State of Alaska
Department of Fish and Game
Division of Sport Fish

Nomination Form
Anadromous Waters Catalog

Region: Southwest

USGS Quad(s): KOD A4

Anadromous Waters Catalog Number of Waterway: NA 258-52-10010-2013-30 11-006

Name of Waterway: Unnamed Pond in Big Creek Watershed (OHHEFT007)

☐ USGS Name ☑ Local Name

☑ Addition ☐ Deletion ☐ Correction ☐ Backup Information

For Office Use

Nomination #	11-205		
Revision Year:	2012	Fisheries Scientist	6/13/11 Date
Revision to:	Atlas ____ Catalog ____ Both X	Habitat Operations Manager	6/13/11 Date
		AWC Project Biologist	6/9/11 Date
Revision Code:	A-2	Cartographer	9/27/11 Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
coho salmon	8.27.10		2		☑
Dolly Varden	8.27.10		1		☑
					☐
					☐
					☐

IMPORTANT: Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

Comments: add new stream and lake w/ coho rearing

Fish trap # OHHEFT007 on attached figure
Location N57 14.069 W153 18.069

ZeF 11-206

Name of Observer (please print): Kate Arduser

Signature: Kate Arduser

Date: 4.1.10

Agency: Solstice Alaska Consulting, Inc.

Address: 2607 Fairbanks Street, Suite B
Anchorage, AK 99503

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Anadromous Waters Catalog.

Signature of Area Biologist: _____ Date: _____

Name of Area Biologist (please print):

Revision 05/08

Johnson, J D (DFG)

From: Kate Arduser [kate@solsticeak.com]
Sent: Monday, March 21, 2011 11:07 AM
To: Johnson, J D (DFG)
Cc: Robin
Subject: Old Harbor, Kodiak Anadromous Fish Waters
Attachments: RDI_2010_Fig1_FishReport_1of1_D01_DRAFT.pdf

Hi,
It was nice talking with you this morning. Below you will find the coordinates I said I would e-mail for potential nomination to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes. I have attached a figure for reference.

We reviewed the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes before we performed field work and found that Lagoon Creek and its tributary were previously cataloged as anadromous by ADF&G. The waterbody labeled as Lake on the attached figure and the two ponds north of the project area, labeled OHHEFT007, OHHEFT008, were not cataloged as anadromous waters as of the date of the study.

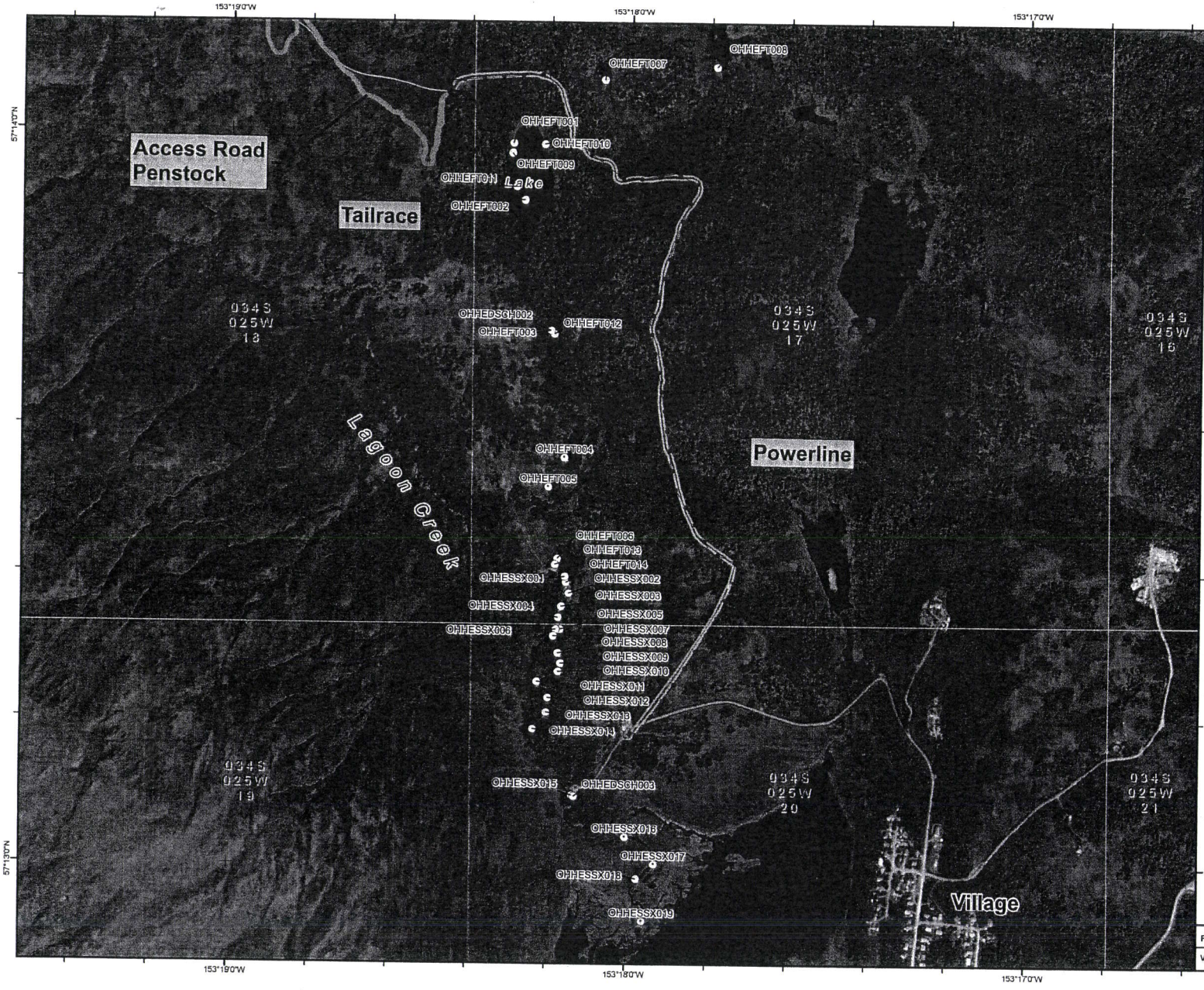
Our fish trapping results show that the entire stretch of Lagoon creek, from its inception to the mouth, supports anadromous fish. The two ponds north of the project area (OHHEFT007, OHHEFT008) in the Big Creek watershed, were also found to be supporting anadromous fish. The Swimming Pond was not found to be supporting anadromous fish.

Here are locations and species found for all the fish traps we used. The waterbody locations (headwaters of Lagoon Creek tributary and two ponds north of the project area, OHHEFT007, OHHEFT008 in the Big Creek watershed) highlighted in yellow were found to support anadromous fish and not previously catalogued as such.

Location ID (optional)	Latitude	Longitude	Datum	Coordinate determination method	Name of water body	Date	Species
OHHEFT001	57.23305	-153.30493	WGS84	GPS	Swimming Pond (also called Lake)	8/26/10	stickleback-unspecified
OHHEFT002	57.2317833	-153.30443	WGS84	GPS	Swimming Pond (also called Lake)	8/26/10	stickleback-unspecified
OHHEFT003	57.2288333	-153.30328	WGS84	GPS	Lagoon Creek (headwaters)	8/26/10	coho salmon
OHHEFT004	57.22595	-153.30268	WGS84	GPS	Lagoon Creek (beaver pond)	8/26/10	coho salmon
OHHEFT005	57.2252833	-153.30335	WGS84	GPS	Lagoon Creek (beaver pond)	8/26/10	coho salmon, Dolly Varden
OHHEFT006	57.2236667	-153.30295	WGS84	GPS	Lagoon Creek (downstream of beaver ponds)	8/26/10	coho salmon, Dolly Varden
OHHEFT007	57.2344833	-153.30115	WGS84	GPS	unnammed pond	8/27/10	coho salmon, Dolly Varden
OHHEFT008	57.2347833	-153.29648	WGS84	GPS	unnammed pond	8/27/10	coho salmon, Dolly Varden, stickleback-unspecified
OHHEFT009	57.2328333	-153.30497	WGS84	GPS	Swimming Pond (also called Lake)	10/16/10	Dolly Varden, stickleback-unspecified
OHHEFT010	57.2330278	-153.30361	WGS84	GPS	Swimming Pond (also called Lake)	10/16/10	stickleback-unspecified
OHHEFT011	57.2320833	-153.30478	WGS84	GPS	Swimming Pond (also called Lake)	10/16/10	stickleback-unspecified
OHHEFT012	57.22875	-153.30314	WGS84	GPS	Lagoon Creek (headwaters)	10/16/10	no fish collected or observed
OHHEFT013	57.2235278	-153.30306	WGS84	GPS	Lagoon Creek (downstream of beaver ponds)	10/16/10	coho salmon, Dolly Varden
OHHEFT014	57.2231111	-153.30258	WGS84	GPS	Lagoon Creek (downstream of beaver ponds)	10/16/10	coho salmon, Dolly Varden

(Here's another version of the locations highlighted in yellow:
OHHEFT007 N57 14.069 W153 18.069
OHHEFT008 N57 14.087 W153 17.789
OHHEFT003 N57 13.730 W153 18.197)

If you have any questions, please let me know.
Thanks,
--
Kate Arduser, Environmental Planner
Solstice Alaska Consulting, Inc.
Office: 907.424.5195
Cell: 907.306.7719
Email: kate@solsticeak.com



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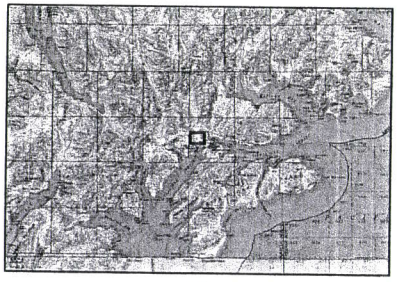
Proposed Old Harbor Hydroelectric Project
Fisheries Map
Figure 1.0

Legend

- 2010 Fish Data Points
- Proposed Penstock
- Proposed Overhead Electric Lines from Powerhouse to Moutain View Drive
- Proposed Tailrace C/L
- Proposed Road from Powerhouse to Moutain View Dr.
- Proposed Access Road from Powerhouse to Penstock
- Proposed Intake
- Proposed Powerhouse

Notes:
Photobase: August Quickbird 2 - August 11, 2009



Feet
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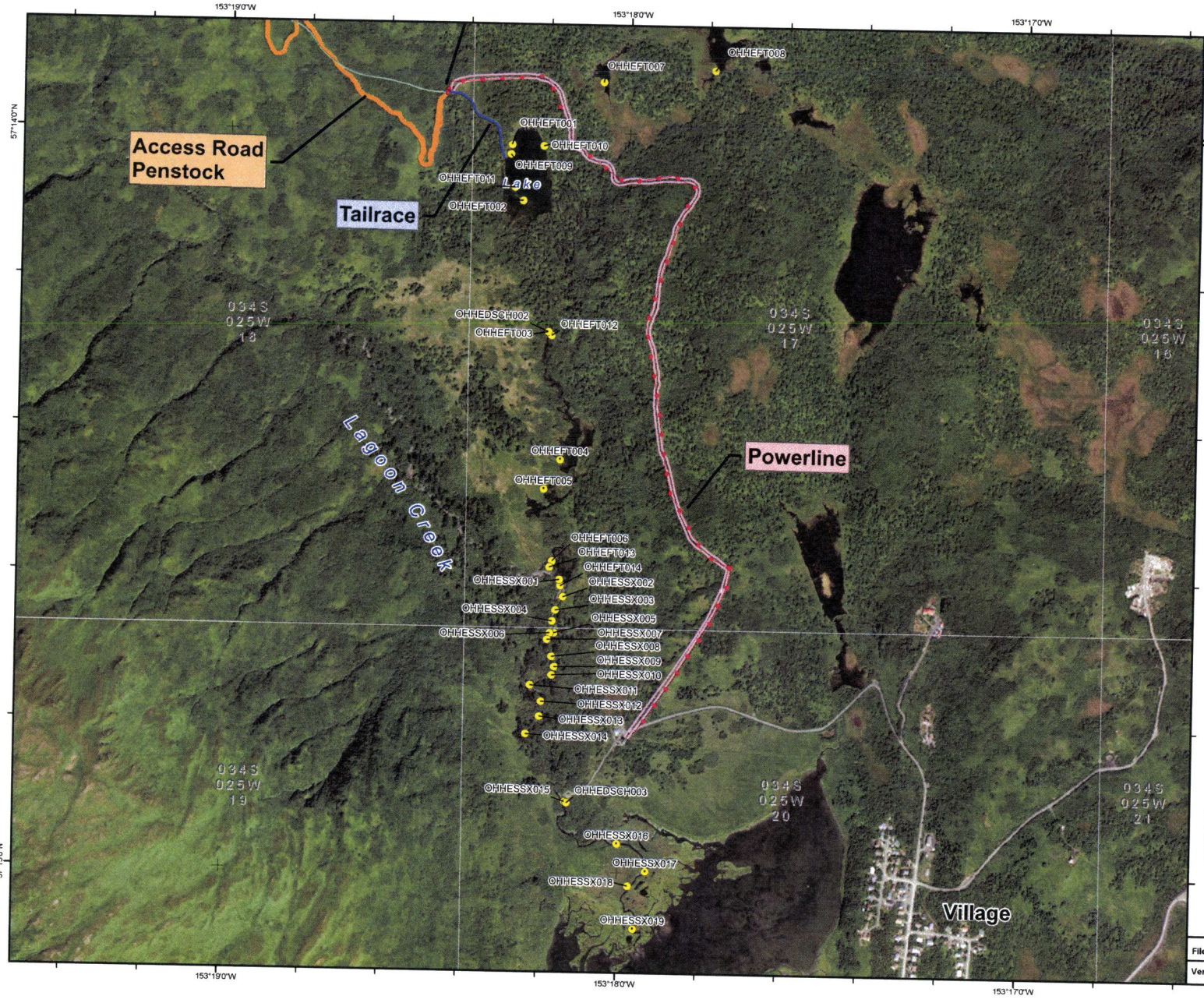
Scale 1:9,356
Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: RDI_2010_Fig1_FishReport_1of1_D01.mxd	Date: November 23, 2010
Version: 1	Author: RDI-DWR



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File: RDI_2010_Fig1_FishReport_1of1_D01.mxd	Date: November 23, 2010
Version: 1	Author: RDI-DWR

Old Harbor Hydroelectric Fish Habitat and Spawning Survey Report

Prepared By:

Christopher L. Love, PWS

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Introduction

The following study characterizes aquatic habitats and completes a spawning survey in Lagoon Creek, ADF&G catalog No.(258-52-10015). It also determines presence/absence of anadromous fish in the Swimming Pond and two unnamed ponds north of the project area. The parameters of the study identify anadromous fish presence/absence, ID's specimens to species, qualitatively describe aquatic habitats, and establish baseline water quality data. The purpose of this study is to collect baseline data which will be use by agency personnel in determining mitigation of impacts from the Old harbor Hydroelectric Project (OHHE). This information will then be used to evaluate resource issues identified during the Federal Energy Regulatory Commission (FERC) public scoping process.

The Alaska Village Electric Cooperative (AVEC), the electrical utility provider in Old Harbor, Alaska is filing with FERC its Proposed Study Plan as part of the Integrated Licensing Process for the Old Harbor Hydroelectric Project (FERC No. P-13272). The Old Harbor Hydroelectric Project is proposed within the Kodiak National Wildlife Refuge, and must be consistent with the Kodiak NWR Comprehensive Plan (USFWS 2008).

Existing Information

According to the State of Alaska Catalog of Anadromous Streams, Lagoon Creek (258-52-10015) and Lagoon Creek Tributary (258-52-10015-2004) support spawning Coho (*Oncorhynchus kisutch*), chum (*O. keta*), and pink (*O. gorbuscha)* salmon (ADF&G 2009). The National Marine Fisheries Service Essential Fish Habitat lists the areas identified above as Essential Habitat for all species of salmon. At the time of the field survey Lagoon Creek (258-52-10015) is not listed as Section 303(d) impaired waterbodies by the State of Alaska (ADEC 2010).

Prior to this study, AVEC performed extensive studies of the fishery resources as part of the previous licensing process. The two areas of study were Mountain Creek and Lagoon Creek. Three reports were provided by AVEC's fisheries consultant, Lonnie White (White 1996, 1996a, 1998), pertaining specifically to assessment of resources and impacts in those two drainages. In the report by White (1998), the spring fed feeder streams with consistent flow, like the Lagoon Creek Tributary, attracted spawning salmon, whereas the streams that occasionally went dry, like the main branch of Lagoon Creek, were devoid of spawning salmon.

Project Area

The waterbodies included in the presence/absence study were two ponds north of the study area in the Big Creek watershed, the waterbody known as the Swimming Pond, and Lagoon Creek (Figure 1). The fish habitat study was focused on the reach of Lagoon Creek from its inception south of the Swimming Pond to the mouth.

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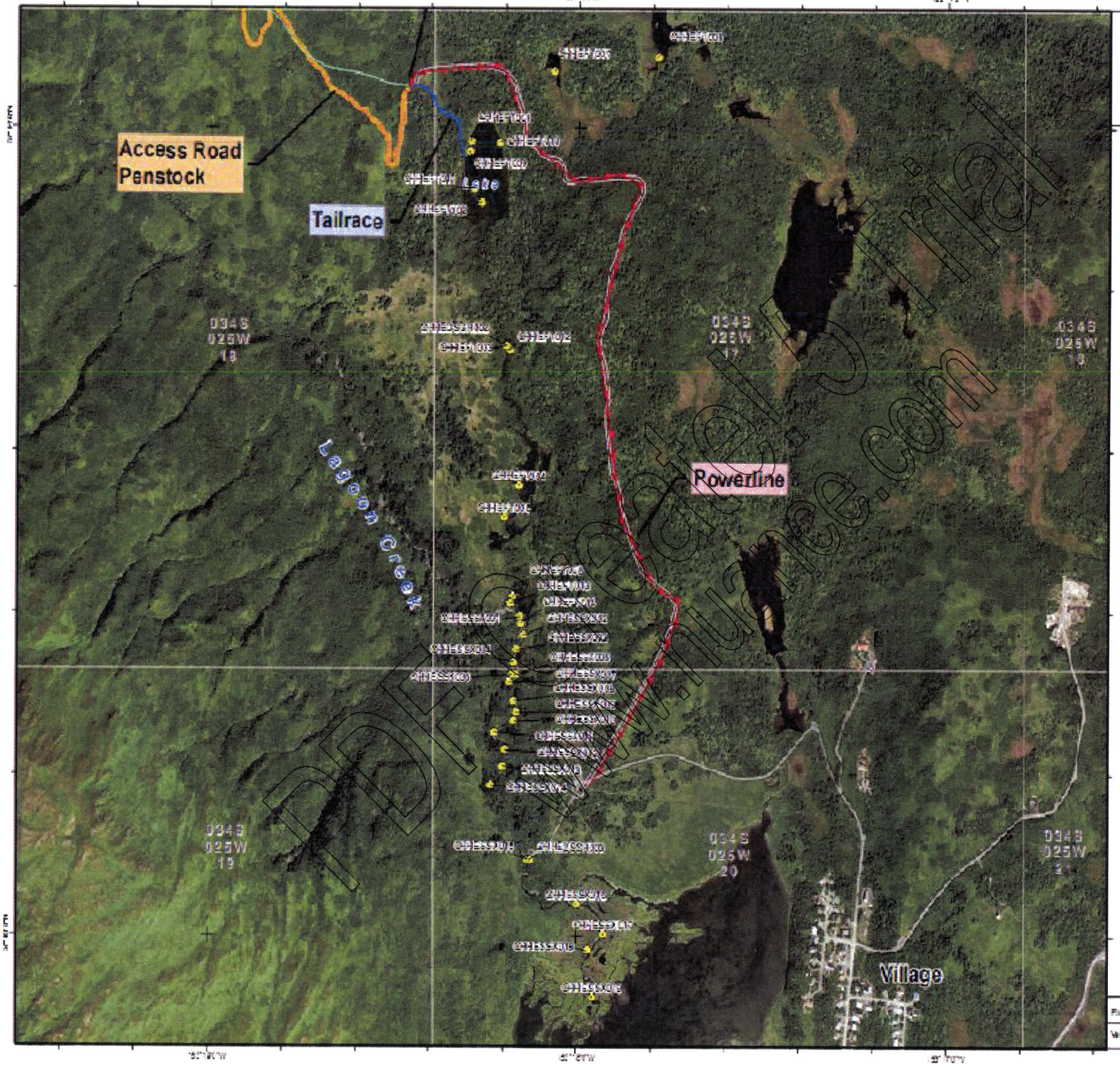

Proposed Old Harbor Hydroelectric Project
Fisheries Map
Figure 1.0

Legend

- 2010 Fish Data Points
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Notes:
Photobase: August Quickbird 2- August 1 , 2009

Feet
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Scale 1:9,388
Alaska State Plane Zone 5 (units feet)
1983 North American Datum

File: FD_2010_Fig1_FishReport_1of_001.mxd	Date: November 21, 2010
Version: 1	Author: RDI-DWR

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Methods

Analysis of Lagoon Creek included channel characteristics, baseline water quality data, and qualitative presents/absence surveys for anadromous fish through short term fish trapping and a spawning survey. Physical measures included stream discharge, channel width, average depth, substrate particle size, corrected velocity, stream feature type, in-stream woody debris (IWD), riparian vegetation, and estimated stream channel shade.

Water quality data was collected using a YSI 556 multiprobe and included temperature, DO%, DO mg/L, and pH when available. The YSI probe was completely submerged in the stream or pond and allowed to stabilize. Stabilization would typically take up to ten minutes. To avoid delay in project data collection the probe would often be turned on and placed in the water while other work was done in tandem. When possible the probe was allowed to remain on and in the water while moving to a new site. This allowed the probe to continue to take measurements and reduced stabilization times.

Twenty two cross sectional profiles were measured at locations along Lagoon Creek. Channel widths, depths, velocity (three cross sections), and feature type were measured on straight channel sections, at ordinary high water (vegetation line), and separated longitudinally by approximately 150 feet where practical.

Discharge was measured at three locations on Lagoon Creek using cross sectional profiles. Depth and stream channel were measured and put into $1/10^{th}$ feet units. Velocity was measured at 0.8 and 0.2 depth with a Marsh McBirney Flowmate model 2000 (MMB). The Marsh McBirney is designed for low flow shallow systems as was characteristic in Lagoon Creek.

Three sites were preselected for taking discharge. The First, OHHEDSCH002, was near the headwaters of Lagoon Creek. The second discharge measurement, OHHEDSCH001, was in the middle section below the beaver dam. The third, OHHEDSCH003, was taken at the pump house close to the mouth of Lagoon Creek.

$$\text{Cross Sectional Area (ft}^2\text{)} * \text{Average Stream Velocity (ft/sec)} = \text{DSCH (cfs)}$$

Three other velocities were taken during the August field effort using timed surface observations. A predetermined distance of 50' or 25', depending on stream dynamics, was measured using a standardized tape. A floating object was then placed on the water surface and timed until it reached the end of the tape. This was repeated three times for each site. The velocity was then multiplied by a correction value to compensate for substrate. Correction values are 0.8 for coarse gravel and 0.9 for mud and sand.

$$\text{Velocity (ft/sec)} = (\text{Distance (ft)} / \text{Time}_{avg})*(\text{Correction Value})$$

In stream Woody Debris (IWD), substrate, riparian vegetation, and % shade were collected while traversing the stream channel between cross sectional data points. The presence/absence of adult spawning salmon was observed by visually surveying waterbodies and short-term fish trapping.

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IWD was collected by tallying dead woody debris in the stream channel greater than 1" in diameter and > 1' in length. Substrate particle size was determined while traversing the stream by measuring a random sample at each new stream feature and at the cross sectional profiles with a standardized measuring stick. Substrate was categorized based on size in inches as silt (very fine), sand (.04-.08), gravel (.08-2.5), cobble (2.5-10.1), and boulder (10.1-80). Riparian vegetation and % shade were determined using ocular estimates of percent cover.

The fish trapping effort was a qualitative study and is not designed for nor implies population dynamics of any of the observed waterbodies. The fish trapping study was only a presence/absence study looking for juvenile anadromous fish species and no other measurements were taken on trapped specimens. Fish trapping was conducted upstream and downstream from the beaver dam on Lagoon Creek, in the Swimming Pond and at two ponds adjacent to the northern end of the project area in the Big Creek watershed. Fish were captured and removed from the waterbodies in minnow traps. Six traps were baited with commercially cured salmon roe and placed within slow moving pool habitats of Lagoon Creek, and off the shore in the remaining waterbodies. After all trapping sets were completed and given an adequate amount of time to soak; fish from each set were identified to species, counted, and returned to the stream or pond.

Spawning surveys for adult salmon were conducted in August and October 2010. In August we observed the entire length of Lagoon Creek from its inception south of the swimming pond to the mouth were it meets the brackish water of the estuary. In October, all but a small section of Lagoon Creek was surveyed due to increased bear activity. In each case, observers donned polarized glasses and traversed the shore and stream channel looking for the presence of adult salmon. Specifically, observers looked in deep water pools, riffles and along cut banks. If any adult salmon were observed estimated, number and species were recorded.

Results

The section of Lagoon Creek above the beaver damn (Figure 2) is a relatively short (< 0.5 mile), low energy low flow system categorized by low energy pools. The stream channel is not well defined in the upper section. The riparian vegetation is predominantly sedge meadow, blue joint herbaceous, and willow scrub shrub. The predominate substrate in the pools are typically organic mud, silt and sands. We did not observe, at any time, zero flow in the upper section of Lagoon Creek. The upper section becomes ponded as it approaches a large beaver damn mid section. It is obvious that the recent beaver activity mid section on Lagoon Creek is affecting the flow regime of the stream. Whether or not these effects are positive or negative to the spawning or rearing of anadromous fish cannot be determined at this time.

The section of Lagoon Creek below the beaver damn is a relatively short (< 0.5 mile), stable, low energy, meandering stream, categorized by pools and riffles. The predominate substrate in the riffles was medium gravels and cobble. Pools are typically silt and sands. We did not observe at any time zero flow on Lagoon Creek. However it is obvious that the recent beaver activity mid section on Lagoon Creek (Figure 3) is affecting the flow regime of the stream. Whether or not

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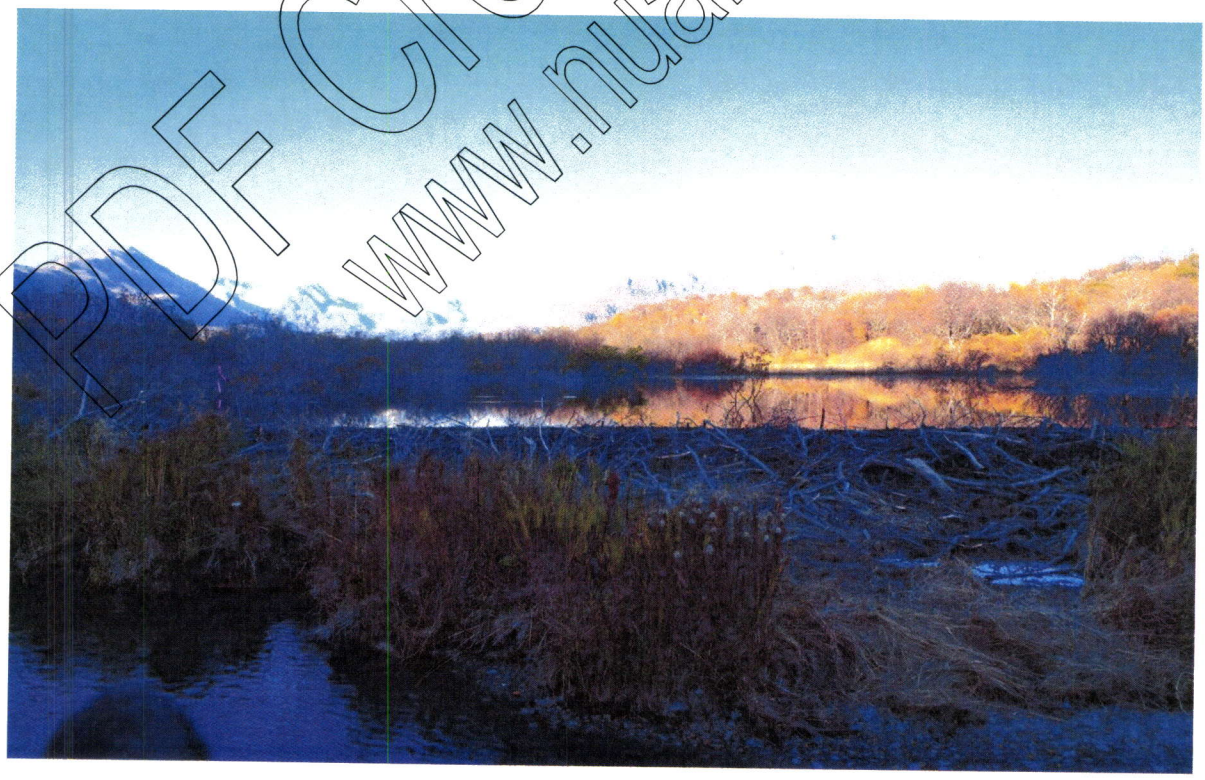
these effects are positive or negative to the spawning or rearing of anadromous fish cannot be determined at this time.

Figure 2: Headwaters of Lagoon Creek

Figure 3: Beaver Dam on Lagoon Creek



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The average width of the Lagoon Creek is 26.5' and the average depth is 0.89'. Average velocity is 1.43 ft/sec (Table 1). IWD was abundant in the sections of stream where the riparian vegetation was predominately alder/willow/poplar (Figure 4) and low towards the mouth where riparian vegetation was predominately persistent herbaceous vegetation. Average shade cover followed the same tread as IWD in that it was higher in the upper sections where woody vegetation was the predominate riparian vegetation and lower towards the mouth. Average estimated shade was 33% with the highest shade being recorded in the midsection of the stream.

Figure 4: Typical Riparian Vegetation Middle Section Lagoon Creek

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Table 1: OHHE Lagoon Creek Channel Measurements and Field Data

Sample Point	Date	GPS	Channel Width (ft)	Depth Average (ft)	Corrected Velocity (ft/sec)	Substrate	Stream Feature	In Stream Woody Debris > 1" Diameter	Riparian Veg	Est. Shade % Stream Cover
OHHESSX001	8/26/2010	N57 13.395 W153 18.158	13.20	0.47	1.37	Gravel/Cobble	Riffle	2	Alder/Willow	20
OHHESSX002	8/26/2010	N57 13.372 W153 18.148	73.80	0.43		Gravel/Cobble	Riffle	12	Alder/Willow	70
OHHESSX003	8/26/2010	N57 13.354 W153 18.166	29.40	0.60		Gravel/Sand	Pool	23	Alder/Willow	85
OHHESSX004	8/26/2010	N57 13.339 W153 18.174	24.70	0.89		Gravel/Cobble	Riffle	18	Alder/Willow	85
OHHESSX005	8/26/2010	N57 13.323 W153 18.169	21.00	0.88		Sand/Gravel	Run	34	Alder/Willow	85
OHHESSX006	8/26/2010	N57 13.323 W153 18.179	24.40	0.72		Gravel/Sand	Run	8	Alder/Willow	20
OHHESSX007	8/26/2010	N57 13.314 W153 18.186	26.30	1.50		Sand/Gravel	Pool	21	Alder/Willow	20
OHHESSX008	8/26/2010	N57 13.291 W153 18.174	25.20	1.20		Gravel/Sand	Pool	24	Poplar/Willow	35
OHHESSX009	8/26/2010	N57 13.277 W153 18.167	25.70	1.00		Gravel/Cobble	Riffle	12	Poplar/Willow	35
OHHESSX010	8/26/2010	N57 13.266 W153 18.173	36.00	0.50	1.85	Gravel/Cobble	Riffle	12	Poplar/Willow	20
OHHESSX011	8/26/2010	N57 13.252 W153 18.226	72.60	0.76		Gravel/Sand	Pool	15	Poplar/Willow	15
OHHESSX012	8/26/2010	N57 13.230 W153 18.198	22.90	0.77		Gravel	Run	26	Poplar/Willow	15
OHHESSX013	8/26/2010	N57 13.210 W153 18.202	24.30	0.68	3.15	Gravel	Riffle	30	Poplar/Willow	40
OHHESSX014	8/26/2010	N57 13.186 W153 18.235	25.20	0.83		Cobble/Gravel	Riffle	24	Poplar/Willow	50
OHHESSX015	8/26/2010	N57 13.095 W153 18.135	28.90	1.90		Sand/Gravel	Pool	10	Poplar/Willow	40
OHHESSX016	8/26/2010	N57 13.039 W153 18.002	21.70	0.83	0.71	Sand/Gravel	Pool	8	Persistent Emergent	<10
OHHESSX017	8/26/2010	N57 13.002 W153 17.929	20.10	0.86		Gravel	Run	3	Persistent Emergent	<10
OHHESSX018	8/26/2010	N57 12.982 W153 17.973	17.80	0.47		Gravel	Riffle	0	Persistent Emergent	<10
OHHESSX019	8/26/2010	N57 12.924 W153 17.958	26.70	2.60		Gravel/Sand	Pool	2	Persistent Emergent	<10
OHHE DSCH001	10/15/2010	N5713'43.8"W15318'11.8	8.80	0.28	1.29	Gravel	Riffle		Alder/Willow	20
OHHE DSCH002	10/16/2010	N5713'43.8"W15318'11.8	14.30	0.31	0.06	Silt/Sand	Pool		Willow	15
OHHE DSCH003	10/16/2010	N5713'05.6"W15318'07.8	28.60	1.08	0.17	Sand/Gravel	Run		Willow	10
		Average	26.50	0.89	1.43					

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Discharge measurements were taken at three locations along Lagoon Creek (Figure 5). The discharge near the inception of Lagoon Creek, OHHE DSCH002, was low (Table 2). Based on our field observations it appears that this area is a ground water discharge zone. The hydrodynamics of the stream near the inception are thought to be primarily groundwater derived but would also include sheet flow and precipitation inputs. Lagoon Creek is thought to be a perennial stream even though low flows were observed in the beginning stretches.

Figure 5: Discharge Being Collected Near the Headwaters of Lagoon Creek

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The second discharge measurement was taken below the beaver dam mid section of the stream (Figure 6). Discharge was greater at this location. The influence of the beaver dam and the storage capacity of the subsequent pond cannot be determined at this time. The third and final discharge measurement was taken at the pump house near the mouth of Lagoon Creek (Figure 7). This location is below any tributaries to Lagoon Creek and as a result the discharge near the mouth is approximately double that of the mid section reaches of the stream (Table 2).

Figure 6: Discharge Being Taken Downstream of the Beaver Dam Middle Section Lagoon Creek

Figure 7: Discharge Being Taken at the Pump House Lower Section Lagoon Creek

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Table 2: OHHE Lagoon Creek Discharge Measurements

Sample Point	GPS	Stream Width (ft)	Depth Average (ft)	Cross Sectional Area (ft^2)	Velocity Average (ft/sec)	DSCH (ft^3/sec)
OHHE DSCH002	N57 13'43.8" W153 18' 11.8"	14.3	0.3125	4.46875	0.06125	0.273711
OHHE DSCH001	N57 13'21.3" W153 18' 10.2"	8.8	0.28125	2.475	1.285	3.180375
OHHE DSCH003	N57 13'05.6" W153 18' 07.8"	28.6	1.08125	30.92375	0.171363636	5.299206

Baseline water quality data was taken during the October field trip at each fish trap site and discharge site for a total of 10 data sets. The baseline data was recorded in a field data book and followed the protocol outlined above. Over all trends were similar among sample sites and among the different water bodies (Figure 3). We were not able to collect pH at each site due to low water temperatures affecting the YSI meter and the two that were recorded appear low and should not be considered as definite. Temperature and DO indicate suitable conditions for rearing salmon. Even in low energy water with shallow depths <1' DO and temperature remained adequate.

Figure 3: OHHE Baseline Water Quality Data

Location	Water Body	Date	Temp	DO%	DO mg/L	pH	Adults Spawning Observed
Beaver Pond	Lagoon Creek	10/15/2010	4.42	84.6	10.82		N
OHHEDSCH 001	Lagoon Creek	10/15/2010	5.00	87.0	11.10		N
OHHEFT009	Swimming Pond	10/16/2010	4.99	95.5	12.18		N
OHHEFT010	Swimming Pond	10/16/2010	5.03	90.6	11.52		N
OHHEFT011	Swimming Pond	10/16/2010	4.99	93.5	12.02		N
OHHEFT012	Lagoon Creek	10/16/2010	4.27	89.7	11.70		N
OHHEFT013	Lagoon Creek	10/16/2010	4.71	77.5	9.97		N
OHHEFT014	Lagoon Creek	10/16/2010	4.72	87.9	11.29		N
OHHE DSCH003	Lagoon Creek	10/16/2010	5.52	88.7	11.18	6.15	N
OHHEWQ001	Lagoon Creek	10/16/2010	5.63	89.9	11.29	6.12	N
		Average	4.93	88.5	11.31	6.14	

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Fish trapping took place during the August and October field efforts. The purpose of the fish trap study was to determine presence/absence of anadromous fish. No other physical measurements were collected on the trapped specimens and no assumption of population dynamics should be inferred. Lagoon Creek and its tributary were previously cataloged as anadromous by ADF&G. The Swimming Pond and the two ponds north of the project area (Figure 8) were not cataloged as anadromous waters as of the date of the study. Our fish trapping results show that the entire stretch of Lagoon creek, from its inception to the mouth, is anadromous (Table 4). The two ponds north of the project area, in the Big Creek watershed, were also found to be supporting anadromous fish. The Swimming Pond was not found to be supporting anadromous fish.

Figure8: Fish Trapping on the Northern Pond in the Big Creek Watershed

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Figure9: Identifying Specimens at the OHHEFT013 on Lagoon Creek.

Spawning surveys were conducted during the August and October field efforts. Field biologist traversed the entire length of Lagoon Creek in an effort to visually identify spawning anadromous fish. Presence/absence of adult spawning salmon was also noted while observing the Swimming Pond. No active adult spawning salmon were observed in Lagoon Creek or the Swimming Pond. Remains of adult salmon were observed within 400' of the mouth, along the shore of Lagoon Creek. The remains were highly decomposed and hard to identify due to bears feeding on the carcasses. Left intact were primarily jaw and gill plate structures and appeared to be chum salmon. An estimated 150 carcasses were observed near the mouth. No actively spawning salmon were observed in the stream near the mouth. No other carcasses were observed on any other stretches of Lagoon Creek, the Beaver Pond or the Swimming Pond.

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Table 4: OHHE Anadromous Fish Survey

Trap	Date Set	Date Pulled	GPS	Time Set	Time Pulled	Depth (ft)	Species*	Adults Spawning Observed
OHHEFT001	8/26/2010	8/26/2010	N57 13.983 W153 18.296	0851	1505	3	26 Sb	N
OHHEFT002	8/26/2010	8/26/2010	N57 13.907 W153 18.266	0857	1512	4	32 Sb	N
OHHEFT003	8/26/2010	8/26/2010	N57 13.730 W153 18.197	0922	1522	2.5	10 Co	N
OHHEFT004	8/26/2010	8/26/2010	N57 13.557 W153 18.161	0952	1537	4.5	31 Co	N
OHHEFT005	8/26/2010	8/26/2010	N57 13.517 W153 18.201	1002	1541	3	37 Co, 6 Dv	N
OHHEFT006	8/26/2010	8/26/2010	N57 13.420 W153 18.177	1022	1557	4.5	18 Co,23 Dv	N
OHHEFT007	8/27/2010	8/27/2010	N57 14.069 W153 18.069	0852	1659	3	2 Co, 1 Dv	N
OHHEFT008	8/27/2010	8/27/2010	N57 14.087 W153 17.789	0923	1712	3	14 Co, 5 Dv, 10 Sb	N
OHHEFT009	10/15/2010	10/16/2010	N57 13' 58.2" W153 18' 17.9"	1301	0958	4	14 Sb, 1 Dv	N
OHHEFT010	10/15/2010	10/16/2010	N57 13' 58.9" W153 18' 13.0"	1310	1005	1	16 Sb	N
OHHEFT011	10/15/2010	10/16/2010	N57 13' 55.5" W153 18' 17.2"	1316	1015	2	19 Sb	N
OHHEFT012	10/15/2010	10/16/2010	N57 13' 43.5" W153 18' 11.3"	1348	1037	3.5	0	N
OHHEFT013	10/15/2010	10/16/2010	N57 13' 24.7" W153 18' 11.0"	1439	1107	2	38 Co, 1 Dv	N
OHHEFT014	10/15/2010	10/16/2010	N57 13' 23.2" W153 18' 09.3"	1442	1126	2	28 Co, 6 Dv	N

*Key: Sb= Stickle Back, Co = Coho, Dv = Dolly Varden

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Conclusion

The purpose of this study was to collect baseline data which will be use by agency personnel in determining mitigation of impacts from the OHHE project. This study is limited in that it does not have the benefit of long term observations such as trends in flow regime, depth, and water chemistry. A more comprehensive study would include a quantitative analysis of stream morphology including stream slope and bank structure.

Two conclusions can be drawn from this study based on the information that was collected. The Lagoon Creek system is productive rearing habitat for Coho salmon and any change in the current flow regime may negatively affect the system's ability to retain its unique habitat structure. Second, our investigation showed that the Swimming Pond is not supporting anadromous fish and that it does not appear there is a significant surface water nexus between it and Lagoon Creek. It would be expected that if there were a significant surface water nexus, at anytime during the year, juvenile Coho would be present in the Swimming Pond.

The southern end of the Swimming Pond has what appears to be an intermittent outlet (Figure 10). Further investigation should be implemented to better understand if this intermittent outlet makes a surface water connection between Lagoon Creek and the Swimming Pond during periods of high precipitation and spring runoff.

Figure 10: Intermittent Outlet Channel on Southern End of the Swimming Pond. Red Line Indicates Intermittent Channel.

Looking at historical aerial photography (Figure 1) one can see the Swimming Pond floods during the spring. Even with the appearance of an intermittent outlet the overflow discharge from the Swimming Pond appears to drain to the Southwest and does not make the connection to Lagoon Creek. Conversely the close proximity of the two waterbodies and the evident drawdown of the Swimming Pond each summer cannot be ignored. It is thought, based on our observations, that the significant nexus between the two waterbodies is through ground water. Because the second conclusion is made based on limited surface observations, a more quantitative study should be implemented to determine the true nature of the connection and retention times of the two waterbodies.

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Appendix A

Field Data Forms

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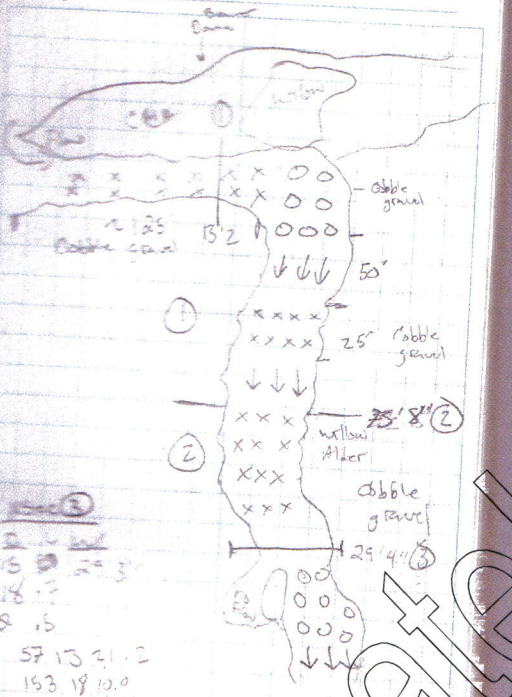
Date 8/24 9

Project / Client

Lagoon Creek



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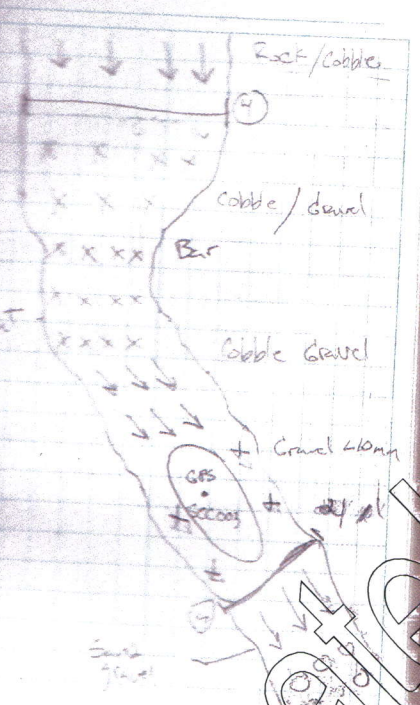
Date 8/26 11



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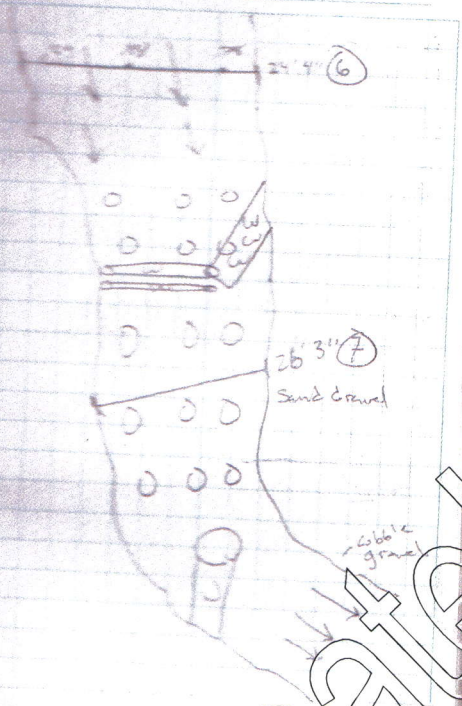

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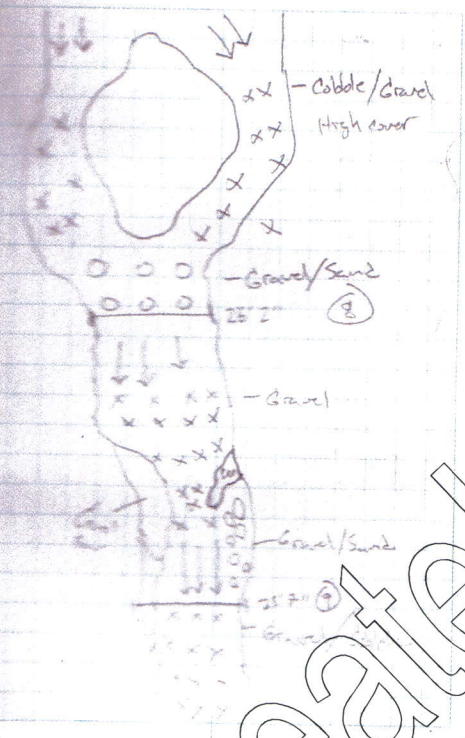
Date 8/26

Site 5



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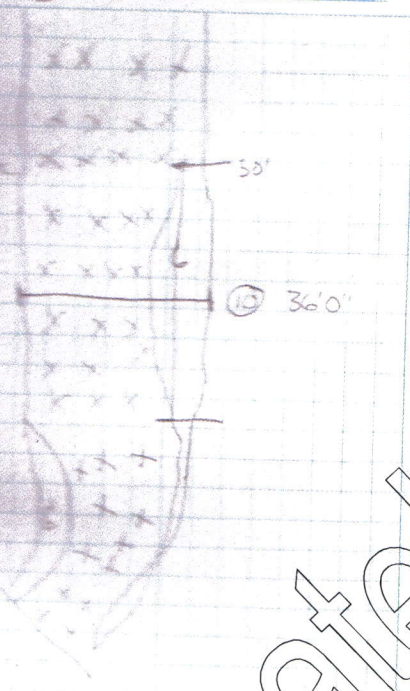
Date 8/26 17



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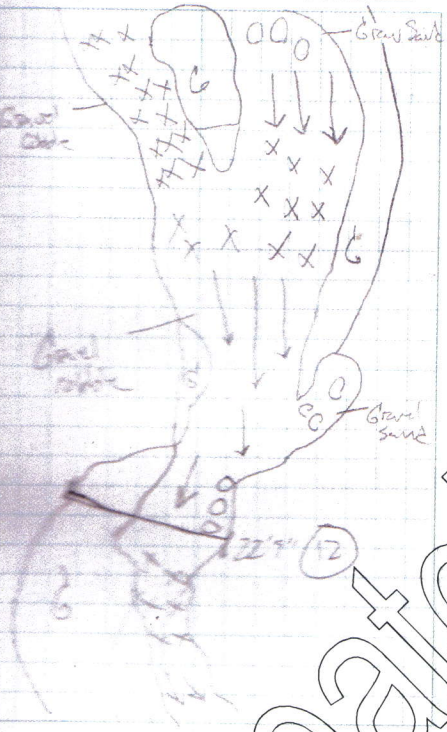
Date 8/26

Sec 8



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Date 8/26 23

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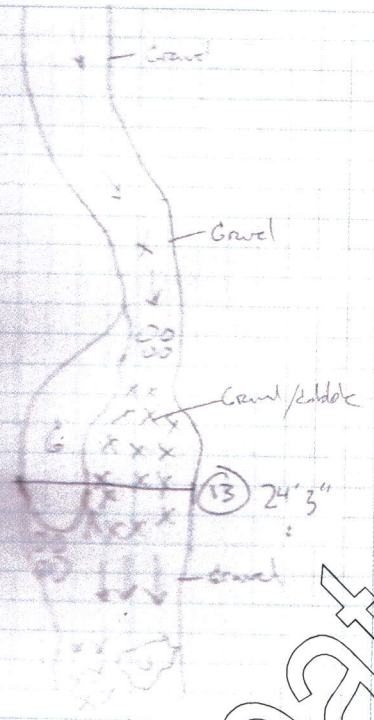

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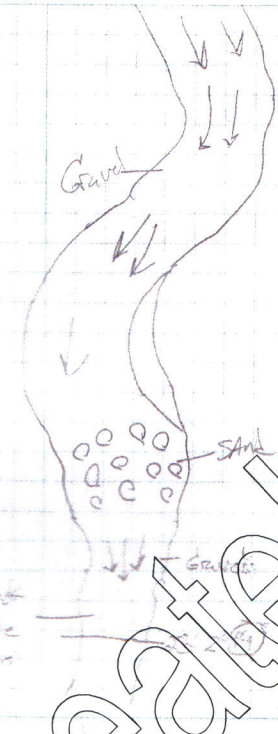
Sec. 10



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Date 8/26 27

Sec 11

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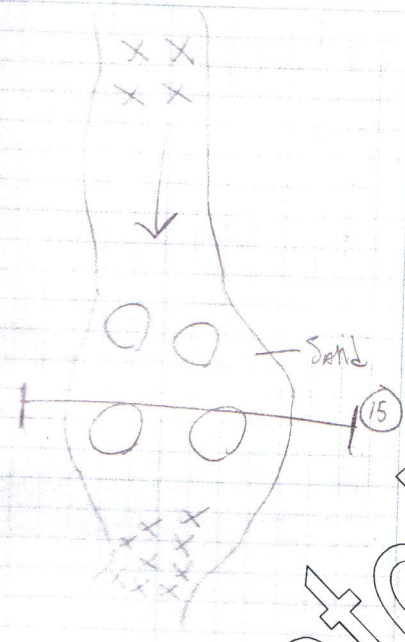
Date 8/24 31

Sec 3



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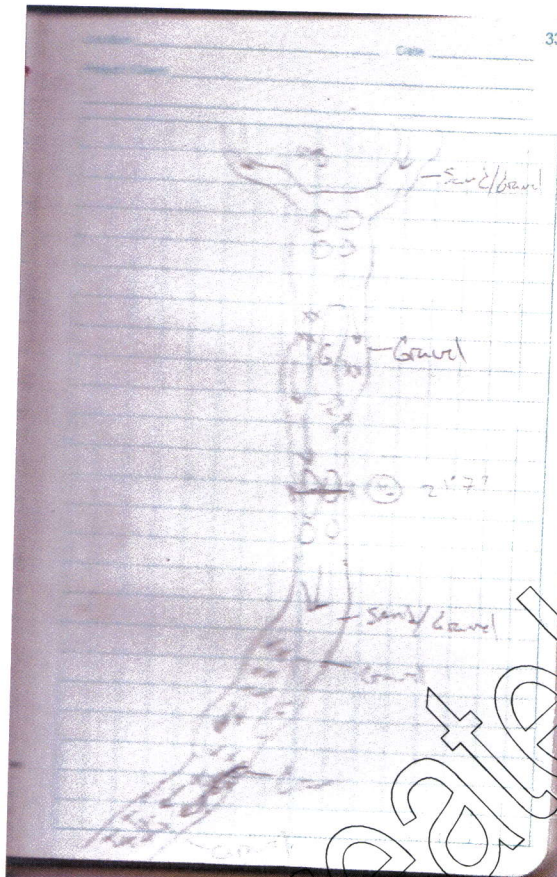

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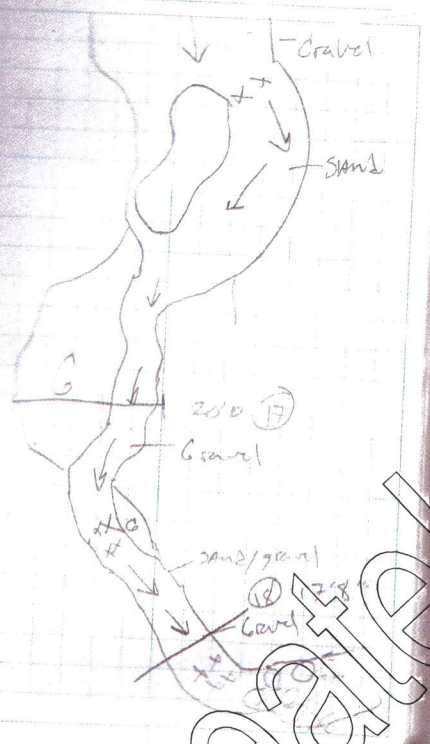

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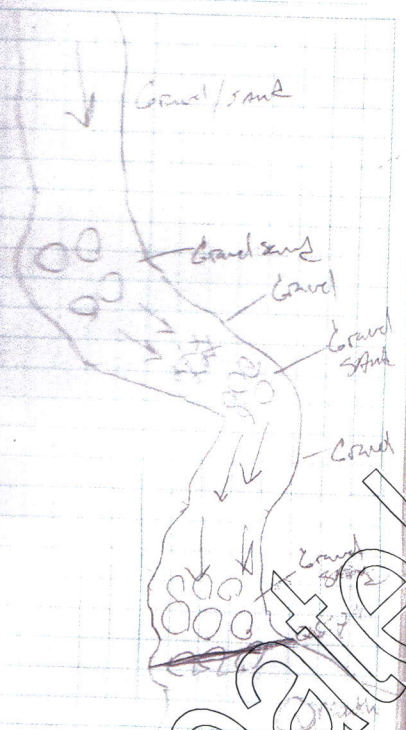

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38

Location

Date 8/27

Project / Client

Time	Trap	dps
0952	007	57 14.04.1
		153 18 04.1
0923	008	57 14 05.2
		153 17.47.3

Time	Trap	spp	#
1659	007	Co	2
		DV	1
1712	004	CO	14
		DV	5
		SB	10

39

Date

Project / Client

OHAEREPU049
57 13 32.5
153 17 52.3

PIC 185/186
RUSP/ALCR

OHAEREPUP046
[illegible]

PIC 187/188
RUSP ALCR

[illegible]

PIC 189/190
SADL / BEPA
RUSP

[illegible]

PIC 191/192

[illegible]

PIC 212/213
BEPA / ATFP
UPAN

[illegible]

PIC 226/227
[illegible]

Location _____ Date _____

Project / Client _____

OHHEREP059
57 13 45.4
153 18 12.9

PICS 231/232
Salix / ISEPA
large Drainage
Pattern. See photo

OHHE REPUP060
57 13 44.1
153 18 15.6

PICS 233/234
Lupine / Salix / CACA
Golden Rod

OHHEREPUP61
57 13 50.8
153 18 18.7
U_25

PIC 235 236
Salix / Golden Rod
EPAN / CACA

OHHEREP UP 34

no PICS

57 13 56.0
153 17 56.3

Location OHHE Swimming Pond Date 10/15/2010

Project / Client _____ Time 1300

OHHE FT 009 Time 1301
GPS 57 13 58.2
153 18 17.9
Depth ~ 4' of H2O Floor / Side
Specimens

OHHEFT010
Shore Over 57 13 58.9 Time 310
~3' H2O 153 18 13.0

OHHEFT011 57 13 56.5 Time 315
Shore Side 153 18 17.2
~1'

Beaver Back water above Beaver Dam N

No Adult Specimens

OHHEFT012 57 13 53.5
upper Beaver lagoon 153 18 11.3
PICS taken of low water. Trap
< 1' of H2O Time 1348

C Beaver dam
OHHE FT 013 57 13 24.1
153 18 11.0
Depth Specimens ~ 2' H2O
Time 1400

Location OHHE Date 10/15/2010

Project / Client

OHHE Temp Beaver 15 F

Launched @ 1427 4.42°C Temp

57 13 24.5 0.022 mS

153 18 10.3 13 mg/L

Anchored to willow & Rebar

Marked w/ Pink Flagging 84.6 DO%

~ 3.5' H2O 10.82 DO mg/L

No Adult spawners

Below Beaver dam

OHHE PT014 57 13 23.7

Time 1442 153 18 09.3

No Adult spawners

Location Discharge 001 Date 10/15/2010

Project / Client

Time 1554 OHHE PSCH 001

Distance ft	Depth	v_1	v_2
13'1"	0	0	0
15'0"	0.2	0.17	0.14
16'0"	0.5	1.28	0.89
17'0"	0.5	1.02	1.27
18'0"	0.5	2.24	2.21
19'0"	0.35	2.11	1.53
20'6"	0.2	0.87	0.92
21'8"	0	0	0

Sunny clear wind ~2mph

~ 45°F

Temp 5.00°C

0.022 mS

13 mS

87% DO

11.10 DO mg/L

4.89 pH

GPS

57 13 21.3

153 18 10.2

No Adult spawners

Lagoon creek @ Pump House

No Adult spawners

pr.ecotech@gmail.com

Location: Swimming Pond Date: 10/16/2010

Project / Client: OHHE

Trap 09 Time 0958 4.95 Temp
0.017 mS/cm³
STBK 14 10 µS/cm
DV 1 ~ 60cm 95.5 DO %
12.18 DO mg/L

Trap 10 Time 1005 5.03 Temp
0.017 mS
STBK 16 10 µS
90.6 DO%
11.52 DO mg/L

Trap 11 Time 1015 4.99 Temp
0.016 mS
STBK 19 10 µS
93.5 DO%
12.02 DO mg/L

Below Swimming Pond 4.27
Trap 12 0.35 mS
P 5.5h Time 10 37 20 µS
89.7 DO%
11.70 DO mg/L

Location: Date: 10/16/2010

Project / Client:

Trap 12 Dist 65 Swim as Trap

Dist Depth

Time 1105

28 CO

1 DV

Trap 4.7

0.042 mS

25 µS

Time 11 26

28 CO

4 DV

no Nitrogen sparge

46

Location _____ Date 10/10/2010

Project / Client _____

Time 12:41

Spawned Egg at Beaver Pond
no Adult Spawners

Pump House DSCH

Dist	Depth (ft)	V_1	V_2
4.9	0	0	0
9.0	.5	0.00	0.01
12.0	1	0.01	0.02
15.0	1.5	0.25	0.21
17.0	1.5	0.35	0.22
19.0	1.5	0.36	[illegible]
21.0	1.5	[illegible]	[illegible]
23.0	1.4	0.46	[illegible]
25.0	1.4	[illegible]	[illegible]
27.0	1.3	0.41	[illegible]
29.0	1.3	0.22	[illegible]
31.0	1.2	[illegible]	[illegible]
33.0	.1	0.05	0.01
35.0	0	0	0

28.0 53.7°

57 13 05.6 5.52 Temp
133 18 07.8 6.83
21

* no Adult Spawners 44.7 00%
11.14 00/L

47

Location _____ Date _____

Project / Client _____

Walked to [illegible] no Spawners
~ 150 [illegible] of Pink & Chum
on Shore [illegible] only heads
[illegible] SHPE W 8 051
[illegible] 2150 2.2
[illegible] 1757.3

Largest
[illegible]

Marsh
McBarney

Pond
Anderson

DR Creatiq
www.nuance.com

6

Location ____ Date ____

Project / Client ____

Spawning Survey

Depth
Vel.
Substrate
- Mud
- Sand
- Gravel
- Cobble
- Bedrock

Pool
Riffle
Mouth
Wb Complex

spp:
#:

Width
Instream Woody Cover
Bank Veg
Ripp. Zone Cond
est. Bank Cover (Shade
Animals
hab. / Prcs

8/26/10
FT001
57 13 59.0
153 18 17.8
no obs. species

No obs. species
Time: 0851
Trap set @ N end of
Swim Pond ~ 3' of Mud

FT002
57 13 59.4
153 18 19.9
no obs. species

Time: 0859
Trap set @ S end of
Swim Pond ~ 1' of Mud

7

Location ____ Date ____

Project / Client ____

8/26/10

FT003
57 13 [illegible]
153 18 11.8
Substrate: unconsolidated
Mud

Time 0922
Trap set in Top
Slough. Depth
Avg 2.5' no obs.
Flow

FT004
57 13 33.4
153 18 09.7
Substrate: unconsolidated mud
Beaver [illegible] obs. Beaver Trap
in [illegible] 4' of Mud, no obs Flow
No Adult [illegible] obs.

Time 0922
[illegible]

FT005
57 13 31.0
153 18 12.0
Substrate: unconsolidated gravel w/ silt
[illegible]

Time 1002
[illegible]

FT006
57 13 25.2
153 18 10.7
Substrate: [illegible]
[illegible] Beaver Dam No
[illegible] Adult [illegible] Depth ~ 4.5' deep

Time 1022
[illegible]

pr.cfg@gmail.com
www.nu.edu/CSTS

Old Harbor Stream Habitat Data Sheet

LOC OHHESSX001
Date 6/26

GPS N 57 13.39 W 153 18.15

Velosity

Distance	Time	Correction
50'	29.90	.8
50'	32.63	.8
50'	24.50	.8

Shade %
20

IWD
2

Feature Type: Riffle

Riparian Veg: Alder / willow

Adult Spawn: no

Substrate

Silt	Sand	Gravel	Cobble	Rock
		X	X	

Fish Trap no

Sp	Number

X Section

Depth (ft)		Width
.43		13.7
.55		
.43		

H2O Chem no

Temp	DO%	DO mg/L	pH

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHESSx002
Date 8/26/2010

GPS N57 13 37 W153 18.13

Velosity no

Distance	Time	Correction

Shade %
70

IWD
12

X Section

Depth (ft)		Width
.47		73.8
.35		
.47		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type Riffle

Riparian Veg Alder / willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
		X	X	

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OLHES8X003
Date 6/26/2010

GPS N 57 13.35 W 153 18.16

Velosity no

Distance	Time	Correction
150		
~~5~~		
~~65~~		

Shade %
85

IWD
23

X Section

Depth (ft)		Width
.6		29.4
.7		
.9		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type Pool

Riparian Veg Alder / willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
	X	X		

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHE~~SSK~~004
Date 8/26/2010

GPS N 57 13.33 W 153 18.17

Velosity no

Feature Type Riffle

Riparian Veg Alder / willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
		X	X	

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

Distance	Time	Correction

Shade % 85

IWD 14

X Section

Depth (ft)		Width
.67		24.7
1.14		
.87		

H2O Chem no

Temp	DO%	DO mg/L	pH

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Old Harbor Stream Habitat Data Sheet

LOC OHHESSX005
Date 8/26/2010

GPS N57 13.32 W153 18.169

Velosity no

Distance	Time	Correction

Shade %
85

IWD
34

X Section

Depth (ft)		Width
.59		21.00
.54		
1.10		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type Run

Riparian Veg Alder / Willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
	X	X		

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHESSK006
Date

GPS N57 13.32 W153 18.17

Velosity no

Distance	Time	Correction

Shade %
20

IWD
8

X Section

Depth (ft)		Width
.35		24.4
.38		
.28		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type Run

Riparian Veg alder / willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
	X	X		

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHESSX008
Date 8/26/2010

GPS

Velosity no

Distance	Time	Correction

Shade %
35

IWD
24

X Section

Depth (ft)		Width
0.71		25.20
1.61		
1.38		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type Pool

Riparian Veg Poplar / willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
	X			

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHES5x007
Date 8/26

GPS N57 13.31 W 153 18.18

Velosity no

Distance	Time	Correction

Shade %
20

IWD
21

X Section

Depth (ft)		Width
1.38		26.3
2.17		
.96		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type Pool

Riparian Veg Alder/willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
	x	x		

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHESSx009
Date 8/26/2010

GPS N 57 13.27 W 153 18.16

Velosity no

Distance	Time	Correction

Shade %
35

IWD
12

X Section

Depth (ft)		Width
1.02		25.7
1.45		
.59		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type Riffle

Riparian Veg Poplar / willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
		X		

Fish Trap

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHESSx010
Date 8/26/2010

GPS N 57 13.26 W 153 18.17

Velosity Y=7

Distance	Time	Correction
50'	21.44	.8
50'	21.10	.6
50	22.52	.8

Shade %
20

IWD
12

Feature Type Riffle

Riparian Veg Poplar / willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
		x	x	

Fish Trap no

Sp	Number

X Section

Depth (ft)		Width
.43		36.00
.51		
.59		

H2O Chem no

Temp	DO%	DO mg/L	pH

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHE~~SS~~X011

Date 6/26/2010

GPS N 57 13.25 W 153 18.22

Velosity NO

Distance	Time	Correction

Shade % 15

IWD 15

X Section

Depth (ft)		Width
.24		72.60
.98		
1.06		

H2O Chem NO

Temp	DO%	DO mg/L	pH

Feature Type Pool / Run

Riparian Veg Poplar / willow

Adult Spawn NO

Substrate

Silt	Sand	Gravel	Cobble	Rock
	X	X		

Fish Trap NO

Sp	Number

DSCH NO

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC 04HF[illegible]

Date 8/26/2010

GPS N57 13.23 W153 18.19

Velosity no

Distance	Time	Correction

Shade % 15

IWD 21

X Section

Depth (ft)		Width
1.02		22.9
.94		
.35		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type run

Riparian Veg Cottonwood/willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHESSx013
Date 8/26/2010

GPS N57 13.21 W153 18.20

Velosity yes

Distance	Time	Correction
50'	12.53	.9
50'	12.61	.9
50'	12.87	.9

Shade %
40

IWD
30

Feature Type
Riffle

Riparian Veg
Grass / willow

Adult Spawn
no

Substrate

Silt	Sand	Gravel	Cobble	Rock

X Section

Depth (ft)		Width
.59		24.3
.71		
.95		

Fish Trap no

Sp	Number

H2O Chem no

Temp	DO%	DO mg/L	pH

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC 04HES5A014
Date 8/26/2010

GPS N57 13.156 W153 16.23

Velosity no

Distance	Time	Correction

Shade % 50

IWD 24

X Section

Depth (ft)		Width
.59		20.20
1.16		
.71		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type Riffle

Riparian Veg Pirlar / willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
		X	X	

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHE55X015
Date 9/26/2010

GPS N 57 13.094 W 153 18.13

Velosity no

Distance	Time	Correction

Shade %
40

IWD
10

X Section

Depth (ft)		Width
1.41		28.4
1.4		
1.7		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type Pool

Riparian Veg Willow

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
	x	x		

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHESSX016
Date 8/26/2010

GPS N57 13.03 W153 18.04

Velosity yes

Distance	Time	Correction
25	30.7	.8
25	31.8	.8
		.8

Shade %
<10

IWD
8

Feature Type Pool / Run

Riparian Veg Sedge Resistant Emergent

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
	X	X		

Fish Trap no

Sp	Number

X Section

Depth (ft)		Width
.31		21.70
.59		
1.5		

H2O Chem no

Temp	DO%	DO mg/L	pH

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHE05X017
Date 8/26/2010

GPS N 57 13.00 W 153 17.92

Velosity no

Feature Type Run

Riparian Veg Persistant Emergent

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
		x		

Distance | Time | Correction

Distance	Time	Correction

Shade %
<10

IWD
3

X Section

Depth (ft)		Width
.34		20.1
.7		
1.57		

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

H2O Chem no

Temp	DO%	DO mg/L	pH

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Old Harbor Stream Habitat Data Sheet

LOC OHHE 55X018

Date 8/26/2010

GPS N57 12.598 W153 17.97

Velosity no

Distance	Time	Correction

Shade %

<10

IWD

0

X Section

Depth (ft)		Width
.74		17.4
.39		
.77		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type Riffle

Riparian Veg Persistent Emergent

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
		X		

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHESSX014
Date 8/26/2010

GPS N57 12.92 W153 17.95

Velosity no

Distance	Time	Correction
~~1.73~~		
~~2.56~~		

Shade %
<10

IWD
2

X Section

Depth (ft)		Width
1.73		26.7
2.56		
3.62		

H2O Chem no

Temp	DO%	DO mg/L	pH

Feature Type Pool

Riparian Veg Persistent Emergent

Adult Spawn no

Substrate

Silt	Sand	Gravel	Cobble	Rock
	x	x		

Fish Trap no

Sp	Number

DSCH no

Dist	Depth	V1	V2

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Old Harbor Stream Habitat Data Sheet

LOC OHHE0SCH001
Date 10/15/2010

GPS N57 13' 43.8" W153 18' 11.8"

Velosity

Distance	Time	Correction

Shade %
15

IWD

X Section

Depth (ft)		Width

H2O Chem

Temp	DO%	DO mg/L	pH
5.00	87	11.10	

Feature Type Riffle

Riparian Veg Alder / Willow

Adult Spawn No

Substrate

Silt	Sand	Gravel	Cobble	Rock
		X		

Fish Trap

Sp	Number

DSCH

Dist	Depth	V1	V2
13.1	0	0	0
15.0	0.2	0.17	0.14
16.0	0.5	1.28	0.89
17.0	0.5	1.87	1.27
18.0	0.5	2.24	2.21
19.0	0.35	2.11	1.53
20.5	0.2	1.87	0.89
21.8	0	0	0

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Old Harbor Stream Habitat Data Sheet

LOC OHHEDSCH002

Date 10/16/2010

GPS N 57 13' 43.4" W 153 18' 11.8"

Velosity See DSCH

Distance	Time	Correction

Shade % 15

IWD

X Section See DSCH

Depth (ft)		Width

H2O Chem

Temp	DO%	DO mg/L	pH
4.7	77.5	8.97	

Feature Type Riffle

Riparian Veg Willow

Adult Spawn NO

Substrate

Silt	Sand	Gravel	Cobble	Rock
	X			

Fish Trap NO

Sp	Number

DSCH

Dist	Depth	V1	V2
3.50	0	0	0
7.0	.6	0.06	0.07
10'	.7	0.10	0.04
12'	.6	0.09	0.09
14'	.6	0.01	0.01
16.4	0	0	0

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Old Harbor Stream Habitat Data Sheet

LOC OHHE DSCH003
Date 10/16/2010

GPS N57 13 05.6 W153 18 07.4"

Velosity

Distance	Time	Correction

Shade %
10

IWD

X Section

Depth (ft)		Width

H2O Chem

Temp	DO%	DO mg/L	pH
5.52	52.7	11.58	6.15

Feature Type Run

Riparian Veg Willow

Adult Spawn ND

Substrate

Silt	Sand	Gravel	Cobble	Rock
	X	X		

Fish Trap

Sp	Number

DSCH

Dist	Depth	V1	V2
4.9	0	0	0
9.0	.5	0.06	0.01
12'	1	0.14	0.09
15'	1.25	0.21	0.21
17'	1.5	0.36	0.22
19'	1.5	0.43	0.28
21'	1.5	0.41	0.36
23'	1.5	0.46	0.46
25'	1.4	0.42	0.40
27'	1.3	0.41	0.31
29	1.5	0.22	0.15
31	1.7	0.05	0.01
33.7	0	0	0

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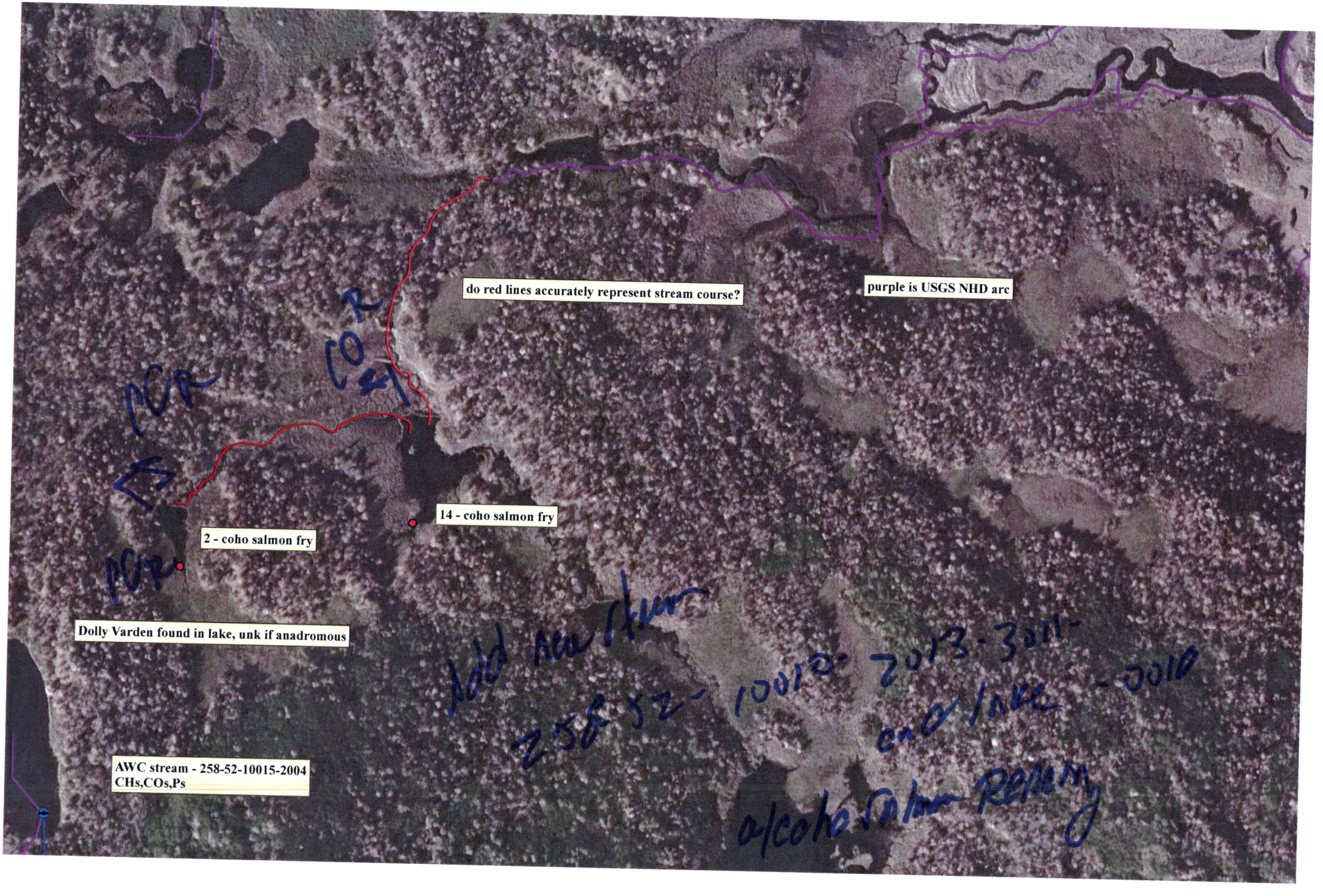
do red lines accurately represent stream course?
purple is USGS NHD arc
14 - coho salmon fry
2 - coho salmon fry
Dolly Varden found in lake, unk if anadromous
AWC stream - 258-52-10015-2004
CHs,COs,Ps
CO
CO
CO
CO
Add new river
258-52-10010-2013-3011-
and lake -3010
alcohol salmon Remm