**State of Alaska**
**Department of Fish and Game**
**Sportfish Division**

**Nomination Form**
**Anadromous Waters Catalog**

M

Region: Southeastern

USGS Quad(s): SKAGWAY B-4, B-4 NE

Anadromous Waters Catalog Number of Waterway: 115-32-10250-2077-3151-4010

Name of Waterway: ☐ USGS Name ☐ Local Name

☐ Addition ☐ Deletion ☑ Correction ☐ Backup Information

For Office Use

| | | | |
|---|---|---|---|
| Nomination # | 14-684 | James J Hasbrouck | 10/3/2014 |
| | | Fisheries Scientist | Date |
| Revision Year: | 2015 | | 10/3/14 |
| Revision to: Atlas | | Habitat Operations Manager | Date |
| Both | x | | 9/10/14 |
| | | AWC Project Biologist | Date |
| Revision Code: | C-8, C-9, D-1 | TA | 10/8/14 |
| | | Cartographer | Date |

OBSERVATION INFORMATION

| Species | Date(s) Observed | Spawning | Rearing | Present | Anadromous |
|---|---|---|---|---|---|
| coho salmon | 05/30/2014 | | ✔ | ✔ | ✔ |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**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:**

Coordinates (Lat,Long): Upper(59.4177,-136.3026) Lower(59.4191,-136.2997) Reposition lower pt.

Revise stream hydrography, shorten stream for coho salmon due to initial error (nom # 96-038)

ref nom # 14-683 (C-9)

COR should not have been added

Name of Observer (please print): Matthew Kern

Signature: 10.7.168.135 (Web Nomination) Date: 09/02/2014

Agency:

Address: 7081 North Douglas Highway
Juneau, AK 99801

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: _____ Revision 02/08

Name of Area Biologist (please print):

State of Alaska
Department of Fish and Game
Nomination for Waters
Important to Anadromous Fish

~~1988~~
Year of Revision

Anadromous Water Catalog Volume 96

USGS Quad SKAGWAY B-4

Name of Waterway GLACIER CREEK — USGS name

Anadromous Water Catalog Number of Waterway
115-32-10250-2077-3151-4010

Change to _____ Atlas
_____ Catalog
X Both

Addition X

Deletion _____

Correction _____

A-2

Name addition:

USGS name _____

Local name _____

For Office Use

Nomination # 96 038

Tanya Heathlander 11-8-95
Regional Supervisor Date

Dean W. Hughes 2/5/96

2. Drone 3/28/96
Drafted Date

| Species | Date(s) Observed | Spawning | Rearing | Migration |
|---|---|---|---|---|
| DOLLY VARDEN | 7/11 - 7/12/95 | | X | |
| CUTTHROAT TROUT | " " | | X | |
| | | | | |
| | | | | |

Comments: Provide any clarifying information, including number of fish observed, location of fish survey data, etc.

*(see attached sheet)

Attach a copy of a map showing location of mouth and upper points of each species, specific stream reaches identified for spawning or rearing, locations of barriers, such as falls. Attach a copy of the fish survey data, if available.

Name of Observer (please print) MICHAEL GAEDE

Date: 8/16/95 Signature: [signature]

Address: P.O. Box 57
HAINES AK 99827

Signature of Area Biologist: [signature]

ALASKA DEPT. OF
FISH & GAME
NOV 14 1995
REGION II
HABITAT AND RESTORATION
DIVISION

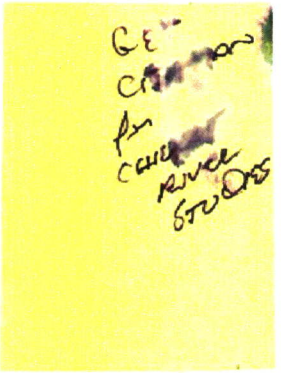
**Comments:**

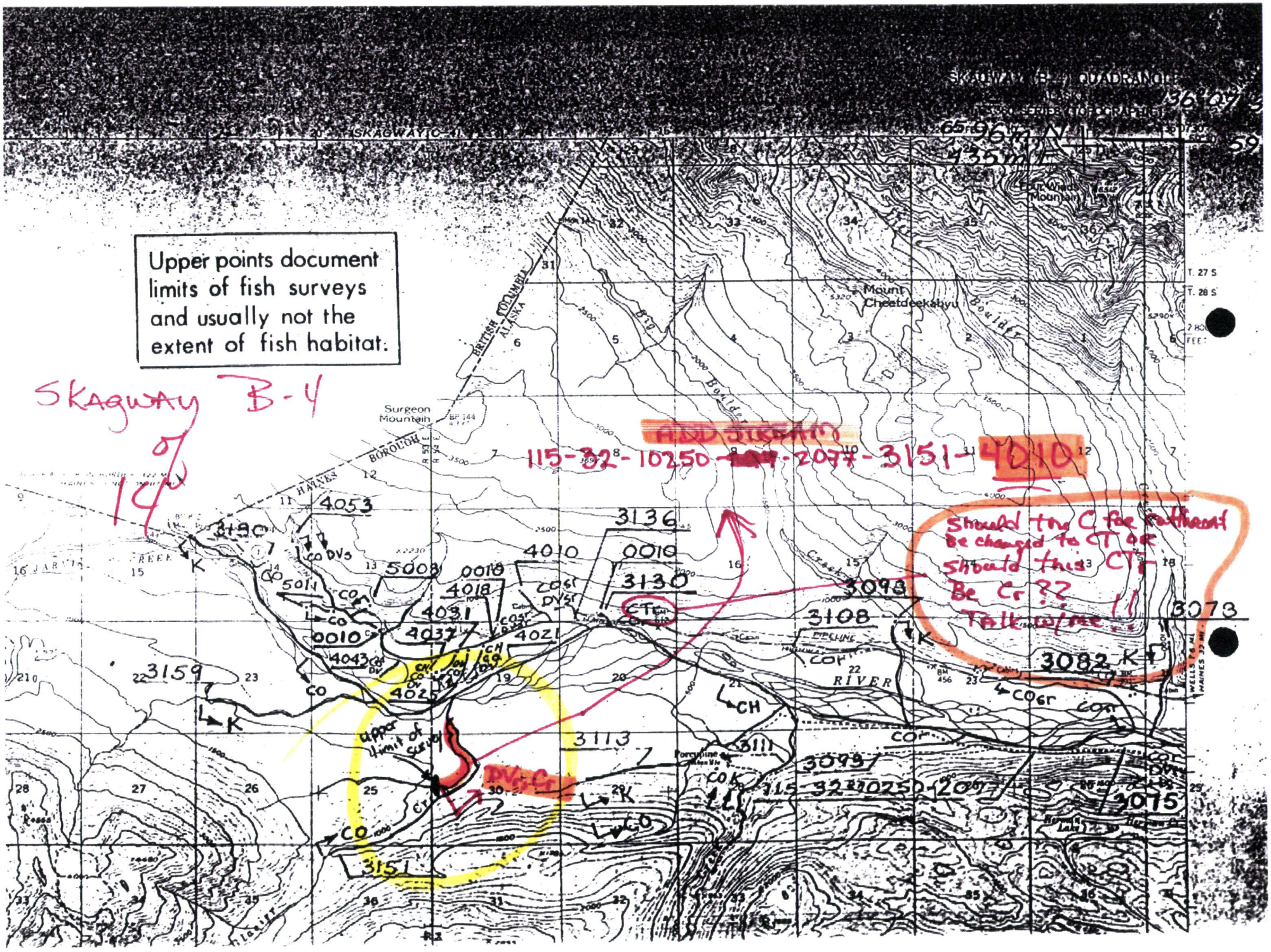
This waterway is a clear-water tributary stream on the lower west side of Glacier Creek (115-32-10250-2077-3151). The stream runs parallel to Glacier Creek for quite a distance, with the headwaters up a mildly sloped draw, and the confluence with Glacier Creek midway between the Klehini River and the Klehini River logging road. A stream survey of this waterway was conducted on 7/11 and 7/12/95 and covered a distance approximately 1/4 mile upstream from the logging road crossing. In that distance, no major fish barriers were observed, with juvenile fish populations plentiful throughout.

The stream survey primarily involved the use of minnow traps to document the type and presence of juvenile fish. Six traps were placed in the stream at 100-200 yd. spacing, baited with salmon eggs and allowed to soak for at least two hours. The results of the survey are as follows:

| Trap # | Number and type of fish caught |
|---|---|
| 1 | 4 Dolly Varden |
| 2 | 16 Dolly Varden / 2 Cutthroat Trout |
| 3 | 0 fish caught |
| 4 | 1 Dolly Varden |
| 5 | 3 Dolly Varden / 1 Cutthroat Trout |
| 6 | 4 Dolly Varden |

This stream should be included in the anadromous stream catalog for the following reason: Previous studies in the Chilkat River drainage indicate that cutthroat trout and Dolly Varden are anadromous and move from one tributary of the Chilkat River to another. Therefore, it would be a fair assumption to say that the fish observed in this stream are anadromous.




Upper points document limits of fish surveys and usually not the extent of fish habitat.
SKAGWAY B-4
14
Should the C for Cutthroat be changed to CT or should this CT be Cr ?? Talk w/me
115-32-10250-2077-3151-4010
upper limit of survey
Mount Cheatdeekshyu
Surgeon Mountain
BRITISH COLUMBIA
ALASKA
BOROUGH
HAINES
RIVER
Boulder
4053
3190
5008
0010
4018
4031
4037
4021
4043
4025
3159
3136
4010
0010
3130
3098
3108
3082
3073
3113
3111
3099
3075
3151

## GLACIER CREEK SURVEY (CONT)

7-11 - Arrived at Glacier creek @ 1052

- Hiked up West side of river from bridge to first trib stream. Low or small: fry observed. Set traps [illegible]
- Trap #1 set @ 1110 Marker in tree - [illegible] pool
- # 2 " 1121 Marker in tree [illegible] deep stream [illegible]
- # 3 - 1131 Log Jam - [illegible] channel

Temp 10°C

[illegible]

Trap in gill [illegible]

* No fish seen in [illegible]

- Picked up 2 traps set yesterday in 1 [illegible] Trib

Trap pulled @ 1338 - No fish caught

No fish seen visually - Waterfalls act as fish barrier from Glacier Creek

- Picked up Traps from W Fork Trib

Trap #1 - pick up @ 1422 - 4 Dolly varden

#2 " 1441 1 Dolly / 2 cutthroat

#3 1446 0 caught (cutthroat fry seen) "D Creek"

→ too shallow for trap to work properly

#4 1458 1 Dolly varden

→ * big surprise to find fish this far up stream



## GLACIER CREEK (CONT)

7-12 - Arrival at Glacier Creek @ 1020

- Placed 2 traps at road culvert W. side of River on small trib [illegible] collect samples of fish [illegible] to positively identify.
- Traps set at 1030 [illegible] culvert
- Traps picked up @ 1500

Below [illegible] 4 dollys

## KLEHINI BEETLE AREA

- Arrived @ 1053 walked down to River from spur road ([illegible] of sale area) [illegible] in West direction to map fish trib fish streams
- Too brushy - too easy to get lost - turned around after walking in a ways. No sign of streams in creeks
- Drove to east end of sale area - drove down to Klehini R. and walked West along outside border of sale area. Found clear water stream

Trap #1 set @ 1330 "D Creek"

Trap #2 " 1345 spring fed

Pickup #1 picked 1510 0 fish walked down

#2 1515 3 fish 6 Dolly's ~1000 ft from Klehini R.

Weak

- a fry seen in stream

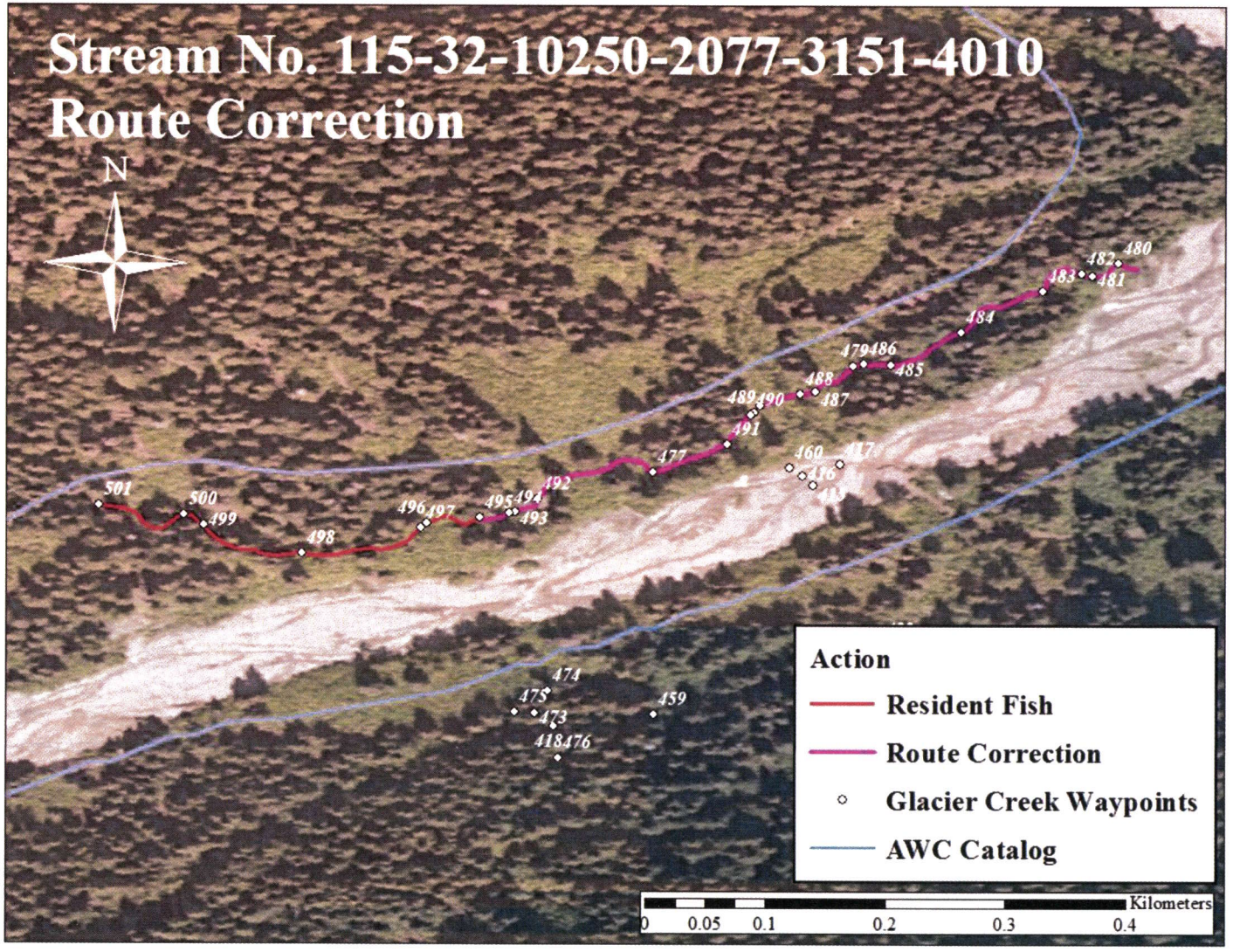



Figure 4.–Map of Glacier Creek tributary with waypoints labeled.

## GLACIER CREEK TRIBUTARY

## CORRECTION

**Water body name:** Unnamed Tributary
**Water body number:** 115-32-10250-2077-3151-4010
**Watershed:** Klehini River
**MTR:** Section 25, 30, 28 S Range 54 E CRM
**Quad:** Skagway B-4

**Survey date:** 5/30/2014
**Species & Lifestage:** CO rearing

**Findings:** We surveyed this Glacier Creek tributary and electrofished from the confluence with Glacier Creek upstream. We captured Dolly Varden char, cutthroat trout, and coho salmon (Figure 1, Table 1). We observed an old culvert beneath an overgrown road that did not block fish passage (Figure 2). The stream contains deep pools, and gravel substrates (Figure 3).
**Recommendations:** We recommend updating the stream arc and upstream coho presence extent of this stream (Figure 4).

Table 1.–Survey data from May 30, 2014 (Page 1 of 2).

| Waypoint | Lat | Long | Notes | Sample Effort | Sample Result |
|---|---|---|---|---|---|
| 477 | 59.4175 | 136.3031 | Set 1 Minnow Trap at 8:53 AM in scour Pool. 1 CT – 65 mm | Minnow Trap | 1 CT – 65 mm |
| 478 | 59.418 | 136.3023 | Culvert under old road - Set 1 trap at outlet at 9:00 AM. 3 CT - 70-100 mm | Minnow Trap | 3 CT - 70-100 mm |
| 479 | 59.4183 | 136.3016 | Tributary enters on River left - 0.5 m wide with minimal flow. Setting trap in large pool just above confluence | Minnow Trap | |
| 480 | 59.4191 | 136.2997 | Confluence of unnamed tributary and Glacier Creek. | | |
| 481 | 59.419 | 136.2998 | 1 DV - 65 mm | Electrofisher | 1 DV - 65 mm |
| 482 | 59.419 | 136.2999 | 3 DV - 45-85 mm | Electrofisher | 3 DV - 45-85 mm |
| 483 | 59.4189 | 136.3002 | 2 CT - 90-100 mm, 1 DV- 60 mm | Electrofisher | 2 CT - 90-100 mm, 1 DV- 60 mm |
| 484 | 59.4186 | 136.3008 | 1 CT - 80 mm | Electrofisher | 1 CT - 80 mm |
| 485 | 59.4183 | 136.3014 | Visual ID 1 CT | Electrofisher | Visual ID 1 CT |
| 486 | 59.4183 | 136.3016 | DV ~ 20 mm | Electrofisher | DV ~ 20 mm |
| 487 | 59.4181 | 136.3019 | 2 CT - 50-75 mm | Electrofisher | 2 CT - 50-75 mm |
| 489 | 59.418 | 136.3024 | 1 CT - 80 mm | Electrofisher | 1 CT - 80 mm |
| 490 | 59.418 | 136.3024 | 1 CT - 70 mm | Electrofisher | 1 CT - 70 mm |
| 491 | 59.4177 | 136.3026 | 1 CO - 50 mm | Electrofisher | 1 CO - 50 mm |
| 492 | 59.4173 | 136.304 | 4 CT - 60-100 mm | Electrofisher | 4 CT - 60-100 mm |
| 493 | 59.4172 | 136.3042 | 1 CT - 80 mm | Electrofisher | 1 CT - 80 mm |

Table 1.–Survey data from May 30, 2014 (Page 2 of 2).

| Waypoint | Lat | Long | Notes | Sample Effort | Sample Result |
|---|---|---|---|---|---|
| 495 | 59.4172 | 136.3044 | 1 CO - 45 mm | Electrofisher | 1 CO - 45 mm |
| 496 | 59.4171 | 136.3048 | 1 DV - 95 mm | Electrofisher | 1 DV - 95 mm |
| 497 | 59.4171 | 136.3049 | 1 CT – 50 mm | Electrofisher | 1 CT – 50 mm |
| 499 | 59.4171 | 136.3065 | 2 CT, 1 DV | Electrofisher | 2 CT, 1 DV |
| 500 | 59.4172 | 136.3067 | 1 DV, 1 CT gradient change | Electrofisher | 1 DV, 1 CT |
| 501 | 59.4173 | 136.3073 | Timber harvest boundary, upstream extent of E-fish effort. | | |

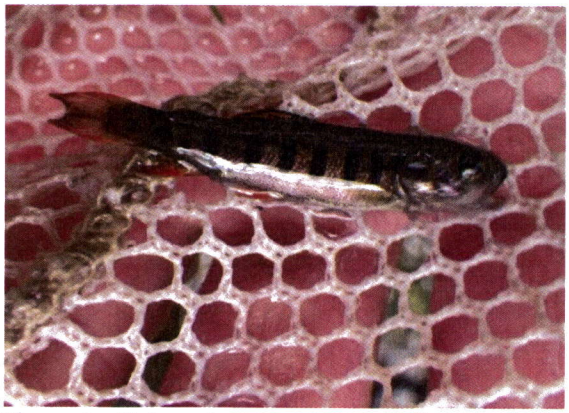


Figure 1.–Coho salmon captured while electrofishing ( May 30, 2014).

Figure 2.–Culvert under overgrown road (May 30, 2014).

Figure 3.–Gravel reach of Glacier Creek tributary (May 30, 2014).

# MEMORANDUM

# State of Alaska

Department of Fish and Game
Division of Habitat

TO: Jackie Timothy
Southeast Regional Supervisor

THRU: Kate Kanouse
Habitat Biologist

FROM: Matthew Kern
Habitat Biologist

DATE: June 26, 2014

SUBJECT: Glacier Creek Investigation
Trip Report

PHONE NO: (907) 465-4182

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On May 27-30, 2014, Habitat Biologists Nicole Legere, Gordon Willson-Naranjo, and I surveyed Glacier Creek and tributaries to determine fish presence along a proposed road alignment. Constantine Metals proposes to reconstruct an existing access road on the east side of Glacier Creek that has overgrown and is no longer usable (Figure 1). The road was constructed in 1977 to access mineral resources. The reconstructed road will be 4 km long with a road prism of 4.25 m top width and a 4.8-5.5 m bottom width. Five bridges between 5.4-12 m long and 18 culverts will be installed for hydraulic conveyance.

Figure 1.–Looking north, down Glacier Creek with approximate road alignment in orange (May 28, 2014).

We identified 23 drainages that cross the road alignment, including ephemeral and perennial streams, none of which are documented to contain anadromous fish (Appendix). We found Dolly Varden char in three streams on the east side of Glacier Creek but did not find fish at or upstream of the proposed road alignment. Therefore, Fish Habitat Permits will not be required for the stream crossings.

## Streams A to G

Streams A through D, and F through G are ephemeral channels that did not contain flowing water during our site visit (Figures 2, 3). Stream E has a deeply incised channel with cobble and boulder substrate and high bed load movement. The channel gradient is 22% upstream and downstream of the road crossing. We electrofished from the Stream E confluence with Glacier Creek to upstream of the proposed road crossing and did not capture fish (Figures 4, 5).

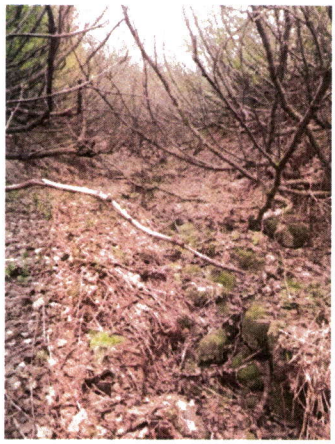

Figure 2.–Stream A (May 28, 2014).

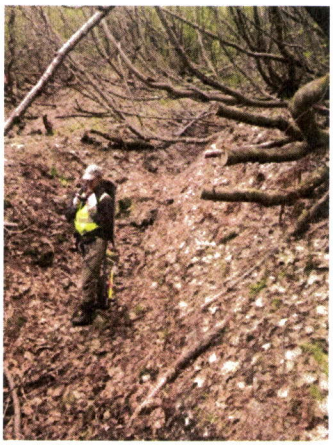

Figure 3.–Stream D (May 28, 2014).

Figure 4. Nicole Legere and Matthew Kern electrofishing Stream E (Photo by Gordon Willson-Naranjo (GWN) May 28, 2014).

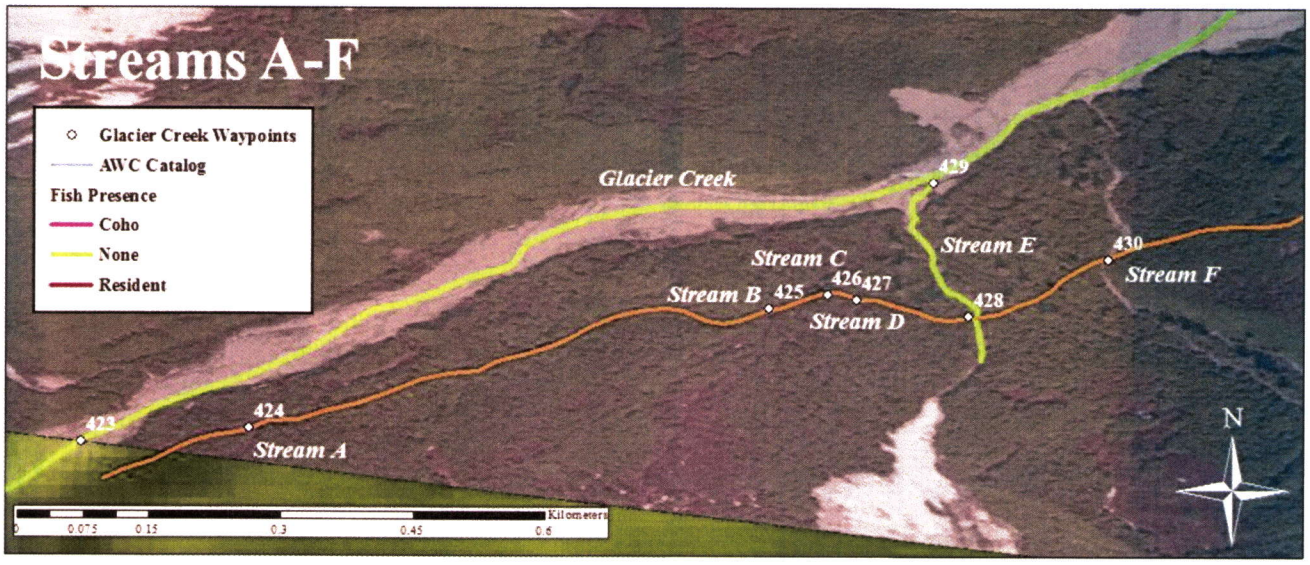


Figure 5.–Map of proposed road alignment and stream crossings A-F.

## Stream H

Stream H, locally known as Christmas Creek, was the largest tributary of Glacier Creek we surveyed. The stream has gravel to boulder substrate. We electrofished above and below the proposed road alignment (Figures 6, 7, 8, 9) and captured two Dolly Varden char, 95-150 mm, and visually observed

one below the alignment. Channel bed width (CBW) at the proposed road crossing averages 3.8 m[1], and the stream gradient is 10% 17 m upstream and 13% 18 m downstream of the road. The crossing was flagged for a 9 m log stringer bridge.

Figure 6.–Nicole Legere and Matthew Kern electro-fishing an undercut bank in Stream H (Photo by GWN: May 28, 2014).

Figure 7.–Dolly Varden char captured in Stream H (Photo by GWN: May 28, 2014).

Figure 8.–Nicole Legere and Matthew Kern electro-fishing Stream H (Photo by GWN: May 28, 2014

Figure 9.–Gordon Willson-Naranjo and Nicole Legere upstream of the road crossing (May 28, 2014).

**Streams I-M**

Streams I, J, and K are tributaries to Christmas Creek (Stream H). We electrofished these drainages and did not capture fish (Figure 10). Stream J is a small drainage that had flow above and below the road alignment, and flowed subsurface for about 15 m at the road alignment. Stream L has an average channel bed width of 2 m, and has 16% gradient 18 m upstream and 12% 20 m downstream of the crossing (Figure 11). The Stream L crossing was flagged as a 48 in corrugated metal pipe (CMP) culvert. Stream M (Figure 12) has an average channel bed width of 1.5 m and a gradient of 26% 18 m upstream and 26% 18 m downstream of the crossing. The Stream M crossing was flagged as a 7.6 m log stringer bridge. We electrofished Streams L and M above and below the road alignment and caught no fish.

[1] We determined channel bed width (CBW) by measuring the wetted width in the center of the road alignment, then taking that distance downstream and measuring the wetted width again. This procedure was repeated 5 times (2 above and 2 below the center) to estimate the average CBW at the road crossing.

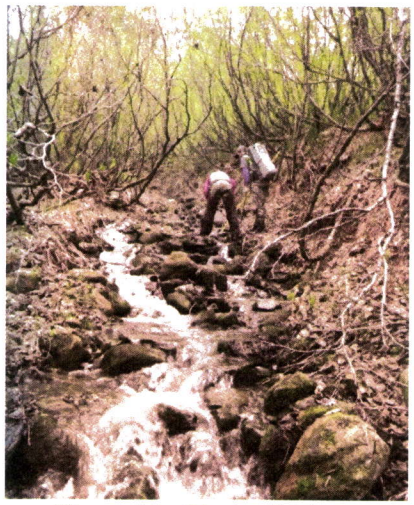

Figure 10.–Electrofishing Stream K (Photo by GWN: May 28, 2014).

Figure 11.–Gordon Willson-Naranjo on the bank of Stream L (May 28, 2014).

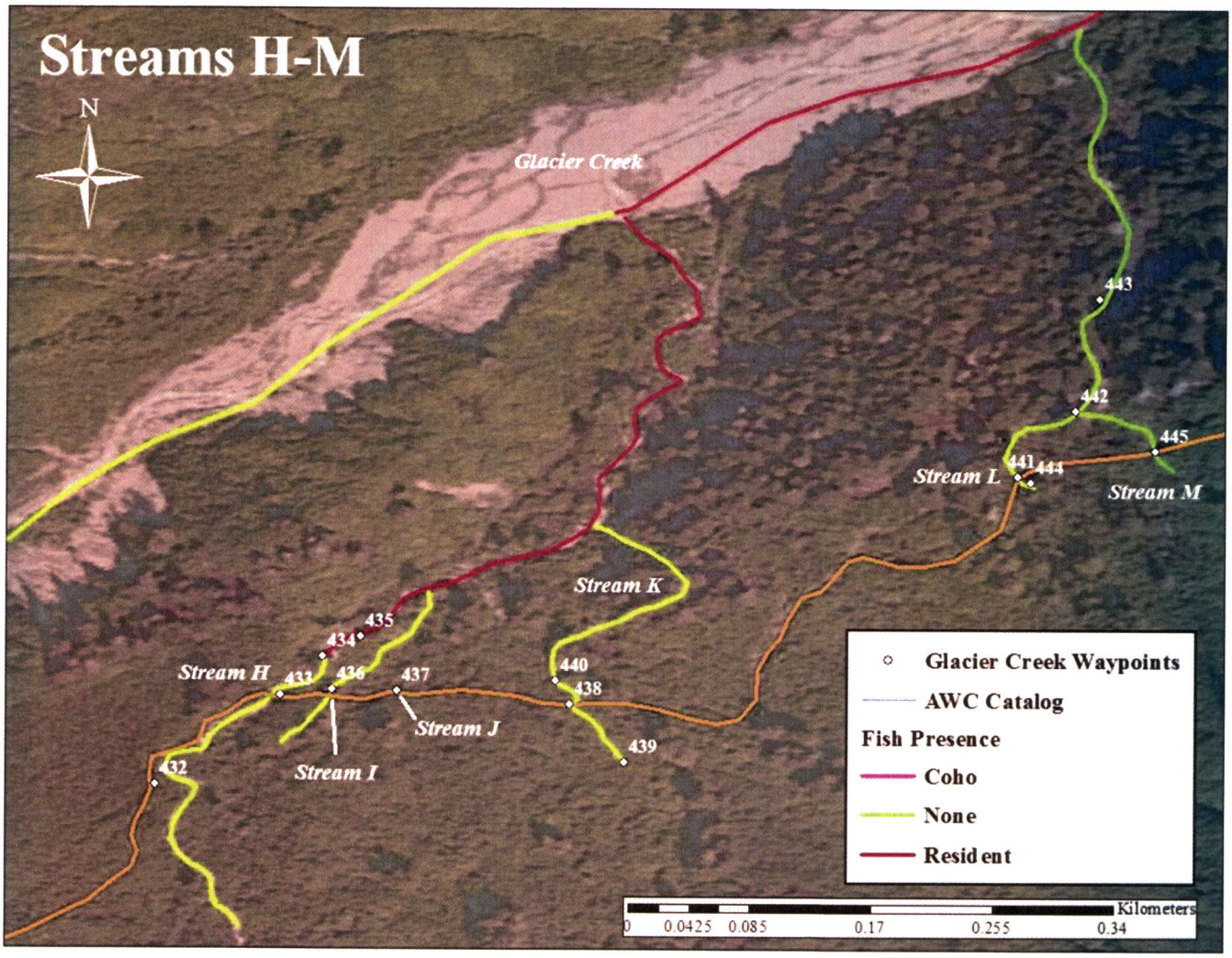


Figure 12.–Map of proposed road alignment and stream crossings H-M.

## Streams N-O

Stream N has an average channel bed width of 0.54 m, and a gradient of 16% 15 m above, and 12% 18 m below the road alignment. We electrofished above and below the crossing and caught no fish. Stream O is an ephemeral vegetated seep that was flagged as an 18 in CMP.

## Stream P

Stream P has gravel substrate and an average channel bed width of 2.3 m near the road alignment (Figure 13). Gradient is 4% 18 m upstream, and 5% 18 m downstream of the road. We captured one 180 mm Dolly Varden char (Figure 14), and visually observed another downstream of the road alignment.

Figure 13.–Stream P just downstream of the road crossing (May 28, 2014).

Figure 14.–Dolly Varden char captured downstream of the road crossing (Photo by GWN: May 28, 2014).

## Stream Q and R

Figure 15.–Gordon Willson-Naranjo on the bank of Stream Q at the crossing (May 29, 2014).

Figure 16.–Matthew Kern at the falls near the confluence of Stream Q and Glacier Creek (Photo by GWN: May 29, 2014).

Stream Q has gravel substrate and an average channel bed width of 1.4 m near the road crossing. The stream was flagged for a 24 in CMP culvert. Stream Q has a gradient of 10% 17 m upstream, and 14% 18 m downstream of the road alignment (Figure 15). We electrofished from the confluence of Glacier Creek to above the road alignment and did not find fish. There is a 1.5 m falls between the Glacier Creek floodplain and Stream Q that may impede upstream resident fish passage (Figure 16).

Stream R may be ephemeral and was flagged as an 18 in CMP (Figure 17). Stream gradient above the road alignment is 18% 15 m upstream and 19% 15 m downstream of the road. Substrate consists of sand and organics.

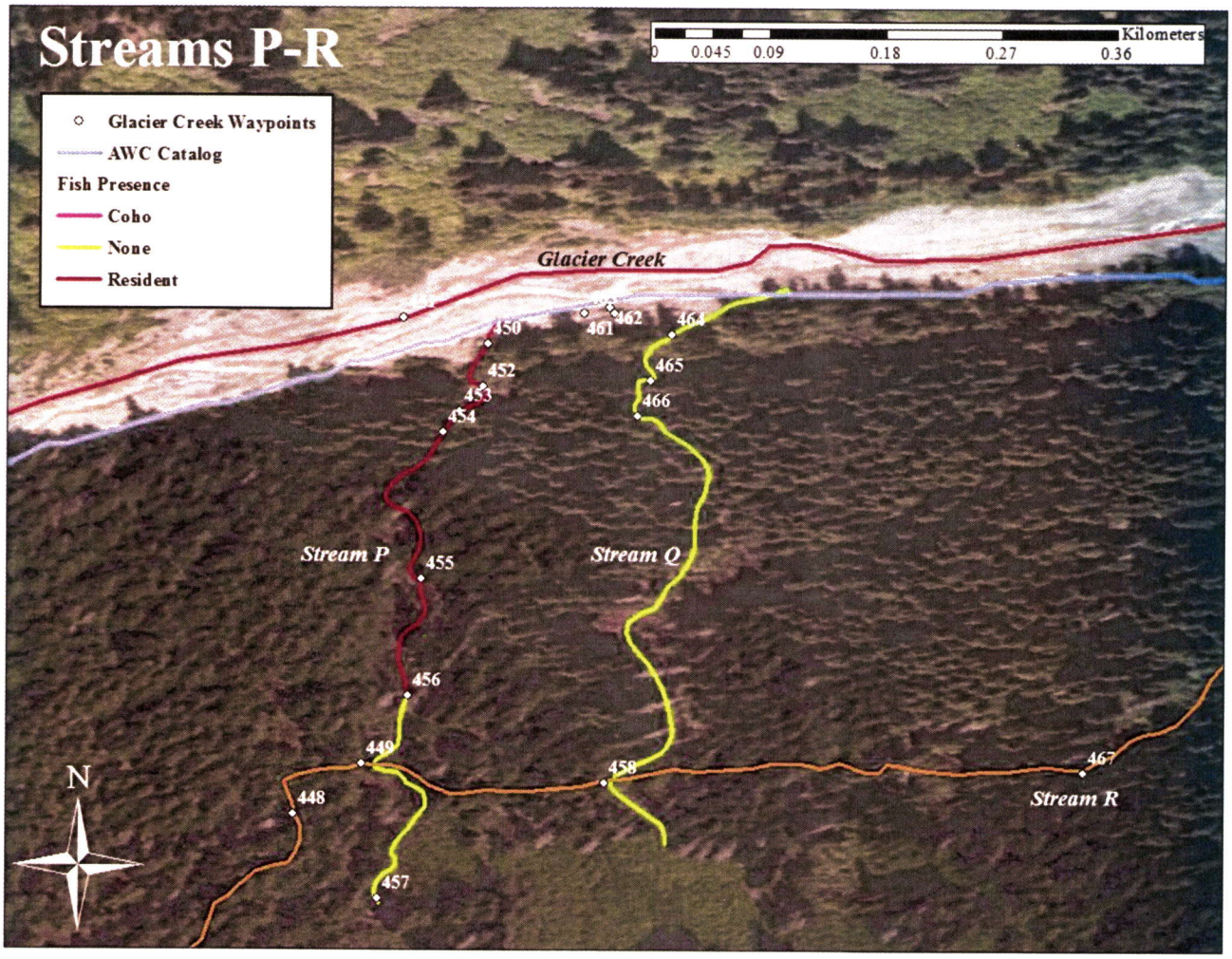


Figure 17.–Map of proposed road alignment and stream crossings P-R.

## Streams S-T

Stream S has 18% gradient 20 m downstream, and 10% gradient 29 m upstream of the road. The average channel bed width near the road crossing is about 2.1 m and the stream was flagged for a 9 m log stringer bridge (Figure 18). We electrofished above and below the road alignment and caught several Ephemeroptera (mayfly) larvae and no fish (Figure 19).

Figure 18.–Stream S near the road crossing (Photo by GWN: May 29, 2014).

Figure 19.–Stream S downstream of the road crossing in a step pool cascade section (May 29, 2014).

Stream T has several step pools and an average channel bed width of 2.6 m near the road alignment (Figure 20). The stream is flagged for a 6 m log stringer bridge. Channel gradient is 23% 15 m upstream and 23% 21 m downstream of the road. We encountered a series of waterfalls and cascades just above the confluence with Glacier Creek that are barriers to fish passage (Figures 21, 22). We electrofished above the barrier and road alignment and did not capture fish. On May 27 we set 4 minnow traps and did not capture fish after an overnight soak.

Figure 20.–Stream T looking downstream from the road alignment (May 29, 2014).

Figure 21.–Series of waterfalls on Stream T just before confluence with Glacier Creek (Photo by GWN: May 29, 2014).

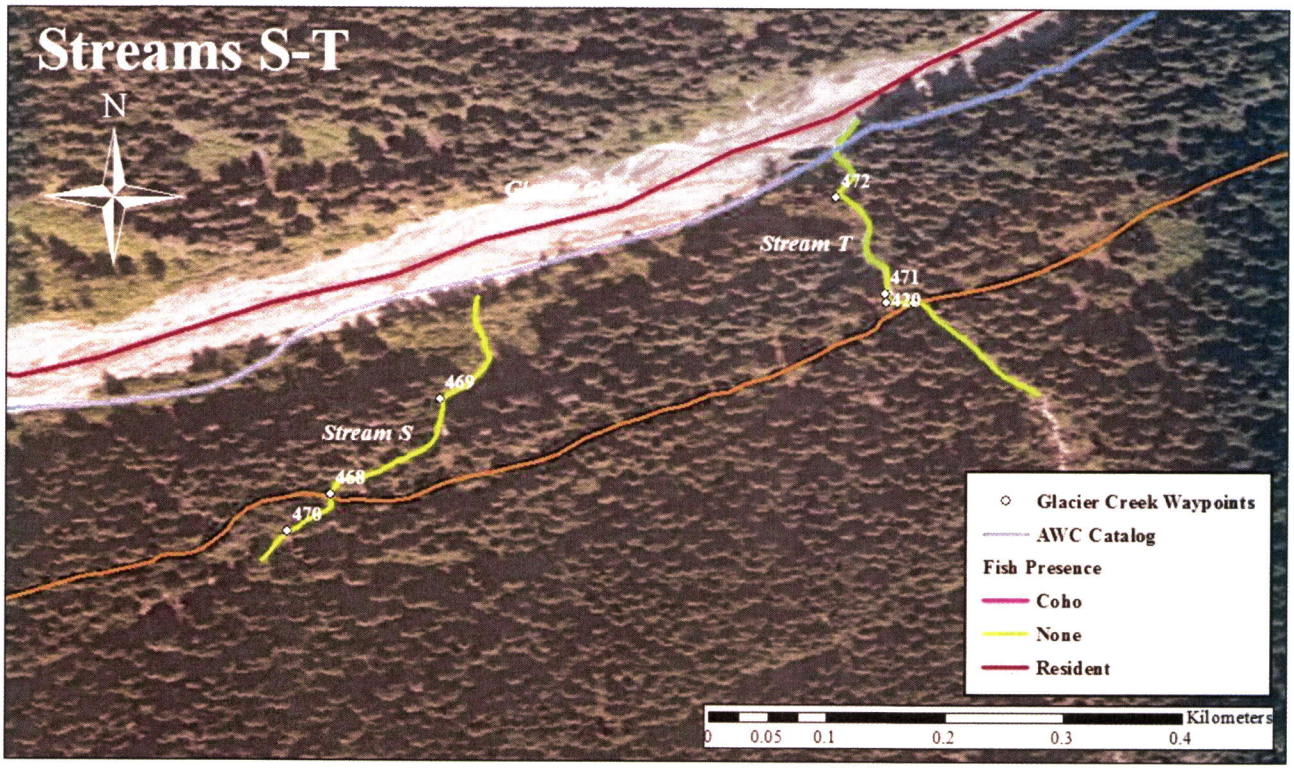


Figure 22.–Map of proposed road alignment and stream crossings S-T.

## Stream U

Figure 23.–Gordon Willson-Naranjo near Stream U at at the road crossing (May 29, 2014).

Figure 24.–Matthew Kern at the confluence of Stream U and the small pond (Photo by GWN: May 29, 2014).

Stream U has an average channel bed width of 0.45 m near the road alignment (Figure 23). The stream flows about 200 m downstream of the crossing before reaching a small pond (Figure 24). On May 27 we set one baited minnow trap in the pond and after an overnight soak captured four 60-80 mm Dolly Varden char. On May 28, we electrofished upstream of the pond and captured two 50-70 mm Dolly Varden char (Figures 25, 26, 27). At the road alignment the stream steepens to 18% 20 m upstream and 16 % 20 m downstream of the road crossing.

Figure 25.–Dolly Varden char captured in Stream U

Figure 26.–Gordon Willson-Naranjo electrofishing up to road crossing in Stream U (May 29, 2014).

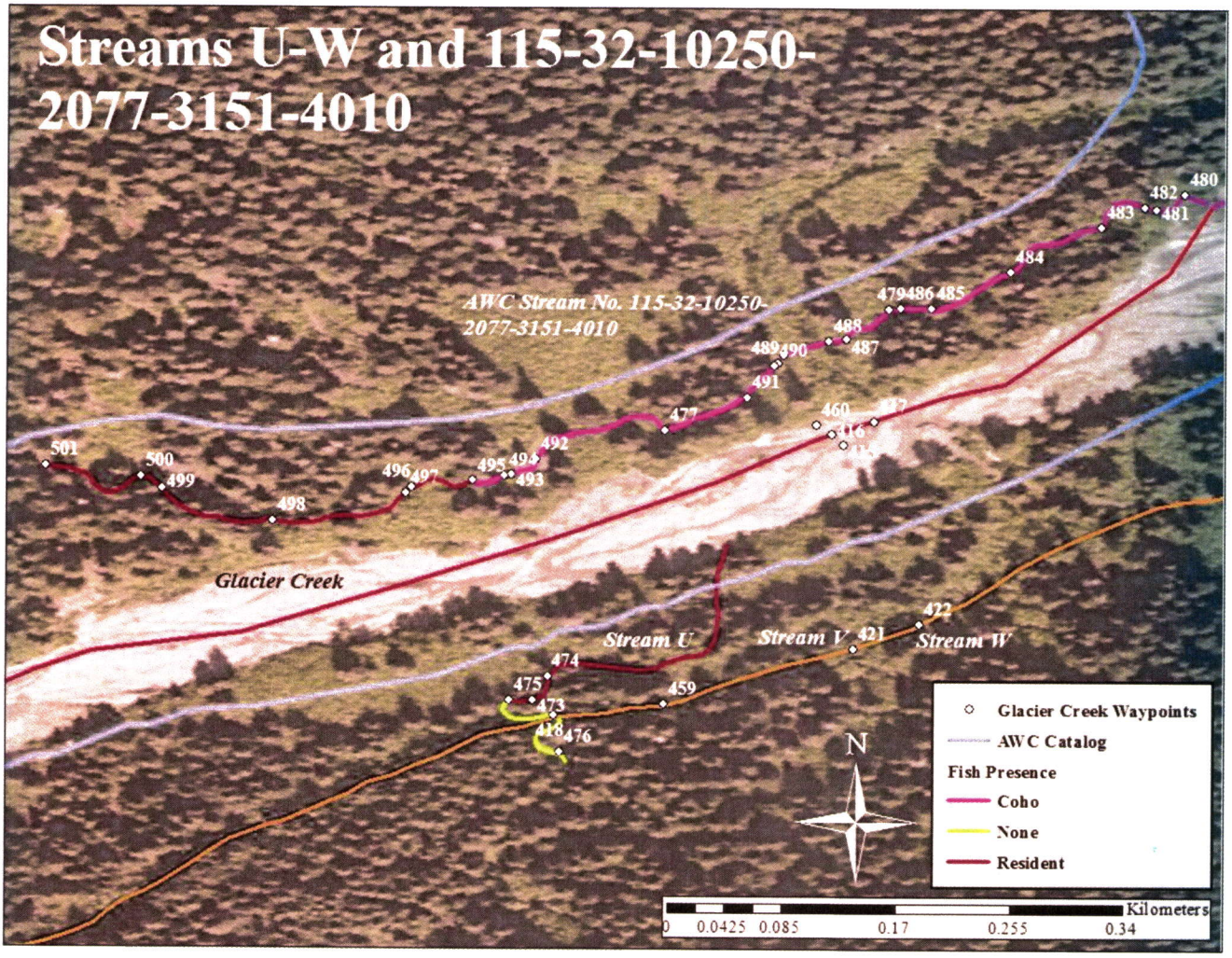


Figure 27.–Map of proposed road alignment, stream crossings U-W and Stream No. 115-32-10250-3151-4010.

**Streams V-W**

Stream V is a vegetated ephemeral seep flagged as an 18 in CMP culvert. Stream W has a channel bed width of about 15 cm and very little flow. The crossing is flagged as an 18 in CMP culvert.

**Glacier Creek**

Glacier Creek, Stream No. 115-32-10250-2077-3151, is cataloged for Dolly Varden char, cutthroat trout, and coho salmon. In Glacier Creek we opportunistically set traps, electrofished, and measured channel gradient, temperature, and conductivity (Figures 28, 29, 30). Channel gradient ranged from 4% to 15%. Water temperature ranged from 35.7° F near the headwaters to 45.8°F at the former bridge crossing[2]. During our site visit the Glacier Creek floodplain was wider than the wetted channel width suggesting that higher summer flows and high bed load movement prevent vegetation from establishing.

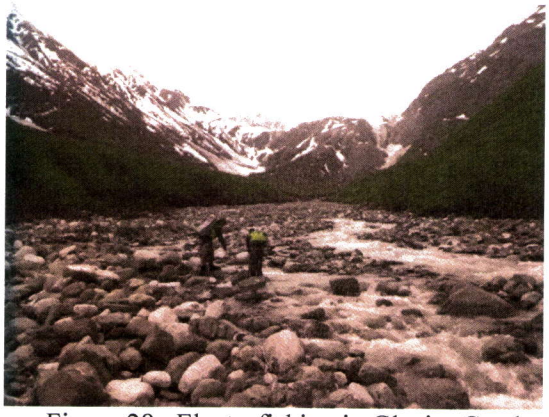

Figure 28.–Electrofishing in Glacier Creek (May 28, 2014).

Figure 29.–Measuring channel gradient in a steep section of Glacier Creek (May 28, 2014).

Figure 30.–Low gradient section of Glacier Creek (May 28, 2014).

Figure 31.–Dolly Varden char, about 20 mm, captured in Glacier Creek (May 29, 2014).

We captured several 20 mm Dolly Varden char (Figure 31) that appeared to be emerging from fine gravel substrate while electrofishing. We also captured Ephemeroptera (mayfly) and Plecoptera (stonefly) larvae while electrofishing (Figure 32). On May 27, we set five baited minnow traps near the former bridge crossing (WPT 415: Appendix A) and captured 17 Dolly Varden char, 55-85 mm, after an overnight soak (Figure 33). Coho salmon have not been documented in Glacier Creek. I will submit a

[2] Temperature and conductivity measurements taken using the Extek Exstick II.

correction to change the upper extent of anadromy to the confluence of 115-32-10250-2077-3151 and 115-32-10250-2077-3151-4010 (Glacier Creek Correction: Appendix).

Figure 32.–Ephemeroptera larvae captured while electrofishing in Glacier Creek (May 29, 2014).

Figure 33.–Dolly Varden char captured in a minnow trap in Glacier Creek (May 28, 2014).

**Stream No 115-32-10250-2077-3151-4010**

On May 30, 2014, we surveyed a cataloged tributary to Glacier Creek, Stream No. 115-32-10250-2077-3151-4010, listed for Dolly Varden char, cutthroat trout, and coho salmon. We electrofished the cataloged reach and captured all three species (Figures 34, 35, Table 1). I will submit a route correction to update the stream route in the Anadromous Waters Catalog (Glacier Creek Tributary Correction: Appendix). The stream channel is low gradient and contains sand, gravel, and cobble substrates (Figures 36, 37), and I will return in the fall to conduct spawning surveys.

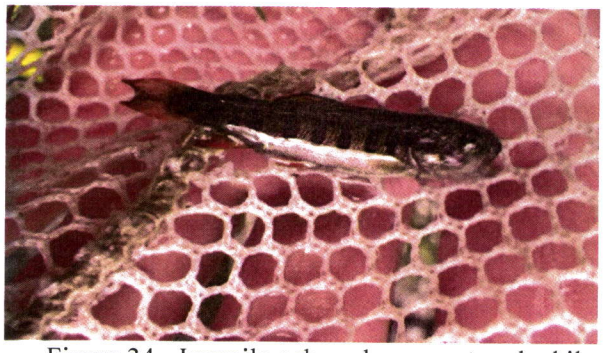

Figure 34.–Juvenile coho salmon captured while electrofishing (May 30, 2014).

Figure 35.–Cutthroat trout captured while electrofishing (May 30, 2014).

We observed a 1.0 m diameter culvert that conveys the stream under an overgrown road that was formerly accessed via the Porcupine Road across the Glacier Creek bridge. Though not bedded, the culvert does not impede fish passage (Figure 38). The stream has several large pools and abundant woody debris (Figure 39).

Figure 36.–Confluence of Stream No. 115-32-10250-3151-4010 and Glacier Creek (May 30, 2014).

Figure 37.–Section of stream with gravel substrate (May 30, 2014).

Figure 38.–Culvert under overgrown road (May 30, 2014).

Figure 39.–Deep scour pool (May 30, 2014).

We want to thank Darwin Green, Vice President of Exploration for Constantine Metal Resources, Ltd. for providing food, lodging, radios and vests, transportation from camp to Glacier Creek, and helicopter support for this investigation.

Email cc:

Al Ott, ADF&G Habitat, Fairbanks
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Stephanie Scott, Mayor, Haines
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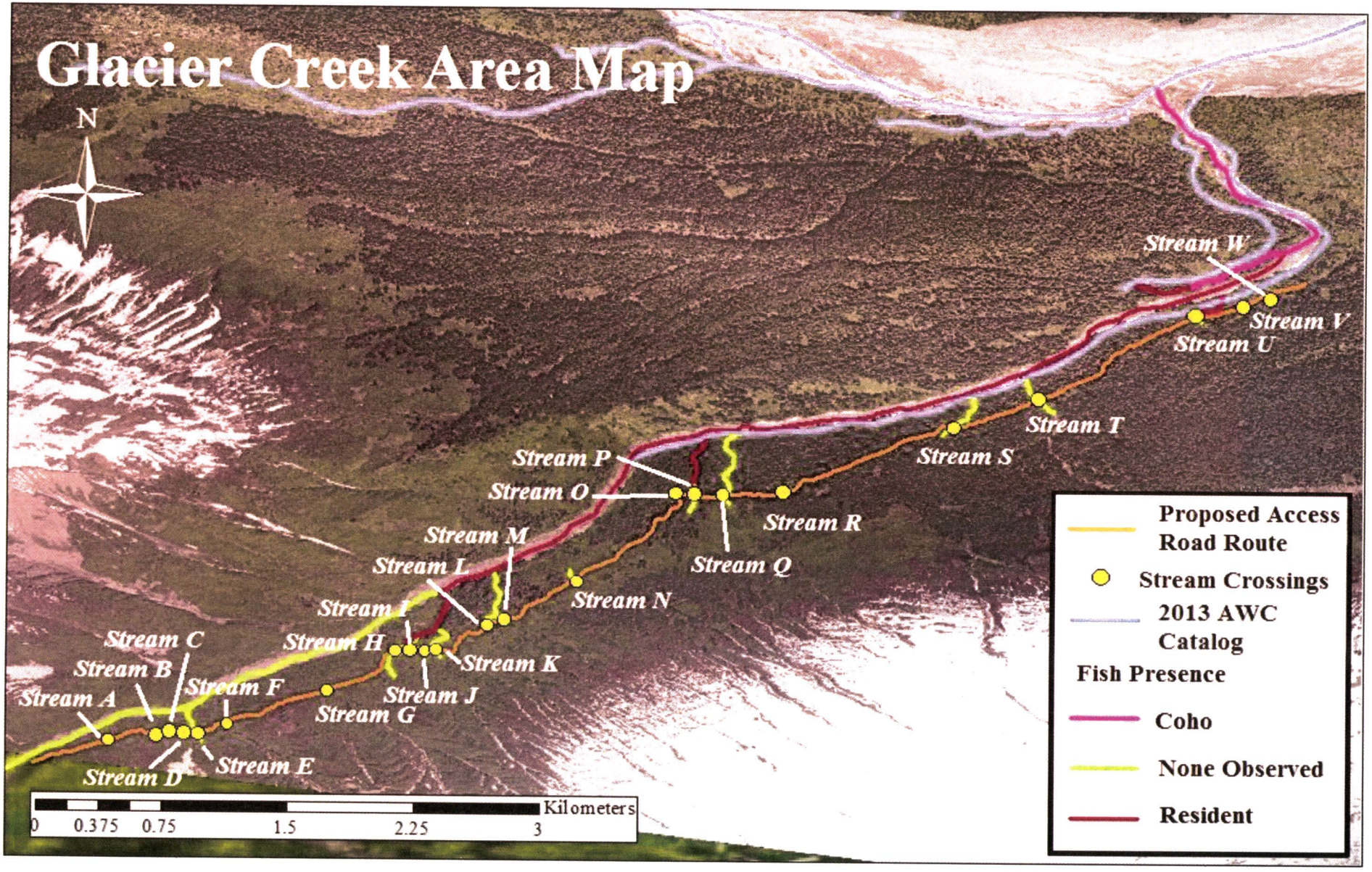
Steve Brockmann, USFWS, Juneau
Randy Vigil, USACE, Juneau
Darwin Green, Constantine Metals




Appendix A.–Map of all stream crossings surveyed and proposed access road.

Table 1.–Waypoint data from May 27-30, 2014.

| WPT | Lat | Long | Notes | WQ | Gradient | Channel Bed Width (meters) |
|---|---|---|---|---|---|---|
| 415 | 59.4174 | -136.3019 | Glacier Creek: Set 1 minnow trap on river left: 3 DV: 70–85 mm | Temp: 45.8 °F, Cond: 242 µS/cm | | |
| 416 | 59.4175 | -136.3020 | Glacier Creek - Set 1 Minnow Trap on river left: 5 DV - 60-80 mm – Set 1 Minnow Trap on river right: 6 DV – 50-100 mm | | | |
| 417 | 59.4176 | -136.3017 | Glacier Creek - Set 1 Minnow Trap on river left: 2 DV - 60-80 mm – Set 1 minnow trap on river right – 1 DV – 55 mm | | | |
| 418 | 59.4156 | -136.3039 | Stream U: Flagged for 18 in culvert | Temp: 45.8 F, Cond: 242 µS/cm | 18% 20 m above road, 16% 20 m below road | 0.5, 0.45, 0.45, 0.4, 0.56 |
| 419 | 59.4111 | -136.3126 | Stream T: Set 4 traps - 2 at bridge crossing, 1 above and 1 below. Flagged as 6 m log stringer bridge (LSB). High flow, step pools and cascades. No Fish Caught | Temp: 43.8 F, Cond: 187 µS/cm | 23% 15 m above road 23% 21 m below road | 2.5, 1.8, 3.0, 3.7, 1.7 |
| 420 | 59.4111 | -136.3128 | Set 1 minnow trap below road in Stream T – No Fish Caught | | | |
| 421 | 59.4161 | -136.3019 | Stream V: Small seep, flagged as 18 in CMP - vegetated upstream, appears ephemeral | | | |
| 422 | 59.4162 | -136.3014 | Stream W: Flagged as 18 in CMP. Minimal flow, CBW 15-25 cm, drains into pond. | | | |
| 423 | 59.3916 | -136.3663 | Glacier Creek - Electrofished confluence and Glacier Creek | Temp: 35.7 F, Cond: 232 µS/cm | 5% 29 m above road 7% 29 m below road | |
| 424 | 59.3917 | -136.3646 | Stream A: dry ephemeral channel. Flagged as 18 in CMP | | | |
| 425 | 59.3929 | -136.3593 | Stream B: dry ephemeral channel - sand and gravel scoured channel about1-1.5 m wide. Flagged as 18 in CMP | | | |
| 426 | 59.3931 | -136.3587 | Stream C: Dry drainage incision with no water | | | |
| 427 | 59.3930 | -136.3584 | Stream D: Dry drainage incision with no water | | | |
| 428 | 59.3929 | -136.3573 | Stream E: Appears to have high bed load movement. Very scoured substrate consisting of sand, cobble, and boulders. Flagged as 15 m LSB | Temp: 41.0 F, Cond 262 µS/cm | 22% 24 m above road 22% 23 m below road | 1.5, 2.1, 1.2, 1.4, 1.5, 1.5 |
| 429 | 59.3942 | -136.3576 | Confluence of Stream E and Glacier Creek. Large alluvial fan from stream meets Glacier Creek at relatively steep location with large boulders and cascading step pools. | | 15% 18 m above road 5% 27 m below road | |
| 430 | 59.3934 | -136.3558 | Stream F: Large dry drainage with evidence of heavy bed load movement. Flagged as 6 m LSB | | 19% 23 m above road 19% 28 m below road | |

Table1.–Waypoint data from May 27-30, 2014, continued.

| WPT | Lat | Long | Notes | WQ | Gradient | Channel Bed Width (meters) |
|---|---|---|---|---|---|---|
| 431 | 59.3950 | -136.3509 | Stream G: Dry channel, probably ephemeral flow with about 2 m incision depth at road crossing. Flagged as 24 in CMP | | 22% 13 m above road<br>23% 13 m below road | |
| 432 | 59.3969 | -136.3473 | Stream H: Large drainage - deeply incised in places. E-fished above and below road crossing. | | | |
| 433 | 59.3974 | -136.3465 | Stream H: crossing location. Flagged as 9 m LSB. | Temp: 39.3 F, Cond: 134 µS/cm | 10% 17 m above road<br>13% 17 m below road | 4.9, 3.4, 3.7, 3.4, 3.7 |
| 434 | 59.3977 | -136.3462 | Visual ID 1 DV ~150 mm | | | |
| 435 | 59.3978 | -136.3460 | E-fished 1 DV - 95 mm, 1 DV – 60 mm | | | |
| 436 | 59.3975 | -136.3462 | Stream I: Small drainage that flows into Stream H about 100 meters below road crossing. E-fished up from confluence of Stream H. Flagged as 24 in CMP | | 22% 15 m above road<br>15% 15 m below road | 0.40, 0.45, 0.51, 0.38, 0.69 |
| 437 | 59.3975 | -136.3458 | Stream J: Small drainage that goes subterranean for about 50 ft at the road crossing, 2-3 m incision depth | | | |
| 438 | 59.3974 | -136.3447 | Stream K: Medium sized stream, gravel to boulder sized substrate - about 5 m incision depth at the road crossing. Flagged as 36 in CMP | Temp: 41.5 F, Cond: 100.7 µS/cm | 19% 12.5 m above road<br>30% 80 m below road | 1.6, 0.9, 0.6, 1.6, 2.0 |
| 439 | 59.3970 | -136.3443 | Upstream extent of E-fish effort on Stream K | | | |
| 440 | 59.3975 | -136.3448 | Downstream extent of E-Fish effort on Stream K | | | |
| 441 | 59.3988 | -136.3419 | Stream L: road crossing is immediately below confluence of two streams. E-fished from below the road crossing and 2 streams above. Flagged as 48 in CMP. | Temp: 43.0 F, Cond: 79.2 µS/cm | 16% 18 m above road<br>12% 20 m below road | 1.3, 1.4, 1.5, 1.0, 1.5 |
| 442 | 59.3992 | -136.3415 | Confluence with Stream | | | |
| 443 | 59.3999 | -136.3414 | Lower extent of E-fish effort | | | |
| 444 | 59.3988 | -136.3418 | Upstream extent of E-fish effort | | | |
| 445 | 59.3990 | -136.3410 | Stream M: This stream joins Stream L at WPT 442. Cascades and small step pools. Substrate gravels to boulder with incision depth of 2-5 m. Flagged as 7.6 m LSB | Temp: 41.5 F, Cond: 61.5 µS/cm | 26% 18 m above road<br>26% 18 m below road | 1.1, 1.5, 1.8, 1.4, 1.1 |
| 446 | 59.4013 | -136.3372 | Stream N: Small stream with shallow gradient. E-fished above and below road crossing | Temp: 43.8 F, Cond: 27.8 µS/cm | 16% 15 m above road<br>12% 20 m below road | 0.54, 0.54, 0.44, 0.64, 0.60 |

Table 1.–Waypoint data from May 27-30, 2014, continued.

| WPT | Lat | Long | Notes | WQ | Gradient | Channel Bed Width (meters) |
|---|---|---|---|---|---|---|
| 447 | 59.4014 | -136.3374 | Downstream extent of E-Fish effort on Stream N | | | |
| 448 | 59.4055 | -136.3316 | Stream O: Small vegetated seep. Flagged as 18 in CMP | Temp: 46.7 F, Cond: 27.8 µS/cm | | |
| 449 | 59.4059 | -136.3311 | Stream P: Large creek in a bench area. Meandering stream channel, gravel substrate. Flagging indicates 9 m LSB. | | 4% 18 m above road<br>5% 18 m below road | 3.2, 1.6, 1.6, 2.7, 2.2 |
| 450 | 59.4088 | -136.3303 | Confluence of Stream P and Glacier Creek | | | |
| 451 | 59.4090 | -136.3309 | Glacier Creek | | 4% 46 m upstream<br>4% 46 m downstream | |
| 452 | 59.4085 | -136.3303 | Visual ID of 1 DV - about 160 mm | | | |
| 453 | 59.4084 | -136.3305 | | | 21% 27 m upstream | |
| 455 | 59.4072 | -136.3307 | Captured 1 DV - 180 mm | | | |
| 456 | 59.4064 | -136.3308 | Visual ID 1 DV - 180 mm | | | |
| 457 | 59.4050 | -136.3310 | Upstream extent of E-fishing effort | | | |
| 458 | 59.4058 | -136.3294 | Stream Q: Small stream with gravel substrate- incision depth 2-4 m. Flagged as 24 in CMP | Temp: 40.0F, Cond: 127.5 µS/cm | 10% 17 m above road<br>14% 18 m below road | 1.3, 1.5, 1.5, 1.2, 1.1 |
| 459 | 59.4157 | -136.3031 | Minnow trap in pond fed by Stream U: 4 DV 80-100 mm | | | |
| 461 | 59.4090 | -136.3294 | Confluence of Stream Q, Stream P, and Glacier Creek. All three converge with braided clear water network. | | | |
| 462 | 59.4091 | -136.3294 | Glacier Creek: E-fished 1 DV ~ 20 mm out of gravels and observed two others - freshly emerged fry. E-fished 3 Ephemeroptera out of Glacier Creek. Inverts captured each shock - Ephemeroptera and Plecoptera. | | | |
| 463 | 59.4090 | -136.3296 | E-fished 1 DV - 60 mm | | | |
| 464 | 59.4089 | -136.3290 | Small falls at base of forest transition to Glacier Creek | | | |
| 465 | 59.4086 | -136.3291 | Base of steep cascades coming up from Glacier Creek floodplain. Shooting Gradient to WPT 466. | | 36% 27 m upstream | |
| 466 | 59.4083 | -136.3292 | Top of cascade section | | | |

Table 1.–Waypoint data from May 27-30, 2014, continued.

| WPT | Lat | Long | Notes | WQ | Gradient | Channel Bed Width (meters) |
|---|---|---|---|---|---|---|
| 467 | 59.4058 | -136.3261 | Stream R: Braided stream with fine and organic substrate. Source of water about 50 ft above the road. Flagged as 18 in CMP | | 18% 15 m above road<br>19% 15 m below road | |
| 468 | 59.4096 | -136.3170 | Stream S: Stream with a steep bank on the south side - Flagged as 9 m LSB | Temp: 40.8 F, Cond: 142.6 µS/cm | 10% 29 m above road<br>18% 20 m below road | 3.0, 1.8, 2.0, 2.4, 1.7 |
| 469 | 59.4104 | -136.3162 | Steep section with several cascades and even steeper just downstream before meeting Glacier Creek floodplain | | 27% 27 m upstream | |
| 470 | 59.4094 | -136.3174 | Upper extent of E-fish effort - no fish seen or caught in stream. Numerous Ephemeroptera captured. | | | |
| 472 | 59.4119 | -136.3132 | Upstream side of bedrock incised chute/waterfall. No upstream fish passage from Glacier Creek. | | | |
| 473 | 59.4157 | -136.3040 | Stream U enters pond where we captured 4 DV in the minnow trap. E-fishing up to road. | | | |
| 474 | 59.4159 | -136.3039 | E-fished 2 DV 50-70 mm | | | |
| 475 | 59.4157 | -136.3042 | E-fished 1 DV - 90 mm | | | |
| 476 | 59.4154 | -136.3038 | Stream U splits into 3 smaller channels. Gradient remains steady uphill - upper extent of E-fishing effort. | Temp: 41.3 F, Cond: 223 µS/cm | | |
| 477 | 59.4175 | -136.3031 | Set 1 Minnow Trap at 8:53 AM in scour Pool. 1 CT – 65 mm | | | |
| 478 | 59.4180 | -136.3023 | Culvert under old road - Set 1 trap at outlet at 9:00 AM. 3 CT - 70-100 mm | | | |
| 479 | 59.4183 | -136.3016 | Tributary enters on River left - 0.5 m wide with minimal flow. Setting trap in large pool just above confluence | | | |
| 480 | 59.4191 | -136.2997 | Confluence of unnamed tributary and Glacier Creek. | | | |
| 481 | 59.4190 | -136.2998 | E-fished 1 DV - 65 mm | | | |
| 482 | 59.4190 | -136.2999 | E-fished 3 DV - 45-85 mm | | | |
| 483 | 59.4189 | -136.3002 | E-fished 2 CT - 90-100 mm, 1 DV- 60 mm | | | |
| 484 | 59.4186 | -136.3008 | E-fished 1 CT - 80 mm | | | |
| 485 | 59.4183 | -136.3014 | Visual ID 1 CT | | | |
| 486 | 59.4183 | -136.3016 | E-fished DV ~ 20 mm | | | |

Table 1.–Waypoint data from May 27-30, 2014, continued.

| WPT | Lat | Long | Notes | WQ | Gradient | Channel Bed Width (meters) |
|---|---|---|---|---|---|---|
| 487 | 59.4181 | -136.3019 | E-fished 2 CT - 50-75 mm | | | |
| 489 | 59.4180 | -136.3024 | E-fished 1 CT - 80 mm | | | |
| 490 | 59.4180 | -136.3024 | E-fished 1 CT - 70 mm | | | |
| 491 | 59.4177 | -136.3026 | E-fished 1 CO - 50 mm | | | |
| 492 | 59.4173 | -136.3040 | E-fished 4 CT - 60-100 mm | | | |
| 493 | 59.4172 | -136.3042 | E-fished 1 CT - 80 mm | | | |
| 495 | 59.4172 | -136.3044 | E-fished 1 CO - 45 mm | | | |
| 496 | 59.4171 | -136.3048 | E-fished 1 DV - 95 mm | | | |
| 497 | 59.4171 | -136.3049 | E-fished 1 CT – 50 mm | | | |
| 499 | 59.4171 | -136.3065 | E-fished 2 CT, 1 DV | | | |
| 500 | 59.4172 | -136.3067 | E-fished 1 DV, 1 CT gradient change | | 13% 26 m upstream | |
| 501 | 59.4173 | -136.3073 | Timber harvest boundary, upstream extent of E-fish effort. | | | |

## Glacier Creek Tributary

## Correction

**Water body name:** Unnamed Tributary
**Water body number:** 115-32-10250-2077-3151-4010
**Watershed:** Klehini River
**MTR:** Section 25, 30, 28 S Range 54 E CRM
**Quad:** Skagway B-4

**Survey date:** 5/30/2014
**Species & Lifestage:** CO rearing

**Findings:** We surveyed this Glacier Creek tributary and electrofished from the confluence with Glacier Creek upstream. We captured Dolly Varden char, cutthroat trout, and coho salmon (Figure 1, Table 1). We observed an old culvert beneath an overgrown road that did not block fish passage (Figure 2). The stream contains deep pools, and gravel substrates (Figure 3).
**Recommendations:** We recommend updating the stream arc and upstream coho presence extent of this stream (Figure 4).

Table 1.–Survey data from May 30, 2014 (Page 1 of 2).

| Waypoint | Lat | Long | Notes | Sample Effort | Sample Result |
|---|---|---|---|---|---|
| 477 | 59.4175 | 136.3031 | Set 1 Minnow Trap at 8:53 AM in scour Pool. 1 CT – 65 mm | Minnow Trap | 1 CT – 65 mm |
| 478 | 59.418 | 136.3023 | Culvert under old road - Set 1 trap at outlet at 9:00 AM. 3 CT - 70-100 mm | Minnow Trap | 3 CT - 70-100 mm |
| 479 | 59.4183 | 136.3016 | Tributary enters on River left - 0.5 m wide with minimal flow. Setting trap in large pool just above confluence | Minnow Trap | |
| 480 | 59.4191 | 136.2997 | Confluence of unnamed tributary and Glacier Creek. | | |
| 481 | 59.419 | 136.2998 | 1 DV - 65 mm | Electrofisher | 1 DV - 65 mm |
| 482 | 59.419 | 136.2999 | 3 DV - 45-85 mm | Electrofisher | 3 DV - 45-85 mm |
| 483 | 59.4189 | 136.3002 | 2 CT - 90-100 mm, 1 DV- 60 mm | Electrofisher | 2 CT - 90-100 mm, 1 DV- 60 mm |
| 484 | 59.4186 | 136.3008 | 1 CT - 80 mm | Electrofisher | 1 CT - 80 mm |
| 485 | 59.4183 | 136.3014 | Visual ID 1 CT | Electrofisher | Visual ID 1 CT |
| 486 | 59.4183 | 136.3016 | DV ~ 20 mm | Electrofisher | DV ~ 20 mm |
| 487 | 59.4181 | 136.3019 | 2 CT - 50-75 mm | Electrofisher | 2 CT - 50-75 mm |
| 489 | 59.418 | 136.3024 | 1 CT - 80 mm | Electrofisher | 1 CT - 80 mm |
| 490 | 59.418 | 136.3024 | 1 CT - 70 mm | Electrofisher | 1 CT - 70 mm |
| 491 | 59.4177 | 136.3026 | 1 CO - 50 mm | Electrofisher | 1 CO - 50 mm |
| 492 | 59.4173 | 136.304 | 4 CT - 60-100 mm | Electrofisher | 4 CT - 60-100 mm |
| 493 | 59.4172 | 136.3042 | 1 CT - 80 mm | Electrofisher | 1 CT - 80 mm |

Table 1.–Survey data from May 30, 2014 (Page 2 of 2).

| Waypoint | Lat | Long | Notes | Sample Effort | Sample Result |
|---|---|---|---|---|---|
| 495 | 59.4172 | 136.3044 | 1 CO - 45 mm | Electrofisher | 1 CO - 45 mm |
| 496 | 59.4171 | 136.3048 | 1 DV - 95 mm | Electrofisher | 1 DV - 95 mm |
| 497 | 59.4171 | 136.3049 | 1 CT – 50 mm | Electrofisher | 1 CT – 50 mm |
| 499 | 59.4171 | 136.3065 | 2 CT, 1 DV | Electrofisher | 2 CT, 1 DV |
| 500 | 59.4172 | 136.3067 | 1 DV, 1 CT gradient change | Electrofisher | 1 DV, 1 CT |
| 501 | 59.4173 | 136.3073 | Timber harvest boundary, upstream extent of E-fish effort. | | |

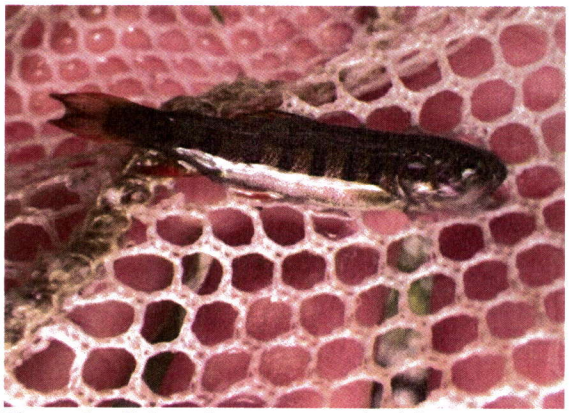


Figure 1.–Coho salmon captured while electrofishing ( May 30, 2014).

Figure 2.–Culvert under overgrown road (May 30, 2014).

Figure 3.–Gravel reach of Glacier Creek tributary (May 30, 2014).

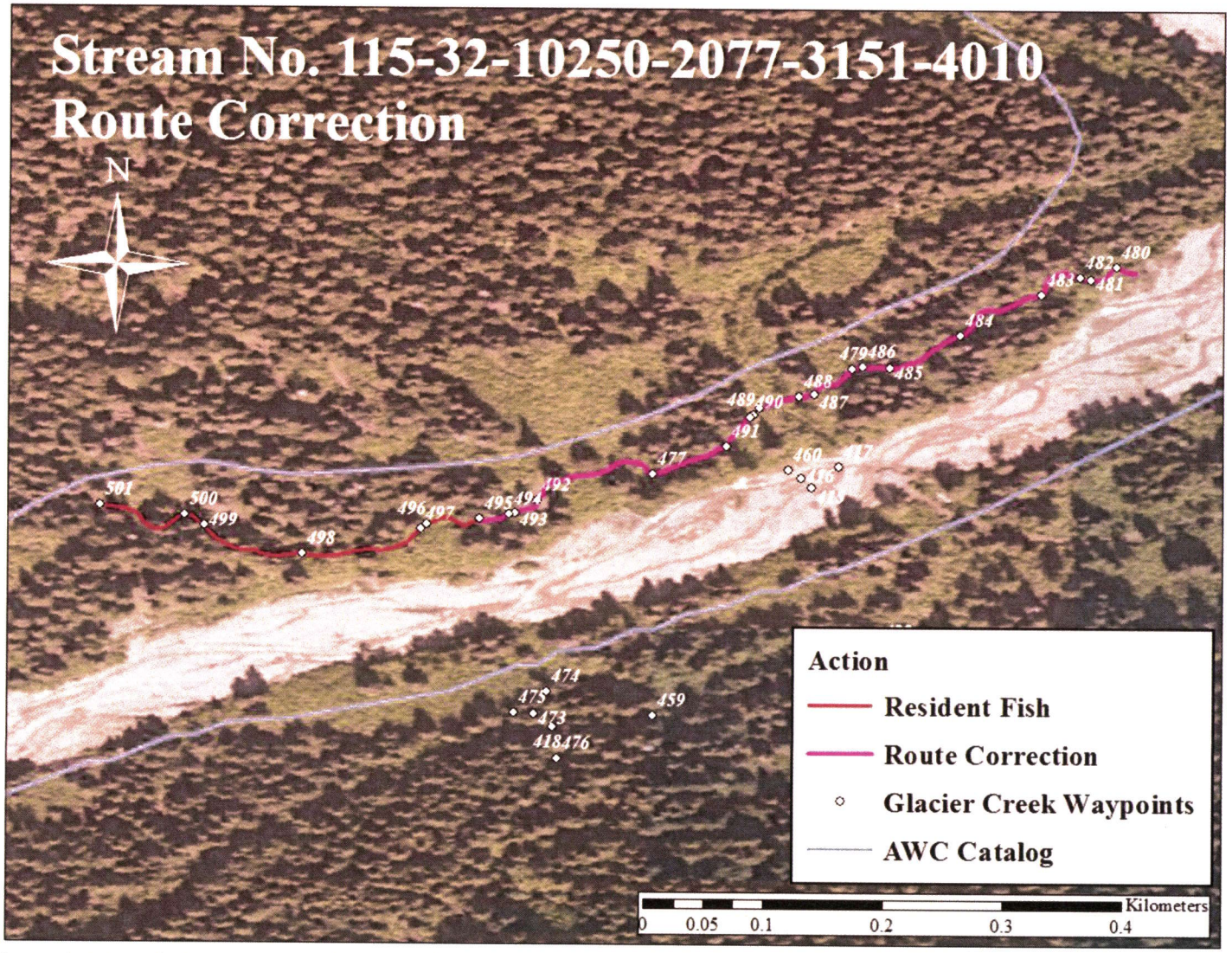



Figure 4.–Map of Glacier Creek tributary with waypoints labeled.

## Glacier Creek

## Correction

**Water body name:** Glacier Creek
**Water body number:** 115-32-10250-2077-3151
**Watershed:** Klehini River
**MTR:** Sections 19, 25, 30, T 28 S, 54 E (Copper River Meridian)
**Quad:** Skagway B-4
**Survey date:** May 27-30, 2014
**Species & Lifestage:** CO rearing
**Findings:** We set minnow traps and electrofished Glacier Creek and captured Dolly Varden char. We captured rearing coho salmon in Stream No. 115-32-10250-2077-3151-4010, therefore anadromous habitat in Glacier Creek extends to that confluence.
**Recommendations:** After a review of all existing nomination documents for Glacier Creek, there is no documentation of anadromous fish, therefore we recommend moving the upstream extent of coho presence to the confluence with Stream No 115-32-10250-2077-3151-4010.

Table 1.–Survey results from May 27-30, 2014 (Page 1 of 2).

| WPT | Latitude | Longitude | Notes | Sample Effort | Sample Results |
|---|---|---|---|---|---|
| 415 | 59.4174 | 136.3019 | Glacier Creek - Set 1 Minnow Trap on River Left | Minnow Trap | 3 DV - 70-85 mm |
| 416 | 59.4175 | 136.3020 | Glacier Creek - Set 1 Minnow Trap on River Left | Minnow Trap | 6 DV - 60-80 mm |
| 417 | 59.4176 | 136.3017 | Glacier Creek - Set 1 Minnow Trap on River Left | Minnow Trap | 2 DV - 60-80 mm |
| 423 | 59.3916 | 136.3663 | Glacier Creek - E fished confluence and Glacier Creek | Electrofisher | No Fish Caught |
| 429 | 59.3942 | 136.3576 | Confluence of Stream E and Glacier Creek. Large alluvial fan from stream meets Glacier Creek at relatively steep location with large boulders and cascading step pools. | Electrofisher | No Fish Caught |
| 450 | 59.4088 | 136.3303 | Confluence of Stream P and Glacier Creek | Electrofisher | No Fish Caught |
| 451 | 59.4090 | 136.3309 | Glacier Creek | Electrofisher | No Fish Caught |
| 461 | 59.4090 | 136.3294 | Confluence of Stream Q, Stream P, and Glacier Creek. All three converge with braided clear water network. | Electrofisher | No Fish Caught |
| 462 | 59.4091 | 136.3294 | Glacier Creek - E-fished 1 DV ~ 20 mm out of gravels - freshly emerged fry. E-fished 3 ephemeroptera out of Glacier Creek. Lots of inverts captured with each shock - ephemeroptera and plecoptera. | Electrofisher | 1 DV ~ 20 mm |
| 463 | 59.4090 | 136.3296 | E-fished 1 DV - 60 mm | Electrofisher | 1 DV ~ 60 mm |

Table 1.–Survey results from May 27-30, 2014 (Page 2 of 2).

| WPT | Latitude | Longitude | Notes | Sample Effort | Sample Results |
|---|---|---|---|---|---|
| 464 | 59.4089 | 136.3290 | Small falls at base of forest transition to Glacier Creek | Electrofisher | |
| 480 | 59.4191 | 136.2997 | Confluence of unnamed tributary and Glacier Creek. | Electrofisher | |
| 481 | 59.4190 | 136.2998 | E-fished 1 DV ~ 65 mm | Electrofisher | 1 DV - 65 mm |
| 495 | 59.4172 | 136.3044 | 1 CO - 45 mm | Electrofisher | 1 CO - 45 mm |

Figure 5.–Glacier Creek at in area of small cascades near waypoint 429 (May 28, 2014).

Figure 6.–Glacier Creek looking downstream (May 28, 2014).

Figure 7.–Setting minnow traps in Glacier Creek near the old bridge (May 27, 2014).

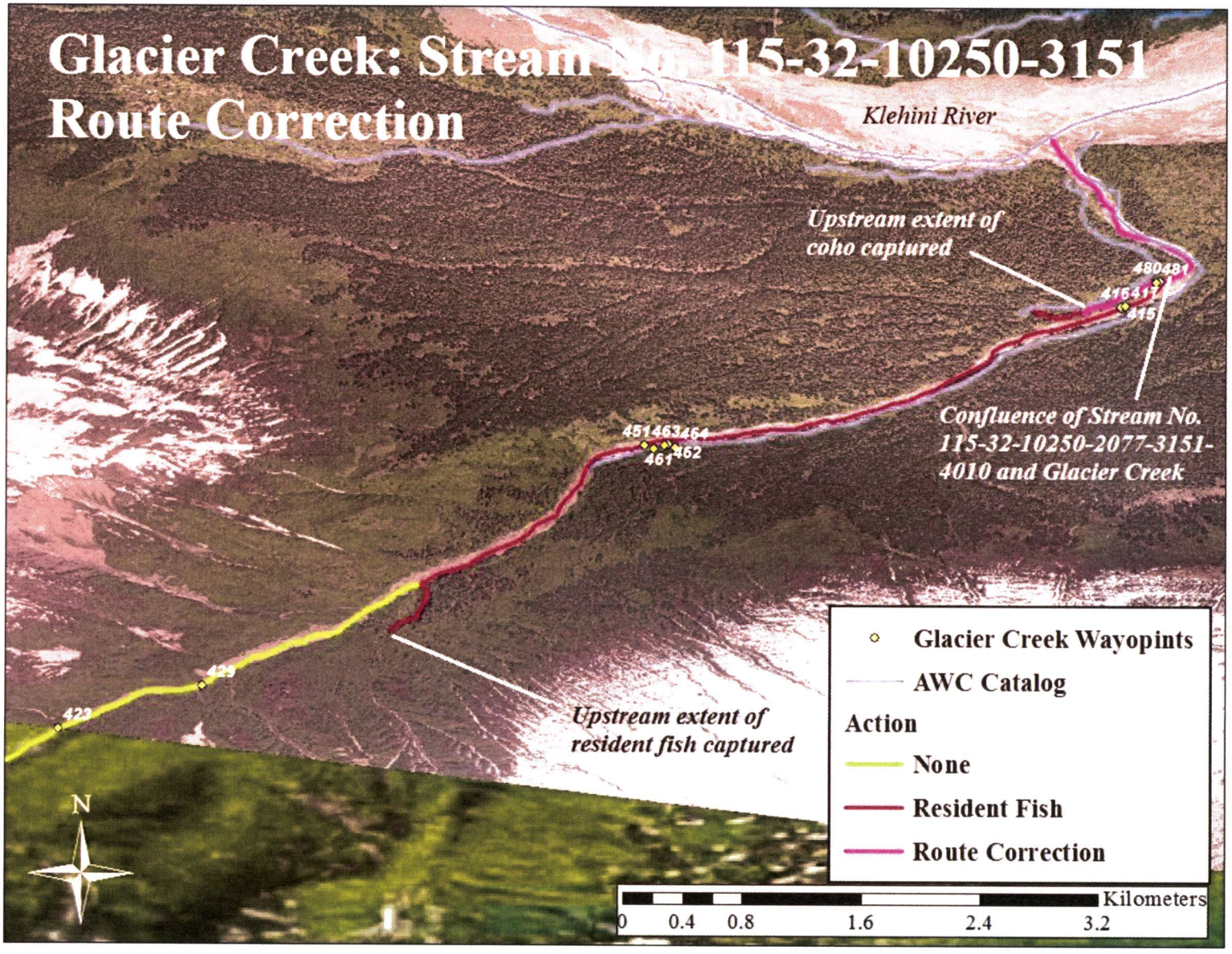
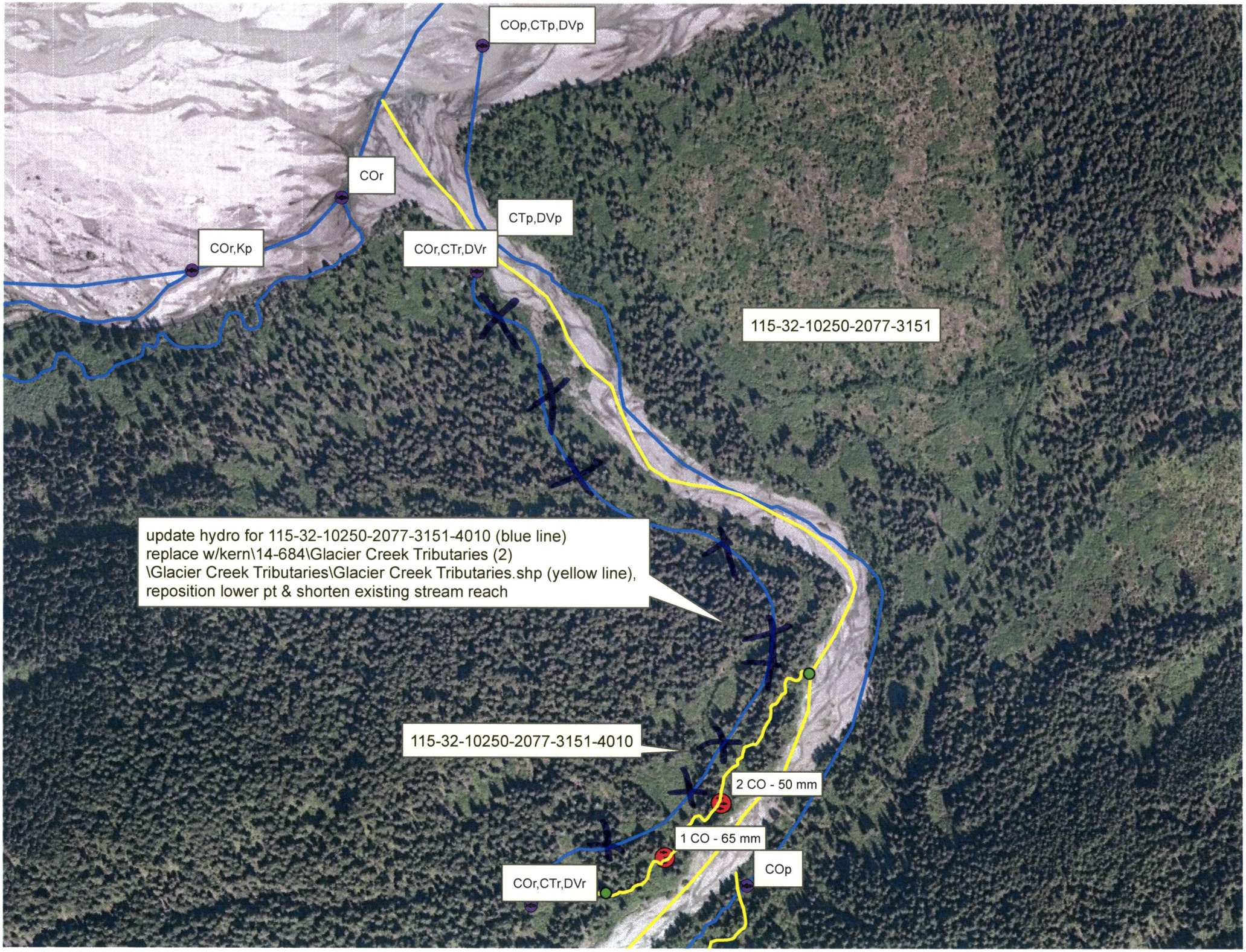
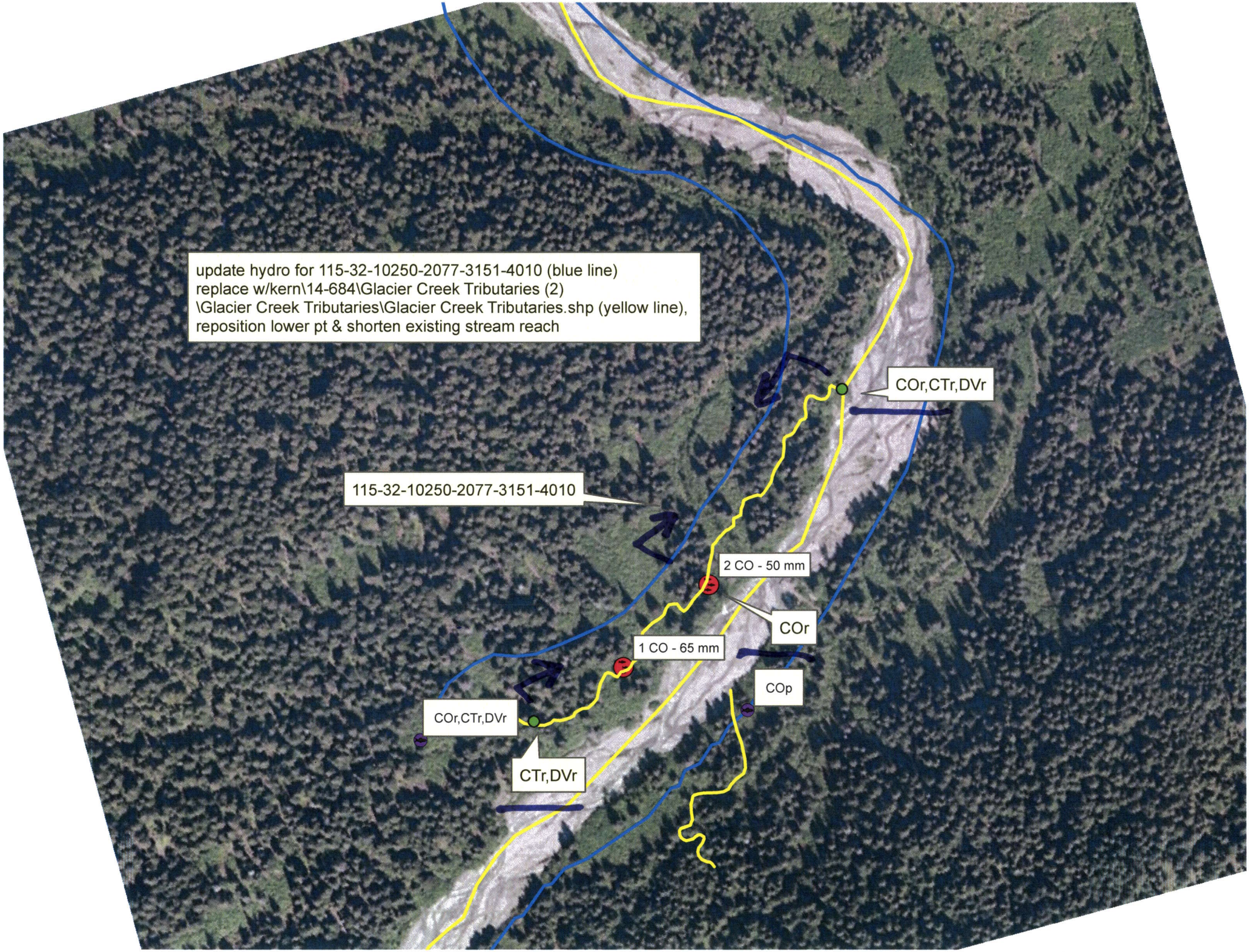



Figure 8.–Area map of Glacier Creek with waypoints labeled.


COp,CTp,DVp
COr
CTp,DVp
COr,Kp
COr,CTr,DVr
115-32-10250-2077-3151
update hydro for 115-32-10250-2077-3151-4010 (blue line)
replace w/kern\14-684\Glacier Creek Tributaries (2)
\Glacier Creek Tributaries\Glacier Creek Tributaries.shp (yellow line),
reposition lower pt & shorten existing stream reach
115-32-10250-2077-3151-4010
2 CO - 50 mm
1 CO - 65 mm
COp
COr,CTr,DVr


update hydro for 115-32-10250-2077-3151-4010 (blue line)
replace w/kern\14-684\Glacier Creek Tributaries (2)
\Glacier Creek Tributaries\Glacier Creek Tributaries.shp (yellow line),
reposition lower pt & shorten existing stream reach
COr,CTr,DVr
115-32-10250-2077-3151-4010
2 CO - 50 mm
COr
1 CO - 65 mm
COp
COr,CTr,DVr
CTr,DVr