

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 *MK*
Habitat Biologist

DATE: June 26, 2014

SUBJECT: Glacier Creek Investigation
Trip Report

PHONE NO: (907) 465-4182

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).

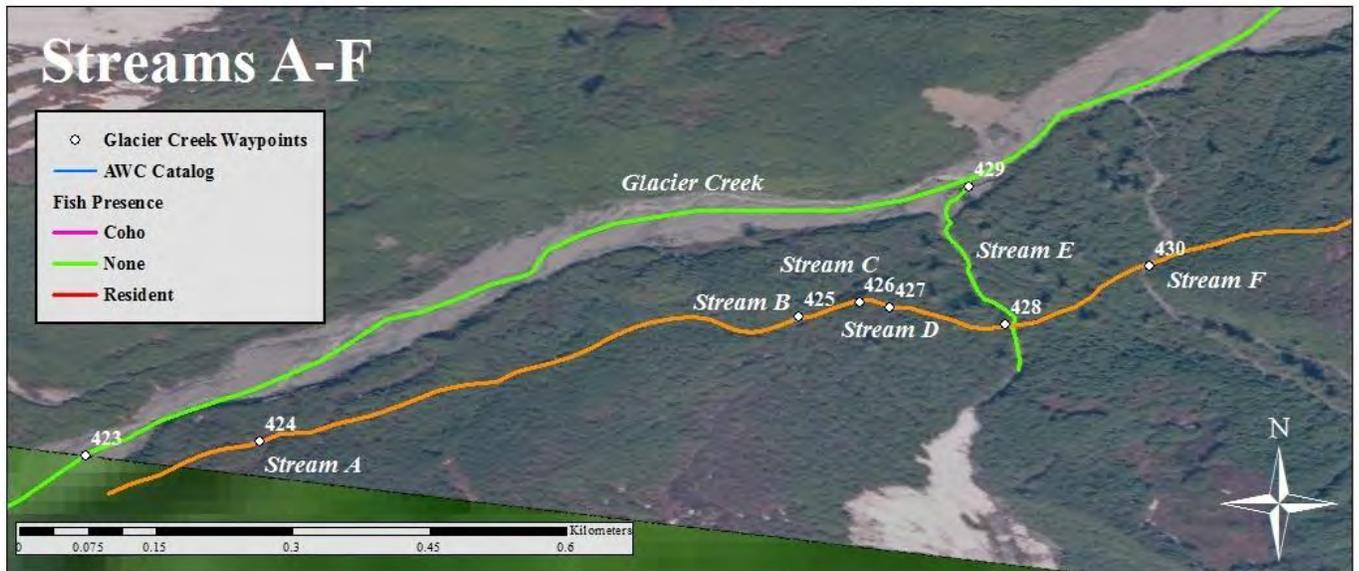


Figure 5.—Map of proposed road alignment and stream crossings A-F.

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 m¹, 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 electrofishing 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 electrofishing 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).

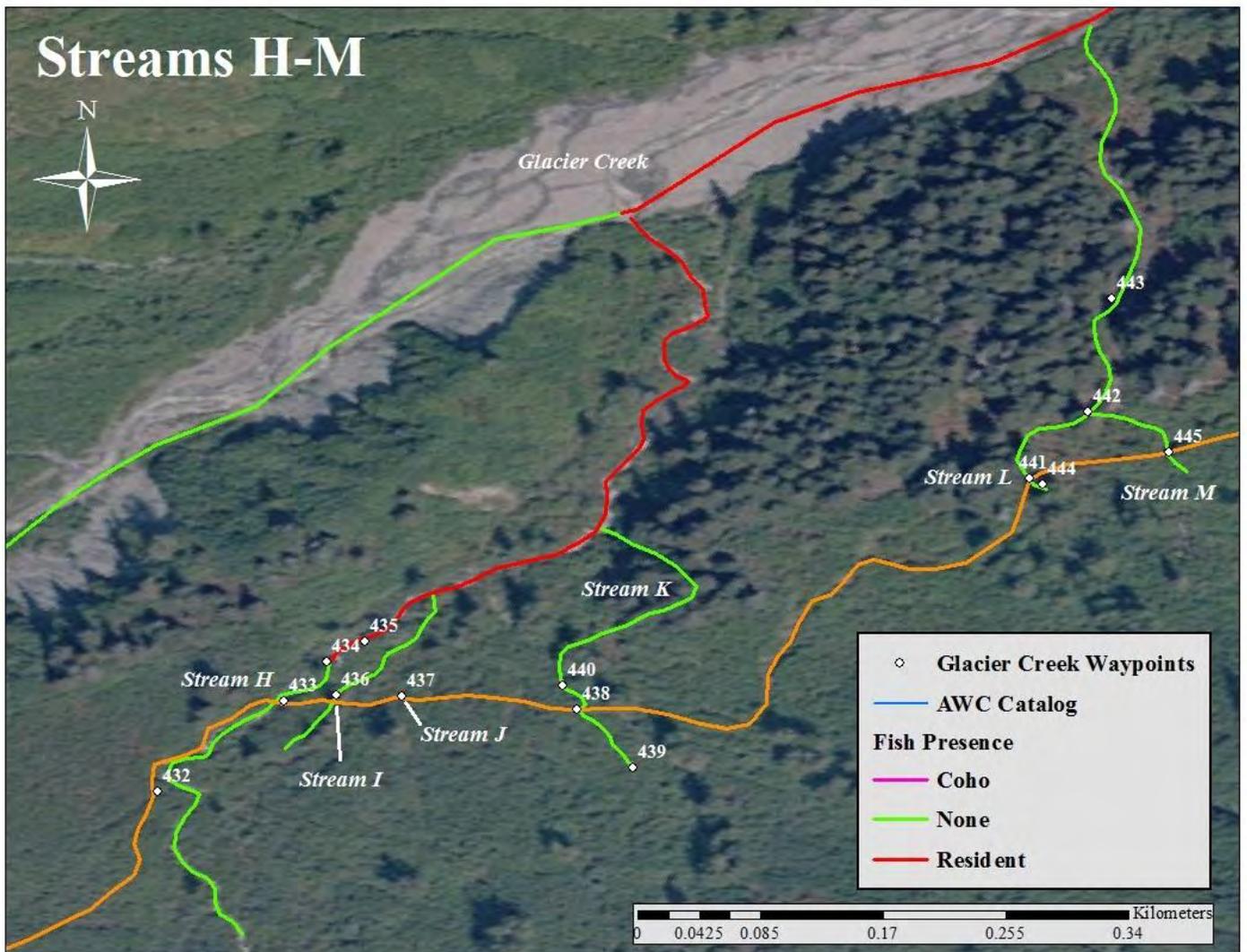


Figure 12.—Map of proposed road alignment and stream crossings H-M.

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.

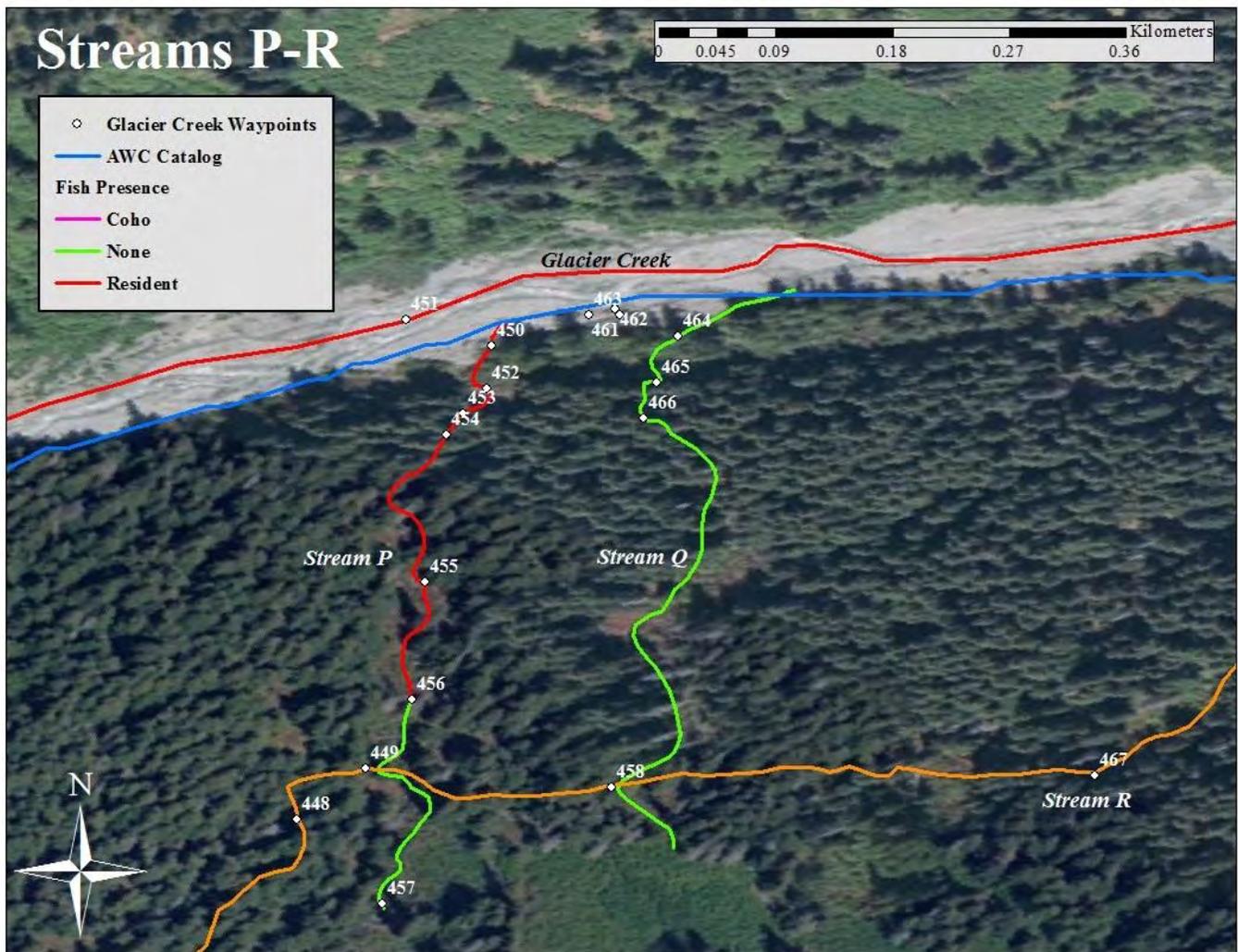


Figure 17.–Map of proposed road alignment and stream crossings P-R.

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).

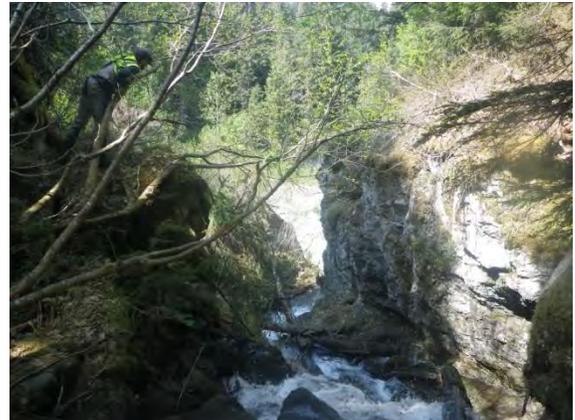


Figure 21.—Series of waterfalls on Stream T just before confluence with Glacier Creek (Photo by GWN: May 29, 2014).

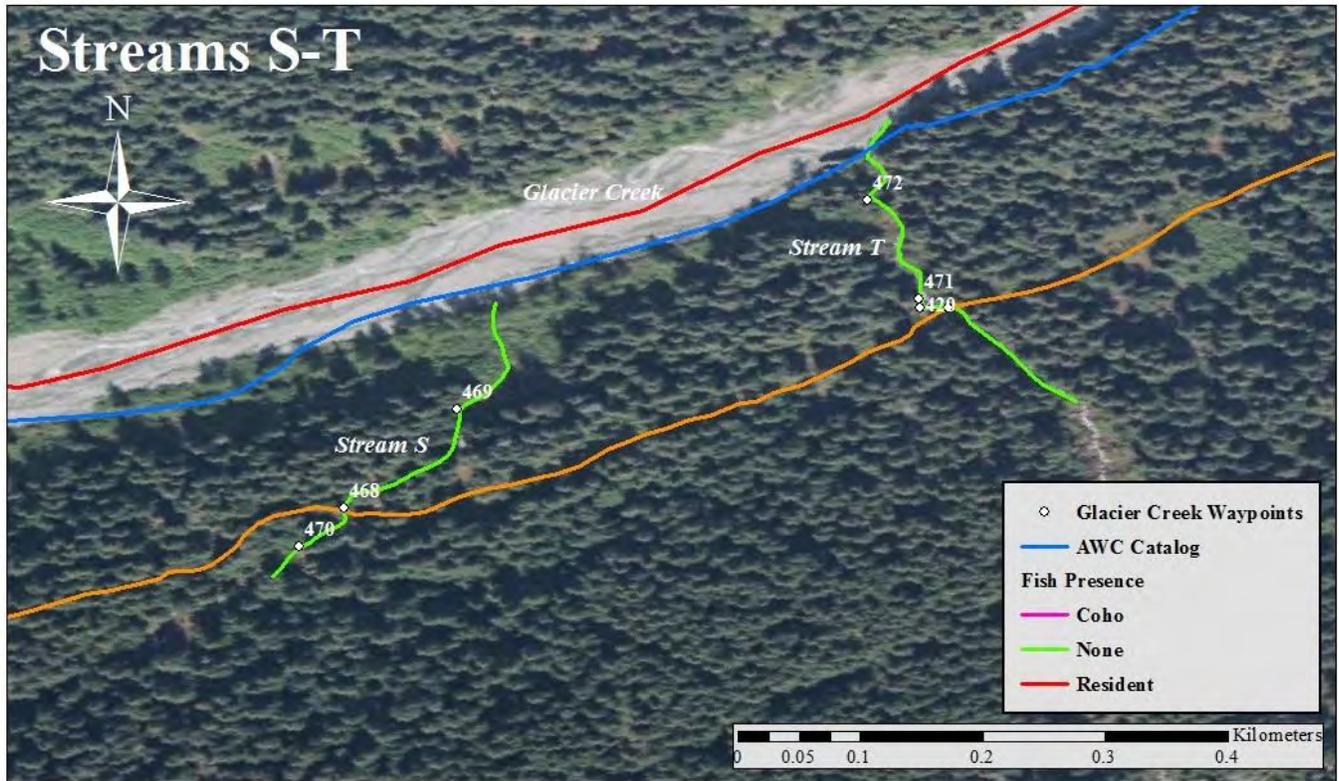


Figure 22.—Map of proposed road alignment and stream crossings S-T.

Stream U



Figure 23.—Gordon Willson-Naranjo near Stream U at 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

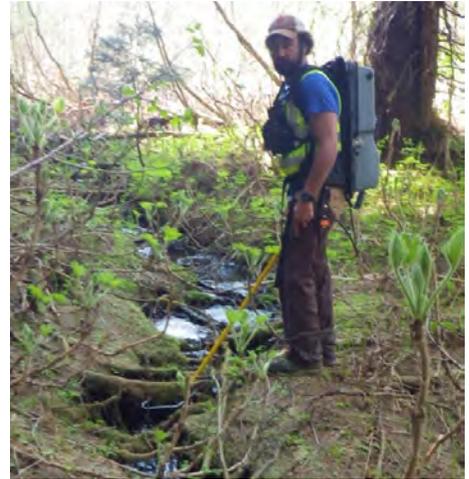


Figure 26.—Gordon Willson-Naranjo electrofishing up to road crossing in Stream U (May 29, 2014).

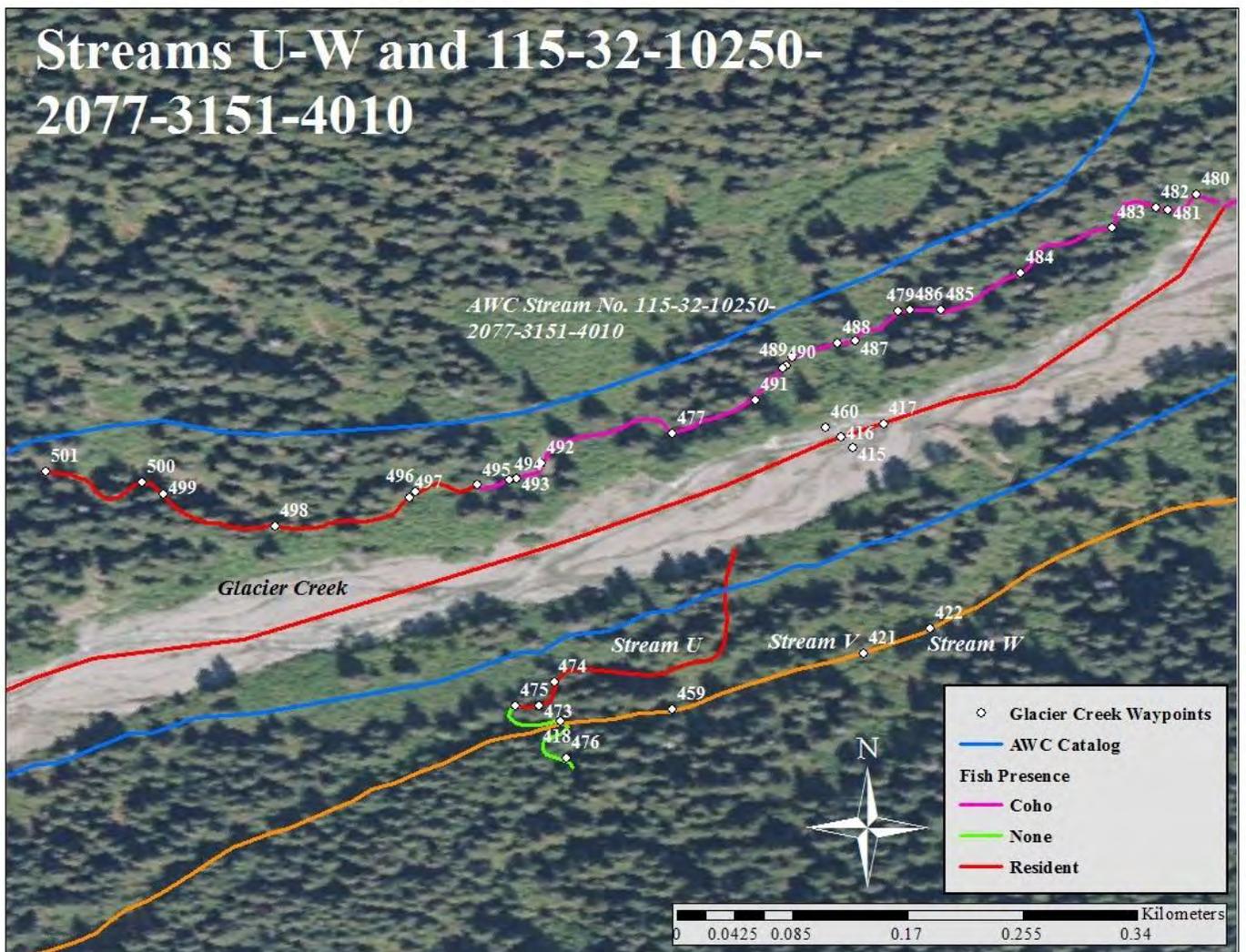


Figure 27.—Map of proposed road alignment, stream crossings U-W and Stream No. 115-32-10250-3151-4010.

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 crossing². 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 Extex 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).

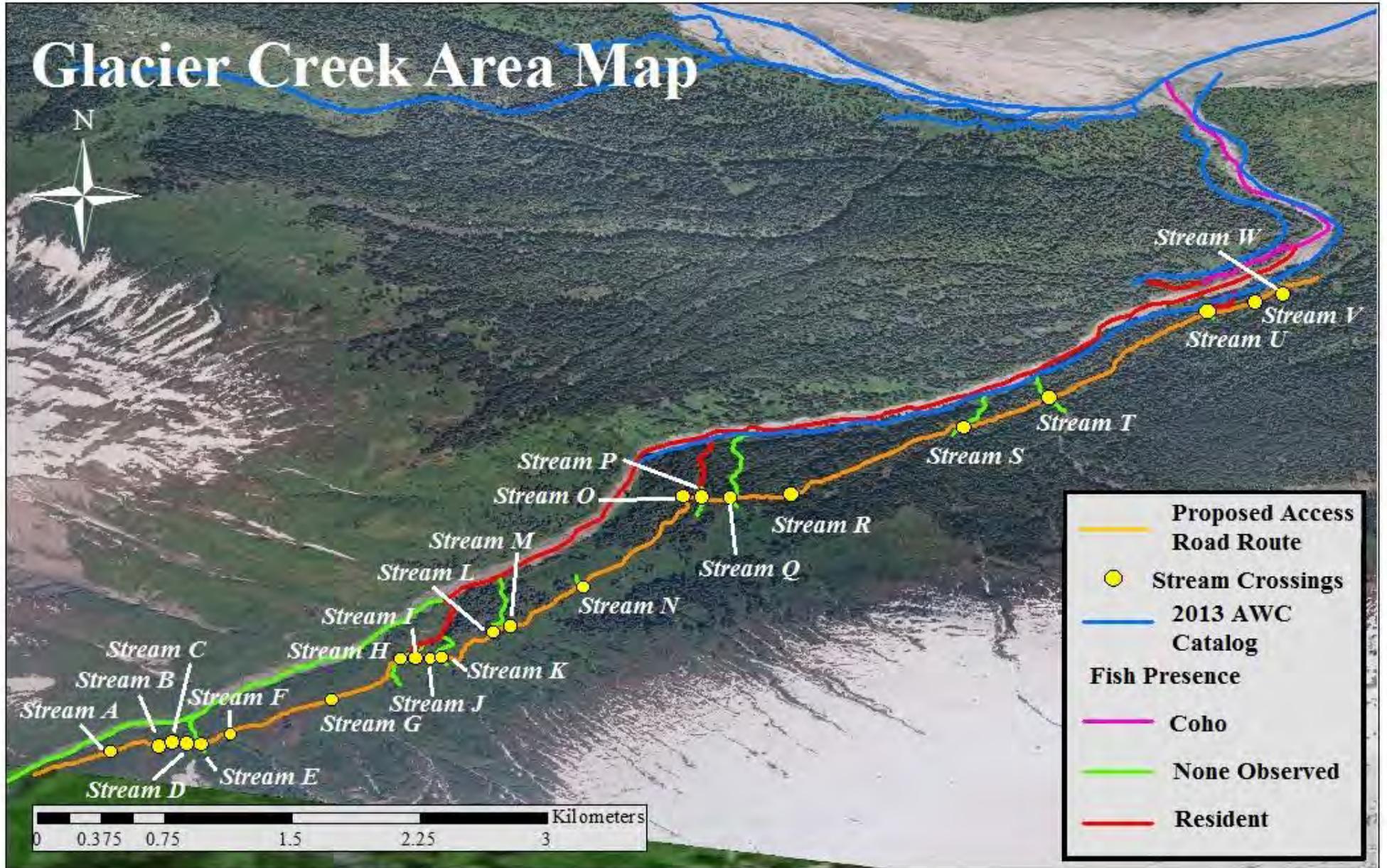


Figure 39.—Deep scour pool (May 30, 2014).

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.

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- Stephanie Scott, Mayor, Haines
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- Steve Brockmann, USFWS, Juneau
- Randy Vigil, USACE, Juneau
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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 about 1-1.5 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	

Table 1. –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 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 μ S/cm	10% 17 m above road 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 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 μ S/cm	19% 12.5 m above road 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 μ S/cm	16% 18 m above road 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 μ S/cm	26% 18 m above road 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 μ S/cm	16% 15 m above road 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 μ S/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 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 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 μ S/cm	10% 17 m above road 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 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 μ S/cm	10% 29 m above road 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 μ S/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

Survey date: 5/30/2014

Water body number: 115-32-10250-2077-3151-4010

Species & Lifestage: CO rearing

Watershed: Klehini River

MTR: Section 25, 30, 28 S Range 54 E CRM

Quad: Skagway B-4

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).

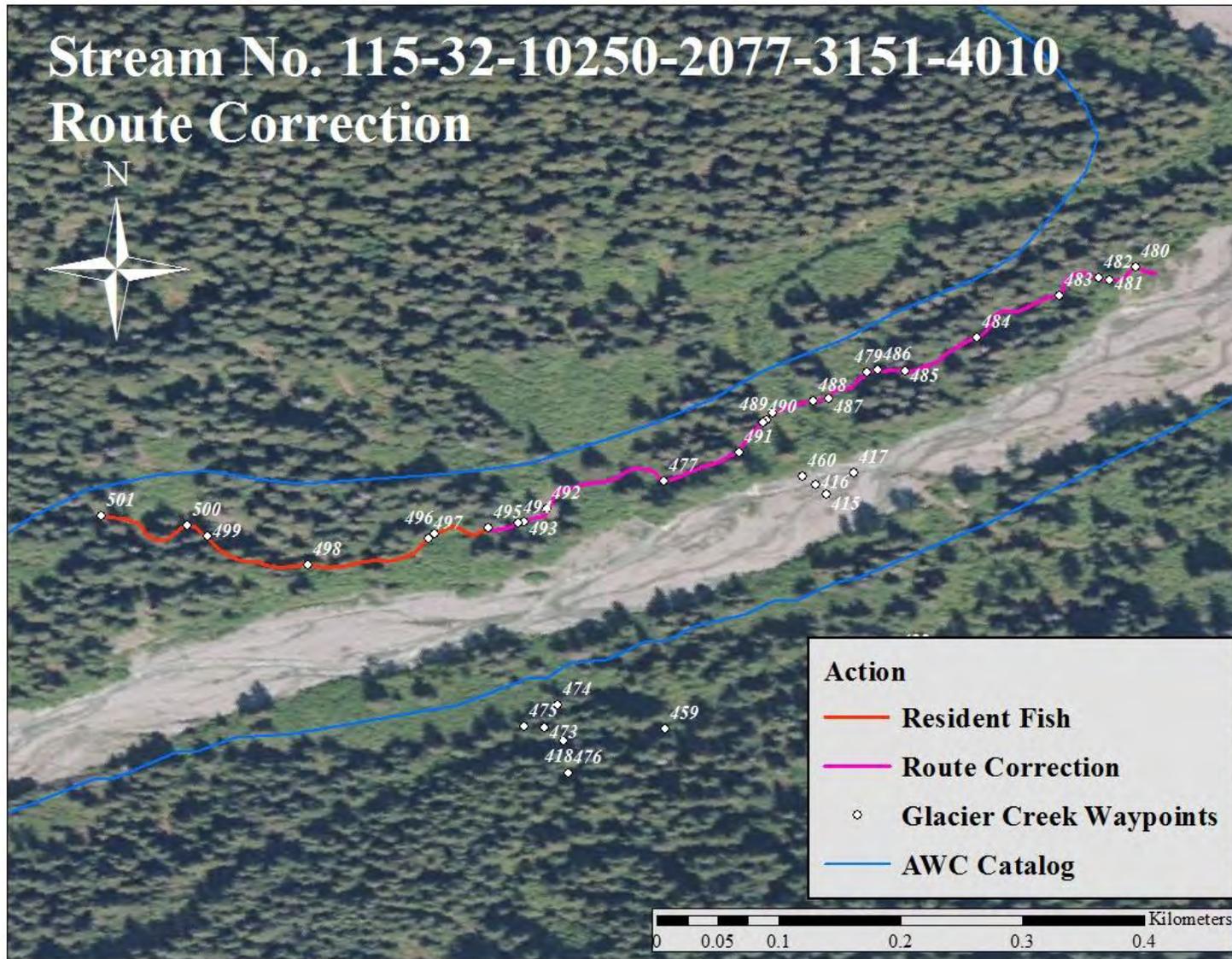


Figure 4.—Map of Glacier Creek tributary with waypoints labeled.

Glacier Creek

Correction

Water body name: Glacier Creek

Survey date: May 27-30, 2014

Water body number: 115-32-10250-2077-3151

Species & Lifestage: CO rearing

Watershed: Klehini River

MTR: Sections 19, 25, 30, T 28 S, 54 E (Copper River Meridian)

Quad: Skagway B-4

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).

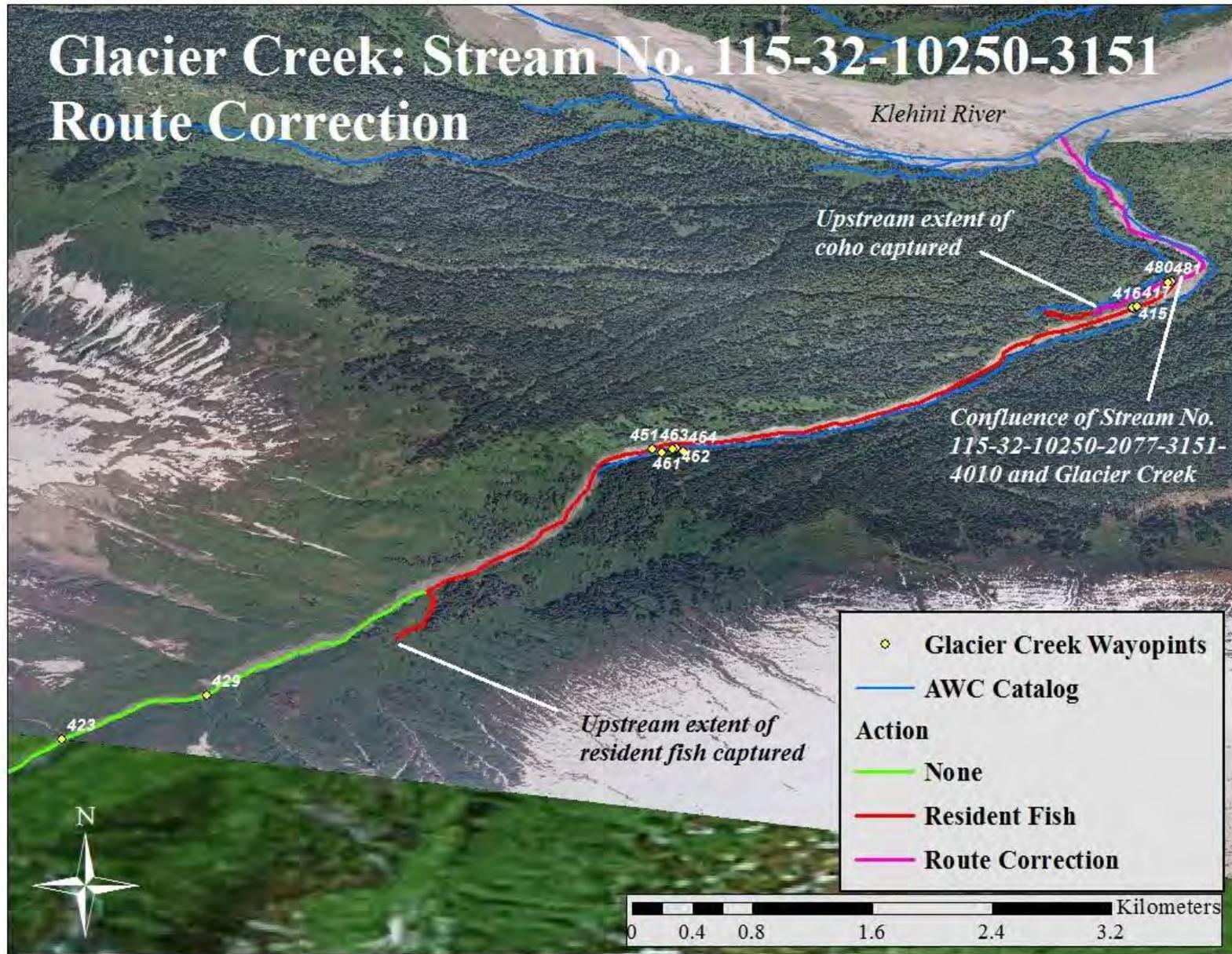


Figure 8.—Area map of Glacier Creek with waypoints labeled.

