Compliance Inspection Report

Helmet Creek Restoration

Adak Petroleum Diesel Spill

January 10, 2014

Prepared by:

Polaris Applied Sciences: on behalf of Adak Petroleum LLC

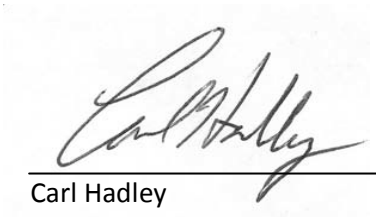
In cooperation with:

The Adak Petroleum Diesel Spill Natural Resource Trustees:

State of Alaska
Department of Environmental Conservation,
Department of Fish and Game, Department
of Natural Resources,
and
Department of Law

U.S. Departments of:
Commerce - National Oceanic and Atmospheric Administration
Interior – Fish and Wildlife Service

This Compliance Inspection Report is timely submitted to the Trustee Council for approval in accordance with paragraph 7 of the Consent Decree, No.3:13-cv-00121-HRH.



Carl Hadley
Professional Fisheries Biologist and
Project Coordinator

Administrative Record: Documents comprising the Administrative Record are available at http://www.darrp.noaa.gov/

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A. Executive Summary

Diesel fuel spilled into Helmet Creek on Adak Island, Alaska on January 11, 2010 injuring natural resources in the creek and the nearby estuary, intertidal and nearshore marine habitats. Investigations performed by the Responsible Party (RP) and the federal and state natural resource trustees (Trustees) during October 2010 and September 2011 identified restoration opportunities on Helmet Creek. A detailed description of proposed restoration activities (Work Plan) was prepared[1]. The restoration work was completed between July 7 -11, 2013 by RP and Trustee staff (Table 1). Figures 1 and 2 identify specific locations in Helmet Creek where restoration took place. Restoration included improvements to fish passage, water quality, stream and stream bank functions, main channel flow, and riparian vegetation.

Prior to the RP/Trustee restoration team arrival onsite, soil sampling was conducted by resident USFWS personnel, and some of the piling and trash rack removal work was conducted by RP staff. The Trustees were present and assisted or supervised during implementation of all remaining activities. Following completion of restoration work, a compliance inspection was performed cooperatively with the RP and Trustees in accordance with paragraph 7 of the Consent Decree, No.3:13-cv-00121-HRH. This Compliance Inspection Report is timely submitted to the Trustee Council for approval in accordance with paragraph 7 of the Consent Decree.

Table 1: Restoration Team Personnel

Name	Position	Organization
Erika Ammann*	Fish Biologist	NOAA Restoration Center
Bradley Dunker*	Habitat Biologist	Alaska Department of Fish & Game
Carl Hadley*	Sr. Fisheries Biologist	Polaris Applied Sciences
Bruce Kvam	Fisheries Biologist	Polaris Applied Sciences
Koby Lincoln	Staff Biologist	Polaris Applied Sciences
Gordon Taylor	Staff Biologist	Polaris Applied Sciences
Marshall Hunt	Staff Biologist	Polaris Applied Sciences

* Participated in compliance monitoring.

[1] Helmet Creek Restoration & Monitoring Work Plan, Adak Petroleum Diesel Spill. April 13, 2013.

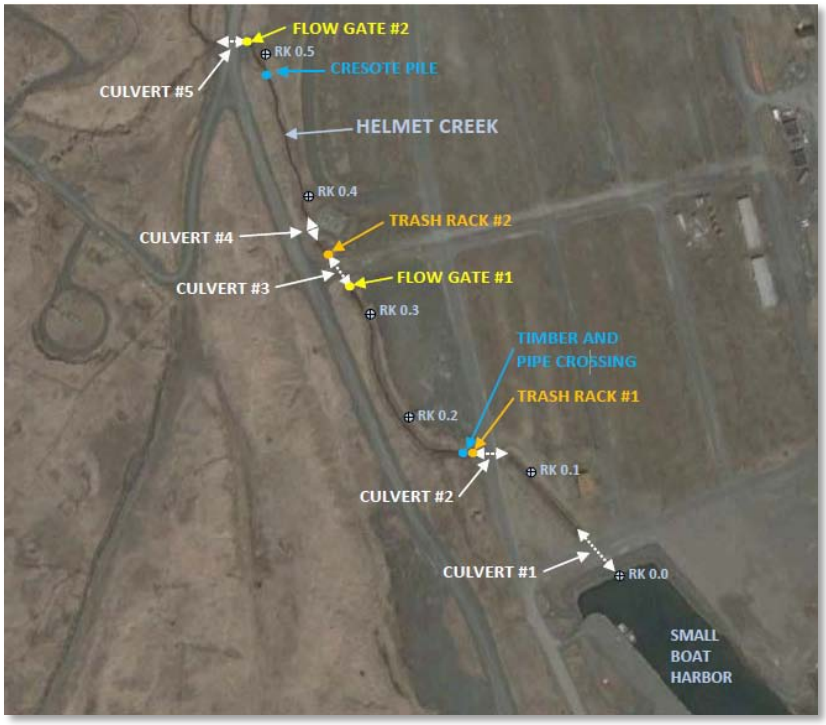

Figure 1: Lower Helmet Creek showing work areas

Figure 2: Upper Helmet Creek showing work areas

B. Water Quality Sampling

Prior to initiating restoration work, soil samples were collected from within and around the old metal barrels located in the proposed work areas (described further in the Work Plan). Although it was not anticipated that these soils would contain hazardous substances, samples were analyzed to ensure restoration activities would not result in a release to Helmet Creek of additional organic or inorganic contaminants commonly found elsewhere on Adak Island in conjunction with Navy waste[2].

Samples were found to be relatively clean with the exception of high levels of copper found at Barrel Location #2 (Table 2). The value of 525,000 ppb was above the level of 149,000 that has been reported as having a probable effect on freshwater organisms (Probable Effect Concentration[3]).

Table 2: Soil Sample Results – Pre-Restoration

		Threshold (ppb)	Results (ppb)		
Symbol	***Contaminant***	***PEC****	**Loc #1**	**Loc #2**	**Loc #3/4**
As	Arsenic	33000	**4870**	**3980**	**3290**
Cd	Cadmium	4980	**479**	**524**	**999**
Cr	Chromium, total	111000	**13600**	**19600**	**10200**
Cu	Copper	149000	**135000**	**525000**	**114000**
Pb	Lead	128000	**55900**	**11500**	**18700**
Hg	Mercury	1060	**90**	**59**	**150**
Ni	Nickel	48600	**12400**	**21400**	**14200**
	PAHs, total (QM calculated)	22800	**47**	**25**	**179**
	PCBs, total (QM calculated)	676	**31**	**ND**	**39**
Zn	Zinc	459000	**237000**	**123000**	**178000**

* PEC - Probable Effect Concentration (above which harmful effects are likely)

The main cause of copper toxicity to fish and aquatic invertebrates is through rapid binding of copper to the gill membranes, which causes damage and interferes with osmoregulatory processes. Exposures of rainbow trout fry to waterborne copper concentrations as low as 4.6 µg/L in laboratory studies resulted in

[2] The Responsible Party agreed to underwrite the cost of additional sampling of soils around and inside barrels wedged in the streambank. The Responsible Party and Trustees agreed that the Responsible Party would not be held accountable for remediation of non-spill related contaminants in the stream. The Trustees and Responsible Party further agreed that if the initial sampling results required a change in the restoration work plan, that change would be accommodated by the Responsible Party, if practicable. Upon receipt of sample results, the Trustees sent an email notification of the results to the Navy on November 26th (contact Justin Peach, NAVFAC project manager). The Trustees plan to collect additional samples in this area as part of their 2014 post-restoration monitoring. The results of future sampling efforts will also be communicated to the Navy.

[3] NOAA Screening Quick Reference Tables (SQuiRTs) for inorganics in sediment. OR&R Report 08-1.

significantly reduced growth and significantly elevated whole-body copper concentrations after 20 days[4]. Adult rainbow trout acclimation to chronic levels of copper of 20 µg/L in water has been demonstrated[5]. A total copper concentration of 20 µg/L is just above that considered to be a non-effect value on fish olfactory systems. In a series of acute toxicity tests, Hansen et al.[6] found that bull trout were less sensitive than rainbow trout to copper exposures when exposed in water at a hardness of 220mg/L (as CaCO3). However, at a water hardness of 100 mg/L, bull trout and rainbow trout had similar sensitivities to copper. The State of Alaska has not designated parameters for copper values for freshwater. Fresh water quality standards in Washington State are calculated using water hardness as a factor (Washington Administrative Code 173-201A-240). Typical values required for the protection of aquatic life in freshwater range between 2.4 and 20 µg/L.

All parties agreed that the presence of copper in samples collected near Helmet Creek is not related to the Adak Petroleum spill, but future copper levels in the water could be temporarily affected by certain work activities associated with sediment disturbance in the restoration areas (e.g., old barrel removal; soil or sediment movement). In order to monitor the potential increase in copper levels in Helmet Creek during and after completion of the restoration work, Adak Petroleum agreed to conduct water quality sampling as follows:

- Collect one water quality sample from Helmet Creek downstream of Site #1 immediately prior to any restoration work being completed at Sites #1 - #4.
- Collect one water quality sample from Helmet Creek downstream of Site #1 within one day after restoration work is completed at Sites #1 - #4.
- Pay to have these two samples shipped and processed for copper by ALS Global (or equivalent), plus one more sample to be collected by the Trustees during the 2014 monitoring effort.

Samples were collected near RK 0.55 during July 2013. Results of the pre- and post-restoration water quality sampling are provided in Table 3.

Table 3: Water Quality Sample Results for Copper in Helmet Creek

Collection Date	*Results (µg/L)
Pre-Restoration: July 8, 2013; 2:30pm	3.15
Post-Restoration: July 11, 2013; 11:30am	3.64

*Typical values required for the protection of aquatic life in freshwater range between 2.4 and 20 µg/L

[4] Marr, J.C.A. and six others. 1996. Relationship between copper exposure duration, tissue copper concentration, and rainbow trout growth. Aquatic Toxicology 36 (1996) p17-30.

[5] Julliard, A.K., D. Saucier, and L. Astic. 1995. Time-course of apoptosis in the olfactory epithelium of rainbow trout exposed to a low copper level. Tissue and Cell 28(3):367-377.

[6] Hansen, J. A., P. G. Welsh, and J. Lipton. 2002b. Relative sensitivity of bull trout (*Salvelinus confluentus*) and rainbow trout (*Oncorhynchus mykiss*) to acute copper toxicity. Environ Tox and Chem, 21:633–639.

C. Restoration

This section briefly describes all restoration work completed between July 7 and 11, 2013. Most of the work closely followed the descriptions in the Work Plan. Any changes from the protocol were pre-approved on site by Trustee staff and are described in additional detail here. Vegetation and other compliance monitoring issues are covered in Section D.

1. Debris Cleanup

Several hundred pieces of anthropogenic debris (mainly sheet plastic, scrap wood, and scrap metal) were removed from the creek (Figure 3). Only a few pieces were deliberately left in place where removal was judged likely to cause more damage to the streambed or banks than was acceptable given the expected benefit. Wood, metal and plastic were separated. Untreated wood will be burned or reused. Metal was hauled to the local metal recycling area. Plastic and treated wood were stored at the Adak Petroleum yard for future disposal in an appropriate manner. On future monitoring trips, this exercise will be repeated to remove any future accumulations of debris in or near the streambed.

A wood stave pipe and timber located immediately above Culvert #2 was removed and the banks were restored (Figure 4). Inspection of the removal site revealed that revegetation and seeding were required at the removal site and this work was conducted. Vegetation monitoring will occur in future monitoring trips as described in the revegetation section.

Figure 3: Example of debris removed from creek

Figure 4: Culvert #2 before (Left - 2011) and after (Right - 2013) restoration

2. Fish Passage

i. Trash Racks

Prior to Trustee arrival, the trash rack at Culvert #2 (Figure 4) came loose and was removed. The trash rack on Culvert #3 was removed by the joint restoration team. Where channel bed regrading was necessary at Culvert #2, the bulk of the work was completed on July 8. The two sites were then left alone until the following day to allow time for a natural hydrologic regime to form in the disturbed areas. Both sites were visited on multiple days to check for changes and stability of the streambed.

Culvert #2: The trash rack at Culvert #2 was removed on July 3 by RP staff using a backhoe operating from the adjacent road (Figure 4). On July 8, the channel bed spanning about 15 feet upstream of the culvert was reconfigured by hand to create a number of small steps leading out of the culvert (Figure 5). Rocks and small boulders found nearby in the creek were moved to create the final configuration. The site was revisited on July 9, 10, and 11 to make additional small adjustments. The final channel contains no drops in excess of six inches. Streambed profile and width data were collected on July 10 (data provided in Section D.1.ii).

Figure 5: New channel bed created at Culvert #2

Culvert #3: The trash rack at Culvert #3 was removed on July 8 by the restoration crew using hand tools and manual labor (Figure 6). The water surface through Culvert 3, including the trash rack area, is completely backwatered by a bed control located about 10-feet downstream of the culvert. As such, no fish passage issues were immediately created by removal of the trash rack, and no channel bed disturbance was judged to be necessary. The site was revisited on July 9 and 10 but no evidence of change was noted. Streambed profile data were collected on July 8 and again on July 10 along with stream width.

Figure 6: Culvert #3 before (Left - 2010) and after (Right - 2013) trash rack removal

ii. Spill Control Structures

Three spill control gates are located on Helmet Creek: one on the downstream end of Culvert #3 and one each on the upstream and downstream ends of Culvert #5. The gate on Culvert #3 was set approximately 6-inches above the moderate flow observed on July 8 (Figure 7). A

mark showing the adequate level of opening was added for future reference by monitoring personnel and Adak Petroleum staff (Figure 7).

Figure 7: Spill control gate on Culvert #3 and reference mark (highlighted)

Culvert #5 has spill control gates at both ends (Figure 8). According to Adak Petroleum staff the downstream gate is rarely used. This gate has been raised to its highest position and will be left as is. On July 10 the gate was approximately 4-inches above the moderate flow level. The upstream gate has a longer range of travel. On July 10 the gate was approximately 6-inches above the moderate flow level. A mark was added for future reference of opening adequacy. In future monitoring trips a measurement will be taken to reference in case the markings wear off.

Figure 8: Spill control gates on Culvert #5 (lower and upper)

iii. Streamwide Issues

All five culverts were examined for fish passage suitability and for evidence of potential debris obstructions. Culverts # 1, 3, and 5 are naturally flooded to a depth that allows fish passage throughout their entire length at all times and contain no potential obstructions (Culvert # 3 shown in Figure 9a). Culvert #2 consists of a low gradient concrete box culvert. Lower flow rates result in shallow sheet flow across the flat floor creating relatively difficult passage conditions. The upstream half of the culvert contained a number of large rocks that helped deepen flows and provided refuge/resting points for fish moving upstream (Figure 5b). Several dozen additional large rocks were manually added to the downstream half of the culvert on July 10. It is believed that this will further facilitate fish passage during all flow conditions. Culvert #4 consists of a bottomless arch culvert with a natural, low gradient streambed (Figure 9b). The culvert is passable at all flows.

Figure 9: Fish passage conditions in Culverts #3 and #4

The joint restoration team walked Helmet Creek from the boat basin upstream to Barrel Location #4 on July 11 to identify any potential barriers to fish migration. No anthropogenic obstructions were noted. A few small (<10-inch high) drops over natural boulder or bed obstructions are located between RK 0.0 and RK 2.1. These are likely fish passable at most flows. The first absolute barrier to fish migration occurs at RK 2.1, where flow drops over a natural 4 to 5-foot high very steep slope. While Dolly Varden were observed upstream of this point, it is not likely that pink salmon could pass this obstruction.

3. Creosote Piling Removal

i. Piling Between Culverts #4 and #5

Three pilings located between Culverts #4 and #5 were removed using a backhoe on the adjacent bank (one instream pile) or road (two bank pile) (Figure 10). The pile in the creek broke off approximately 2 to 3 feet below the streambed while it was being removed. The

hole was capped with stream gravel from a nearby gravel bar. The two upland piling were removed in their entirety and the holes filled with topsoil and capped with a vegetation plug.

Figure 10: In-stream piling before and after removal

ii. Piling After Culvert #5

Four piling located on the upper bank near the road adjacent to Culvert #5 were removed by a back-hoe operating on the road. The piling were removed in their entirety (extended approximately 4-feet below ground surface) and the surface capped with clean soil and native grass seed (Figure 11).

Figure 11: Upper bank pilings before and after removal

4. Floodplain Barrel Removal (Site #1)

The floodplain barrel removal effort resulted in the elimination of eleven (11) whole barrels, plus some pieces of barrels located above ordinary high-water at Site #1 (Figure 12). The barrels

and all other man-made debris were hauled away for disposal as described earlier. The barrels were filled primarily with dirt, although some contained a large proportion of rocks. A portion of one barrel located at the downstream end was allowed to remain as it supported a large piece of overhanging bank that all agreed was best left undisturbed. Stream width data was collected to serve as a general reference for future monitoring years.

Vegetation mats removed from atop the barrels were replaced in the hole the barrel occupied after first grading the removal location to a stable configuration using soil from the barrels. All mats at risk of being carried away during peak flow events were staked in place using one or more wooden stakes. All disturbed locations were seeded with the *Approved Vegetation Mix* (See Table 4) to supplement the mats. Excess soil removed from the barrels was broadcast around terraces (old building sites) 20 to 75 feet from the channel.

Figure 12: Site #1 before (left) and after (right) barrel removal

Table 4: Approved Vegetation Mix

Percent	*Common Name*	*Scientific Name*
60	'Norcoast' Bering Hairgrass	*Deschampsia beringensis*
20	'Boreal' Red Fescue	*Festuca rubra*
15	'Arctared' Red Fescue	*Festuca rubra*
5	Annual Ryegrass	*Lolium multifloum*

5. In-Stream Barrel Removal (Sites #2 and #3)

Roughly 15 to 18 barrels and portions of barrels were removed from within the active channel (Figure 13). The exact number of barrels was difficult to count because many came out as partial sections and pieces. The barrels and all other man-made debris were hauled away for disposal as described in Section C.1. One or two partial barrel sections were allowed to remain at Site #2, as they supported significant pieces of bank, and were not deemed current or future potential obstructions to fish passage. Both barrels had suffered from significant degradation and were slowly collapsing. This slow collapse allows vegetation mats to settle and re-root and appears to result in a stable situation as evidenced in other sections of the channel where barrels had completely collapsed.

Vegetation mats removed from atop some of the barrels were replaced on disturbed sections after first grading the bank to a stable configuration. All mats at risk of being carried away during peak flow events were staked in place using one or more wooden stakes. All disturbed locations were seeded with the *Approved Vegetation Mix* to supplement the mats. A pre-existing steep unvegetated slope near the work area was also covered with a few leftover mats and seeded. Excess soil removed from around the barrels was broadcast on the upper terraces 25 to 75 feet from the channel. Stream width and depth data were collected to serve as a general reference for future monitoring years.

Site #3 had a single, partial barrel embedded deeply into the streambank (Figure 14). The vegetation mat atop the barrel was peeled back by hand and held while the underlying barrel was removed. The mat was then allowed to return and cover the bank where the barrel had been removed. No seeding was necessary.

Figure 13: Site #2 before (left) and after (right) barrel removal

Figure 14: Site #3 before (left) and after (right) barrel removal

6. Upstream Capping of Barrel Culverts (Site #4)

The upstream end (intake) of the barrel complex was plugged by first filling the mouth of the culvert with large rocks (6-12”) and then placing an 18”x24” vegetation mat over the entire area (Figure 15). Wood stakes were driven through the plug and into the underlying soil to hold the plug in place. A small amount of the *Approved Vegetation Mix* was added to supplement the mat. The plug eliminated about 95 percent of the flow coming out of the culvert at the downstream end.

Figure 15: Culvert complex (Site #4) before and after plugging

7. Erosion and Sediment Control

The *Approved Vegetation Mix* identified for this project was developed by the Alaska Plant Materials Center for use in reclamation at various upland landfill locations on Adak Island (Alaska 2011 in RP report). Ten pounds of the seed mix used on the site was obtained from Alaska Garden & Pet Supply, Inc in Anchorage (Figure 16). The seed mix was applied at a rate of approximately 40 lbs/acre (1 lb/1000 sq.ft.) as recommended by the Alaska Plant Materials Center for the type of sandy soils found adjacent to Helmet Creek. No fertilizer was applied due to the proximity of the restoration work to the creek channel. At many locations, dead vegetative material was spread over the recently seeded area to keep the underlying soil moist.

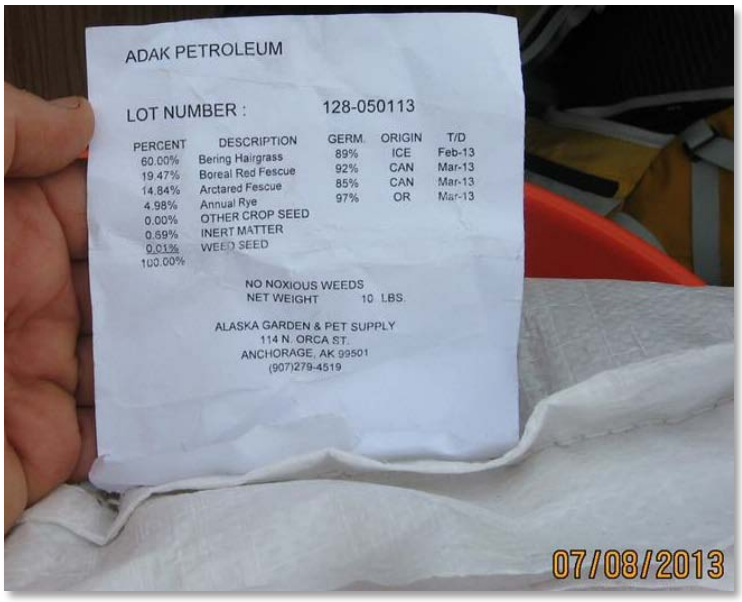

Figure 16: Label from Approved Vegetation Mix

D. Compliance Monitoring

Purpose: The objective of compliance inspection is to verify that all proposed actions and restoration goals, as described in the Work Plan, have been correctly and fully implemented, and that any changes made in the field are consistent with restoration planning goals. The compliance inspection survey is meant to evaluate each work location upon completion of the restoration action and serve as a record of the post-restoration baseline condition for future monitoring. Field evaluation tasks rely primarily on photographs taken by trained personnel, with some measurements for channel slope and vegetation survival.

Date: The joint restoration team completed a compliance inspection on July 11, 2013. Future monitoring will occur in 2014, 2015 and 2017.

Staff: The compliance inspection was conducted by two Trustee staff, one each from NOAA and ADFG, and one RP representative (Table 1).

1. Fish Passage:

i. Trash Racks

Monitoring confirmed that both trash racks were removed; the streambeds had been reconfigured where necessary such that no drops with jump heights in excess of 10-inches were present, and all disturbed areas on the banks had been revegetated.

ii. Streambed Regrading Following Trash Rack Removal

- Transect measurements of in-stream parameters including stream width, depth, and grade were collected (See Figure 17 for Culvert #2 and Figure 18 or Culvert #3). Monitoring frequency for this assessment will be every monitoring year.
- Photo points were established (See Figures 5 and 6) and a visual assessment of stream bed and stream bank integrity made looking downstream and upstream over the regraded channel area. Monitoring frequency for this assessment will be every monitoring year.

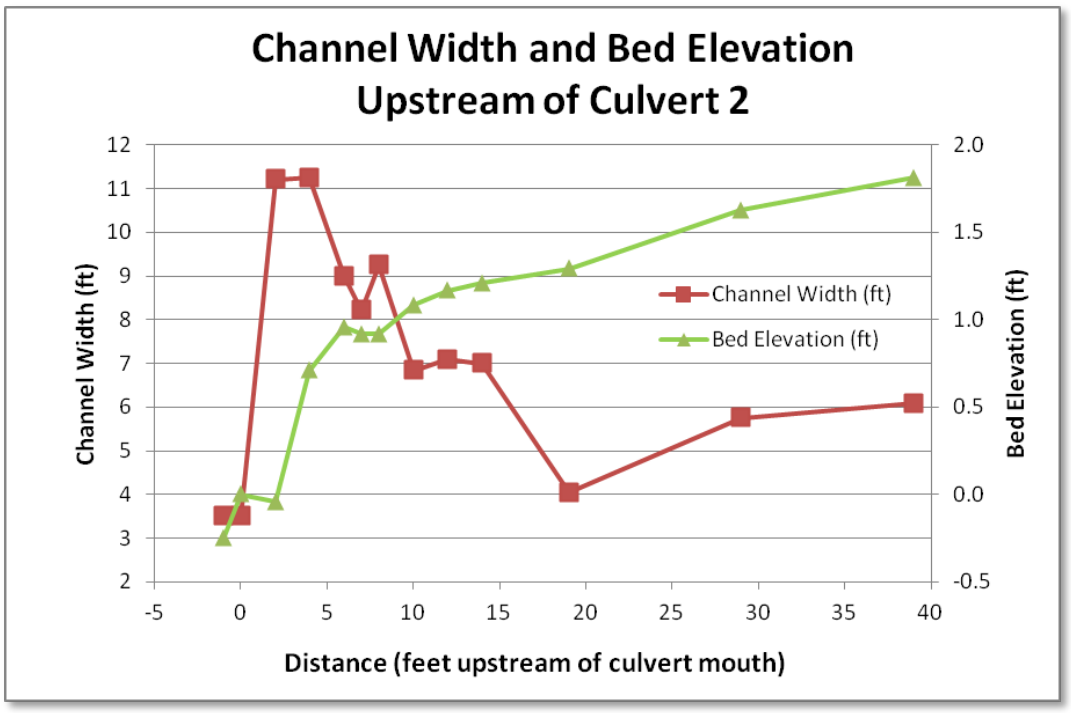

Figure 17: Post-Construction channel measurements (Culvert #2)

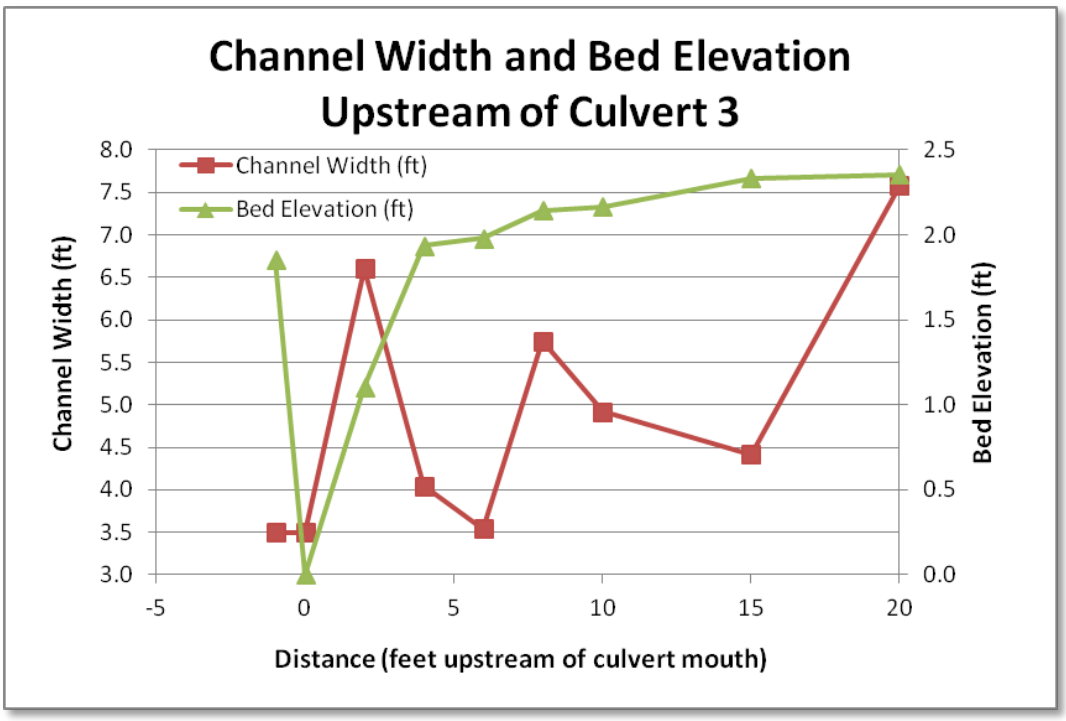

Figure 18: Post-Construction channel measurements (Culvert #3)

iii. Spill Control Structures

Monitoring confirmed that the spill control gates located on the downstream end of Culvert #3 and the upstream end of Culvert #5 had been set approximately 6-inches above the moderate flow level observed on July 8 (Figure 7). The spill control gate on the downstream end of Culvert #5 was set approximately 4-inches above the moderate flow level and could not be moved higher without structural changes. All three gates allowed light to enter the culverts and fish passage should not be a problem.

iv. Salmon Use Observation

On August 25, 2013, a single adult salmon was observed in Helmet Creek immediately downstream of Culvert #3 (Figure 19). The fish had successfully negotiated the most significant area of channel disturbance located upstream of Culvert #2 (Figures 4 and 5) where a blockage had been removed as part of this effort. The observation was incidental and not part of a systematic survey. No other locations were searched for fish. Fish species was not reported.

2. Creosote Piling Removal

Monitoring confirmed that seven piles had been removed, the resulting holes filled, and suitable revegetation measures had been applied. This is one more pile than anticipated in the work plan (Figures 10 and 11).

Figure 19: Adult salmon observed near RK 0.3 (8/25/2013)

3. Floodplain Barrel Removal

Monitoring confirmed that all barrels that could be removed without significant disturbance to the channel have been removed and disposed of off-site. No drops with jump heights in excess of 10-inches are present. All disturbed areas on the banks have been revegetated.

Photo points were established (Figure 12) and a visual assessment of stream bed and stream bank integrity looking downstream and upstream over the area of removal was completed (Figure 20). Stream width was measured through the restoration area (Figure 21). Monitoring frequency for this assessment will be every monitoring year. Vegetation monitoring for this area is covered in Section 6v.

Figure 20: Site #1 – Post Construction looking upstream (L) and downstream (R)

Figure 21: Site #1 – Post Construction channel width measurements

4. In-Stream Barrel Removal

- Monitoring confirmed that all barrels that could be removed at Sites #2 and #3 without significant disturbance to the channel have been removed and disposed of off-site. No drops with jump heights in excess of 10-inches are present. It is also noted that a large rock was present in the middle of the stream; the rock does not create a barrier and existed prior to restoration. All disturbed areas on the banks have been revegetated.
- Photo points were established (Figure 13 – Site #2; Figure 14 – Site #3) and a visual assessment of stream bed and stream bank integrity looking downstream and upstream over the area of removal was completed (Figure 22 – Site #2; Figure 23 – Site #3). Monitoring frequency for this assessment will be every monitoring year.
- Transect measurements of in-stream parameters including stream width, depth, and grade were completed at Site #2 (Figure 24). Only minimal channel disturbance occurred at Site #3 (Figure 14) and no physical channel measurements were deemed necessary.

Figure 22: Site #2 – Post Construction looking upstream (L) and downstream (R)

Figure 23: Site #3 – Post Construction looking upstream (L) and downstream (R)

Figure 24: Site #2 – Post Construction channel measurements

5. Capping of Upstream Culvert Barrel Complex

Monitoring confirmed that the mouth of the culvert complex has been plugged (Figure 15). All disturbed areas on the banks have been revegetated.

A photo point and visual assessment of stream bed and stream bank integrity was made (Figure 25). Monitoring frequency for this assessment will be every monitoring year.

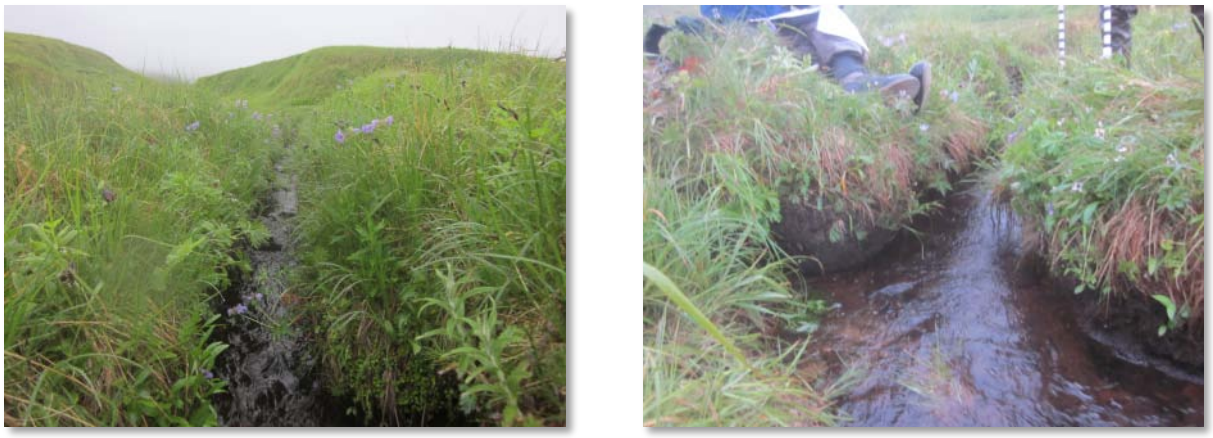

Figure 25: Site #4 – Post Construction looking upstream (L) and downstream (R)

6. Erosion /Revegetation

Representative photos including detailed photo quadrats were taken at each area where streambanks were disturbed. The photos are for use in addressing stated performance measures during future monitoring years.

Vegetation makeup and density under baseline conditions (immediately post-restoration) were evaluated for each site. Monitoring frequency for this assessment will be performed every monitoring visit. On following monitoring trips, percent cover and vegetation makeup may be either compared to post restoration pictures or to undisturbed areas as vegetation makeup and determination of percent cover can vary from season to season. Percent Cover is defined for our purposes as the amount of living vegetation measured as if the vegetation was upright. During the initial data collection, flagging was used and notes were taken on location to enable the Trustees to identify the areas that would be resampled. On return, monitoring and reassessment will occur as close as possible to the original data collection areas using the 2013 flagging, photos and notes.

i. Trash Rack Removal Areas

Bank disturbance that occurred during removal of the wooden timber and pipe near Trash Rack #1 was revegetated using vegetation plugs and seed mix (Figure 4). Photo quadrats are provided in Figure 26.

No bank disturbance occurred near Trash Rack #2 and no restoration or monitoring was required.

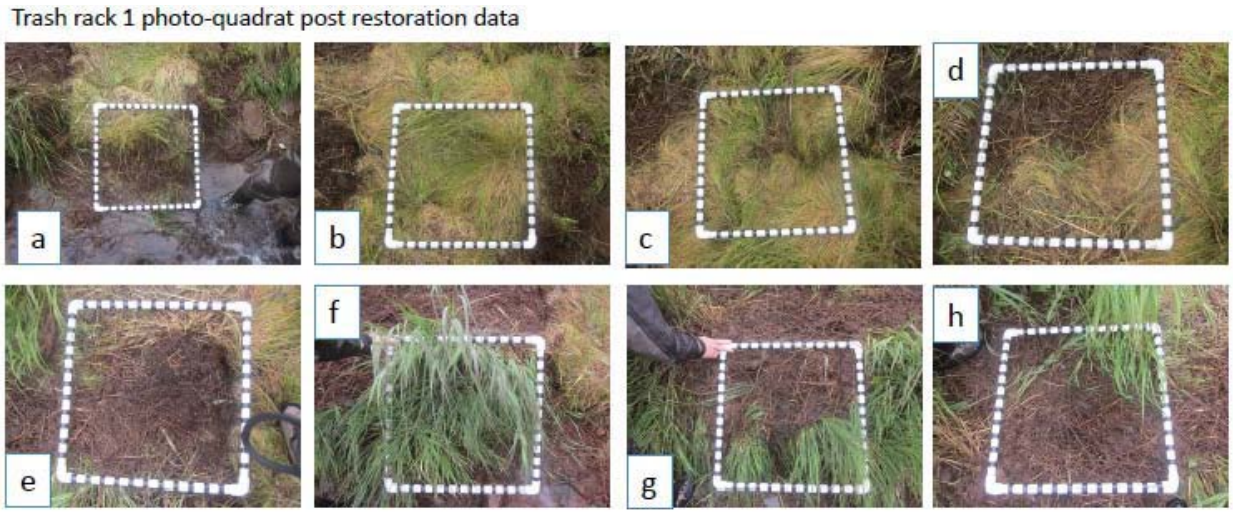

Figure 26: Photo quadrats for Trash Rack #1 streambank

Vegetation makeup: Grasses dominant most likely 'Norcoast' Bering Hairgrass (http://plants.alaska.gov/publications/pdf/plant-flyers/NorcoastBeringHairgrass.pdf)

Percent cover by photo: a: 30%, b: 90%, c: 85%, d: 55% (note; dead material was present and placed on mats to keep the underlying soil moist), e: 5% (note; dead material added), f: 90%, g: 10% (note; dead material added), h: 5% (note; dead material added).

ii. Streambank Barrel Removal (Site #1)

- Photo quadrat and visual assessment of stream bank integrity was conducted. Post-construction bank condition for areas of bank disturbance that occurred during removal of the barrels was recorded for Site #1. In addition to recording percent cover, the photos were taken so that visual comparisons of the bank could be made. Some of the bank instability is natural and preexisting as noted (Figure 27).

Vegetation makeup: Grasses dominant most likely 'Norcoast' Bering Hairgrass (http://plants.alaska.gov/publications/pdf/plant-flyers/NorcoastBeringHairgrass.pdf), geranium, fireweed

Percent cover by photo: a: 6%, b: 4% (note; dead material was present), c: 20% (note; photo includes open space, d: 5% (note; dead material was present and photo includes open space), e: 10% (note; dead material present) f: 2% (note; steep slope aiming for growth at base not on slope), g: 6% (note; photo includes stream), h: 5% (note; dead material and bank slope), i: 15% (note photo includes stream), j: 7% (note; dead material present and open space), k:7% (note; open space and slope of bank), l: 7% (note; open space and slope of bank).

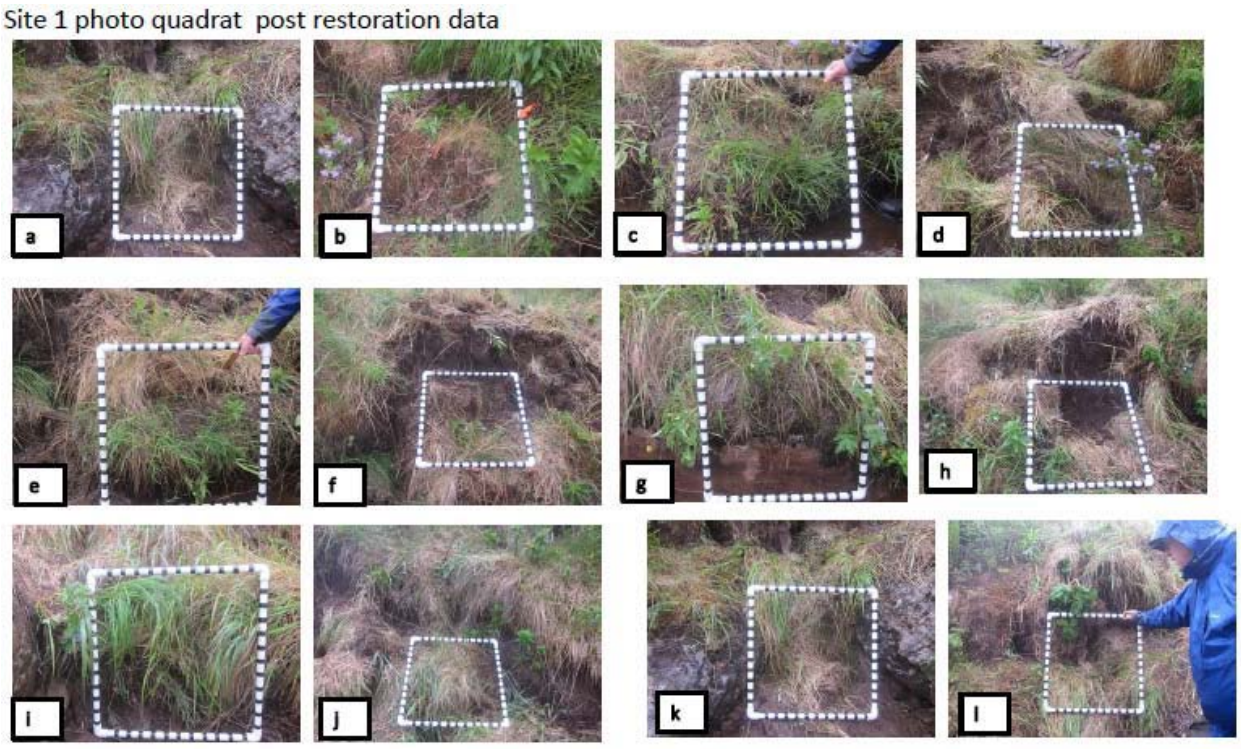

Figure 27: Photo quadrats for Barrel Removal Site #1 streambank

iii. In-Stream Barrel Removal (Site #2 and Site #3)

- Photo quadrat and visual assessment of stream bank integrity was conducted. Post-construction bank condition for areas of bank disturbance that occurred during removal of the barrels was recorded for Site #2 (Figure 28) and Site #3 (Figure 29).

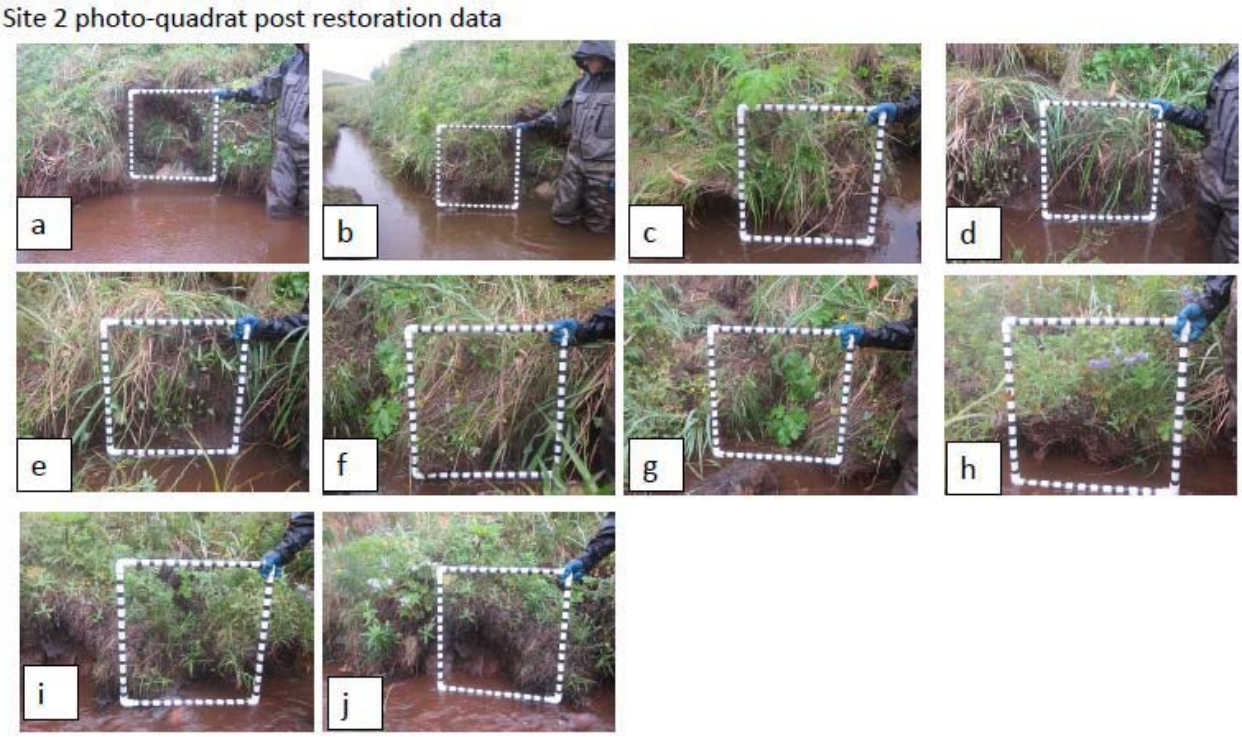

Figure 28: Photo quadrats for Barrel Removal Site #2 streambank

Vegetation makeup: Dominant: Grasses, most likely 'Norcoast' Bering Hairgrass. Non dominant: devils club, wild geranium, Sitka Burnett, Chocolate lily, Cinquefoil, fireweed, lupine, twisted stalk.

Percent cover by photo: a: 10%, b:40%, c: 35%, d: 40%, e: 25%, f: 30%, g: 25%, h: 40%, i: 35%, j: 15%.

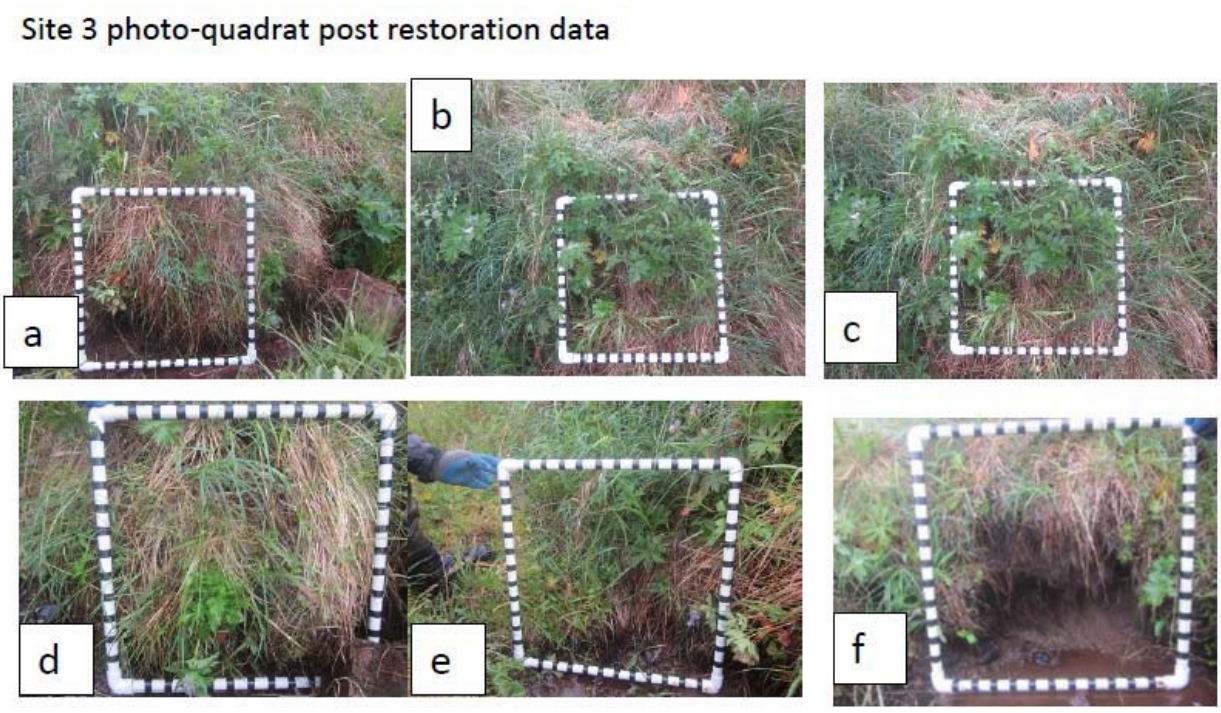

Figure 29: Photo quadrats for Barrel Removal Site #3 streambank.

Vegetation Makeup: Dominant: Grasses, most likely 'Norcoast' Bering Hairgrass. Non dominant: devils club, wild geranium, Sitka Burnett.

Percent cover by photo: a: 25%, b: 30%, c: 40%, d: 20%, e: 35%, f: 15%

iv. Culvert Plug (Site #4)

- Photo quadrat and visual assessment of stream bank integrity was conducted. Post-construction bank condition for areas of bank disturbance that occurred during plugging of the barrel complex was recorded for Site #4 (Figure 30).

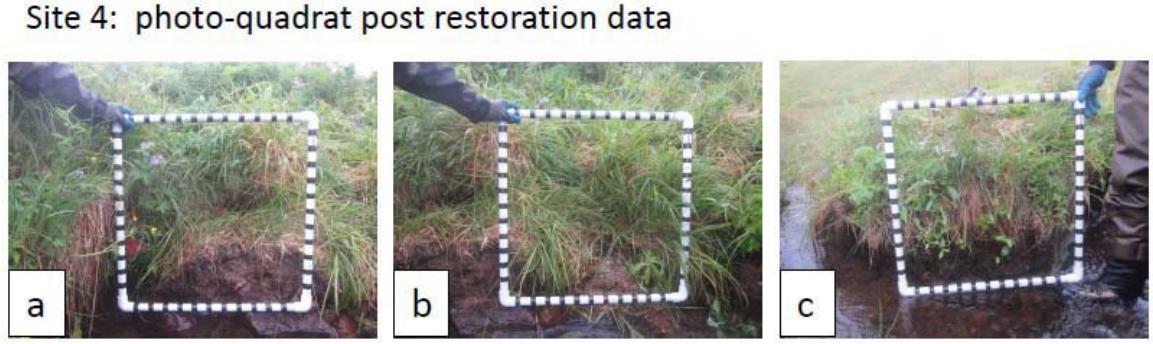

Figure 30: Photo quadrats for Barrel Plug Site #4 streambank.

- ***Vegetation Makeup***: Dominant: Grasses, most likely 'Norcoast' Bering Hairgrass. Non dominant: devils club, wild geranium, Sitka Burnett, equisetum, twisted stalk, non-native veg dandelion.
- ***Percent cover by photo***: a: 25%, b: 30%, c: 25%**.**

E. Conclusion

This Compliance Inspection Report summarizes all restoration work completed on July 7-11, 2013. The Report evaluates each work location and serves as a record of the post-restoration baseline condition for future monitoring. The restoration work largely followed the requirements of the Work Plan, and any deviations were approved onsite by Trustee staff prior to completion. All actions completed to date have been correctly and fully implemented, and any changes in the field have been consistent with performance standards outlined in the Work Plan.