorporated the feedback that agency representatives have given to the HDR study leads through the summer and fall of last year on the fisheries and instream flow studies. We also appreciate the assistance this spring as we consulted agencies on methodologies for the more time sensitive aspects of the terrestrial study plans. In a similar spirit of collaboration, we would appreciate comments as soon as practicable from the agencies on all of the study plans, and hope that where there are time sensitive elements, agency personnel will continue to cooperate with our study leads and provide input to ensure data collected in support of the license application will fully support the agencies' environmental review needs.

If agencies are unable to supply comments on the study plans until July 6, 2010, we are willing to consider comments that you may provide at that time, giving due consideration to study elements that are time sensitive.

We look forward to your review comments and participation in both the scoping meeting(s) and the June 22 Instream Flow TWG meeting.

Best Regards,
Brad Zubeck

From: Douglas_Palmer@fws.gov [mailto:Douglas_Palmer@fws.gov]
Sent: Thursday, May 20, 2010 2:05 PM
To: Zubeck, Brad; jborovansky@longviewassociates.com; mark.ivy@ferc.gov
Cc: jason.mouw@alaska.gov; jim.ferguson@alaska.gov; susan.walker@noaa.gov; kaoleary@fs.fed.us; valerie@akcenter.org; Phil_Brna@fws.gov; Lynnda_Kahn@fws.gov; Jeffry_Anderson@fws.gov
Subject: Grant Lake Project Draft Study Plans

Mr. Zubeck,

In order to effectively respond to your solicitation for comments on the various *Draft Study Plans* for the Grant Lake Project, the USFWS is requesting an extension of time to coincide with FERC's scoping comments deadline of July 6th. Up until April 24th, when we received an email from Long View Associates advising that the decision had been made to proceed with the full 2010 study program, we were under the impression that the project was on hold and that field studies would not be conducted this year, due to funding constraints. Thus, we scheduled other project reviews, field investigations, and priority project development. In the meantime, 1/3 of the USFWS Region 7 personnel are being asked to sign-up for possible deployment to the Gulf of Mexico to assist with the massive oil spill clean-up efforts. It wasn't until May 4th that we were provided copies of "some" of the *draft* study plans, with the remainder being submitted to us on May 11th. After a cursory review of the Aquatic Resources Study Plan, we find that many of the proposed study objectives are not well-defined or measurable which will require a more comprehensive review. In addition, any rainbow trout spawning studies that were planned for this year, as referenced in the "Aquatic Resources" *Draft Study Plan*, would not be appropriate given the timing of your request.

While we have agreed to rearrange our schedules to participate in one of the Scoping Meetings the 1st week of June, we are not prepared to provide reasonable and substantive input by your proposed deadlines. Further, due to the lack of time for appropriate interagency coordination, the Service respectfully requests an extension of time to July 6, 2010. If you have any questions please feel free to Lynnda Kahn or myself at (907) 262-9863.

****

Doug Palmer
Field Supervisor
Kenai Fish & Wildlife Field Office
43655 Kalifornsky Beach Road
Soldotna, AK 99669
(907) 260-0127

From: Karen A Oleary [kaoleary@fs.fed.us]
Sent: Thursday, May 20, 2010 7:13 PM
To: BZubeck@HomerElectric.com; Jenna Borovansky; mark.ivy@ferc.gov
Cc: Douglas_Palmer@fws.gov; Klein, Joseph P (DFG); susan.walker@noaa.gov; kaoleary@fs.fed.us; valerie@akcenter.org; Phil_Brna@fws.gov; lynnda_kahn@fws.gov; Jeffry_Anderson@fws.gov; jason.mouw@alaska.gov
Subject: Fw: Grant Lake Project Draft Study Plans

Mr. Zubeck:

The Forest Service also supports Mr. Palmer's and Mr. Mouw's recommendation to extend the deadline for comments on the Grant Lake project draft study plans.

At this time, we are unable to provide the necessary review and comment by the due dates. The field season has begun and personnel are currently unavailable to review the draft study plans. We plan to participate in the scheduled scoping meetings in June and should have more availability after the first week of June.

Thank you for considering our request to extend the comment deadline.
+++++++++++++++++++++++++++++
Karen O'Leary
Special Uses Service Team Leader
Chugach National Forest
3301 C Street, Suite 300
Anchorage, AK 99503
phone: (907)743-9542, fax: (907)743-9492
email: kaoleary@fs.fed.us
+++++++++++++++++++++++++++++
----- Forwarded by Karen A Oleary/R10/USDAFS on 05/20/2010 05:40 PM -----

"Mouw, Jason E B (DFG)" <jason.mouw@alaska.gov>

05/20/2010 02:46 PM

To BZubeck@HomerElectric.com, jborovansky@longviewassociates.com, mark.ivy@ferc.gov

cc Douglas_Palmer@fws.gov, "Klein, Joseph P (DFG)" <joe.klein@alaska.gov>, susan.walker@noaa.gov, kaoleary@fs.fed.us, valerie@akcenter.org, Phil_Brna@fws.gov, lynnda_kahn@fws.gov, Jeffry_Anderson@fws.gov

Subject RE: Grant Lake Project Draft Study Plans

Mr. Zubeck:

ADF&G supports Mr. Palmer's recommendation to extend the deadline for comments on the Grant Lake Project draft study plans to July 6th. For reasons mentioned, there has been insufficient time for intra and interagency coordination and review of the study plans. We would also like to attend the upcoming technical working group meeting scheduled for June 22 to learn more about the instream flow program before we submit our final comments.

We look forward to discussing the proposed draft studies at the upcoming scoping meetings the first week of June and thank you for considering this request to extend our comment deadline to July 6.

Thank you,

Jason E.B. Mouw
Division of Sport Fish - Research & Technical Services

Alaska Department of Fish & Game
333 Raspberry Rd. Anchorage, AK 99518
phone: (907) 267-2179
fax: (907) 267-2422
From: Douglas_Palmer@fws.gov [mailto:Douglas_Palmer@fws.gov]
Sent: Thursday, May 20, 2010 2:05 PM
To: BZubeck@HomerElectric.com; jborovansky@longviewassociates.com; mark.ivy@ferc.gov
Cc: Mouw, Jason E B (DFG); Ferguson, Jim M (DFG); susan.walker@noaa.gov; kaoleary@fs.fed.us; valerie@akcenter.org; Phil_Brna@fws.gov; lynnda_kahn@fws.gov; Jeffry_Anderson@fws.gov
Subject: Grant Lake Project Draft Study Plans

Mr. Zubeck,

In order to effectively respond to your solicitation for comments on the various *Draft Study Plans* for the Grant Lake Project, the USFWS is requesting an extension of time to coincide with FERC's scoping comments deadline of July 6th. Up until April 24th, when we received an email from Long View Associates advising that the decision had been made to proceed with the full 2010 study program, we were under the impression that the project was on hold and that field studies would not be conducted this year, due to funding constraints. Thus, we scheduled other project reviews, field investigations, and priority project development. In the meantime, 1/3 of the USFWS Region 7 personnel are being asked to sign-up for possible deployment to the Gulf of Mexico to assist with the massive oil spill clean-up efforts. It wasn't until May 4th that we were provided copies of "some" of the *draft* study plans, with the remainder being submitted to us on May 11th. After a cursory review of the Aquatic Resources Study Plan, we find that many of the proposed study objectives are not well-defined or measurable which will require a more comprehensive review. In addition, any rainbow trout spawning studies that were planned for this year, as referenced in the "Aquatic Resources" *Draft Study Plan*, would not be appropriate given the timing of your request.

While we have agreed to rearrange our schedules to participate in one of the Scoping Meetings the 1st week of June, we are not prepared to provide reasonable and substantive input by your proposed deadlines. Further, due to the lack of time for appropriate interagency coordination, the Service respectfully requests an extension of time to July 6, 2010. If you have any questions please feel free to Lynnda Kahn or myself at (907) 262-9863.

****

Doug Palmer
Field Supervisor
Kenai Fish & Wildlife Field Office
43655 Kalifornsky Beach Road
Soldotna, AK 99669
(907) 260-0127

From: Jenna Borovansky
Sent: Friday, May 21, 2010 9:33 AM
To: comments@kenaihydro.com
Subject: Grant Lake Scoping Meeting and Study Plan Review Sessions

Dear Interested Parties,

Kenai Hydro, LLC (KHL) would like to provide a reminder of upcoming FERC scoping meetings for the Project and details about opportunities to provide feedback on the draft study plans issued earlier this month.

June 2 – 3, 2010 FERC Scoping Meetings (Details in FERC scoping notice, available at: http://www.kenaihydro.com/documents/GrantLake_Scoping1.pdf)

- Site Visit – Wednesday, June 2 (8 am – 5 pm) – RSVP to jborovansky@longviewassociates.com by May 23
- FERC Public Scoping Meeting - Wednesday, June 2 (7 pm – 10 pm) – Moose Pass Community Hall
- FERC Agency Scoping Meeting (public welcome) – Thursday, June 3 (10 am – 2 pm) – Moose Pass Community Hall
- Scoping written comment deadline (comments should be made directly to FERC and reference Project No. 13211/13212) – July 6, 2010

Study Plan Discussion Sessions (hosted by Kenai Hydro) – Thursday, June 3 (2pm – 6pm, following the FERC scoping meeting) – Moose Pass Community Hall
As noted in earlier notices, we would like to provide the opportunity for feedback and questions on the study plans, in addition to the written comment opportunities. The public and agencies are invited to attend a discussion session regarding study plans. In addition there will be an opportunity for interested parties to provide information they have about the study area. Rather than hold formal work group meetings, the format for this session will remain flexible based on interest of the participants in order to allow for participation of parties who may not be available for the entire session.

- Agenda Study Plan Discussion Sessions
  - Overview of 2010 Study Plan Schedules and Involvement Opportunities
  - Concurrent Sessions to discuss and answer questions regarding the draft study plans (resource based groups will be combined based on participation/interest)
    - Cultural Resources
      - Note: Due to the privileged nature of some of the Cultural Resources information, individual consultation with interested tribes, state and federal agencies will occur outside of the public forum. However, if the public has questions or comments on the study plan, KHL will be available to discuss them at this session.
    - Recreation/Visual Resources
      - In addition to review of the study plans, Kenai Hydro is soliciting feedback on recreation and local use of the area (trails, hunting, etc)
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- Instream Flow Technical Work Group Meeting – Tuesday, June 22 (10 am – 3:30 pm) – 2525 C Street, 1st Floor Meeting Room, Anchorage
  - Draft agenda is posted at: www.kenaihydro.com under the calendar section on the main page

- Teleconferencing will be offered for those who cannot attend in person
- RSVP requested to jborovansky@longviewassociates.com by June 8 (let us know if you plan to attend in person or by phone)

Draft Study Plan – Written Comment Request Reminder

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- Terrestrial Resources Study Plan – Available at: http://www.kenaihydro.com/work_groups/terrestrial_environment.php . Comments requested by June 7, 2010.
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Written comments on all plans may be emailed to comments@kenaihydro.com .

Thank you for your continued interest in the Grant Lake Hydroelectric Project. Please contact me (jborovansky@longviewassociates.com) if you have questions about any of the documents or upcoming meetings.

Sincerely,
Jenna Borovansky
Long View Associates, Inc.
On Behalf of Kenai Hydro, LLC
208.765.1413

From: Jenna Borovansky
Sent: Sunday, May 23, 2010 5:04 PM
To: 'Mike & Kate Glase'
Subject: RE: Grant Lake Hydro project site visit

Kate,
I have you on the list to attend. The details of the visit are below. We are all meeting at the Scenic Mountain Air boat launch by 8am on June 2, and will boat to trail locations.

I believe there will be a need to cross Grant Creek side channels, so waterproof footwear is going to be useful; I will be getting a follow-up email to folks who are attending with more details. We are going to break into two groups (and then swap at lunch so each group sees both the dam location on Grant Lake and the powerhouse location on Grant Creek). Trail distance summary is:

- Grant Creek – Approximately 1-mile round trip, with minimal elevation gain… it follows the grade of the creek which is a fairly low gradient. (Boat across Trail Lake to start hike at Grant Creek outlet)
- Grant Lake – Approximately a 2.1-mile round trip with an elevation gain of approx. 200-ft. – hike in on north side via trail, then use small boat across lake to access the outlet/proposed diversion site

Environmental Site Review
Date and Time: Wednesday, June 2, 8:00 a.m. – 5:00 p.m. (Alaska ST)
Location: Scenic Mountain Air boat launch
31702 Depot Road
Moose Pass, AK 99631
Phone Number: (907) 288-3646

All participants interested in the environmental site review should meet at the Scenic Mountain Air boat launch in Moose Pass by 8 a.m. Participants should be in good health and prepared/able to hike without assistance in unimproved trail conditions for the entire day (+3 miles with 200 feet of elevation gain). Participants should also pack their own lunch, snacks and water, wear waterproof, rugged footwear, and be prepared for inclement and potentially cold weather conditions.

From: Mike & Kate Glase [mailto:glaser@seward.net]
Sent: Sunday, May 23, 2010 8:50 AM
To: Jenna Borovansky
Subject: Grant Lake Hydro project site visit

I would like to come along on the Grant Lake proposed hydro-electric project site visit hike. Where and when do we meet for the hike? What do I need to bring? (water boots, etc.?) Kate Glaser – glaser@seward.net

From: Jenna Borovansky
Sent: Monday, May 24, 2010 3:52 PM
To: 'Jeff Estes'
Cc: 'Zubeck, Brad'
Subject: RE: Grant Lake Scoping Meeting and Study Plan Review Sessions

Jeff,
The engineers have been working through various alternatives, and the "new" alignment is the most feasible, but does come much closer to the Iditarod route, as you noted. During the licensing process, Kenai Hydro plans to discuss the new road alternative with agencies and stakeholders, and will share the issues that are being addressed with the new alignment.

Thanks, Jenna

From: Jeff Estes [mailto:jestes@cityofseward.net]
Sent: Friday, May 21, 2010 11:31 AM
To: Jenna Borovansky
Subject: RE: Grant Lake Scoping Meeting and Study Plan Review Sessions

I t appears that your Road and T-line alignment are now in conflict with the 1000 foot Iditarod trail corridor and an archeological site. Your previous plan east of Vagt lake and along Crown Point mine road did not have these conflicts. Were there conflicts that promoted this plan change.

From: Jenna Borovansky [mailto:jborovansky@longviewassociates.com]
Sent: Friday, May 21, 2010 8:33 AM
To: comments@kenaihydro.com
Subject: Grant Lake Scoping Meeting and Study Plan Review Sessions

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Written comments on all plans may be emailed to comments@kenaihydro.com .

Thank you for your continued interest in the Grant Lake Hydroelectric Project. Please contact me (jborovansky@longviewassociates.com) if you have questions about any of the documents or upcoming meetings.

Sincerely,
Jenna Borovansky
Long View Associates, Inc.
On Behalf of Kenai Hydro, LLC
208.765.1413

From: Mary A Benoit [mailto:mbenoit@fs.fed.us]
Sent: Tuesday, May 25, 2010 10:32 AM
To: Brownlee, Sirena
Subject: Re: FW: Grant Lake map request

Hi Sirena, the dates look fine to me, although the goshawk surveys may be getting a little late. We normally conduct between mid June and Aug 1.

Regarding the goshawk surveys, yes it is two surveys per year for 2 seasons to meet the protocol. If you can not do the surveys to protocol it will be hard to accept the environmental analsysis regarding goshawks because the information will not be acceptable.

I am reviewing a copy of the Grant Lake Terrestrial Study Plan now.

The shapefile you sent does not have a defined coordinate system so I am unable to use it. Can you define one and resend? Thanks

From: Jenna Borovansky
Sent: Tuesday, May 25, 2010 5:10 PM
To: Jenna Borovansky; Steve Padula; jmorsell@nothernecological.coms; smorsell@northernecological.com; bzubeck@homerelectric.com; msalzetti@homerelectric.com; Paul.mclarnon@hdrinc.com; Erin.cunningham@hdrinc.com; Patrick.blair@hdrinc.com; Mark.ivy@ferc.gov; Kim.nguyen@ferc.gov; Ryan.hansen@ferc.gov; joe.klein@alaska.gov; jslang@fs.fed.us; prufrock@arctic.net; PRussell@borough.kenai.ak.us; Valerie@akcenter.org; salmonfisher@alaska.net; glaser@seward.net; Cassie_Thomas@nps.gov; bstanley@fs.fed.us; kaoleary@fs.fed.us; marionglaser@gmail.com
Subject: Grant Lake Site Visit Logistics - June 2, 2010

Dear Site Visit Attendees,

We have over 20 participants in the site visit, so would like to provide you with some revised logistics for the Wednesday, June 2 visit:

8 am – Meet at the Scenic Mountain air boat launch in Moose Pass
8 am – ~12:00 pm (noon) – Groups of four to five (depending on weight) will go by float plane to the outlet of Grant Lake, hop out to view the approximate location of the dam and be returned to boat launch (weather permitting; if weather hinders our ability to fly-in, we will hike-in and boat across Grant Lake to access the site)
8:30 am – ~4 pm - As groups return from the Lake, they will be shuttled by boat across Trail Lake to Grant Creek, and hike up the Creek in small groups (about 1-mile round trip), and will be shuttled back to the boat launch.

Please remember to bring your own lunch and water. Also, wear rugged, waterproof footwear and be prepared for inclement and potentially cold weather conditions. As we will be in and out of boats and near wetland areas, knee-high waterproof boots are recommended, and depending on your comfort level hiking in waders, hip boots/waders may be useful.

Please let us know if you have further questions or your plans change regarding attendance at the site visit. My cell phone number is: 208.699.3993, if you need to contact us on the day of the site visit.

Thank you,

Jenna Borovansky
208.765.1413

From: Jenna Borovansky
Sent: Wednesday, May 26, 2010 1:37 PM
To: 'Zubeck, Brad'; Douglas_Palmer@fws.gov; jason.mouw@alaska.gov; mark.ivy@ferc.gov
Cc: jim.ferguson@alaska.gov; susan.walker@noaa.gov; kaoleary@fs.fed.us; valerie@akcenter.org; Phil_Brna@fws.gov; Lynnda_Kahn@fws.gov; Jeffry_Anderson@fws.gov; Klein, Joseph P (DFG); Phil_Brna@fws.gov
Subject: RE: Grant Lake Project Draft Study Plans

Hello agency representatives,

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Thanks,
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208.765.1413

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If agencies are unable to supply comments on the study plans until July 6, 2010, we are willing to consider comments that you may provide at that time, giving due consideration to study elements that are time sensitive.

We look forward to your review comments and participation in both the scoping meeting(s) and the June 22 Instream Flow TWG meeting.

Best Regards,
Brad Zubeck

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Sent: Thursday, May 20, 2010 2:05 PM
To: Zubeck, Brad; jborovansky@longviewassociates.com; mark.ivy@ferc.gov
Cc: jason.mouw@alaska.gov; jim.ferguson@alaska.gov; susan.walker@noaa.gov; kaoleary@fs.fed.us; valerie@akcenter.org; Phil_Brna@fws.gov; Lynnda_Kahn@fws.gov; Jeffry_Anderson@fws.gov
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****

Doug Palmer
Field Supervisor
Kenai Fish & Wildlife Field Office
43655 Kalifornsky Beach Road
Soldotna, AK 99669
(907) 260-0127

From: Hasbrouck, James J (DFG) [mailto:james.hasbrouck@alaska.gov]
Sent: Wednesday, May 26, 2010 3:51 PM
To: Brady, James
Subject: RE: Vagt Lake

Hi James,

General lake stocking database query at:
http://www.sf.adfg.state.ak.us/Statewide/hatchery/index.cfm/FA/stocking.search

Vagt Lake specific stocking information at:
http://www.sf.adfg.state.ak.us/Statewide/hatchery/index.cfm/FA/stocking.locSearchResults

General lake fishing database query at:
http://www.sf.adfg.state.ak.us/Statewide/LakeData/index.cfm/FA/main.region/MgtAreaID/3

Vagt Lake bathymetric map and other lake info at:
http://www.sf.adfg.state.ak.us/Statewide/LakeData/index.cfm/FA/main.lakeDetail/LakeID/541

For additional info contact Jason Pawluk, Sport Fish Asst. Area Management Biologist for Northern Kenai Peninsula Area, at 260-2919 (jason.pawluk@alaska.gov).

Hope this helps. Please contact me if you want additional information. Jim

James J. Hasbrouck
Regional Supervisor
Alaska Department of Fish and Game
Division of Sport Fish, Region II
333 Raspberry Road
Anchorage, AK 99518-1599

Ph: 907/267-2124
Fax: 907/267-2401
Email: james.hasbrouck@alaska.gov

From: Mark Ivy [Mark.Ivy@ferc.gov]
Sent: Wednesday, May 26, 2010 1:41 PM
To: Jenna Borovansky
Subject: RE: Grant Lake Project Draft Study Plans

Jenna,

Thank you for sending out the follow up email. I do not think that there should be any more confusion.

Mark

Mark Ivy, PhD
Outdoor Recreation Planner
Division of Hydropower Licensing
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426
202.502.6156
202.219.2152 (fax)

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Sent: Thursday, May 20, 2010 2:05 PM
To: Zubeck, Brad; jborovansky@longviewassociates.com; mark.ivy@ferc.gov
Cc: jason.mouw@alaska.gov; jim.ferguson@alaska.gov; susan.walker@noaa.gov; kaoleary@fs.fed.us; valerie@akcenter.org; Phil_Brna@fws.gov; Lynnda_Kahn@fws.gov; Jeffry_Anderson@fws.gov
Subject: Grant Lake Project Draft Study Plans

Mr. Zubeck,

In order to effectively respond to your solicitation for comments on the various *Draft Study Plans* for the Grant Lake Project, the USFWS is requesting an extension of time to coincide with FERC's scoping comments deadline of July 6th. Up until April 24th, when we received an email from Long View Associates advising that the decision had been made to proceed with the full 2010 study program, we were under the impression that the project was on hold and that field studies would not be conducted this year, due to funding constraints. Thus, we scheduled other project reviews, field investigations, and priority project development. In the meantime, 1/3 of the USFWS Region 7 personnel are being asked to sign-up for possible deployment to the Gulf of Mexico to assist with the massive oil spill clean-up efforts. It wasn't until May 4th that we were provided copies of "some" of the *draft* study plans, with the remainder being submitted to us on May 11th. After a cursory review of the Aquatic Resources Study Plan, we find that many of the proposed study objectives are not well-defined or measurable which will require a more comprehensive review. In addition, any rainbow trout spawning studies that were planned for this year, as referenced in the "Aquatic Resources" *Draft Study Plan*, would not be appropriate given the timing of your request.

While we have agreed to rearrange our schedules to participate in one of the Scoping Meetings the 1st week of June, we are not prepared to provide reasonable and substantive input by your proposed deadlines. Further, due to the lack of time for appropriate interagency coordination, the Service respectfully requests an extension of time to July 6, 2010. If you have any questions please feel free to Lynnda Kahn or myself at (907) 262-9863.

****

Doug Palmer
Field Supervisor
Kenai Fish & Wildlife Field Office
43655 Kalifornsky Beach Road
Soldotna, AK 99669
(907) 260-0127

From: Zubeck, Brad [BZubeck@HomerElectric.com]
Sent: Wednesday, May 26, 2010 9:31 AM
To: Eric Rothwell; Jenna Borovansky
Cc: Susan Walker
Subject: RE: Grant Lake Questions

Hi Eric,

It would not be a problem for you to tag along with a field crew. We will have to look at the schedule to see when crews will be out there & coordinate accordingly. More to come regarding the schedule…

Regards,
Brad Z.

From: Eric Rothwell [mailto:Eric.Rothwell@noaa.gov]
Sent: Tuesday, May 25, 2010 2:02 PM
To: Zubeck, Brad; 'Jenna Borovansky'
Cc: Susan Walker
Subject: Re: Grant Lake Questions

Hi Brad and Jenna,

Neither Sue or I can make the June 2nd meeting and site visit to see Grant Lake outlet and Grant Creek. Would it be possible for me to tag along with one of your field crews before July to see the study sites and proposed project locations? I'm reviewing background material and study plans but feel like I would better understand the project with a site visit. If accompanying one of the field crews doesn't work out would you suggest a self-guided?

Thanks,

Eric Rothwell
Hydrologist
Alaska Region
National Marine Fisheries Service
907.271.1937

On 5/4/2010 1:40 PM, Zubeck, Brad wrote:
Hi Eric,

Thanks for the note. Other than the FERC e-Library, the best place to find project information is Kenai Hydro's web site established to facilitate the pre-licensing process. The link to the site is www.kenaihydro.com.

Initially, you can find information & documents you may be looking for within the "Documents" menu option positioned just under the banner. The NOI & PAD are located under the "Documents" page. You will find the aquatics and water quality information you are looking for under the "Work Groups" menu items, and then under "Fish & Aquatics, Water Quality, and Hydrology" on the drop-down menu.

Start checking the site out and I will call you this afternoon to see if you have additional questions.

Best Regards,

Brad Z.

From: Eric Rothwell [mailto:Eric.Rothwell@noaa.gov]
Sent: Tuesday, May 04, 2010 12:14 PM
To: Zubeck, Brad
Cc: Susan Walker
Subject: Grant Lake Questions

Hi Brad,

I just wanted to follow up my phone message with an email. I have only read the May 3rd Project Update and would like to read more background material but didn't find it when I searched FERC (I searched P-13211 and P-13212).

The Project Update was a good place for me to start reviewing as it was concise, one thing that I didn't see was any description about spill below the proposed dam or plan/studies for instream flow in Grant Creek below the tailrace. Also the location of the tailrace is described as located to minimize effects on fish habitat, is there an anadromous barrier that it will be located above?

Thanks for taking my questions, I'm trying to catch up quickly.
Best Regards,
Eric

--
Eric Rothwell
Hydrologist
Alaska Region
National Marine Fisheries Service
907.271.1937

--
Eric Rothwell
Hydrologist
Alaska Region
National Marine Fisheries Service
907.271.1937

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Judith Bittner
State Historic Preservation Officer
Alaska Office of History and Archaeology
550 W. 7th Avenue, Suite 1310
Anchorage, Alaska 99501-3565

Dear Ms. Bittner:

On October 7, 2008, the Federal Energy Regulatory Commission (FERC) issued two Preliminary Permits (permits) to Kenai Hydro, LLC to study the feasibility of developing hydroelectric projects on Grant Lake and Falls Creek on the Kenai Peninsula, near the community of Moose Pass, Alaska. In its Notice of Intent and Pre-application Document (PAD), filed on August 6, 2009, the applicant proposed a combined Grant Lake/Falls Creek hydroelectric project. In order to support development of the Project, FERC granted authorization for Kenai Hydro, LLC to conduct day-to-day consultation under Section 106 of the National Historic Preservation Act (NHPA; please see attached). Subsequently, for purposes of Section 106 of the NHPA (36 CFR 800.3), we are initiating consultation to assist in identification of historic properties that may be affected by the proposed Project.

The Project is located near the community of Moose Pass approximately 25 miles north of Seward and just east of the Seward Highway. The Project is located within Section 13 of Township 4 North, Range 1 West; Sections 1, 2, 5, 6, 7, and 18 of Township 4 North, Range 1 East; and Sections 27, 28, 29, 31, 32, 33, 34, 35, and 36 of Township 5 North, Range 1 East, Seward Meridian (USGS Seward B-6 and B-7 Quadrangles; Figure 1).

The proposed Project would include construction of a diversion dam at the outlet to Grant Lake and a powerhouse along Grant Creek. The proposed lake level would range from approximately nine feet above to up to 25 feet below the natural lake elevation. Additionally, an approximately 2,800-foot-long, 10-foot diameter horseshoe tunnel would be constructed to convey water from a multi-level intake near the diversion dam, to directly above the powerhouse at an elevation of approximately 650 mean sea level (MSL). At the outlet of the tunnel, a 650-foot-long intake structure (penstock) would convey water to the powerhouse located at an approximate elevation 518 MSL. The tailrace (the downstream part of the dam where the impounded water would re-enter Grant Creek), would be placed upstream of the most productive fish habitat, returning flows to Grant Creek and minimizing impacts to fish habitat. Other elements of the proposed Project include the construction of an access road between Falls and Grant creek, as well as the installation of a transmission line. Two potential transmission line options would be investigated, including an overhead and underground option. Both the overhead and underground

transmission line corridor would generally follow the access road grade. Additional information about the Project can be found on the Project website: http://www.kenaihydro.com/index.php .

The Area of Potential Effect (APE) for the proposed Project includes the area extending 30 feet above the high water mark around Grant Lake (740 feet MSL); an area 30 feet beyond the perimeter of Project features, such as the powerhouse construction, and also includes the right-of-way for road access and transmission line alignments (Figure 1).

An Alaska Heritage Resources Survey (AHRS) database search was performed at the Office of History and Archaeology (OHA) to document previously recorded cultural resource sites within or adjacent to the Project APE. In addition, a review of the National Register of Historic Places (NRHP) database was conducted. Nine documented cultural resources are located within the APE (Table 1). Thirty additional cultural resources sites are located within one mile of the Project, but outside the proposed Project APE. These sites are identified in the Draft Cultural Resources Study Plan developed for the Project.

Table 1: Previously Recorded Cultural Resources in the APE

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SEW-00678	Upper Trail Lake Garage	Pole and beam garage ruins	No Determination of Eligibility
SEW-00768	Grant Lake Cabin	Frame cabin, dating to historic prospecting, mining, hunting, or trapping	No Determination of Eligibility
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SEW-01142	USFS	No available information	No Determination of Eligibility
SEW-01143	USFS	No available information	No Determination of Eligibility
SEW-01144	USFS	No available information	No Determination of Eligibility

Field documentation and assessment of properties within the APE will be conducted in July 2010, and a Cultural Resources Survey and Section 106 report will be disseminated to your office upon completion.

As part of consultation for this Project, we would like to invite you to attend a Section 106 Initiation meeting on June 10, 2010 from 10 AM to 12 PM at the Anchorage HDR Alaska, Inc. offices (2525 C Street, Suite 305). We will provide a teleconference number for those participants who cannot attend in person. We will be following-up on this invitation in the next week to confirm your availability.

Additionally, FERC scoping meetings and Study Plan Discussion Sessions for the Project are scheduled for June 2-3, 2010 at the Moose Pass Community Hall (http://www.kenaihydro.com/documents/GrantLake_Scoping1.pdf). The Draft Cultural Resources Study Plan is available on the internet at http://www.kenaihydro.com/work_groups/cultural_resources.php. Written comments on the draft study plan are requested by June 7, 2010. Comments on the study plans can also be discussed in person or by teleconference at the June 10, 2010 Section 106 Initiation meeting. Other opportunities for consultation may be scheduled as outlined in the study plans or as necessary based on feedback received from consulting parties.

If you have questions or comments regarding the proposed Project, I can be reached at the address above, by telephone at (907) 335-6204, or by e-mail at bzubeck@homerelectric.com. For specific questions regarding the Cultural Resources Study, I encourage you to contact HDR Alaska, Inc. directly. The point of contact at HDR Alaska, Inc. is:

Kirsten Anderson, Cultural Resources Practice Group Lead
HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, Alaska 99503-2632
Email: kirsten.anderson@hdrinc.com
Phone: (907) 644-2096

Sincerely,

Brad Zubeck, Project Engineer
Kenai Hydro, LLC

Enclosures:

Figure 1: Location Vicinity Map and Proposed Project APE
FERC Section 106 Consultation Authorization
Grant Lake/Falls Creek Hydroelectric Project Section 106 Consultation Contacts

cc w/o enclosures:

Jenna Borovansky, Long View Associates, Inc.
Sally Morsell, Northern Ecological Services
James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Charles W. Totemoff
President
Chenega Corporation
3000 C Street, Suite 301
Anchorage, Alaska 99503

Dear Mr. Totemoff:

On October 7, 2008, the Federal Energy Regulatory Commission (FERC) issued two Preliminary Permits (permits) to Kenai Hydro, LLC to study the feasibility of developing hydroelectric projects on Grant Lake and Falls Creek on the Kenai Peninsula, near the community of Moose Pass, Alaska. In its Notice of Intent and Pre-application Document (PAD), filed on August 6, 2009, the applicant proposed a combined Grant Lake/Falls Creek hydroelectric project. In order to support development of the Project, FERC granted authorization for Kenai Hydro, LLC to conduct day-to-day consultation under Section 106 of the National Historic Preservation Act (NHPA; please see attached). Subsequently, for purposes of Section 106 of the NHPA (36 CFR 800.3), we are initiating consultation to assist in identification of historic properties that may be affected by the proposed Project.

The Project is located near the community of Moose Pass approximately 25 miles north of Seward and just east of the Seward Highway. The Project is located within Section 13 of Township 4 North, Range 1 West; Sections 1, 2, 5, 6, 7, and 18 of Township 4 North, Range 1 East; and Sections 27, 28, 29, 31, 32, 33, 34, 35, and 36 of Township 5 North, Range 1 East, Seward Meridian (USGS Seward B-6 and B-7 Quadrangles; Figure 1).

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transmission line corridor would generally follow the access road grade. Additional information about the Project can be found on the Project website: http://www.kenaihydro.com/index.php .

The Area of Potential Effect (APE) for the proposed Project includes the area extending 30 feet above the high water mark around Grant Lake (740 feet MSL); an area 30 feet beyond the perimeter of Project features, such as the powerhouse construction, and also includes the right-of-way for road access and transmission line alignments (Figure 1).

An Alaska Heritage Resources Survey (AHRS) database search was performed at the Office of History and Archaeology (OHA) to document previously recorded cultural resource sites within or adjacent to the Project APE. In addition, a review of the National Register of Historic Places (NRHP) database was conducted. Nine documented cultural resources are located within the APE (Table 1). Thirty additional cultural resources sites are located within one mile of the Project, but outside the proposed Project APE. These sites are identified in the Draft Cultural Resources Study Plan developed for the Project.

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Field documentation and assessment of properties within the APE will be conducted in July 2010, and a Cultural Resources Survey and Section 106 report will be disseminated to your office upon completion.

As part of consultation for this Project, we would like to invite you to attend a Section 106 Initiation meeting on June 10, 2010 from 10 AM to 12 PM at the Anchorage HDR Alaska, Inc. offices (2525 C Street, Suite 305). We will provide a teleconference number for those participants who cannot attend in person. We will be following-up on this invitation in the next week to confirm your availability.

Additionally, FERC scoping meetings and Study Plan Discussion Sessions for the Project are scheduled for June 2-3, 2010 at the Moose Pass Community Hall (http://www.kenaihydro.com/documents/GrantLake_Scoping1.pdf). The Draft Cultural Resources Study Plan is available on the internet at http://www.kenaihydro.com/work_groups/cultural_resources.php. Written comments on the draft study plan are requested by June 7, 2010. Comments on the study plans can also be discussed in person or by teleconference at the June 10, 2010 Section 106 Initiation meeting. Other opportunities for consultation may be scheduled as outlined in the study plans or as necessary based on feedback received from consulting parties.

If you have questions or comments regarding the proposed Project, I can be reached at the address above, by telephone at (907) 335-6204, or by e-mail at bzubeck@homerelectric.com. For specific questions regarding the Cultural Resources Study, I encourage you to contact HDR Alaska, Inc. directly. The point of contact at HDR Alaska, Inc. is:

Kirsten Anderson, Cultural Resources Practice Group Lead
HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, Alaska 99503-2632
Email: kirsten.anderson@hdrinc.com
Phone: (907) 644-2096

Sincerely,

Brad Zubeck, Project Engineer
Kenai Hydro, LLC

Enclosures:

Figure 1: Location Vicinity Map and Proposed Project APE
FERC Section 106 Consultation Authorization
Grant Lake/Falls Creek Hydroelectric Project Section 106 Consultation Contacts

cc w/o enclosures:

Jenna Borovansky, Long View Associates, Inc.
Sally Morsell, Northern Ecological Services
James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Sheri D. Buretta
Chairman of the Board
Chugach Alaska Corporation
3800 Centerpoint Drive, Suite 601
Anchorage, Alaska 99503

Dear Ms. Buretta:

On October 7, 2008, the Federal Energy Regulatory Commission (FERC) issued two Preliminary Permits (permits) to Kenai Hydro, LLC to study the feasibility of developing hydroelectric projects on Grant Lake and Falls Creek on the Kenai Peninsula, near the community of Moose Pass, Alaska. In its Notice of Intent and Pre-application Document (PAD), filed on August 6, 2009, the applicant proposed a combined Grant Lake/Falls Creek hydroelectric project. In order to support development of the Project, FERC granted authorization for Kenai Hydro, LLC to conduct day-to-day consultation under Section 106 of the National Historic Preservation Act (NHPA; please see attached). Subsequently, for purposes of Section 106 of the NHPA (36 CFR 800.3), we are initiating consultation to assist in identification of historic properties that may be affected by the proposed Project.

The Project is located near the community of Moose Pass approximately 25 miles north of Seward and just east of the Seward Highway. The Project is located within Section 13 of Township 4 North, Range 1 West; Sections 1, 2, 5, 6, 7, and 18 of Township 4 North, Range 1 East; and Sections 27, 28, 29, 31, 32, 33, 34, 35, and 36 of Township 5 North, Range 1 East, Seward Meridian (USGS Seward B-6 and B-7 Quadrangles; Figure 1).

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Field documentation and assessment of properties within the APE will be conducted in July 2010, and a Cultural Resources Survey and Section 106 report will be disseminated to your office upon completion.

As part of consultation for this Project, we would like to invite you to attend a Section 106 Initiation meeting on June 10, 2010 from 10 AM to 12 PM at the Anchorage HDR Alaska, Inc. offices (2525 C Street, Suite 305). We will provide a teleconference number for those participants who cannot attend in person. We will be following-up on this invitation in the next week to confirm your availability.

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Anchorage, Alaska 99503-2632
Email: kirsten.anderson@hdrinc.com
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Sincerely,

Brad Zubeck, Project Engineer
Kenai Hydro, LLC

Enclosures:

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Grant Lake/Falls Creek Hydroelectric Project Section 106 Consultation Contacts

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Jenna Borovansky, Long View Associates, Inc.
Sally Morsell, Northern Ecological Services
James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Margaret L. Brown
President
Cook Inlet Region, Inc.
P.O. Box 93330
Anchorage, Alaska 99509-3330

Dear Ms. Brown:

On October 7, 2008, the Federal Energy Regulatory Commission (FERC) issued two Preliminary Permits (permits) to Kenai Hydro, LLC to study the feasibility of developing hydroelectric projects on Grant Lake and Falls Creek on the Kenai Peninsula, near the community of Moose Pass, Alaska. In its Notice of Intent and Pre-application Document (PAD), filed on August 6, 2009, the applicant proposed a combined Grant Lake/Falls Creek hydroelectric project. In order to support development of the Project, FERC granted authorization for Kenai Hydro, LLC to conduct day-to-day consultation under Section 106 of the National Historic Preservation Act (NHPA; please see attached). Subsequently, for purposes of Section 106 of the NHPA (36 CFR 800.3), we are initiating consultation to assist in identification of historic properties that may be affected by the proposed Project.

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HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, Alaska 99503-2632
Email: kirsten.anderson@hdrinc.com
Phone: (907) 644-2096

Sincerely,

Brad Zubeck, Project Engineer
Kenai Hydro, LLC

Enclosures:

Figure 1: Location Vicinity Map and Proposed Project APE
FERC Section 106 Consultation Authorization
Grant Lake/Falls Creek Hydroelectric Project Section 106 Consultation Contacts

cc w/o enclosures:

Jenna Borovansky, Long View Associates, Inc.
Sally Morsell, Northern Ecological Services
James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Jaylene Peterson-Nyren
Director
Kenaitze Indian Tribe
P.O. Box 988
Kenai, Alaska 99611

Dear Ms. Peterson-Nyren:

On October 7, 2008, the Federal Energy Regulatory Commission (FERC) issued two Preliminary Permits (permits) to Kenai Hydro, LLC to study the feasibility of developing hydroelectric projects on Grant Lake and Falls Creek on the Kenai Peninsula, near the community of Moose Pass, Alaska. In its Notice of Intent and Pre-application Document (PAD), filed on August 6, 2009, the applicant proposed a combined Grant Lake/Falls Creek hydroelectric project. In order to support development of the Project, FERC granted authorization for Kenai Hydro, LLC to conduct day-to-day consultation under Section 106 of the National Historic Preservation Act (NHPA; please see attached). Subsequently, for purposes of Section 106 of the NHPA (36 CFR 800.3), we are initiating consultation to assist in identification of historic properties that may be affected by the proposed Project.

The Project is located near the community of Moose Pass approximately 25 miles north of Seward and just east of the Seward Highway. The Project is located within Section 13 of Township 4 North, Range 1 West; Sections 1, 2, 5, 6, 7, and 18 of Township 4 North, Range 1 East; and Sections 27, 28, 29, 31, 32, 33, 34, 35, and 36 of Township 5 North, Range 1 East, Seward Meridian (USGS Seward B-6 and B-7 Quadrangles; Figure 1).

The proposed Project would include construction of a diversion dam at the outlet to Grant Lake and a powerhouse along Grant Creek. The proposed lake level would range from approximately nine feet above to up to 25 feet below the natural lake elevation. Additionally, an approximately 2,800-foot-long, 10-foot diameter horseshoe tunnel would be constructed to convey water from a multi-level intake near the diversion dam, to directly above the powerhouse at an elevation of approximately 650 mean sea level (MSL). At the outlet of the tunnel, a 650-foot-long intake structure (penstock) would convey water to the powerhouse located at an approximate elevation 518 MSL. The tailrace (the downstream part of the dam where the impounded water would re-enter Grant Creek), would be placed upstream of the most productive fish habitat, returning flows to Grant Creek and minimizing impacts to fish habitat. Other elements of the proposed Project include the construction of an access road between Falls and Grant creek, as well as the installation of a transmission line. Two potential transmission line options would be investigated, including an overhead and underground option. Both the overhead and underground

transmission line corridor would generally follow the access road grade. Additional information about the Project can be found on the Project website: http://www.kenaihydro.com/index.php .

The Area of Potential Effect (APE) for the proposed Project includes the area extending 30 feet above the high water mark around Grant Lake (740 feet MSL); an area 30 feet beyond the perimeter of Project features, such as the powerhouse construction, and also includes the right-of-way for road access and transmission line alignments (Figure 1).

An Alaska Heritage Resources Survey (AHRS) database search was performed at the Office of History and Archaeology (OHA) to document previously recorded cultural resource sites within or adjacent to the Project APE. In addition, a review of the National Register of Historic Places (NRHP) database was conducted. Nine documented cultural resources are located within the APE (Table 1). Thirty additional cultural resources sites are located within one mile of the Project, but outside the proposed Project APE. These sites are identified in the Draft Cultural Resources Study Plan developed for the Project.

Table 1: Previously Recorded Cultural Resources in the APE

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SEW-00768	Grant Lake Cabin	Frame cabin, dating to historic prospecting, mining, hunting, or trapping	No Determination of Eligibility
SEW-00822	Grant Lake Prospect	Prospecting pit with channel or ditch	No Determination of Eligibility
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SEW-01142	USFS	No available information	No Determination of Eligibility
SEW-01143	USFS	No available information	No Determination of Eligibility
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Field documentation and assessment of properties within the APE will be conducted in July 2010, and a Cultural Resources Survey and Section 106 report will be disseminated to your office upon completion.

As part of consultation for this Project, we would like to invite you to attend a Section 106 Initiation meeting on June 10, 2010 from 10 AM to 12 PM at the Anchorage HDR Alaska, Inc. offices (2525 C Street, Suite 305). We will provide a teleconference number for those participants who cannot attend in person. We will be following-up on this invitation in the next week to confirm your availability.

Additionally, FERC scoping meetings and Study Plan Discussion Sessions for the Project are scheduled for June 2-3, 2010 at the Moose Pass Community Hall (http://www.kenaihydro.com/documents/GrantLake_Scoping1.pdf). The Draft Cultural Resources Study Plan is available on the internet at http://www.kenaihydro.com/work_groups/cultural_resources.php. Written comments on the draft study plan are requested by June 7, 2010. Comments on the study plans can also be discussed in person or by teleconference at the June 10, 2010 Section 106 Initiation meeting. Other opportunities for consultation may be scheduled as outlined in the study plans or as necessary based on feedback received from consulting parties.

If you have questions or comments regarding the proposed Project, I can be reached at the address above, by telephone at (907) 335-6204, or by e-mail at bzubeck@homerelectric.com. For specific questions regarding the Cultural Resources Study, I encourage you to contact HDR Alaska, Inc. directly. The point of contact at HDR Alaska, Inc. is:

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Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Vernon Stanford
Chair
Kenai Natives Association, Inc.
215 Fidalgo Avenue, Suite 101
Kenai, Alaska 99611-7776

Dear Mr. Stanford:

On October 7, 2008, the Federal Energy Regulatory Commission (FERC) issued two Preliminary Permits (permits) to Kenai Hydro, LLC to study the feasibility of developing hydroelectric projects on Grant Lake and Falls Creek on the Kenai Peninsula, near the community of Moose Pass, Alaska. In its Notice of Intent and Pre-application Document (PAD), filed on August 6, 2009, the applicant proposed a combined Grant Lake/Falls Creek hydroelectric project. In order to support development of the Project, FERC granted authorization for Kenai Hydro, LLC to conduct day-to-day consultation under Section 106 of the National Historic Preservation Act (NHPA; please see attached). Subsequently, for purposes of Section 106 of the NHPA (36 CFR 800.3), we are initiating consultation to assist in identification of historic properties that may be affected by the proposed Project.

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James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Dorothy Cook
President
Native Village of Eklutna
26339 Eklutna Village Road
Chugiak, Alaska 99567

Dear Ms. Cook:

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3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Gary Oskolkoff
President
Ninilchik Natives Association, Inc.
P.O. Box 39130
Anchorage, Alaska 99503

Dear Mr. Oskolkoff:

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May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Sara Jackinsky
President
Ninilchik Traditional Council
P.O. Box 39070
Ninilchik, Alaska 99639

Dear Ms. Jackinsky:

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2525 C Street, Suite 305
Anchorage, Alaska 99503-2632
Email: kirsten.anderson@hdrinc.com
Phone: (907) 644-2096

Sincerely,

Brad Zubeck, Project Engineer
Kenai Hydro, LLC

Enclosures:

Figure 1: Location Vicinity Map and Proposed Project APE
FERC Section 106 Consultation Authorization
Grant Lake/Falls Creek Hydroelectric Project Section 106 Consultation Contacts

cc w/o enclosures:

Jenna Borovansky, Long View Associates, Inc.
Sally Morsell, Northern Ecological Services
James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Dianne McRae
President
Qutekcak Native Tribe
P.O. Box 1467
Seward, Alaska 99664

Dear Ms. McRae:

On October 7, 2008, the Federal Energy Regulatory Commission (FERC) issued two Preliminary Permits (permits) to Kenai Hydro, LLC to study the feasibility of developing hydroelectric projects on Grant Lake and Falls Creek on the Kenai Peninsula, near the community of Moose Pass, Alaska. In its Notice of Intent and Pre-application Document (PAD), filed on August 6, 2009, the applicant proposed a combined Grant Lake/Falls Creek hydroelectric project. In order to support development of the Project, FERC granted authorization for Kenai Hydro, LLC to conduct day-to-day consultation under Section 106 of the National Historic Preservation Act (NHPA; please see attached). Subsequently, for purposes of Section 106 of the NHPA (36 CFR 800.3), we are initiating consultation to assist in identification of historic properties that may be affected by the proposed Project.

The Project is located near the community of Moose Pass approximately 25 miles north of Seward and just east of the Seward Highway. The Project is located within Section 13 of Township 4 North, Range 1 West; Sections 1, 2, 5, 6, 7, and 18 of Township 4 North, Range 1 East; and Sections 27, 28, 29, 31, 32, 33, 34, 35, and 36 of Township 5 North, Range 1 East, Seward Meridian (USGS Seward B-6 and B-7 Quadrangles; Figure 1).

The proposed Project would include construction of a diversion dam at the outlet to Grant Lake and a powerhouse along Grant Creek. The proposed lake level would range from approximately nine feet above to up to 25 feet below the natural lake elevation. Additionally, an approximately 2,800-foot-long, 10-foot diameter horseshoe tunnel would be constructed to convey water from a multi-level intake near the diversion dam, to directly above the powerhouse at an elevation of approximately 650 mean sea level (MSL). At the outlet of the tunnel, a 650-foot-long intake structure (penstock) would convey water to the powerhouse located at an approximate elevation 518 MSL. The tailrace (the downstream part of the dam where the impounded water would re-enter Grant Creek), would be placed upstream of the most productive fish habitat, returning flows to Grant Creek and minimizing impacts to fish habitat. Other elements of the proposed Project include the construction of an access road between Falls and Grant creek, as well as the installation of a transmission line. Two potential transmission line options would be investigated, including an overhead and underground option. Both the overhead and underground

transmission line corridor would generally follow the access road grade. Additional information about the Project can be found on the Project website: http://www.kenaihydro.com/index.php .

The Area of Potential Effect (APE) for the proposed Project includes the area extending 30 feet above the high water mark around Grant Lake (740 feet MSL); an area 30 feet beyond the perimeter of Project features, such as the powerhouse construction, and also includes the right-of-way for road access and transmission line alignments (Figure 1).

An Alaska Heritage Resources Survey (AHRS) database search was performed at the Office of History and Archaeology (OHA) to document previously recorded cultural resource sites within or adjacent to the Project APE. In addition, a review of the National Register of Historic Places (NRHP) database was conducted. Nine documented cultural resources are located within the APE (Table 1). Thirty additional cultural resources sites are located within one mile of the Project, but outside the proposed Project APE. These sites are identified in the Draft Cultural Resources Study Plan developed for the Project.

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Brad Zubeck, Project Engineer
Kenai Hydro, LLC

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Sally Morsell, Northern Ecological Services
James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Penny Carty
President
Salamatof Native Association, Inc.
P.O. Box 2682
Kenai, Alaska 99611

Dear Ms. Carty:

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3977 Lake Street
Homer, AK 99603

May 26, 2010

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Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

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Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

William G. O'Leary
Acting President and Chief Executive Officer
Alaska Railroad Corporation
327 W. Ship Creek Avenue
Anchorage, Alaska 99501

Dear Mr. O'Leary:

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May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Pat Porter
Mayor
City of Kenai
210 Fidalgo Avenue
Kenai, Alaska 99611-7794

Dear Mayor Porter:

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The Area of Potential Effect (APE) for the proposed Project includes the area extending 30 feet above the high water mark around Grant Lake (740 feet MSL); an area 30 feet beyond the perimeter of Project features, such as the powerhouse construction, and also includes the right-of-way for road access and transmission line alignments (Figure 1).

An Alaska Heritage Resources Survey (AHRS) database search was performed at the Office of History and Archaeology (OHA) to document previously recorded cultural resource sites within or adjacent to the Project APE. In addition, a review of the National Register of Historic Places (NRHP) database was conducted. Nine documented cultural resources are located within the APE (Table 1). Thirty additional cultural resources sites are located within one mile of the Project, but outside the proposed Project APE. These sites are identified in the Draft Cultural Resources Study Plan developed for the Project.

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If you have questions or comments regarding the proposed Project, I can be reached at the address above, by telephone at (907) 335-6204, or by e-mail at bzubeck@homerelectric.com. For specific questions regarding the Cultural Resources Study, I encourage you to contact HDR Alaska, Inc. directly. The point of contact at HDR Alaska, Inc. is:

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HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, Alaska 99503-2632
Email: kirsten.anderson@hdrinc.com
Phone: (907) 644-2096

Sincerely,

Brad Zubeck, Project Engineer
Kenai Hydro, LLC

Enclosures:
- Figure 1: Location Vicinity Map and Proposed Project APE
- FERC Section 106 Consultation Authorization
- Grant Lake/Falls Creek Hydroelectric Project Section 106 Consultation Contacts

cc w/o enclosures:

Jenna Borovansky, Long View Associates, Inc.
Sally Morsell, Northern Ecological Services
James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Jeff Twait
Commission Chair
City of Kenai, Planning and Zoning Commission
210 Fidalgo Avenue
Kenai, Alaska 99611-7794

Dear Mr. Twait:

On October 7, 2008, the Federal Energy Regulatory Commission (FERC) issued two Preliminary Permits (permits) to Kenai Hydro, LLC to study the feasibility of developing hydroelectric projects on Grant Lake and Falls Creek on the Kenai Peninsula, near the community of Moose Pass, Alaska. In its Notice of Intent and Pre-application Document (PAD), filed on August 6, 2009, the applicant proposed a combined Grant Lake/Falls Creek hydroelectric project. In order to support development of the Project, FERC granted authorization for Kenai Hydro, LLC to conduct day-to-day consultation under Section 106 of the National Historic Preservation Act (NHPA; please see attached). Subsequently, for purposes of Section 106 of the NHPA (36 CFR 800.3), we are initiating consultation to assist in identification of historic properties that may be affected by the proposed Project.

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Sally Morsell, Northern Ecological Services
James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Willard Dunham
Mayor
City of Seward
P.O. Box 167
Seward, Alaska 99664-0167

Dear Mayor Dunham:

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Brad Zubeck, Project Engineer
Kenai Hydro, LLC

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- Grant Lake/Falls Creek Hydroelectric Project Section 106 Consultation Contacts

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Sally Morsell, Northern Ecological Services
James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Tom Swan
Commission Chair
Seward Historic Preservation Commission
P.O. Box 167
Seward, Alaska 99664-0167

Dear Mr. Swan:

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3977 Lake Street
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May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Dave Carey
Mayor
Kenai Peninsula Borough
144 North Binkley Street
Soldotna, Alaska 99669

Dear Mayor Carey:

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Additionally, FERC scoping meetings and Study Plan Discussion Sessions for the Project are scheduled for June 2-3, 2010 at the Moose Pass Community Hall (http://www.kenaihydro.com/documents/GrantLake_Scoping1.pdf). The Draft Cultural Resources Study Plan is available on the internet at http://www.kenaihydro.com/work_groups/cultural_resources.php. Written comments on the draft study plan are requested by June 7, 2010. Comments on the study plans can also be discussed in person or by teleconference at the June 10, 2010 Section 106 Initiation meeting. Other opportunities for consultation may be scheduled as outlined in the study plans or as necessary based on feedback received from consulting parties.

If you have questions or comments regarding the proposed Project, I can be reached at the address above, by telephone at (907) 335-6204, or by e-mail at bzubeck@homerelectric.com. For specific questions regarding the Cultural Resources Study, I encourage you to contact HDR Alaska, Inc. directly. The point of contact at HDR Alaska, Inc. is:

Kirsten Anderson, Cultural Resources Practice Group Lead
HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, Alaska 99503-2632
Email: kirsten.anderson@hdrinc.com
Phone: (907) 644-2096

Sincerely,

Brad Zubeck, Project Engineer
Kenai Hydro, LLC

Enclosures:
Figure 1: Location Vicinity Map and Proposed Project APE
FERC Section 106 Consultation Authorization
Grant Lake/Falls Creek Hydroelectric Project Section 106 Consultation Contacts

cc w/o enclosures:

Jenna Borovansky, Long View Associates, Inc.
Sally Morsell, Northern Ecological Services
James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

May 26, 2010

In Reply Refer To:
FERC Project No.: 13212-001 and 13211-001 - Alaska
Grant Lake/Falls Creek Hydroelectric Project Initiation of Consultation

Jeremy Karchut
Forest Archaeologist
U.S. Forest Service, Chugach National Forest
3301 C Street, Suite 300
Anchorage, Alaska 99503

Dear Mr. Karchut:

On October 7, 2008, the Federal Energy Regulatory Commission (FERC) issued two Preliminary Permits (permits) to Kenai Hydro, LLC to study the feasibility of developing hydroelectric projects on Grant Lake and Falls Creek on the Kenai Peninsula, near the community of Moose Pass, Alaska. In its Notice of Intent and Pre-application Document (PAD), filed on August 6, 2009, the applicant proposed a combined Grant Lake/Falls Creek hydroelectric project. In order to support development of the Project, FERC granted authorization for Kenai Hydro, LLC to conduct day-to-day consultation under Section 106 of the National Historic Preservation Act (NHPA; please see attached). Subsequently, for purposes of Section 106 of the NHPA (36 CFR 800.3), we are initiating consultation to assist in identification of historic properties that may be affected by the proposed Project.

The Project is located near the community of Moose Pass approximately 25 miles north of Seward and just east of the Seward Highway. The Project is located within Section 13 of Township 4 North, Range 1 West; Sections 1, 2, 5, 6, 7, and 18 of Township 4 North, Range 1 East; and Sections 27, 28, 29, 31, 32, 33, 34, 35, and 36 of Township 5 North, Range 1 East, Seward Meridian (USGS Seward B-6 and B-7 Quadrangles; Figure 1).

The proposed Project would include construction of a diversion dam at the outlet to Grant Lake and a powerhouse along Grant Creek. The proposed lake level would range from approximately nine feet above to up to 25 feet below the natural lake elevation. Additionally, an approximately 2,800-foot-long, 10-foot diameter horseshoe tunnel would be constructed to convey water from a multi-level intake near the diversion dam, to directly above the powerhouse at an elevation of approximately 650 mean sea level (MSL). At the outlet of the tunnel, a 650-foot-long intake structure (penstock) would convey water to the powerhouse located at an approximate elevation 518 MSL. The tailrace (the downstream part of the dam where the impounded water would re-enter Grant Creek), would be placed upstream of the most productive fish habitat, returning flows to Grant Creek and minimizing impacts to fish habitat. Other elements of the proposed Project include the construction of an access road between Falls and Grant creek, as well as the installation of a transmission line. Two potential transmission line options would be investigated, including an overhead and underground option. Both the overhead and underground

transmission line corridor would generally follow the access road grade. Additional information about the Project can be found on the Project website: http://www.kenaihydro.com/index.php .

The Area of Potential Effect (APE) for the proposed Project includes the area extending 30 feet above the high water mark around Grant Lake (740 feet MSL); an area 30 feet beyond the perimeter of Project features, such as the powerhouse construction, and also includes the right-of-way for road access and transmission line alignments (Figure 1).

An Alaska Heritage Resources Survey (AHRS) database search was performed at the Office of History and Archaeology (OHA) to document previously recorded cultural resource sites within or adjacent to the Project APE. In addition, a review of the National Register of Historic Places (NRHP) database was conducted. Nine documented cultural resources are located within the APE (Table 1). Thirty additional cultural resources sites are located within one mile of the Project, but outside the proposed Project APE. These sites are identified in the Draft Cultural Resources Study Plan developed for the Project.

Table 1: Previously Recorded Cultural Resources in the APE

AHRS No.	Site Name	Description	Eligibility
SEW-00258	Solars Sawmill	Collection of wooden structures, operated between 1920-1941	Determined Not Eligible
SEW-00659	Case Mine (Grant Lake Placer Mine)	Cabin, bunkhouse, and 4 associated structures, 1900-1940s	Determined Eligible
SEW-00678	Upper Trail Lake Garage	Pole and beam garage ruins	No Determination of Eligibility
SEW-00768	Grant Lake Cabin	Frame cabin, dating to historic prospecting, mining, hunting, or trapping	No Determination of Eligibility
SEW-00822	Grant Lake Prospect	Prospecting pit with channel or ditch	No Determination of Eligibility
SEW-00823	North Grant Lake Cabin (Case Mine Dynamite Shack)	Log cabin/dynamite storage for area mines	No Determination of Eligibility
SEW-01142	USFS	No available information	No Determination of Eligibility
SEW-01143	USFS	No available information	No Determination of Eligibility
SEW-01144	USFS	No available information	No Determination of Eligibility

Field documentation and assessment of properties within the APE will be conducted in July 2010, and a Cultural Resources Survey and Section 106 report will be disseminated to your office upon completion.

As part of consultation for this Project, we would like to invite you to attend a Section 106 Initiation meeting on June 10, 2010 from 10 AM to 12 PM at the Anchorage HDR Alaska, Inc. offices (2525 C Street, Suite 305). We will provide a teleconference number for those participants who cannot attend in person. We will be following-up on this invitation in the next week to confirm your availability.

Additionally, FERC scoping meetings and Study Plan Discussion Sessions for the Project are scheduled for June 2-3, 2010 at the Moose Pass Community Hall (http://www.kenaihydro.com/documents/GrantLake_Scoping1.pdf). The Draft Cultural Resources Study Plan is available on the internet at http://www.kenaihydro.com/work_groups/cultural_resources.php. Written comments on the draft study plan are requested by June 7, 2010. Comments on the study plans can also be discussed in person or by teleconference at the June 10, 2010 Section 106 Initiation meeting. Other opportunities for consultation may be scheduled as outlined in the study plans or as necessary based on feedback received from consulting parties.

If you have questions or comments regarding the proposed Project, I can be reached at the address above, by telephone at (907) 335-6204, or by e-mail at bzubeck@homerelectric.com. For specific questions regarding the Cultural Resources Study, I encourage you to contact HDR Alaska, Inc. directly. The point of contact at HDR Alaska, Inc. is:

Kirsten Anderson, Cultural Resources Practice Group Lead
HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, Alaska 99503-2632
Email: kirsten.anderson@hdrinc.com
Phone: (907) 644-2096

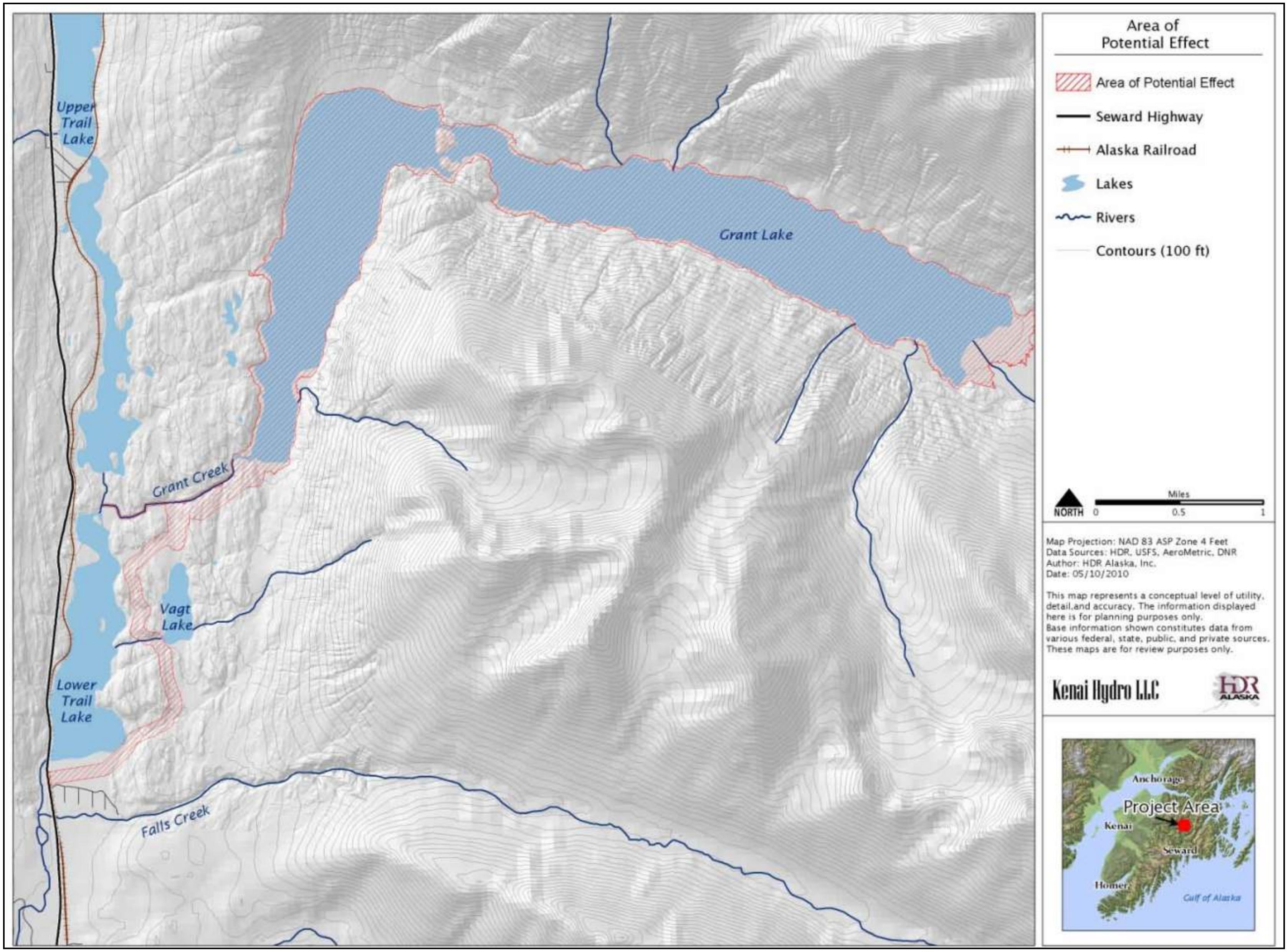
Sincerely,

Brad Zubeck, Project Engineer
Kenai Hydro, LLC

Enclosures:
- Figure 1: Location Vicinity Map and Proposed Project APE
- FERC Section 106 Consultation Authorization
- Grant Lake/Falls Creek Hydroelectric Project Section 106 Consultation Contacts

cc w/o enclosures:

Jenna Borovansky, Long View Associates, Inc.
Sally Morsell, Northern Ecological Services
James Brady, HDR Alaska, Inc.
Kirsten Anderson, HDR Alaska, Inc.



Upper Trail Lake
Grant Lake
Grant Creek
Vagt Lake
Lower Trail Lake
Falls Creek
Area of Potential Effect
Area of Potential Effect
Seward Highway
Alaska Railroad
Lakes
Rivers
Contours (100 ft)
NORTH
Miles
0
0.5
1
Map Projection: NAD 83 ASP Zone 4 Feet
Data Sources: HDR, USFS, AeroMetric, DNR
Author: HDR Alaska, Inc.
Date: 05/10/2010
This map represents a conceptual level of utility, detail,and accuracy. The information displayed here is for planning purposes only.
Base information shown constitutes data from various federal, state, public, and private sources.
These maps are for review purposes only.
Kenai Hydro LLC
HDR ALASKA
Anchorage
Project Area
Kenai
Seward
Homer
Gulf of Alaska

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D. C. 20426
September 15, 2009

OFFICE OF ENERGY PROJECTS

Project No. 13212-001 and 13211-001
– Alaska
Grant Lake/Falls Creek Hydroelectric
Project
Kenai Hydro, L.L.C.

Steve Gilbert, Manager
Kenai Hydro, L.L.C.
6921 Howard Avenue
Anchorage, AK 99504

RE: Section 106 Consultation Authorization

Dear Mr. Gilbert:

In the letter filed August 6, 2009, you requested that we grant permission for you to initiate Section 106 consultation on our behalf. By copy of this letter, we are authorizing Kenai Hydro L.L.C. to initiate consultation with the Alaska State Historic Preservation Officers, appropriate Native American tribes, Chugach National Forest, and other consulting parties, pursuant to 36 CFR § 800.2(c)(4) of the regulations implementing Section 106 of the National Historic Preservation Act. This consultation pertains to the original licensing effort by Kenai Hydro, L.L.C. involving the Grant Lake/Falls Creek Hydroelectric Project located on the Kenai Peninsula, near the community of Moose Pass, Alaska.

We are granting authorization to Kenai Hydro, L.L.C. in order for them to conduct day-to-day section 106 consultation responsibilities in regards to the above proposed project; however, the Commission remains ultimately responsible for all findings and determinations.

If you have any questions, please contact Joseph C. Adamson at 202-502-8085, or by email at joseph.adamson@ferc.gov with any questions or comments.

Sincerely,

Jennifer Hill, Chief
Hydro West Branch

cc: Mailing List
Service List

Judith Bittner
State Historic Preservation Officer
550 West Seventh Avenue, Suite 1310
Anchorage, AK 99801-3565

John Fowler, Executive Director
Advisory Council on Historic Preservation
1100 Penn. Ave., NW, Suite 809
Washington, DC 20004

Karen O'Leary
Chugach National Forest
3301 C Street, Suite 300
Anchorage, AK 99503

Dorothy Cook, President
Native Village of Eklutna
26339 Eklutna Village Road
Chugiak, AK 99567

Richard Greg Encelewski, President
Ninilchik Traditional Council
P.O. Box 39070
Ninilchik, AK 99639

Penny Carty, President
Salamatof Native Association, Inc.
P.O. Box 2682
Kenai, AK 99611

Vernon Stanford, Chair
Kenai Natives Association, Inc.
2115 Fidalgo Avenue, Suite 101
Kenai, AK 99611-7776

Margaret L. Brown, President
Cook Inlet Region, Inc.
P.O. Box 93330
Anchorage, AK 99509-3330

Sheri D. Buretta, Chairman of the Board
Chugach Alaska Corporation
3800 Centerpoint Drive, Suite 601
Anchorage, AK 99503

Charles W. Totemoff, President
Chenega Corporation
3000 C Street, Suite 301
Anchorage, AK 99503

Dianne McRae, President
Qutekcak Native Tribe
P.O. Box 1467
Seward, AK 99664

Jaylene Peterson-Nyren, Director
Kenaitze Indian Tribe
P.O. Box 988
Kenai, AK 99611

Brad Zubeck, Project Engineer
Kenai Hydro, L.L.C.
280 Airport Way
Kenai, AK 99611

Grant Lake/Falls Creek Hydroelectric Project Section 106 Consultation Contacts

Kenai Hydro LLC contact:
Brad Zubeck, Project Engineer
Kenai Hydro, LLC
280 Airport Way
Kenai, AK 99611

SHPO:
Ms. Judith Bittner
State Historic Preservation Officer
Alaska Office of History and Archaeology
550 W. 7th Avenue, Suite 1310
Anchorage, Alaska 99501-3565

Tribes/Tribal Organizations:
Charles W. Totemoff, President
Chenega Corporation
3000 C Street, Suite 301
Anchorage, Alaska 99503

Sheri D. Buretta, Chairman of the Board
Chugach Alaska Corporation
3800 Centerpoint Drive, Suite 601
Anchorage, Alaska 99503

Margaret L. Brown, President
Cook Inlet Region, Inc.
P.O. Box 93330
Anchorage, Alaska 99509-3330

Jaylene Peterson-Nyren, Director
Kenaitze Indian Tribe
P.O. Box 988
Kenai, Alaska 99611

Vernon Stanford, Chair
Kenai Natives Association, Inc.
215 Fidalgo Avenue, Suite 101
Kenai, Alaska 99611-7776

Tribes/Tribal Organizations (continued):
Dorothy Cook, President
Native Village of Eklutna
26339 Eklutna Village Road
Chugiak, Alaska 99567

Gary Oskolkoff, President
Ninilchik Natives Association, Inc.
P.O. Box 39130
Anchorage, Alaska 99503

Sara Jackinsky, President
Ninilchik Traditional Council
P.O. Box 39070
Ninilchik, Alaska 99639

Dianne McRae, President
Qutekcak Native Tribe
P.O. Box 1467
Seward, Alaska 99664

Penny Carty, President
Salamatof Native Association, Inc.
P.O. Box 2682
Kenai, Alaska 99611

Penny Carty, President
Village of Salamatoff
P.O. Box 2682
Kenai, Alaska 99611

Other Consulting Parties:
William G. O'Leary, Acting President and Chief Executive Officer
Alaska Railroad Corporation
327 W. Ship Creek Avenue
Anchorage, Alaska 99501

Pat Porter, Mayor
City of Kenai
210 Fidalgo Avenue
Kenai, Alaska 99611-7794

Other Consulting Parties (continued):
Jeff Twait, Commission Chair
City of Kenai, Planning and Zoning Commission
210 Fidalgo Avenue
Kenai, Alaska 99611-7794

Willard Dunham, Mayor
City of Seward
PO Box 167
Seward, Alaska 99664-0167

Tom Swan, Commission Chair
Seward Historic Preservation Commission
P.O. Box 167
Seward, Alaska 99664-0167

Dave Carey, Mayor
Kenai Peninsula Borough
144 North Binkley Street
Soldotna, Alaska 99669

Jeremy Karchut, Forest Archaeologist
U.S. Forest Service, Chugach National Forest
3301 C Street, Suite 300
Anchorage, Alaska 99503

From: tom harkreader [harkfamily@yahoo.com]
Sent: Saturday, May 29, 2010 8:42 AM
To: Jenna Borovansky
Subject: Re: Grant Lake Site Visit Logistics - June 2, 2010

Thanks for the info. due to the heavy snow load on the trail and our mine site we have been delayed in getting to our area so I will head north to our cabin over June 2.
On another note that has come to mind to put in your file for the north shore is that there are certified survey post markers from the early days when the old timer had filed for patent land along the lake, two of them are on our lower claim, the others are in the area but I have not been able to locate them yet, It may take a surveyor to find them. I do have the maps of there location which you probably won't find in public record or whether have a hard time finding them since it was done around the 50's. When it comes time for your north shore visit and inspection let me know and I can get that info. to you.
Tom H.

From: Jenna Borovansky <jborovansky@longviewassociates.com>
To: tom harkreader <harkfamily@yahoo.com>
Sent: Fri, May 28, 2010 2:32:16 PM
Subject: FW: Grant Lake Site Visit Logistics - June 2, 2010

Tom,
Fyi, below are the details of the site visit. (I understand you will not be attending, but based on our phone call, I thought the details would answer your questions about the proximity of the site visit attendees to your work site.) We will no longer be hiking into the Lake, and will be on the ground on the south side of the outlet to Grant Creek.

Thanks for the information on your activities in the area. Let me know if you have further questions.

Jenna Borovansky
208.765.1413
208.699.3993 (cell)

From: Jenna Borovansky
Sent: Tuesday, May 25, 2010 5:10 PM
To: Jenna Borovansky; Steve Padula; jmorsell@nothernecological.coms; smorsell@northernecological.com; bzubeck@homerelectric.com; msalzetti@homerelectric.com; Paul.mclarnon@hdrinc.com; Erin.cunningham@hdrinc.com; Patrick.blair@hdrinc.com; Mark.ivy@ferc.gov; Kim.nguyen@ferc.gov; Ryan.hansen@ferc.gov; joe.klein@alaska.gov; jslang@fs.fed.us; prufrock@arctic.net; PRussell@borough.kenai.ak.us; Valerie@akcenter.org; salmonfisher@alaska.net; glaser@seward.net; Cassie_Thomas@nps.gov; bstanley@fs.fed.us; kaoleary@fs.fed.us; marionglaser@gmail.com
Subject: Grant Lake Site Visit Logistics - June 2, 2010

Dear Site Visit Attendees,

We have over 20 participants in the site visit, so would like to provide you with some revised logistics for the Wednesday, June 2 visit:

8 am – Meet at the Scenic Mountain air boat launch in Moose Pass
8 am – ~12:00 pm (noon) – Groups of four to five (depending on weight) will go by float plane to the outlet of Grant Lake, hop out to view the approximate location of the dam and be returned to boat launch (weather permitting; if weather hinders our ability to fly-in, we will hike-in and boat across Grant Lake to access the site)

8:30 am – ~4 pm - As groups return from the Lake, they will be shuttled by boat across Trail Lake to Grant Creek, and hike up the Creek in small groups (about 1-mile round trip), and will be shuttled back to the boat launch.

Please remember to bring your own lunch and water. Also, wear rugged, waterproof footwear and be prepared for inclement and potentially cold weather conditions. As we will be in and out of boats and near wetland areas, knee-high waterproof boots are recommended, and depending on your comfort level hiking in waders, hip boots/waders may be useful.

Please let us know if you have further questions or your plans change regarding attendance at the site visit. My cell phone number is: 208.699.3993, if you need to contact us on the day of the site visit.

Thank you,

Jenna Borovansky
208.765.1413

From: Jenna Borovansky
Sent: Tuesday, June 08, 2010 2:55 PM
To: 'Mark Luttrell'
Subject: RE: email addresses

Mark,
I spoke with HDR project manager this AM, apparently SHPO is unavailable for June 10, so that meeting will be rescheduled. HDR is trying to work out a new date. I assume that Kirsten is waiting to contact you until she has a new date to propose.

Her email is Kirsten.anderson@hdrinc.com. Thanks, Jenna

From: Mark Luttrell [mailto:prufrock@arctic.net]
Sent: Tuesday, June 08, 2010 2:07 PM
To: Jenna Borovansky
Subject: Re: email addresses

Hey Jenna

I have a couple of calls into Kirsten about inviting myself into the cultural workgroup. Do you have an email for her or could you contact her? I remember that there is a June 10 meeting scheduled and I'd like to participate in.

Mark

On Jun 6, 2010, at 10:16 PM, Jenna Borovansky wrote:

Hi Mark,
Ingrid.corson@hdrinc.com and erin.cunningham@hdrinc.com

Thanks for the photo. Also, either Kirsten Anderson or Elizabeth Grover from HDR-cultural resources team on Kenai Hydro Project should be contacting you regarding the cultural resources workgroup meeting activities.

-Jenna

From: Mark Luttrell [mailto:prufrock@arctic.net]
Sent: Friday, June 04, 2010 10:51 AM
To: Jenna Borovansky
Subject: email addresses

Hi Jenna:

Do you have email addresses for Ingrid and Erin of HDR? I have some photos of them that I'd like to send on.

Cheers

Mark

Mark Luttrell, President
Resurrection Bay Conservation Alliance
Box 1092
Seward, AK 99664
907 224-4621
prufrock@arctic.net
rbca-alaska.org

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rbca-alaska.org

FEDERAL ENERGY REGULATORY COMMISSION
Washington, D. C. 20426
July 30, 2010

OFFICE OF ENERGY PROJECTS

Project Nos. 13212-001 & 13211-001
Grant Lake/Falls Creek Hydroelectric Project
Kenai Hydro, LLC

Mr. Brad Zubeck,
Project Manager
Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

Subject: Hydropower Development on the Chugach National Forest

Dear Mr. Zubeck:

In its September 19, 2008, filing, the U.S. Forest Service (Forest Service) indicated that your proposed Grant Lake/Falls Creek Hydroelectric Project would be located within an area of the Chugach National Forest designated in the 2002 Revised Chugach National Forest Land and Resources Management Plan (2002 Forest Plan) as Fish, Wildlife, and Recreation Management Land Use Designation (Fish, Wildlife, & Recreation LUD). Additionally, the Forest Service indicated that your proposed project would be located within an Inventoried Roadless Area (Kenai Mountains Roadless Area) of the Chugach National Forest.

Based on our review of the pre-filing record for the Grant Lake/Falls Creek Hydroelectric Project, it appears as though the current configuration of your proposed project[1] may be inconsistent with current standards and guidelines specified in the 2002 Forest Plan for development of a hydroelectric project within a Fish, Wildlife, & Recreation LUD. It also appears as though your proposed project may be inconsistent with approved development activities for a roadless area.[2] Our review therefore suggests that your project as currently proposed may not be allowable under the standards of the 2002 Forest Plan and may not be allowable under the current roadless area policy.

You need to work closely to resolve any land use issues regarding your proposed project and the 2002 Forest Plan. Based on our review of the project record, however, it

[1] As proposed in the May 11, 2010 Scoping Document 1, September 16, 2009 Pre-application Document, and April 28, 2008 Application for Preliminary Permit.

[2] As described in the Secretary of Agriculture's May 28, 2010 memorandum.

appears as though a discussion concerning these issues has been limited and that these issues have not been resolved. Therefore, within 120 days of the date of this letter, please meet with the Forest Service to discuss options, which may include a project alternative that meets the standards of the plan, and file a report that provides a description of how you and the Forest Service intend to resolve the land use issues regarding the current configuration of your proposed project, the 2002 Forest Plan, and current roadless area policy.

For further information or assistance on licensing matters, please contact Mark Ivy at (202) 502-6156.

Sincerely,

Jennifer Hill, Chief
Northwest Branch
Division of Hydropower Licensing

cc: Service List
Public Files

Document Content(s)

Kenai Hydro, LLC
Grant Lake/Falls Creek Hydroelectric Project
FERC Project Number 13212/13211
9:00 – 9:30 am, August 10, 2010
Conference Call Summary

In Attendance

Jenna Borovansky, Long View Associates (LVA), on behalf of Kenai Hydro, LLC (KHL)
Steve Padula, LVA, on behalf of KHL
Karen O'Leary, United States Forest Service (USFS)
Kevin Laves, USFS
Barbara Stanley, USFS

Agenda

Review status of project proposal for the Grant Lake Project and discuss FERC's July 30 letter regarding consistency with Forest Plan standards and the roadless area policy.

Jenna Borovansky confirmed the agenda for the meeting, and stated that KHL representatives spoke with Mark Ivy, FERC, to confirm the intent of the July 30 letter from FERC. She noted that Mr. Ivy confirmed that FERC did not expect resolution of the issues in the letter within the 120-day response period, but FERC staff would like confirmation that both the USFS and KHL are aware of the potential issues identified in the letter (consistency with forest plan land use designations and the roadless area policy).

Meeting Summary

The USFS noted that several projects in Alaska had received similar letters from FERC. Jenna Borovansky stated the Kenai Hydro, LLC appreciates comments it has received from the USFS on the preliminary permits, and more recently FERC's scoping document, and KHL's study plans. She acknowledged that the Forest Service has provided useful information regarding the land use designations and status of the roadless area policy in the existing Forest Service comments on the record, and that KHL would like to confirm these comments with the Forest Service.

Consistency with Chugach National Forest Plan Land Use Designations

- The USFS confirmed that the land use designation for the area is Fish, Wildlife, and Recreation for the project vicinity.
- The Forest Plan includes utility systems as an allowed activity within the Fish, Wildlife, and Recreation designation, so there is no inherent conflict between the proposed project and this land use designation.
- The USFS will also be applying forest-wide standards and guidelines in its review of the project to ensure there are no resource-based conflicts between the project proposal and the forest-wide standards.
- The USFS will continue to be interested in resolution of the potential issues associated with the Iditarod Trail, as the USFS holds the easement from the state for the trail in the Project area. KHL will be filing a revised project description with FERC by August 13

that acknowledges that it will continue to work with state agencies and the USFS to develop a facilities and access road design compatible with the Iditarod Trail.

Consistency with Roadless Area Policy

- Portions of the Grant Lake shoreline on USFS lands are within the Kenai Mountains Roadless Area.
- The USFS confirmed that the Secretary of Agriculture has reserved authority to review proposed projects within roadless areas. The secretary will review the license application, and consider issues such as:
    - Is the activity in the roadless area (e.g., timber harvest) necessary?
    - Were other alternatives and solutions for the activity considered before the current alternative was chosen?
- The USFS noted that the two primary activities that are potential issues in roadless areas are road construction and any clearing of harvestable timber around the lakeshore.
- KHL is not proposing to construct roads within the roadless area, so the applicable issue to consider is whether shoreline timber will need to be removed. At this time, it is unknown if any shoreline vegetation will need to be removed. A shoreline vegetation study will record existing vegetation to determine whether clearing of the potential inundation area (approximately 2 feet maximum) will include any timber sized vegetation.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

August 13, 2010

Secretary Kimberly D. Bose
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

- FILED ELECTRONICALLY -

RE: Revised Project Facilities and Operations Description for the Grant Lake Hydroelectric Project (Nos. 13212-001 and 13211-001) and Updated Filing Schedule

Dear Secretary Bose:

As summarized in its July 6, 2010 comments on FERC's Scoping Document 1 (SD1) for the Grant Lake Project, Kenai Hydro, LLC (KHL) has produced draft study plans and is in ongoing consultation with relevant agencies regarding several key issues raised during scoping meetings and review of study plans by the agencies and the public. Several of these issues directly impact the proposed Project facilities and associated study efforts. In order to fully consider and consult with agencies regarding potential Project effects and necessary study efforts, KHL has determined a revised Project development schedule is necessary.

Milestones in KHL's revised filing schedule are:

- Summer – Fall 2010: Consult with agencies re: Iditarod Trail and relevant study components
- Winter 2010 – Spring 2011: Consult with agencies and the public regarding revised study plans for 2011-2012 study program
- Summer 2011 –Fall 2012: Continue field studies
- May 2013 – File Draft License Application
- October 2013 – File Final License Application

KHL appreciates FERC's responsiveness to public and agency requests for early NEPA scoping, and looks forward to providing FERC with a license application in fall 2013.

As discussed with Mark Ivy on August 5, KHL is aware of the need to ensure that the final facilities proposal and potential impacts are adequately studied, and thus, has attached a revised Project facilities and operations description (Attachment 1) that will serve as KHL's basis to continue consultation with agencies and the public regarding appropriate study efforts. KHL expects that this Project description will continue to evolve as studies are implemented and feedback from agencies on key issues is received, primarily, the location of the Iditarod Commemorative Trail in the Project vicinity and determination of potential resource impacts and instream flow needs in the bypass reach and the tailrace.

Please feel free to contact me (msalzetti@homerelectric.com or 907-283-2375) with any questions regarding this filing.

Sincerely,

/s/_Mike Salzetti________________

Mike Salzetti
Generation Engineer
Kenai Hydro, LLC

cc: Service List and Mailing List for Project Nos. 13211 and 13212
Mark Ivy, FERC
Kim Nguyen, FERC
Kenai Hydro, LLC Project email contact list

Attachments
Attachment 1: Revised Project Facilities and Operations Description

Attachment 1
Grant Lake Project (FERC No. 13211/13212)
Revised Project Description

This section completely replaces Section 3 of the PAD filed with FERC August 6, 2009 and revisions filed on May 3, 2010.

3 PROJECT LOCATIONS, FACILITIES, AND OPERATIONS

3.1. Authorized Agent for the Applicant

The name, business address, and telephone number of each person authorized to act as agent for the Applicant is as follows:

Brad Zubeck
Project Engineer
Kenai Hydro, LLC
3977 Lake Street
Homer, Alaska 99603
907-335-6204
bzubeck@homerelectric.com

Mike Salzetti
Generation Engineer
Kenai Hydro, LLC
3977 Lake Street
Homer, Alaska
907-283-2375
msalzetti@homerelectric.com

3.2. Project Location

The proposed Grant Lake Hydroelectric Project would be located near the community of Moose Pass, Alaska (pop. 206), approximately 25 miles north of Seward, Alaska (pop. 3,016), just east of the Seward Highway (State Route 9); this highway connects Anchorage (pop. 279,671) to Seward. The Alaska Railroad parallels the route of the Seward Highway, and is also adjacent to the Project area. The community of Cooper Landing (pop. 369) is located 24 miles to the northwest and is accessible via the Sterling Highway (State Route 1) which connects to the Seward Highway approximately 10 miles northwest of Moose Pass. The proposed Project location is in the mountainous terrain of the Kenai Mountain Range.

Land ownership and the proposed locations for Project facilities are shown in Figure 3.2-1.

3.3. Proposed Project Facilities

The proposed Project is comprised of a diversion dam at the outlet to Grant Lake (under consideration), an intake structure in Grant Lake, a tunnel, a surge tank, a penstock, a powerhouse, a tailrace detention pond, a switchyard with disconnect switch and step-up transformer, an overhead or underground transmission line, and a pole-mounted disconnect switch where the line intersects the existing City of Seward distribution line and access roads.

The powerhouse will contain two Francis turbine generating units with a combined rated capacity of 5.0 MW with a total design flow of 385 cfs.

3.3.1. Summary of Project Features

The proposed Project features have been developed based upon existing physical and environmental information and are conceptual in nature. As part of the pre-filing consultation process additional information will be obtained through technical and environmental studies, research, and consultation with equipment manufacturers and resource agencies. As new information becomes available, the design features presented below will continue to be refined and/or modified to accommodate any changed conditions, including maintenance of instream flow requirements or other resource management needs. A final proposal will be presented in the license application to FERC.

Project features as currently envisioned are summarized in Table 3.3-1 and are described in this section.

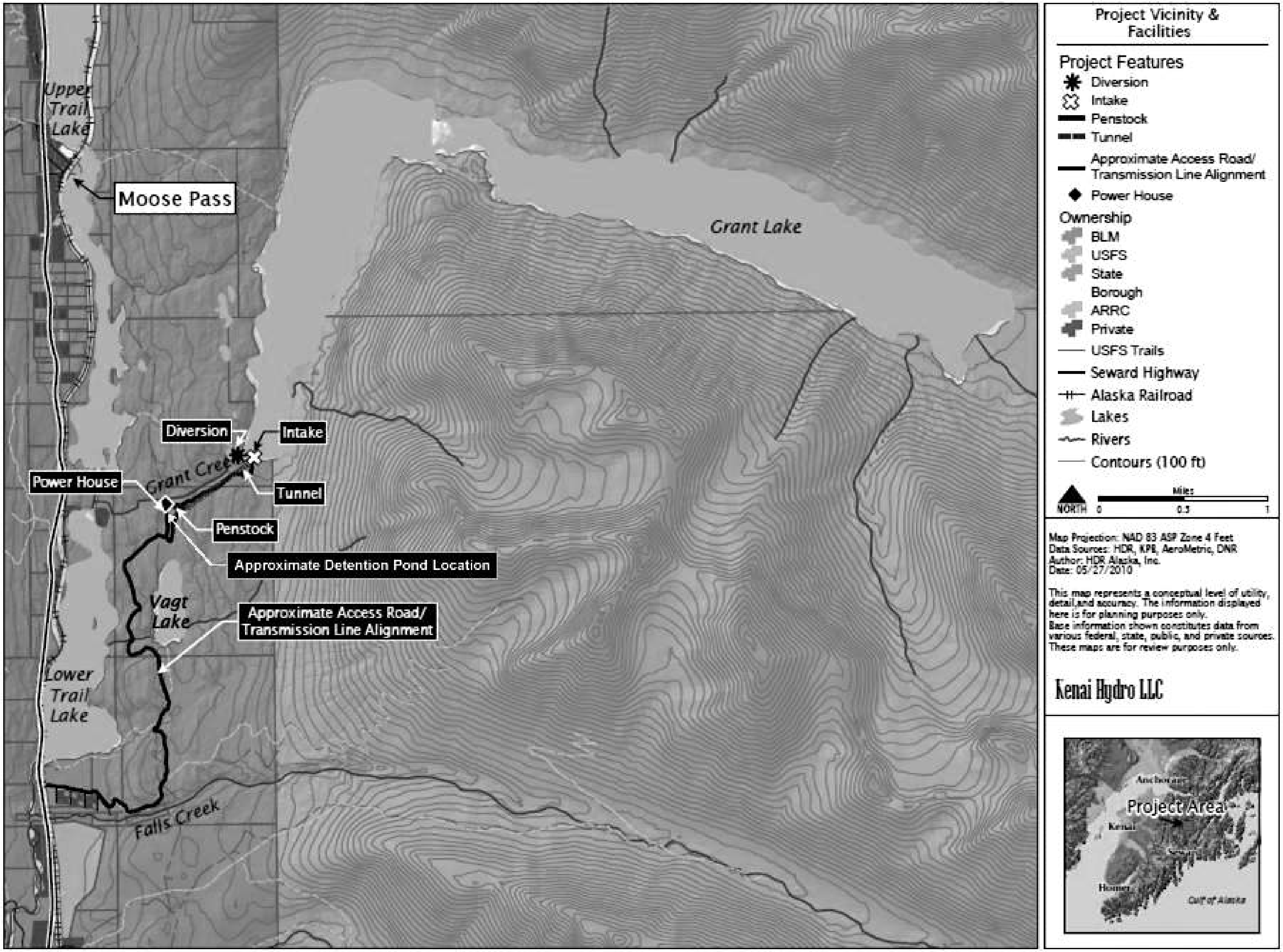

Figure 3.2-1. Proposed Project facilities, approximate access and transmission road location, and land ownership**.**

Summary of Project Features		
Number of Generating Units	2	
Turbine Type	Francis	
Rated Generator Output		
Unit 1	1.0 MW	
Unit 2	4.0 MW	
Maximum Rated Turbine Discharge		
Unit 1	75 cfs	
Unit 2	310 cfs	
Turbine Centerline Elevation	521.0	
Normal Tailwater Elevation		
Minimum	512.0	
Maximum	515.0	
Average Annual Energy	19,700 MWh	
Normal Maximum Reservoir Elevation	698.0 fmsl	
Normal Minimum Reservoir Elevation	687.0 fmsl	
Gross Head	183.0 feet	
Net Head at Maximum Rated Discharge	171.6 feet	
Grant Lake		
Drainage Area	44.0 sq. mi.	
Surface Area at Elevation 698.0 fmsl	1,790 acres	
Surface Area at Elevation 687.0 fmsl	1,700 acres	
Active Storage Volume	15,900 acre feet (Elevation 698.0 to 687.0)	
Average Annual Natural Outflow	139,650 acre feet	
Average Annual Natural Outflow	193 cfs	
Grant Creek Diversion		
Type (2 options under consideration)	**None (natural lake outlet)**	**Concrete Gravity Dam**
Maximum Height	Na	2 feet
Overall Width	Na	120 feet
Spillway Crest Length	Na	60 feet
Crest Elevation	698 fmsl	700 fmsl
Water Conveyance		
Intake	Tower	
Invert Elevation	655 fmsl	
Lower Pressure Pipeline		
Type	Welded Steel	
Length	200 feet	

Summary of Project Features	
Diameter	48 inches
Pressure Tunnel	
Type	10-foot Horseshoe
Length	3,200 feet
Velocity at Maximum Turbine Discharge	3.9 fps
Surge Tank	
Diameter	96 inches
Base Elevation (Preliminary)	650 fmsl
Top Elevation (Preliminary)	760 fmsl
Penstock	
Type	Welded Steel
Length	360 feet
Diameter	72 inches
Powerhouse	
Approximate Dimensions	45 feet x 60 feet x 30 feet high
Finished Floor Elevation	526 fmsl
Tailrace Detention Pond	
Approximate Acreage	5 acres
Approximate Capacity	15 Acre feet
Outlet Conveyance Length	300 feet
Tailrace	
Type	Open Channel
Length	200 feet
Transmission Line	
Type	Overhead or Underground
Length	Approximately 3.5 miles
Voltage	24.9kV
Access Roads	
Type	Single lane gravel surfacing with turnouts
Length	Approximately 4.0 miles; including 3.0 miles to the powerhouse and 1.0 mile to the intake (portions will be new road)

Table 3.3-1. Summary of proposed Project features.

3.3.1.1. Grant Creek Diversion

Two concepts are currently being evaluated for water control at the outlet of Grant Lake. In one option the natural lake outlet will provide control of flows out of Grant Lake. A new low level outlet will be constructed on the south side of the natural outlet to release any required environmental flows when the lake is drawdown below the natural outlet level. The outlet works will consist of a 48-inch diameter pipe extending back into Grant Lake, a gate house, regulating gate, controls and associated monitoring equipment. The outlet will discharge into Grant Creek immediately below the natural lake outlet.

In the second option, a concrete gravity diversion structure will be constructed near the outlet of Grant Lake. The gravity diversion structure would raise the pool level by a maximum height of approximately 2 feet, and the structure would have an overall width of approximately 120 feet. The center 60 feet of the structure would have an uncontrolled spillway section with a crest elevation at approximately 700 feet mean sea level (fmsl). Similar to the first option, a low level outlet will be constructed on the south side of the natural outlet to release any required environmental flows when the lake is drawn down below the natural outlet level. The outlet works will consist of a 48-inch diameter pipe extending back into Grant Lake, a gate house a regulating gate, controls, and associated monitoring equipment. The outlet will discharge into Grant Creek immediately below the diversion structure.

3.3.1.2. Grant Lake Intake

The water intake will be a concrete tower structure located approximately 500 feet east of the natural outlet of Grant Lake and adjacent to the shore. The intake structure will have base dimensions of approximately 15 feet by 15 feet. At the top of the intake will be a small house to contain the gate hoist mechanism and controls.

The intake will allow for drawdown of Grant Lake to elevation 687 fmsl thereby creating approximately 15,900 acre-feet of active storage for the project between elevations 698 fmsl and 687 fmsl. The intake can be designed to allow the Project to draw water near the surface at various levels of storage, if deemed necessary. The invert of the intake will be at elevation 655 to provide for adequate submergence to the tunnel. The front of the intake will be protected by a steel trashrack. Downstream of the trashrack will be a shut-off gate.

3.3.1.3. Tunnel

An approximately 3,200-foot-long, 10-foot diameter horseshoe tunnel will convey water from the intake to directly above the powerhouse at about elevation 623 fmsl. It is expected that the tunnel will be supported with rock bolts and shotcrete. It may be partially lined depending upon the geotechnical conditions encountered during excavation.

Near the end of the tunnel an 8-foot diameter surge shaft will be constructed. The surge shaft will extend to the ground surface at approximately elevation 750 fmsl. At the ground surface the shaft will transition to a steel pipe section. The pipe section will have a top elevation of 760 fmsl.

3.3.1.4. Penstock

At the outlet to the tunnel a short section of penstock will convey water to the powerhouse. The penstock will be constructed of welded steel and will be approximately 360-feet-long and will have an outside diameter of 72 inches. The penstock will bifurcate at the bottom immediately upstream of the powerhouse.

3.3.1.5. Tailrace

The tailrace will be an open channel approximately 200-feet-long and will convey water back to Grant Creek at approximately elevation 508 fmsl. The tailrace will be excavated from in-situ material and armored with riprap to prevent erosion. A control weir with an elevation of 512 fmsl will be constructed immediately downstream of the powerhouse at the beginning of the tailrace section.

3.3.1.6. Tailrace Detention Pond

An off-stream detention pond will be created to provide a storage reservoir for flows generated during the rare instance when the units being used for emergency spinning reserve are needed to provide full load as described in Section 3.4.1. In this situation, the additional powerhouse flows would be diverted into the detention pond and then released slowly back into Grant Creek. The detention pond would be located immediately south of the powerhouse and would have a capacity of approximately 15 acre feet and a surface area of approximately 5 acres. Water would be conveyed back to Grant Creek through a pipeline.

3.3.1.7. Powerhouse

The powerhouse will be located on the south bank of Grant Creek near the end of the canyon section of the creek. The powerhouse will be approximately 45 feet by 60 feet by 30 feet high and will have a finished floor elevation of 526 fmsl. The powerhouse will be a pre-engineered metal building on a concrete foundation.

The powerhouse will contain two horizontal Francis type turbine/ generator units with a rated total capacity of 5,000 kW, guard valves, and associated switchgear and controls. Unit 1 will have a design flow of 75 cfs and a rated capacity of 1,000 kW. Unit 2 will have a design flow of 310 cfs and a rated capacity of 4,000 kW. The size of each unit will be optimized once all flow conditions are known. Centerline of the turbine and generator units will be approximately 521 fmsl. The turbines could operate over a range of flows from the maximum of 385 cfs to a minimum of around 22 cfs depending on conditions. The tailwater elevation at the powerhouse will range from approximately elevation 512 to 515 depending upon the output level. The powerhouse will also contain a bypass valve to release flows during power generation outages.

3.3.1.8. Transmission Line/Switchyard

Both underground and overhead transmission lines to deliver energy from the Project to the grid are being evaluated. In addition to any overhead transmission structures, the facilities will include a switchyard at the powerhouse consisting of a pad-mounted disconnect switch and a pad-mounted step-up transformer. The transmission line will run from the powerhouse parallel to the access road where it will intersect the City of Seward distribution line. The interconnection will have a pole mounted disconnect switch.

If utilized, the poles would be designed as tangent line structures on about 250 foot centers. Design of the line will also incorporate the latest raptor protection guidelines. Collision avoidance devices will be installed on the line at appropriate locations to protect migratory birds.

3.3.1.9. Access Roads

The Grant Lake Project will require an access road to both the powerhouse located near the base of the Grant Creek canyon and to the intake at Grant Lake. This access road will be primarily used during project construction but afterwards, the powerhouse will be visited approximately once a week and the intake visited approximately once a month beginning just after the ice melts and continuing until just before freeze up. The powerhouse access road will be maintained year around. The intake access road will not be maintained in winter.

The road to the powerhouse is approximately three miles long beginning at the south end of Lower Trail Lake and crossing the Alaska Railroad tracks at an existing crossing located at approximately MP 25.2 of the Seward Highway. The first mile of this road will follow the existing Falls Creek mining road. At a point approximately one mile up the Falls Creek road the access road will continue northward to the powerhouse staying between Lower Trail Lake and Vagt Lake. As currently proposed, portions of the road come near, or intersect with the commemorative Iditarod National Historic Trail that will be under construction soon. The location of the road or the trail may be adjusted to avoid or mitigate potential impacts of the access road on the trail.

The intake access road is approximately one mile long, beginning at the powerhouse. The road will ascend a 230-foot bluff to get to the top of the southern lip of the Grant Creek canyon. The road then generally follows the southern edge of the Grant Creek canyon until it descends to Grant Lake.

The road will be gravel with a 14 foot top width. Maximum grade will be 16 percent. Periodic turnouts will be provided to allow construction traffic to pass. Fifty-foot radius curves will be used to more closely contour around the small steep hills of bedrock to limit the extent of the excavation and the height of the embankments.

3.3.2. Proposed Project Boundary

The proposed Project Boundary will encompass each of the Project features described above, and the area around Grant Lake up to approximately contour elevation 700 fmsl. The corridors for the access roads/transmission line and penstock will be approximately 50-75 feet from each side of the centerline. The specific delineation of the proposed Project Boundary, in terms of survey coordinates, will be made after study work has been completed and will be included as part of the license application.

3.3.3. Proposed Construction and Development Schedule

The Project will be constructed over a 30-36 month timeframe after the issuance of the Project license. Construction will begin in the April timeframe with the construction of access roads. Construction of the Grant Lake diversion structure (if necessary) and intake will be performed by first drawing down the lake elevation using a pair of diversion trenches cut through the outlet of the lake. This method will allow the lake to be drawn down to approximately elevation 680 fmsl over the winter, if necessary. Next the intake will be constructed behind an in-situ rock cofferdam. Once the intake and tunnel are complete the in-situ cofferdam will be removed by blasting. The Grant Lake diversion structure, if needed, will be constructed at the same time. The precise construction schedule and methods will be described further in the license application.

3.4. Project Operations

3.4.1. Proposed Project Operations

The Project will operate in block loading and level control (run-of-river) modes. The primary operational mode will be block loading at a specific output level. Level control, or balancing of outflow to inflow, will likely only occur during periods of low natural inflow to Grant Lake when the reservoir is at or near minimum pool elevation. Due to the small size of the Project in relation to the size of the interconnected system, the Project is not likely to be used to load follow. Additionally, the units will be utilized to fulfill a portion of Homer Electric Company's spinning reserve capacity requirement. Spinning reserve is energy capacity that is immediately available to assist Alaskan Railbelt utilities in the event of emergency conditions. Use of full emergency spin capacity is a rare event but when required, the units would be called upon to provide full load at maximum ramp rates for 15 minutes. This should provide sufficient time for non-spinning reserve to come on-line. The water from this event would be diverted to a detention pond (as described earlier) and slowly released at a controlled rate back into the stream.

With Grant Lake operating as a regulating reservoir, the typical mode of operation will be to capture high spring and summer runoff and to enter the late fall and winter season with the reservoir full at elevation 698 fmsl (without an impoundment structure) or 700 fmsl (with an impoundment structure as described in 3.3.1.1). During the winter months when the energy is needed most on the system, the reservoir will be systematically drafted to produce energy throughout the winter. The rate at which water is drawn from storage will generally be equal to the required environmental flow requirement downstream of the powerhouse. Occasionally, the Project may run at higher capacities to meet system needs at intermittent times. However, the amount of time the Project could operate at higher outputs would be limited by available storage. This process will continue until the reservoir begins to refill with snowmelt (typically around

May). During the summer months when inflow exceeds powerhouse capacity, the Project will most often run continuously at peak capacity.

Expected average annual reservoir fluctuations are shown in Figure 3.4-1. Due to the amount of storage, there will be negligible carryover storage from one year to the next. The maximum lake level drawdown could be below the average drawdown to as low as 687 fmsl, but actual drawdown will be dependent on water inflow and operational scenarios.

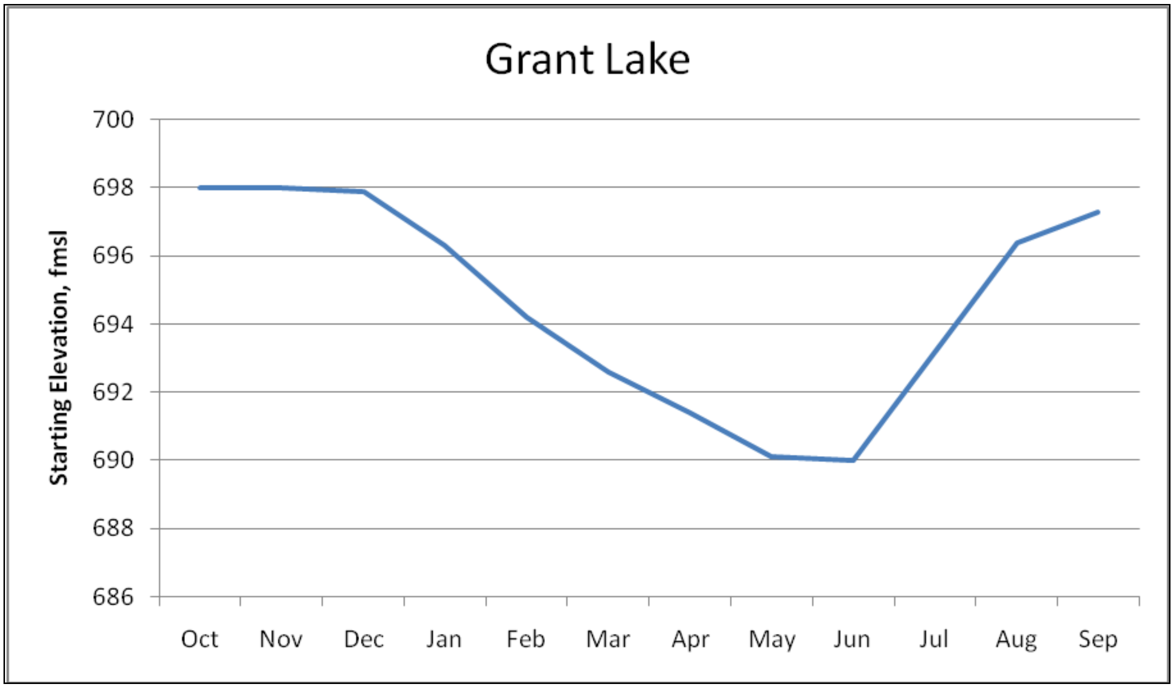

Figure 3.4-1. Estimated average Grant Lake elevations with proposed Project operations.

Flows in Grant Creek are naturally high during the summer when snowmelt is occurring and low in the winter when temperatures are below freezing. With the proposed Project in operation, the high flows in the summer will be stored and released later in the season. Figure 3.4-2 shows the effect of this operation.

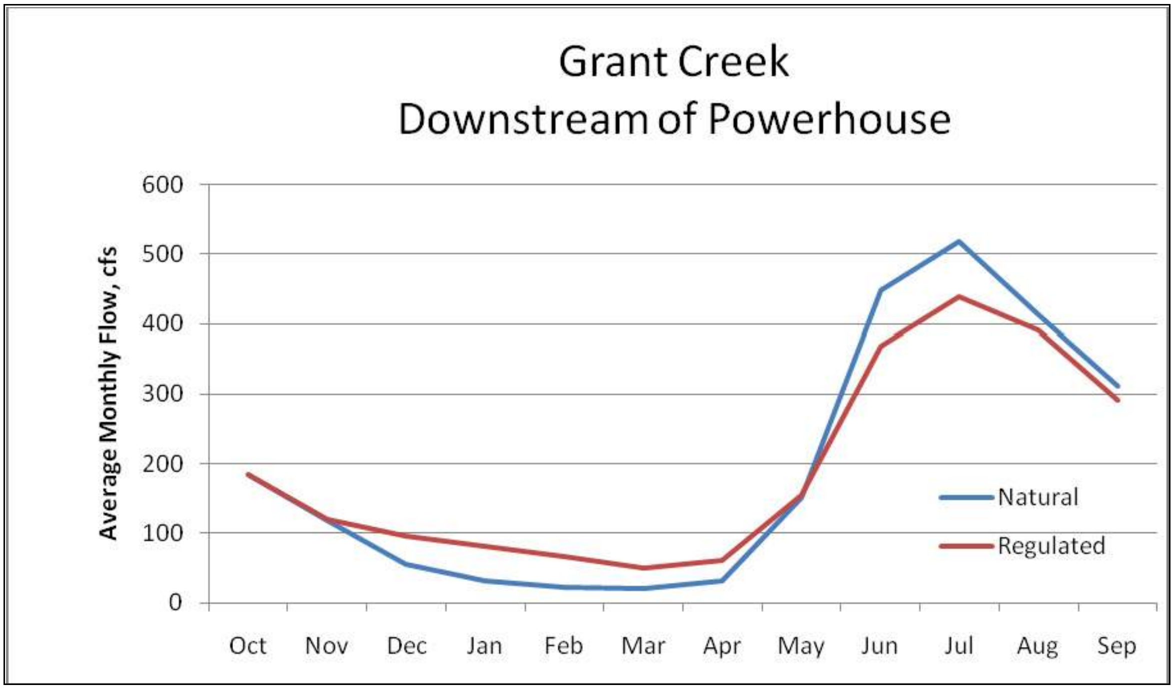

Figure 3.4-2. Estimated average monthly flows in Grant Creek downstream of the proposed powerhouse location.

Flows in Grant Creek downstream of the tailrace will be a combination of turbine discharges, natural inflow, and flows released into the creek at the lake outlet. Generally, the flows in the reach of Grant Creek below the lake outlet will be reduced to the environmental flow requirement, which has not yet been determined. Flows in this reach between the lake outlet and the powerhouse will increase when spill is occurring at the lake outlet.

3.4.2. Project Capacity and Production

The Project will have an installed capacity of 5,000 kW. Estimated energy production was simulated using a computer model utilizing daily flows, reservoir characteristics, and assumed equipment data. The predicted average annual energy from the Project with a maximum lake elevation of 698 fmsl is 19,700 MWh representing a plant factor of 45%. Predicted average annual energy with a maximum lake elevation of 700 fmsl is 20,500 MWh. Monthly generation is assumed to vary as shown in Figure 3.4-3. Estimates will be revised once instream flow studies are completed, and any flow requirements for the reach between the Grant Lake outlet and the powerhouse are determined.

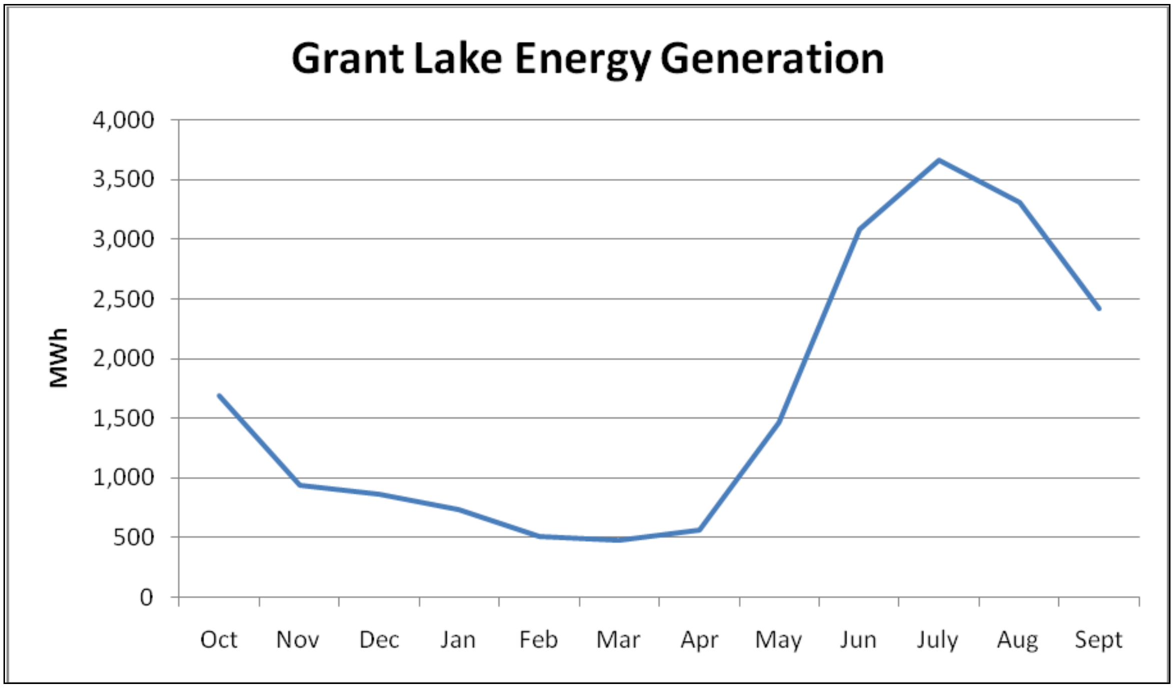

Figure 3.4-3. Grant Lake estimated average monthly generation.

3.4.3. Summary of Project Generation

The proposed Project is a new facility. As such there is not a record of generation.

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

September 30, 2010

Secretary Kimberly D. Bose
Federal Energy Regulatory Commission
Attn: DHAC, PJ-12.2
888 First Street, NE
Washington, DC 20426

- FILED ELECTRONICALLY -

RE: Fourth Six Month Preliminary Permit Progress Report for the Grant Lake (Project No. 13212) and Falls Creek (Project No. 13211) Hydroelectric Project, April 2010 – September 2010

Dear Secretary Bose:

Kenai Hydro, LLC (KHL) hereby submits its fourth six month report for the period of April 1, 2010 to September 30, 2010 for the Grant Lake and Falls Creek hydroelectric project, pursuant to Article 4 of the preliminary permits issued on October 7, 2008.

ACTIVITIES DURING THE REPORTING PERIOD (APRIL 2010 – SEPTEMBER 2010)

Engineering and Environmental Studies
The following environmental study efforts were conducted:

- A reconnaissance geological survey was conducted at the Grant Lake outlet in support of on-going engineering facilities design work.
- Preliminary engineering efforts continue to refine the operations and facilities proposal as outlined in KHL's August 13, 2010 submittal to FERC.
- Study plans for Terrestrial Resources, Aquatic Resources, Recreation and Visual Resources, Cultural Resources, and Water Resources were provided for agency and public review in May 2010.
- Field efforts as outlined in the Aquatic Resources study plan were conducted between May 2010 and July 2010.
- Wildlife and wetland surveys were conducted in the Project area in May and June 2010, as outlined in the study plans.
- Reconnaissance efforts to identify recreation uses and trail locations for the Recreation and Visual Resources study were conducted in June 2010.
- Hydrologic gaging stations were re-established at locations identified in the Water Resources study plan in May 2010.

Stakeholder Outreach and Consultation
In addition to participating in the formal scoping process hosted by FERC, KHL continued consultation regarding proposed licensing studies and Project facilities. These consultation activities included:

- KHL hosted an environmental site visit and participated in FERC's scoping meetings on June 2 and 3, 2010.
- KHL hosted a study plan review meeting with agencies and interested parties on June 3, 2010.
- KHL provided study plans identified above for a 60-day comment period.

- KHL initiated consultation with the Alaska Department of Natural Resources and the U.S. Forest Service regarding the Iditarod National Historic Trail location in the Project vicinity.
- KHL held an instream flow and aquatic resources technical work group meeting in Anchorage, Alaska on June 22, 2010.
- KHL presented its Project proposal and timeline to the Kenai Peninsula Borough Assembly on June 22, 2010.
- KHL initiated consultation under Section 106 of the National Historic Preservation Act, and held a meeting to review the study plan and proposed Area of Potential Effect with consulting parties on June 24, 2010.

ACTIVITIES PROPOSED FOR THE NEXT REPORTING PERIOD (OCTOBER 2010 – MARCH 2011)

KHL will continue resource study, engineering, and consultation efforts in support of its license application.

<u>Engineering and Environmental Studies</u>
KHL plans to process 2010 field study data, develop revised study plans, and respond to agency and public comments.

<u>Stakeholder Outreach and Consultation</u>

- KHL will continue consultation regarding the Iditarod National Historic Trail location in the Project vicinity.
- KHL will consult with agencies regarding revised study plans and an updated consultation schedule for license application development.

Please feel free to contact me (907.283.2375 or msalzetti@homerelectric.com) with any questions regarding this filing.

Sincerely,

<u>/s/ Mike Salzetti</u>

Mike Salzetti
Project Manager
Kenai Hydro, LLC

cc: Service List and Mailing List for Project Nos. 13211 and 13212

Kenai Hydro, LLC
3977 Lake Street
Homer, AK 99603

October 12, 2010

Ms. Jennifer Hill
Northwest Branch – Division of Hydropower Licensing
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

- FILED ELECTRONICALLY -

RE: Kenai Hydro, LLC's Response to FERC's July 30, 2010 Information Request Regarding the Proposed Grant Lake/Falls Creek (Project Nos. 13212-001 & 13211-001) Hydropower Development on the Chugach National Forest

Dear Ms. Hill:

On July 30, 2010, the Commission requested that Kenai Hydro, LLC (KHL) meet with the Forest Service within 120-days to discuss project alternatives that would meet the standards of the Chugach National Forest Plan and current roadless area policy.

On August 10, 2010, representatives of Kenai Hydro, LLC met with representatives of the Chugach National Forest via conference call to discuss the issues identified in FERC's July 30, 2010 communication. While the U.S. Forest Service will need to review the Project proposal presented by KHL in its license application, at this time, no inherent conflicts were identified between the Project proposal and standards in the Forest Plan or the current roadless area policy. Please see the enclosed meeting summary for details.

Please feel free to contact me (msalzetti@homerelectric.com, 907-283-2375) with any questions regarding this filing.

Sincerely,

/s/ Mike Salzetti

Mike Salzetti
Project Engineer
Kenai Hydro, LLC

cc: Service List for Project Nos. 13211 and 13212

Kenai Hydro, LLC
Grant Lake/Falls Creek Hydroelectric Project
FERC Project Number 13212/13211
9:00 – 9:30 am, August 10, 2010
Conference Call Summary

In Attendance

Jenna Borovansky, Long View Associates (LVA), on behalf of Kenai Hydro, LLC (KHL)
Steve Padula, LVA, on behalf of KHL
Karen O'Leary, United States Forest Service (USFS)
Kevin Laves, USFS
Barbara Stanley, USFS

Agenda

Review status of project proposal for the Grant Lake Project and discuss FERC's July 30 letter regarding consistency with Forest Plan standards and the roadless area policy.

Jenna Borovansky confirmed the agenda for the meeting, and stated that KHL representatives spoke with Mark Ivy, FERC, to confirm the intent of the July 30 letter from FERC. She noted that Mr. Ivy confirmed that FERC did not expect resolution of the issues in the letter within the 120-day response period, but FERC staff would like confirmation that both the USFS and KHL are aware of the potential issues identified in the letter (consistency with forest plan land use designations and the roadless area policy).

Meeting Summary

The USFS noted that several projects in Alaska had received similar letters from FERC. Jenna Borovansky stated the Kenai Hydro, LLC appreciates comments it has received from the USFS on the preliminary permits, and more recently FERC's scoping document, and KHL's study plans. She acknowledged that the Forest Service has provided useful information regarding the land use designations and status of the roadless area policy in the existing Forest Service comments on the record, and that KHL would like to confirm these comments with the Forest Service.

Consistency with Chugach National Forest Plan Land Use Designations

- The USFS confirmed that the land use designation for the area is Fish, Wildlife, and Recreation for the project vicinity.
- The Forest Plan includes utility systems as an allowed activity within the Fish, Wildlife, and Recreation designation, so there is no inherent conflict between the proposed project and this land use designation.
- The USFS will also be applying forest-wide standards and guidelines in its review of the project to ensure there are no resource-based conflicts between the project proposal and the forest-wide standards.
- The USFS will continue to be interested in resolution of the potential issues associated with the Iditarod Trail, as the USFS holds the easement from the state for the trail in the Project area. KHL will be filing a revised project description with FERC by August 13

that acknowledges that it will continue to work with state agencies and the USFS to develop a facilities and access road design compatible with the Iditarod Trail.

Consistency with Roadless Area Policy

- Portions of the Grant Lake shoreline on USFS lands are within the Kenai Mountains Roadless Area.
- The USFS confirmed that the Secretary of Agriculture has reserved authority to review proposed projects within roadless areas. The secretary will review the license application, and consider issues such as:
    - Is the activity in the roadless area (e.g., timber harvest) necessary?
    - Were other alternatives and solutions for the activity considered before the current alternative was chosen?
- The USFS noted that the two primary activities that are potential issues in roadless areas are road construction and any clearing of harvestable timber around the lakeshore.
- KHL is not proposing to construct roads within the roadless area, so the applicable issue to consider is whether shoreline timber will need to be removed. At this time, it is unknown if any shoreline vegetation will need to be removed. A shoreline vegetation study will record existing vegetation to determine whether clearing of the potential inundation area (approximately 2 feet maximum) will include any timber sized vegetation.

Document Content(s)