A SURVEY OF RECREATIONAL OFF-ROAD VEHICLE (ORV) STREAM CROSSINGS ALONG TRAILS ORGINATING FROM THE NABESNA ROAD IN WRANGELL-ST. ELIAS NATIONAL PARK AND PRESERVE

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Alaska Department of Fish and Game
Division of Habitat

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INTRODUCTION

During July, 2008 through September, 2008, the Alaska Department of Fish and Game (ADF&G), Division of Habitat, conducted an inventory of trail crossings of known and suspected fish-bearing streams along nine off-road vehicle (ORV) trails originating from the Nabesna Road within Wrangell-St. Elias National Park and Preserve.

The Nabesna Road inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the current habitat conditions available to both resident and anadromous fish species in fish-bearing or potentially fish-bearing streams that are subject to impact from ORV's crossing the streams. The objective of the biological inventory was to document fish presence if fish were incidentally caught while performing other field work

The objective of this report is to document the current habitat conditions and identify stream crossings in fish-bearing or potentially fish-bearing streams which are degraded or that may become degraded by continued ORV use.

METHODS

The habitat inventory and biological inventory were conducted by biologists employed by the Alaska Department of Fish and Game's Division of Habitat and staff from Wrangell-St. Elias National Park and Preserve. The inventory was conducted in two-person teams. Stream crossings were examined during three periods in 2008: July 17-23, August 22-25, and September 19.

Fifty-nine (59) ORV stream crossings were surveyed to gather habitat-specific information regarding the condition of the crossing, to document stream characteristics both upstream and downstream of the crossing, and to collect photo-documentation of each crossing.

Crossings were labeled in accordance with the name of the trail and the crossing number, in most cases assigning the number 1 to the furthest upstream crossing and working downstream. For example, the first crossing evaluated on the Caribou Creek Trail was the furthest one upstream and was labeled CC-1. The next crossing evaluated was located downstream from CC-1 and was labeled CC-2, and so forth. Exceptions to this order are seen on the Copper Lake Trail and Tanada Lake Trail, with the Copper Lake Trail being labeled in the opposite order (i.e., starting downstream and working upstream) and the Tanada Lake Trail being labeled in three different segments and not in a sequential upstream to downstream order.

All GPS data were presented on maps (see Figures 3 through 12). Crossings on which no recommendations were given were labeled as "surveyed crossing" and were identified with an orange "X" on the maps. Any crossings that were recommended for evaluation or improvement were labeled as "degraded crossing" and were identified using a purple "X" on the maps.
In the systems with a broad, active floodplain (Trail Creek, Lost Creek, Soda Creek) where boulders, cobble and gravels dominate the streambed, it was often difficult to locate precisely where the trail crossed the stream. The channels in these systems are dynamic, which causes trail users to find new crossing locations as the terrain changes. In these situations where the

stream morphology and substrate were very similar from one crossing to the next, and/or where the crossings were not identifiable, no data were collected on an individual basis. Alternatively, reference was made to the number of similar crossings made between two documented crossings and were referred to as "random crossings". This approach was taken due to time constraints in the field and to avoid having excessive amounts of redundant data.

For most of the trails, it was not feasible to travel further upstream along the trail (in the case of Tanada Lake, it was not feasible to travel further downstream). High water levels resulted in restraints on field time and limited access in some areas. Based on the stream morphology, substrate composition, topography, general trail and site conditions, we assumed that any additional crossings would be similar in condition to the initial one, or most similar one, in which data was collected.

Habitat Inventory

A standardized habitat inventory form was developed for use with the stream surveys to be conducted on the nine different trails originating from the Nabesna Road. This form was used on all of the streams crossings surveyed to record measurements and observations.

1. Photographs

Generally, four photographs were taken from each perspective of a crossing: upstream, left bank, downstream and right bank.

2. Crossing Location

GPS coordinates of each crossing location were recorded in map datum NAD83 using a Garmin eTrex handheld GPS unit and later converted to NAD27 for presentation. Crossings were also identified on USGS quads at a scale of 1:63360.

3. Waterbody Type and Floodplain Type

The type of waterbody was visually observed and was recorded as river, stream, pond or lake. Floodplain type was identified as V-shaped, flat or terraced.

4. Water Stage, Bankfull Width, Waterbody Slope, Floodplain Width

Bankfull widths were either paced off by observers or measured with a tape measure and recorded in feet. Waterbody slope was measured using a clinometer over a length of at least 50 channel feet. Floodplain widths were visually estimated and recorded in feet.

5. Stream Morphology

Stream morphology was classified using Dave Rosgen's Applied River Morphology geomorphic characterization (Rosgen, 1996).

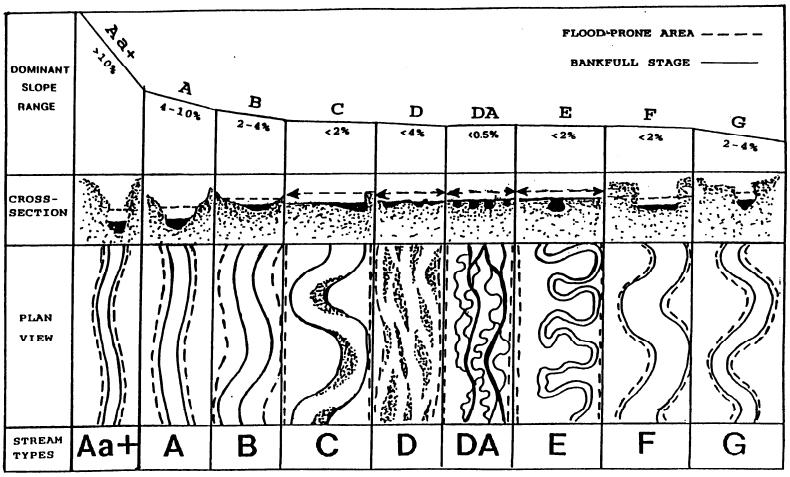


Figure 1: Broad level stream classification delineation showing longitudinal, cross-sectional, and plan views of major stream types (from Rosgen, 1996).

Aa+	Deeply entrenched; vertical steps with deep scour pools; waterfalls; Slope > 10%.
A	Entrenched, cascading step/pool stream; Slope 4 to 10%.
B	Moderately entrenched, riffle dominated; Slope 2 to 4%.
C	Meandering point-bar, riffle/pool alluvial channel; Slope < 2%.
D	Braided channel w/ longitudinal and transverse bars; Slope < 4%.
DA	Anastomosing (multiple channels) with well vegetated bars; fine alluvium or lacustrine soils; Slope < 0.5%.
E	Incised, beaded tundra stream; high meander width ratio; Slope <2%.
F	Entrenched meandering riffle/pool channel; Slope < 2%.
G	Entrenched "gully" step/pool; Slope 2 to 4%.

Figure 2: General description of stream types (From Rosgen, 1996).

Primary channel types represented in the study area were A, B, C, and D with the majority falling into the moderately entrenched, riffle dominated (B) channel type.

6. Water Stage and Water Color

Water stage was visually estimated and issued a number ranging from 1-5, with 1 being low and 5 being at bankfull. Most flows were near bankfull during the survey with most estimated between 3 and 5. Water color was visually estimated using a list of five colors (muddy, humic, stained, clear, glacial (low)).

7. Substrate Composition

Substrate composition ranges from silt/clay sized particles to boulders. Substrate composition was visually estimated using a list of seven size classes and recorded as percentages of each class present at the observed site (Bureau of Land Management, Fairbanks, undated).

8. Habitat Type

Habitat types include pool, riffle, glide and side channel. One or more habitat type was recorded for each crossing. (Derived from Bureau of Land Management, Fairbanks, Yukon Drainage Production Inventory: Field Instructions, undated (circa 2001)).

9. Riparian Vegetation

Stream bank composition ranged from bare rock to complete vegetation. These factors influence the ability of stream banks to withstand high water flows. Riparian vegetation and its functional condition were assessed at one of three levels: functional, functional-at risk or non-functional. The overall functional condition was evaluated for an area approximately 300 feet upstream and downstream of the surveyed site. A rating does not necessarily reflect the impacts from ORV use but may be the result of natural disturbances such as that which is often noted in glacial systems. Degradation of the functional condition that was found to be attributable to ORV use is noted under the "Evaluation of Crossing Condition" list below. The functional ratings are described as follows:

- Functional: Full coverage; root mass capable of withstanding high-stream flow events.
- Functional-At Risk: Partial coverage; root mass either spotty or partially damaged and not capable of withstanding high-stream flow without some damage.
- Non-functional: No coverage or root mass severely damaged and incapable of withstanding high-stream flow without severe damage.

10. Evaluation of Crossing Condition

Crossings were examined for the following impacts:

- Degradation of the crossing was suspected to cause sedimentation directly or indirectly into a waterbody that is fish-bearing or has the potential to be fish-bearing.
- If spawning habitat is present or potentially present and the condition or use of the crossing could lead to direct destruction of spawning habitat and/or live eggs present in the gravels.
- Crossing is in such condition that it is a direct impediment (obstruction present) to fish passage
- Riparian vegetation is degraded due to ORV use.

The level of the above listed degradation ratings are valued equally. Each crossing that is considered for repair was assigned one or more letters from the impact rating list (see "Discussion" section of this report) in order to describe the crossing condition and why repairs are suggested.

Biological Inventory

Gee-Minnow traps baited with salmon eggs were set in potential fish-bearing locations for a minimum of 3 hours and a maximum of 8 hours. The location of the trap, the time the trap was

set and trap catch were recorded. In this report we use the terms king and Chinook salmon interchangeably when referring to *Oncorhynchus tshawytscha*.

RESULTS

We examined 59 stream crossings on nine ORV trails originating from the Nabesna Road. See both Appendix A and Appendix B for specific data collected at each crossing.

Copper Lake Trail

This trail is in the Copper River watershed. We examined 8 crossings along this trail. All crossings except for CL-1, CL-3 and CL-4 suffered from one or more impacts (Table 1). We were unable to survey CL-3 due to high flows. However, all the crossings except for TC-1 were considered sustainable at the ongoing level of use. Crossing TC-1 has the potential to result in the destruction of Chinook salmon eggs or alevins.

Streambank composition for all crossings was evaluated to be functional.

Seven of the crossings are located on unnamed tributaries which lead to the Copper River. Fish data does not exist for these unnamed tributaries, however existing data indicates that the Copper River is utilized by sockeye, Chinook, and coho salmon. Additionally, the crossing at that outlet of Copper Lake (CL-3) also has no specific fish data; however existing data indicates that Copper Lake is utilized by burbot, lake trout, kokanee, sockeye and grayling. Fish data indicates that grayling, slimy sculpin, Chinook and sockeye salmon utilize Tanada Creek (Appendix B).

Boomerang Lake Trail

This trail is located within the Copper River watershed. We surveyed two crossings along this trail. The BT-1 crossing was an old crossing that was very difficult to identify as the trail is not heavily used. Locating an actual crossing along Drop Creek (DC-1) was also very difficult to identify for the same reason. The data collected for both of these crossings was taken from a representative reach within the general area of the suspected crossing. Both crossings were in good condition.

Streambank composition for the two crossings surveyed along this trail system was evaluated to be functional for the channel type.

Existing fish data indicates that the Copper River is utilized by sockeye, Chinook, and coho salmon. Fish data for Drop Creek indicates that it is utilized by Chinook salmon (Appendix B).

Caribou Creek Trail

We examined 3 crossings along this trail. Caribou Creek is a tributary to Tanada Creek, which is in the Copper River watershed. It appears that on crossing CC-2, the original crossing point on the right bank has been washed out and an alternate route has been created less than 50 feet upstream from the original crossing point. The crossing closest to the Nabesna Road (CC-3) has

already been hardened. All three crossings were in good condition and streambank composition for all crossings was evaluated to be functional.

Two of the crossings are over unnamed tributaries to Natat Creek. Existing fish data indicates that Natat Creek is utilized by Chinook salmon. There is no data available for the unnamed tributary to Caribou Creek, however, data shows that slimy sculpin have been collected in Caribou Creek (Appendix B).

Lost Creek Trail

We examined 8 crossings along this trail, which is a tributary to Jack Creek, located within the Nabesna River watershed. The trail is split into two sections, one north of the Nabesna Road and the other portion of the trail lies south of the Nabesna Road.

Lost Creek has a broad, active floodplain with boulders, cobble and gravels making it difficult at times to identify where the trail crossed the stream. This is a dynamic system which causes trail users to find new crossing points as the terrain changes. The stream morphology and substrate were very similar from one crossing to the next and 19 crossings were not identifiable. No data was collected on these 19 crossings and they were referred to as "random crossings". We surveyed and collected data for 7 crossings along the northern portion of the trail, all of which were in good condition. There is an unconfined crossing (LC-7) at the Nabesna Road which shifts with flood events. AK DOT/PF maintains this crossing within the road right-of-way.

On the southern portion of the trail, we surveyed one crossing (LCS-1) but were unable to travel further due to high waters and degraded conditions making it challenging to cross Lost Creek at this point. This crossing has a partial plunge which is not considered to be a barrier to fish passage in its current condition. The crossing appears to have been washed out with the recent water event and will need to be re-evaluated again at low water (Table 1).

Streambank composition for 6 of the 8 crossings was functional for the channel type, one crossing was rated as non-functional and another was functional, but functional-at risk on the right bank.

One minnow trap was set in Lost Creek. No fish were observed in the trap after 8 hours. Fish data does not exist for Lost Creek, however Lost Creek flows into Jack Creek which data indicate supports burbot, grayling and slimy sculpin (Appendix B).

Trail Creek Trail

We examined 9 crossings along this trail, which is a tributary to Jack Creek, located in the Nabesna River watershed. Trail Creek has a broad, active floodplain with boulders, cobble and gravels making it difficult at times to identify where the trail crossed the stream. This is a dynamic system which causes trail users to find new crossing points as the terrain changes. The stream morphology and substrate were very similar from one crossing to the next and 12 crossings were not identifiable. No data was on these 12 crossings and they were referred to as "random crossings". We surveyed and collected data for 9 crossings along the northern portion of the trail, all of which were in good condition.

Streambank composition for 5 of the 9 crossings was functional, one crossing was rated as functional for the channel type, one was rates as functional-at risk and two were rated as non-functional.

Fish data does not exist for Trail Creek (Appendix B).

Soda Creek Trail

We examined 7 crossings along this trail, which is within the Nabesna River watershed. All crossings were in good condition with the exception of SC-7 which was very soft with fines being released with disturbance (Table 1).

Streambank composition for 5 of the 7 crossings was rated as functional-at risk and 2 were rated as non-functional.

Three minnow traps were set along the trail; one in an unnamed tributary to Chalk Creek, one in an unnamed tributary to Platinum Creek, and one in Soda Creek. No fish were observed in the trap after 3-5 hours. Fish data does not exist for Soda Creek, the unnamed tributary to Soda Creek, the unnamed tributary to Platinum Creek, Platinum Creek itself, or the unnamed tributary to Chalk Creek. Chalk Creek supports round whitefish and grayling (Appendix B).

Suslota Lake Trail

We surveyed three crossings along this trail, which is in the Slana River watershed. All crossings except for SLT-2 suffered from one or more impacts (Table 1). Crossing SLT-1 and SLT-3 were severely degraded. At each site there were three cuts perpendicular to the stream from ORV use, each cut less than 25-50 ft. apart. These cuts are causing rutting in the streambed as the substrate is somewhat soft and altering water flow which allows water to overflow into the ruts during high flows.

An additional crossing (SLT-2) was located approximately 100 feet downstream from SLT-1. This crossing appeared to be much more suitable and in better condition than the upstream crossing. The approaches are mildly steep, but the crossing itself is naturally hardened with cobbles.

Streambank composition for all crossings was rated as functional.

One minnow trap was set in Natat Creek along the trail. No fish were observed in the trap after 3 hours. Existing fish data indicates that Natat Creek is utilized by Chinook salmon (Appendix B).

Tanada Lake Trail

We examined 7 crossings along this trail, which is in the Copper River watershed. Most of the crossings along this trail had some rutting on the approaches and weakened banks. TLT-14 was significantly degraded and was impassable. Crossing TLT-6 had significant drop which was creating a barrier to juvenile fish passage. Crossings TLT-5, TLT-8, TLT-9, TLT-10, TLT-11, TLT-12, TLT-13, and TLT-14, were also degraded by one or more impacts (Table 1).

Streambank composition for 8 of the 16 crossings was rated as functional and the other 8 crossings were rated as functional-at risk.

A portion of the Tanada Lake Trail (located between crossings TLT-7 and TLT-16) was inundated with runoff from wetlands to the east of the trail. There was no discernible crossing. It appeared that water from the adjacent wetland has been intercepted by the trail, and a portion of the trail had essentially become a new streambed. It also could have simply been sheet flow from above average precipitation this year.

On 10 of the crossings that are on unnamed tributaries to Tanada Lake, there is no existing fish data, however all of these tributaries lead to Tanada Lake where data indicates sockeye salmon, burbot, grayling, round whitefish, slimy sculpin and lake trout are supported. Five crossings are on unnamed tributaries that lead to Tanada Creek. Fish data does not exist for these 5 tributaries, however current data indicates that Tanada Creek supports sockeye and Chinook salmon, grayling, round whitefish, and slimy sculpin. Fish data does not exist for the unnamed tributary to the unnamed pond at crossing TLT-9 (Appendix B).

Reeve Field Trail

Three crossings were examined along this trail, which is located within the Nabesna River watershed. All three crossings were rated as functional for streambank composition and all three were in good condition.

One minnow trap was set in Jack Creek. No fish were observed in the trap after 5 hours. Existing fish data for Jack Creek indicates that it supports burbot, grayling and slimy sculpin (Appendix B).

DISCUSSION

Of the 59 crossings surveyed, we considered 23 to be potential candidates for repair to maintain or restore unimpeded fish passage, if fish are present, and for the preservation of water quality in fish bearing systems. Problems associated with these crossings may include impact to water quality via sediment deposition locally or in spawning habitat downstream of the crossing, direct destruction of spawning habitat and/or impeded fish passage.

A crossing was given an impact rating if it met at least one of the following conditions (Table 1):

S Degradation of the crossing was suspected to cause sedimentation directly or indirectly into a waterbody that is fish-bearing or has the potential to be fish-bearing.

H If spawning habitat is present or potentially present and the condition of the crossing could lead to direct destruction of spawning habitat.

O Crossing is in such a condition that it is a direct impediment (obstruction present) to fish passage.

R Crossing has directly degraded riparian vegetation.

Each crossing that was considered for repair was assigned one or more letters from the impact list in order to describe the crossing condition and why repairs are being suggested.

From these observations, management recommendations were made based on the degree to which the crossing allowed for unimpeded fish passage, the potential for impact on water quality and the amount of stream channel disruption. Anadromous status of a waterbody did not affect the decision to identify a crossing as impacted or not, and all crossings were treated equally regardless of fish presence and status.

Precipitation levels for the field season were higher than average. Most streams were at or just below bankfull, making it difficult to accurately and thoroughly assess the condition of the crossing due to decreased visibility and difficulty collecting the data because of high and fast flows. We recommend that the following crossings be re-surveyed at low flows: CL-3, LCS1, and the inundated area on the Tanada Lake Trail (Table 1).

Several of the crossings (CL-2, CL-5, CL-6, CL-7, SC-7, TLT-1, TLT-4 (Table 1)) were in a sustainable condition but with increased use, we suspect they would become degraded and would need to be repaired. We considered these crossings to be inadequate with heavy use and therefore should be monitored and re-evaluated if their current level of use increases or their condition worsens.

Table 1: List of impacted crossings and management recommendations.

Site	Impact Type	Comments	Management Recommendations
		Copper Lake Trail	
CL-2	S, R	sustainable/adequate for current use	may need to be hardened with increased use; should be monitored if use increases.
CL-3	unknown/ unable to survey	water too high to determine exact location of crossing	crossing lies between two bodies of water that provide fish habitat for anadromous and resident species; should be re-evaluated at low flows.
CL-5	R	sustainable/adequate for current use	may need to be hardened with increased use; should be monitored if use increases.
CL-6	S, R	sustainable/adequate for current use	may need to be hardened with increased use; should be monitored if use increases.
CL-7	S, R	sustainable/adequate for current use	may need to be hardened with increased use; should be monitored if use increases.
TC-1	S, H	see discussion below	see discussion below

		Lost Creek Trail	
LC1S	S, O, R	recently washed out and may become a problem for fish passage in the future	re-evaluate at low flows to determine how the flow is concentrated and to better evaluate the condition of the crossing.
		Soda Creek Trail	
SC-7	S	sustainable/adequate for current use	may need to be repaired with increased use; should be monitored if use increases.
		Suslota Lake Trail	
SLT-1	S, R	substantially degraded and may contribute to water quality issues	repair or re-route
SLT-2	S, R	consider re-routing the trail to use the crossing at this location as opposed to the crossing identified at SLT-1	re-grade the approaches to decrease erosion risk
SLT-3	S, R	substantially degraded and may contribute to water quality issues	repair
		Tanada Lake Trail	
TLT-1	R	sustainable/adequate for current use	may need to be repaired with increased use; should be monitored if use increases.
TLT-4	R	sustainable/adequate for current use	may need to be repaired with increased use; should be monitored if use increases.
TLT-5	S, H, R	crossing is located within 1500 feet of Tanada Lake, which is cataloged as sockeye spawning. The crossing is degraded and may contribute to water quality issues and have a negative impact on sockeye spawning habitat	repair
TLT-6	O	if fish are present in this system, this crossing may impede passage for juveniles	determine fish presence and repair obstruction if fish are present.
TLT-8	S, R	has weakened approaches on both banks.	monitor

		Tanada Lake Trail	
TLT-9	S, R	degraded approaches on both banks which may contribute to water quality issues	the stream at this crossing appears to lead to an unnamed pond, however, if further evaluation indicates that it leads to Tanada Creek, it should be considered for repair.
TLT-10	S, R	degraded and may lead to water quality issues	re-evaluate stream location for this crossing and if it leads to Tanada Creek, the crossing should be monitored.
TLT-11	S, R	degraded and may lead to water quality issues.	re-evaluate stream location for this crossing and if it leads to Tanada Creek, the crossing should be monitored.
TLT-12	S, H, R	Degraded; may contribute to water quality issues and have a negative impact on sockeye spawning habitat. This crossing is located within approximately 1500 feet of a cataloged sockeye spawning reach in Tanada Creek.	repair
TLT-13	S, H, R	degraded and may contribute to water quality issues and have a negative impact on sockeye spawning habitat; crossing is located within approximately 400 feet of a cataloged sockeye spawning reach in Tanada Creek.	repair
TLT-14	S, H, R	Degraded; may contribute to water quality issues and have a negative impact on sockeye spawning habitat; crossing is located within approximately 400 feet of Tanada Lake, which is cataloged as sockeye spawning.	repair
TLT-16	S	has a deep cut on the right bank and some erosion	repair
Inundated area on trail (Figure 9)	unable to survey	Between TLT-7 and TLT-16 (see Figure 9); high water made it difficult to accurately determine site conditions.	re-evaluate during years with near average precipitation.

Copper Lake Trail/Boomerang Lake Trail

The crossing at Tanada Creek (TC-1) along the Copper Lake Trail crosses a portion of Tanada Creek that is cataloged as king and sockeye presence. The habitat that is traversed by this crossing is suitable for Chinook salmon spawning. Potential impacts associated with this crossing include sedimentation and destruction of spawning areas. Due to the sensitive nature of salmon stocks in Tanada Creek, we recommend that park managers strongly consider management options that would:

1) prevent disturbance of Chinook salmon redds if they occur at this crossing location
2) reduce sedimentation associated with this crossing location

Additionally, the trail leading down to this crossing on Tanada Creek runs adjacent to the stream bank and is on questionable terrain in a few locations. Over time, there could be bank erosion from overland flow or undercutting as the area becomes weakened by continual trail use. It may be feasible to re-route the trail to entirely eliminate the portion that is located in this "peninsula". By re-routing the trail and keeping it out of the peninsula, the trail will be on more stable ground.

Other stream crossings along the Copper Lake trail appear capable of sustaining the current level of use. However, most of these crossings should be monitored to reduce the potential for degradation through increased use (Table 1).

Due to the proximity of CL-3 to occupied fish habitat, this crossing should be a priority to re-survey during average flow conditions (Appendix B). There is potential that this crossing could disturb occupied spawning habitat.

Tanada Lake Trail

There were only four out of 16 surveyed crossings along the Tanada Lake Trail that were in good condition; the rest were degraded from one or more impacts (Table 1). There are sensitive salmon species in both Tanada Creek and Tanada Lake. Many of the crossings are on tributaries that lead to the lake or the creek and can have an impact to water quality via sedimentation into a fish bearing system.

There are three crossings on the Tanada Lake Trail (TLT-9, TLT-10, TLT-11) that are on tributaries for which the outlet was uncertain. The outlet for these crossings should be field verified and if it is determined that they lead to Tanada Creek, then these crossings should be considered for repair (Table 1).

A portion of Tanada Lake Trail (located between crossings TLT-7 and TLT-16) is inundated with runoff from wetlands to the east of the trail. It appears that water from the adjacent wetland has been intercepted by the trail and this portion of the trail has essentially become a new streambed. This could also simply be due to sheet flow from above average precipitation this year. This area needs to be re-evaluated for a potential stream crossing when the summer seasonal precipitation is near average.

The rest of the crossings on the Tanada Lake Trail are considered to be in good condition.

Lost Creek Trail

The crossings along the Lost Creek Trail system were in good condition with the exception of the crossing located south of the Nabesna Road (LCS-1), as it has the potential to become a barrier to fish passage. Fish data does not exist for Lost Creek, however Lost Creek flows into Jack Creek which data indicate supports burbot, grayling and slimy sculpin (Appendix B). Lost Creek may provide habitat for grayling and slimy sculpin, both of which are easily limited by passage barriers. This crossing needs to be re-evaluated during low flows to properly assess the crossing condition (Table 1).

Trail Creek Trail

Trail Creek has a broad, active, aggrading floodplain with boulders, cobble and gravels and is very resilient to impacts from ORV use due to the large substrate and dynamic floodplain. The condition of the vegetation at the non-functional crossings may be a function of the effects of the aggradation rather than ORV impacts.

Reeve Field Trail

Jack Creek, which data shows supports grayling, slimy sculpin and burbot provides good low gradient gravel spawning habitat. The majority of ORV use on this trail does not coincide with spawning and therefore no impacts to fish eggs or alevins are anticipated.

Caribou Creek Trail

All of the stream crossings for Caribou Creek were in good condition. Streambank composition was functional for all of the stream crossings. In general, this trail does not appear to substantially impact fish habitat.

Suslota Lake Trail

All of the stream crossings along this trail were degraded, some were severely degraded. In some areas the effects of the trail crossing are substantially altering the stream channel. Vegetation is in relatively good condition, which may be due to the low velocity and discharge in the stream channel. While Natat Creek is utilized in the lower reaches by Chinook salmon, it is uncertain whether or not Chinook salmon utilize the stream reaches that are impacted by the stream crossings. However, sediment input from the stream crossings has the potential to impact water quality and habitat downstream via deposition on areas utilized by spawning Chinook salmon.

Soda Creek Trail

With the exception of SC-7, all of the stream crossings along this trail were in good condition. SC-7 is adequate for the current level of use but may require maintenance if the level of use increases. Streambank composition was functional at-risk or non-functional, however this condition would be expected in the dynamic, aggrading stream channels associated with this trail.

RECOMMENDATIONS

We recommend that 23 of the surveyed crossings be considered for observation, re-evaluation and/or repair due to their proximity to fish-bearing systems or potential fish-bearing systems and/or the severity of damage.

Modification recommendations may consist of a combination of alternatives for trail improvement and management. Some management alternatives to consider for impacted trails and crossings could be:

- Implementing crossing/trail hardening techniques appropriate for site specific conditions
- Bypassing sensitive areas by re-routing trails to more suitable terrain
- Close trails (temporarily or permanently) to allow for re-establishment of vegetation
- Enforce temporary closures during wet conditions to prevent further degradation
- Enforce vehicle weight restrictions and/or vehicle types

We recommend that all crossings in fish-bearing or potentially fish-bearing systems be monitored to determine the effects of increased use, and/or other habitat changes that may occur with increased flows or other natural events.

APPENDIX A

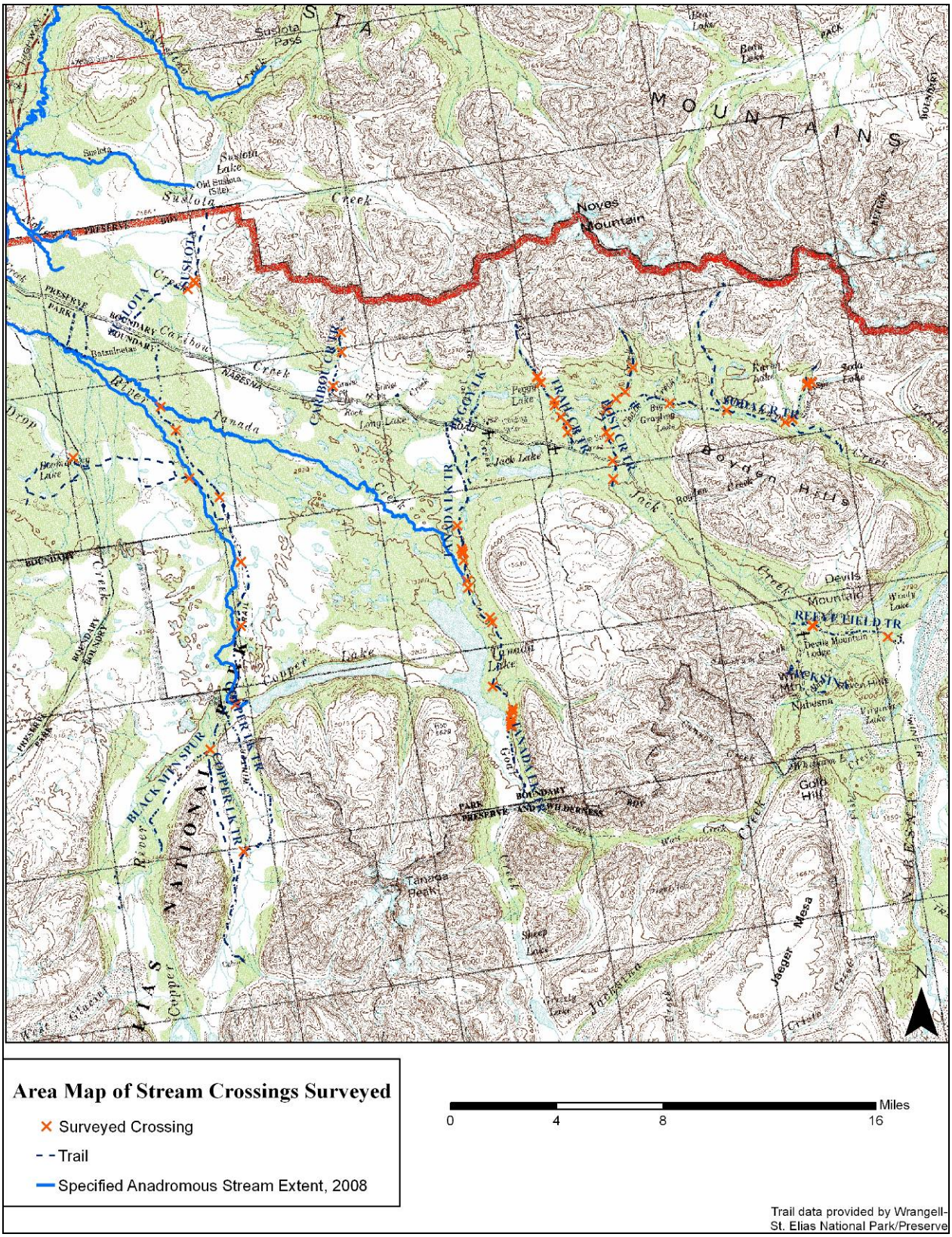


Figure 3: Map of trails extending from the Nabesna Road where stream crossing surveys were conducted.

COPPER LAKE AND BOOMERANG LAKE TRAILS

Figure 4: Map of survey sites on both the Copper Lake Trail and Boomerang Lake Trail.

*Errata: Figure 4 should have crossing CL5 denoted in purple instead of orange.

Downstream view from crossing CL-1.

Additional downstream view CL-1 (notice stream splits into two channels).

Upstream view from crossing CL-1.

View of right bank.

Left bank.

DATE: 7/22/08 **TIME**: 12:45 pm **STATION NO.** CL-1 **HABITAT :** Riffle, pool **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed tributary from Tanada Peak Glacier to the Copper River (no fish data available for this tributary, but it leads to an uncataloged portion of the Copper River).

GPS LATITUDE: 62° 20.105 **GPS LONGITUDE**: 143°40.730 **RIPARIAN VEGETATION:** Functional

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** C **H_2O STAGE:** 3
WATERBODY SLOPE: est. 2 % **BANKFULL WIDTH**: 75 (ft.) **FLOODPLAIN WIDTH**: 300+ (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _50_ Gravel _50_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Bad transition, steep entry on left bank. Note: Clinometer unavailable, waterbody slope is an estimate.

Upstream view from crossing CL-2.

Downstream view from crossing CL-2.

Left bank.

Right bank.

DATE: 7/22/08 **TIME**: 1:00 pm **STATION NO.** CL-2 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Unnamed tributary from Tanada Peak Glacier to the Copper River (no fish data available for this tributary, which leads to an uncataloged portion of the Copper River).
GPS LATITUDE: 62° 23.552 **GPS LONGITUDE**: 143° 41.936
RIPARIAN VEGETATION: Functional, but right hand trail approach is partially degraded
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 3
WATERBODY SLOPE: est. 2 % **BANKFULL WIDTH**: 50 (ft.) **FLOODPLAIN WIDTH**: 100 + (ft.)
SUBSTRATE (%): Bedrock ____ Boulder _5__ Cobble _40_ Gravel _55_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Adequate for current level of use. Note: Clinometer unavailable, waterbody slope is an estimate.

Upstream view from crossing CL-3.

Downstream view from crossing CL-3.

View of right bank.

DATE: 7/22/08 **TIME**: 1:20 pm **STATION NO.** CL-3 **HABITAT :** Riffle, pool **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Copper Lake outlet to the Copper River (no fish data available for this tributary but it leads to a portion of the Copper River that is cataloged as sockeye present).
GPS LATITUDE: 62° 24.873 **GPS LONGITUDE**: 143° 39.671 **RIPARIAN VEGETATION:** Functional
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** C **H_2O STAGE:** 4
WATERBODY SLOPE: est. 2 % **BANKFULL WIDTH**: 50 (ft.) **FLOODPLAIN WIDTH**: 150 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble ____ Gravel _100_ Sand ____ Silt/Clay ____ Organic ___
COMMENTS: No discernable crossing (trail fans out), may be one toward Copper River near private cabin. Too deep to cross to get photo of left bank. Note: Clinometer unavailable, waterbody slope is an estimate.

Upstream view from crossing CL-4.

Downstream view from crossing CL-4.

Left bank.

Right bank.

DATE: 7/22/08 **TIME**: 2:00 pm **STATION NO.** CL-4 **HABITAT :** Riffle, pool **WATER COLOR:** Clear, Stained
WATERBODY NAME/DESCRIPTION: Unnamed tributary to Copper River (no fish data for this tributary, but leads to a portion of the Copper River that is cataloged as sockeye present).
GPS LATITUDE: 62° 27.380 **GPS LONGITUDE**: 143° 38.447 **RIPARIAN VEGETATION:** Functional
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 3
WATERBODY SLOPE: est. 2 % **BANKFULL WIDTH**: 20 (ft.) **FLOODPLAIN WIDTH**: 50 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder _20_ Cobble _60_ Gravel_ 20__ Sand ____ Silt/Clay ____ Organic ___
COMMENTS: Trail approaches are mostly rock. Stream dropping off high bench into the Copper River. Note: Clinometer unavailable, waterbody slope is an estimate.

Upstream view from crossing CL-5.

Downstream view from crossing CL-5.

Left bank.

Right bank.

DATE: 7/22/08 **TIME**: 2:30 pm **STATION NO.** CL-5 **HABITAT :** Riffle **WATER COLOR:** Clear, stained

WATERBODY NAME/DESCRIPTION: Unnamed tributary to the Copper River (no fish data available but this tributary leads to a portion of the Copper River that is cataloged as sockeye present)

GPS LATITUDE: 62° 29.444 **GPS LONGITUDE**: 143°37.762

RIPARIAN VEGETATION: Functional, but both bank approaches are downcut and partially degraded

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 3

WATERBODY SLOPE: est. 2 % **BANKFULL WIDTH**: 10 (ft.) **FLOODPLAIN WIDTH**: 25 (ft.)

SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _50_ Gravel _50__ Sand ____ Silt/Clay ____ Organic ___

COMMENTS: Trail approaches are gradual and rock/sand. Stream dropping off high bench into Copper River. Note: Clinometer unavailable, waterbody slope is an estimate.

Upstream view from crossing CL-6.

Downstream view from crossing CL-6.

Left bank.

Additional view of left bank.

Third view of left bank.

View of right bank from crossing CL-6.

Additional view of right bank.

Third view of right bank.

DATE: 7/22/08 **TIME**: 3:05 pm **STATION NO.** CL-6 **HABITAT :** Riffle, pool **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Unnamed tributary to the Copper River (no fish data available for this tributary but it leads to a portion of the Copper River that is cataloged as sockeye present)

GPS LATITUDE: 62° 31.643 **GPS LONGITUDE**: 143° 38.518

RIPARIAN VEGETATION: Functional, but both bank approaches are downcut and degraded

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 4

WATERBODY SLOPE: est. 2 % **BANKFULL WIDTH**: 10 (ft.) **FLOODPLAIN WIDTH**: 25 (ft.)

SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _50_ Gravel _50_ Sand ____ Silt/Clay ____ Organic ____

COMMENTS: Three crossings at this site. Approaches are set back 10 ft. from channel. Flooded with semi-solid but muddy base, some entrenchment from ATV tracks; possible run-off from upland trail. Minimal soil exposed at the 3 entrance points. Note: Clinometer unavailable, waterbody slope is an estimate.

Upstream view from crossing CL-7.

Downstream view from crossing CL-7.

Left bank.

Right bank.

DATE: 7/22/08 **TIME**: 4:40 pm **STATION NO.** CL-7 **HABITAT :** Riffle **WATER COLOR:** Clear, stained

WATERBODY NAME/DESCRIPTION: Unnamed tributary to the Copper River (no fish data available for this tributary but it leads to a portion of the Copper River that is cataloged as sockeye present)

GPS LATITUDE: 62° 34.011 **GPS LONGITUDE**: 143° 40.865

RIPARIAN VEGETATION: Functional, but both bank approaches are downcut and partially degraded

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 4

WATERBODY SLOPE: est. 2 % **BANKFULL WIDTH**: 15 (ft.) **FLOODPLAIN WIDTH**: 30 (ft.)

SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _50_ Gravel _40__ Sand _10_ Silt/Clay ____ Organic ___

COMMENTS: Trail approaches are set back, mostly sand, low grade with minor upper trail run-off. Note: Clinometer unavailable, waterbody slope is an estimate.

CROSSING AT TANADA CREEK (COPPER LAKE TRAIL)

Upstream view from crossing TC-1.

Downstream view from crossing TC-1.

Left bank.

DATE: 7/23/08 **TIME**: 11:00 pm **STATION NO.** TC-1 **HABITAT :** Pool **WATER COLOR:** Clear, stained

WATERBODY NAME/DESCRIPTION: Tanada Creek (cataloged as king present and sockeye present in this stretch of the creek. Approximately 11 miles upstream it is also cataloged as sockeye spawning. Also supports grayling and slimy sculpin).

GPS LATITUDE: 62° 34.851 **GPS LONGITUDE**: 143° 41.664 **RIPARIAN VEGETATION:** Functional

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** C **H_2O STAGE:** 4

WATERBODY SLOPE: 1.5 % **BANKFULL WIDTH**: 30 (ft.) **FLOODPLAIN WIDTH**: 75 (ft.)

SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble ____ Gravel _100_ Sand ____ Silt/Clay ____ Organic ___

COMMENTS: Area recently flooded. Crossing hard to see due to high water, but appears to be in good condition with little to no erosion. Unable to get photo of left bank due to inability to cross stream.

BOOMERANG LAKE TRAIL

During a helicopter supported aerial reconnaissance the trails were located to identify any stream crossings. We were not able to see any stream crossings. At times, it was hard to see the trail from the air which would suggest that this particular trail system is not heavily used.

Upstream view from the crossing (BT-1).

Downstream view from the crossing (BT-1).

View of the right bank of the Copper River from the crossing (BT-1).

DATE: 7/21/08 **TIME**: 12:00 pm **STATION NO.** BT-1 **HABITAT :** Riffle, side channel **WATER COLOR:** Glacial
WATERBODY NAME/DESCRIPTION: Copper River (cataloged as sockeye present in this stretch)
GPS LATITUDE: 62°32.396 **GPS LONGITUDE**: 143° 40.423 **RIPARIAN VEGETATION:** Functional for channel type
WATERBODY TYPE: river **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** D **H_2O STAGE:** 3
WATERBODY SLOPE: 1 % **BANKFULL WIDTH**: 50 (ft.) **FLOODPLAIN WIDTH**: 500 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _25_ Gravel _25_ Sand ____ Silt/Clay _50_ Organic ____
COMMENTS: It was very difficult to identify an actual crossing since the trail is not heavily used. The data collected was taken from a representative reach within the general area of the suspected crossing. No point was plotted on the map (Figure 2).

CROSSING AT DROP CREEK (BOOMERANG LAKE TRAIL)

Upstream view from the crossing DC-1.

Downstream view from the crossing DC-1.

Left bank view from the crossing DC-1.

View of right bank from crossing DC-1.

DATE: 7/21/08 **TIME**: 2:30 pm **STATION NO.** DC-1 **HABITAT :** Riffle **WATER COLOR:** Glacial
WATERBODY NAME/DESCRIPTION: Drop Creek (no fish data available)
GPS LATITUDE: unknown **GPS LONGITUDE**: unknown **RIPARIAN VEGETATION:** Functional for channel type
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** D **H_2O STAGE:** 3
WATERBODY SLOPE: 0.5 % **BANKFULL WIDTH**: variable **FLOODPLAIN WIDTH**: variable
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _75_ Gravel _20_ Sand ____ Silt/Clay _5__ Organic ____
COMMENTS: It was very difficult to identify an actual crossing since the trail is not heavily used. The data collected were taken from a representative reach within the general area of the suspected crossing. Tried to locate Latitude: 62° 33'36.8", Longitude: 143° 48'34.8" and believe we were close to this location, but were not able to specifically identify trail location. GPS data not plotted on map.

CARIBOU CREEK TRAIL

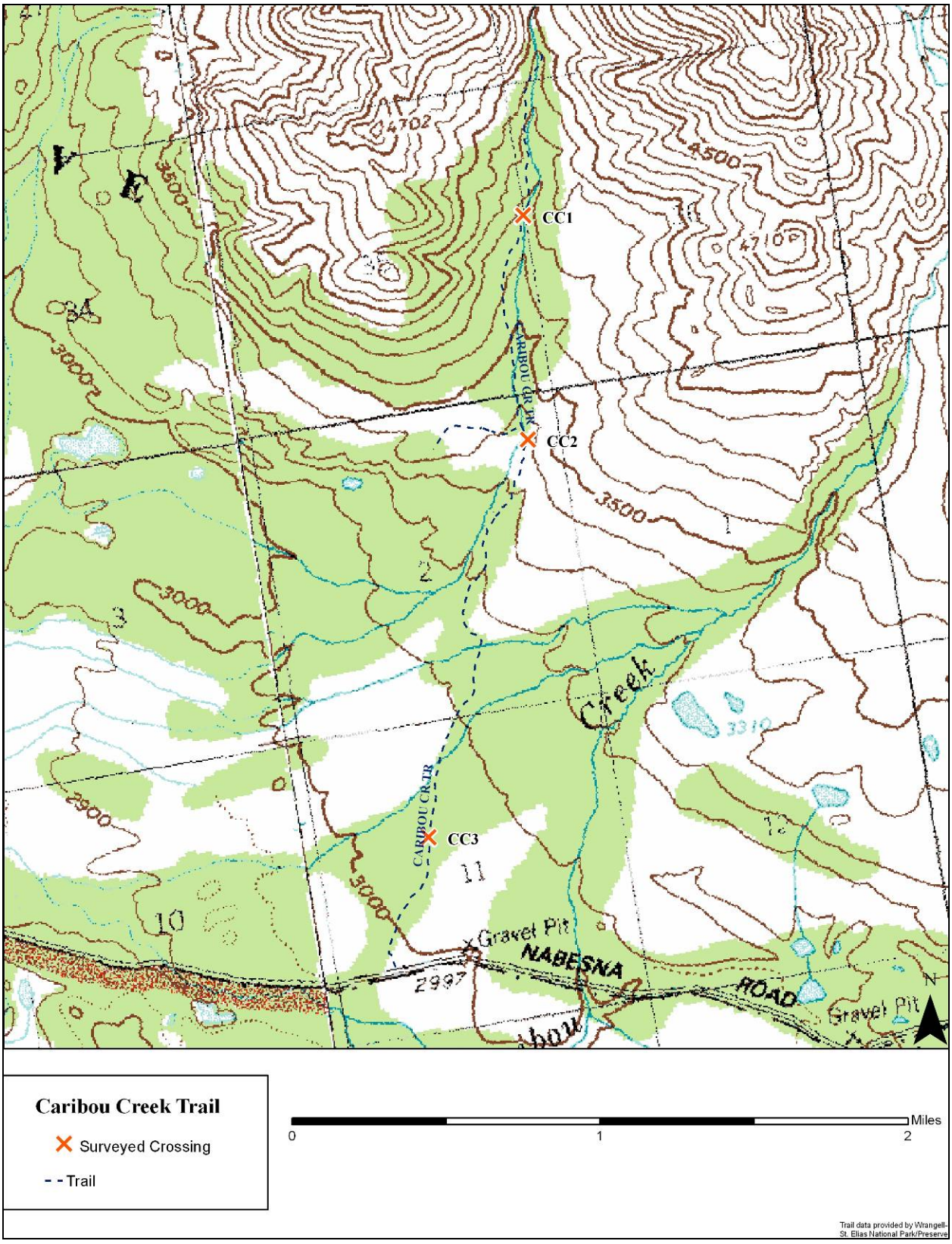


Figure 5: Map of survey points on Caribou Creek Trail.

Upstream view from crossing CC-1

Downstream view from crossing CC-1.

View of left bank from crossing CC-1.

View of right bank from crossing CC-1.

DATE: 7/18/08 **TIME**: 3:00 pm **STATION NO.** CC-1 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed tributary to Natat Creek (no fish data for this tributary but leads to a portion of Natat Creek, approximately 10 miles downstream, which is cataloged as king present and king spawning).

GPS LATITUDE: 62° 26.326 **GPS LONGITUDE**: 143° 28.178 **RIPARIAN VEGETATION:** Functional

WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** A **H_2O STAGE:** 1

WATERBODY SLOPE: 6 % **BANKFULL WIDTH**: 15 (ft.) **FLOODPLAIN WIDTH**: 50 (ft.)

SUBSTRATE (%): Bedrock ____ Boulder _10_ Cobble _40_ Gravel _50_ Sand ____ Silt/Clay ____ Organic ____

COMMENTS: Crossing in good condition.

Upstream view from crossing CC-2.

Downstream view from crossing CC-2.

Left bank CC-2.

Right bank. Notice washout to the left.

DATE: 7/1808 **TIME**: 3:40 pm **STATION NO.** CC-2 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Unnamed tributary to Natat Creek (no fish data for this tributary but it leads to a portion of Natat Creek, approximately 10 miles downstream, that is cataloged as king present and king spawning).
GPS LATITUDE: 62°35.702 **GPS LONGITUDE**: 143°28.370 **RIPARIAN VEGETATION:** Functional
WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** A **H_2O STAGE:** 3
WATERBODY SLOPE: 5 % **BANKFULL WIDTH**: 30 (ft.) **FLOODPLAIN WIDTH**: 45 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder _10_ Cobble _40_ Gravel _50_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Appears that the original crossing on the right bank has been washed out (see photo of right bank) and a new one started to the upstream side of the old crossing on the right bank.

Upstream view from crossing CC-3.

Downstream view from crossing CC-3.

View of right bank.

View of left bank.

DATE: 7/18/08 **TIME**: 4:00 pm **STATION NO.** CC-3 **HABITAT :** Pool, side channel **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Unnamed tributary to Caribou Creek (no fish data available for this tributary or for Caribou Creek)
GPS LATITUDE: 62°34.640 **GPS LONGITUDE**: 143°29.348 **RIPARIAN VEGETATION:** Functional
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** unknown **H_2O STAGE:** 1
WATERBODY SLOPE: 1 % **BANKFULL WIDTH**: 20 (ft.) **FLOODPLAIN WIDTH**: 50-100 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble ____ Gravel _10_ Sand _20_ Silt/Clay _70_ Organic ____
COMMENTS: Crossing has already been hardened.

LOST CREEK TRAIL

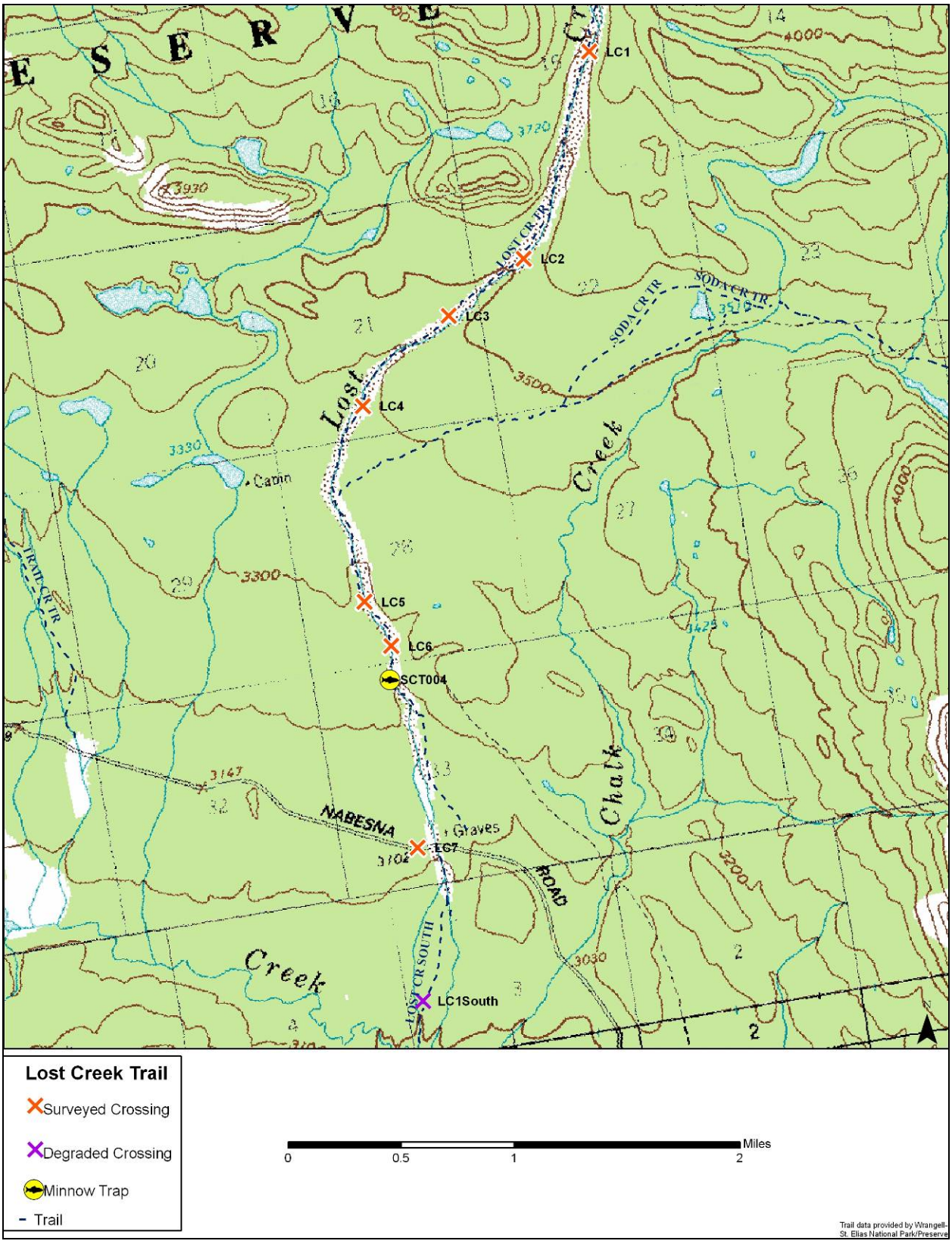


Figure 6: Map of survey sites on Lost Creek Trail.

Lost Creek Trail (portion located north of the Nabesna Road)

Upstream view from crossing LC-1.

Downstream view from crossing LC-1.

Right bank.

DATE: 7/18/08 **TIME**: 11:05 pm **STATION NO.** LC-1 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Lost Creek (no fish data available)
GPS LATITUDE: 62° 33.675 **GPS LONGITUDE**: 143° 08.161 **RIPARIAN VEGETATION:** Non-functional
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** D **H_2O STAGE:** 3
WATERBODY SLOPE: 2 % **BANKFULL WIDTH**: 15 (ft.) **FLOODPLAIN WIDTH**: 200 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder _10__ Cobble _70_ Gravel _20_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Crossing appears to be in good condition. Conditions of the entire trail are the same (cobble, boulders, and gravel with indistinguishable crossings, all in good condition) and assume the same is true further upstream.

Upstream view from crossing LC-2.

Downstream view from crossing LC-2.

Right bank.

DATE: 7/18/08 **TIME**: 11:35 pm **STATION NO.** LC-2 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Lost Creek (no fish data available)
GPS LATITUDE: 62° 32.937 **GPS LONGITUDE**: 143° 08.987 **RIPARIAN VEGETATION:** Functional for channel type
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** D **H_2O STAGE:** 3
WATERBODY SLOPE: 1.5 % **BANKFULL WIDTH**: 25 (ft.) **FLOODPLAIN WIDTH**: 300 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder _10_ Cobble _70_ Gravel _20_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Made 3 random crossings between LC-1 and LC-2, each of which was very similar to LC-1.

Upstream view from crossing LC-3.

Downstream view from crossing LC-3

Left bank.

DATE: 7/18/08 **TIME**: 11:45 pm **STATION NO.** LC-3 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Lost Creek (no fish data available)
GPS LATITUDE: 62° 32.766 **GPS LONGITUDE**: 143° 09.683 **RIPARIAN VEGETATION:** Functional for channel type
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** D **H_2O STAGE:** 3
WATERBODY SLOPE: 1.5 % **BANKFULL WIDTH**: 25 (ft.) **FLOODPLAIN WIDTH**: 300 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder _10_ Cobble _70__ Gravel _20_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Crossing in good condition.

Upstream view from crossing LC-4.

Downstream view of crossing LC-4.

Additional downstream view of crossing.

Left bank.

View of right bank.

DATE: 7/18/08 **TIME**: 12:00 pm **STATION NO.** LC-4 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Lost Creek (no fish data available)
GPS LATITUDE: 62° 32.477 **GPS LONGITUDE**: 143° 10.505 **RIPARIAN VEGETATION:** Functional for channel type
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** D **H_2O STAGE:** 3
WATERBODY SLOPE: 3.5 % **BANKFULL WIDTH**: 15 (ft.) **FLOODPLAIN WIDTH**: 200 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _70_ Gravel _30_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Crossing in good condition. Made 4 random crossings between LC -3 and LC-4 all of which have similar conditions to LC-3 crossing.

Upstream view from crossing LC-5.

Downstream view from crossing LC-5.

Left bank.

Right bank.

DATE: 7/18/08 **TIME**: 12:20 pm **STATION NO.** LC-5 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Lost Creek (no fish data available)
GPS LATITUDE: 62° 31.747 **GPS LONGITUDE**: 143° 10.756 **RIPARIAN VEGETATION:** Functional for channel type
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** D **H_2O STAGE:** 3
WATERBODY SLOPE: 1 % **BANKFULL WIDTH**: 20 (ft.) **FLOODPLAIN WIDTH**: 250 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _50_ Gravel _50_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Crossing in good condition. Made 12 random crossings of between LC-4 and LC-5 all of which had similar conditions to LC-4. Most of these random crossings were of ephemeral streams with cobbles and gravels and very shallow water (less than 6 inches deep).

Upstream view from crossing LC-6.

Downstream view from crossing LC-6.

Left bank.

Right bank.

DATE: 7/18/08 **TIME**: 12:30 pm **STATION NO.** LC-6 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Lost Creek (no fish data available)
GPS LATITUDE: 62° 31.554 **PS LONGITUDE**: 143° 10.591 **RIPARIAN VEGETATION:** Functional for channel type
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** D **H_2O STAGE:** 3
WATERBODY SLOPE: 1.5 % **BANKFULL WIDTH**: 50 (ft.) **FLOODPLAIN WIDTH**: 300 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _50__ Gravel _50_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Crossing in good condition.

Upstream view from the crossing on the Nabesna Road.

Downstream view from crossing LC-7.

Left bank.

Right bank.

DATE: 7/18/08 **TIME**: 12:30 pm **STATION NO.** LC-7 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Lost Creek at the Nabesna Road (no fish data available)

GPS LATITUDE: 62° 31.554 **GPS LONGITUDE**: 143° 10.591 **RIPARIAN VEGETATION:** Functional for channel type

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** D **H_2O STAGE:** 3

WATERBODY SLOPE: no data collected **BANKFULL WIDTH**: no data collected **FLOODPLAIN WIDTH**: no data collected

SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _50__ Gravel _50_ Sand ____ Silt/Clay ____ Organic ____

COMMENTS: Unconfined crossing at the Nabesna Road which shifts with flood events. AK DOT/PF maintains this crossing within the road right -of -way. This crossing could be recommended for improvement.

Lost Creek Trail (portion located south of the Nabesna Road)

Upstream view from crossing LC1S.

Downstream view from crossing LC1S.

Left bank.

Right bank.

DATE: 7/17/08 **TIME**: 4:16 pm **STATION NO.** LC1S **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Lost Creek (no fish data available)
GPS LATITUDE: 62° 30.197 **GPS LONGITUDE**: 143° 10.815
RIPARIAN VEGETATION: Functional, but functional-at risk at right bank trail approach.
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 4
WATERBODY SLOPE: 3 % **BANKFULL WIDTH**: 8 (ft.) **FLOODPLAIN WIDTH**: 20 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble ____ Gravel _100_ Sand ____ Silt/Clay ____ Organic ___
COMMENTS: Recently flooded, crossing somewhat washed out. Can see evidence of material that had sloughed off into the stream at the crossing. Sediment deposits on banks. Water cutting a trench through the trail. Water levels too high to cross. Partial plunge that has been created is not a barrier to fish (if present) currently.

TRAIL CREEK TRAIL

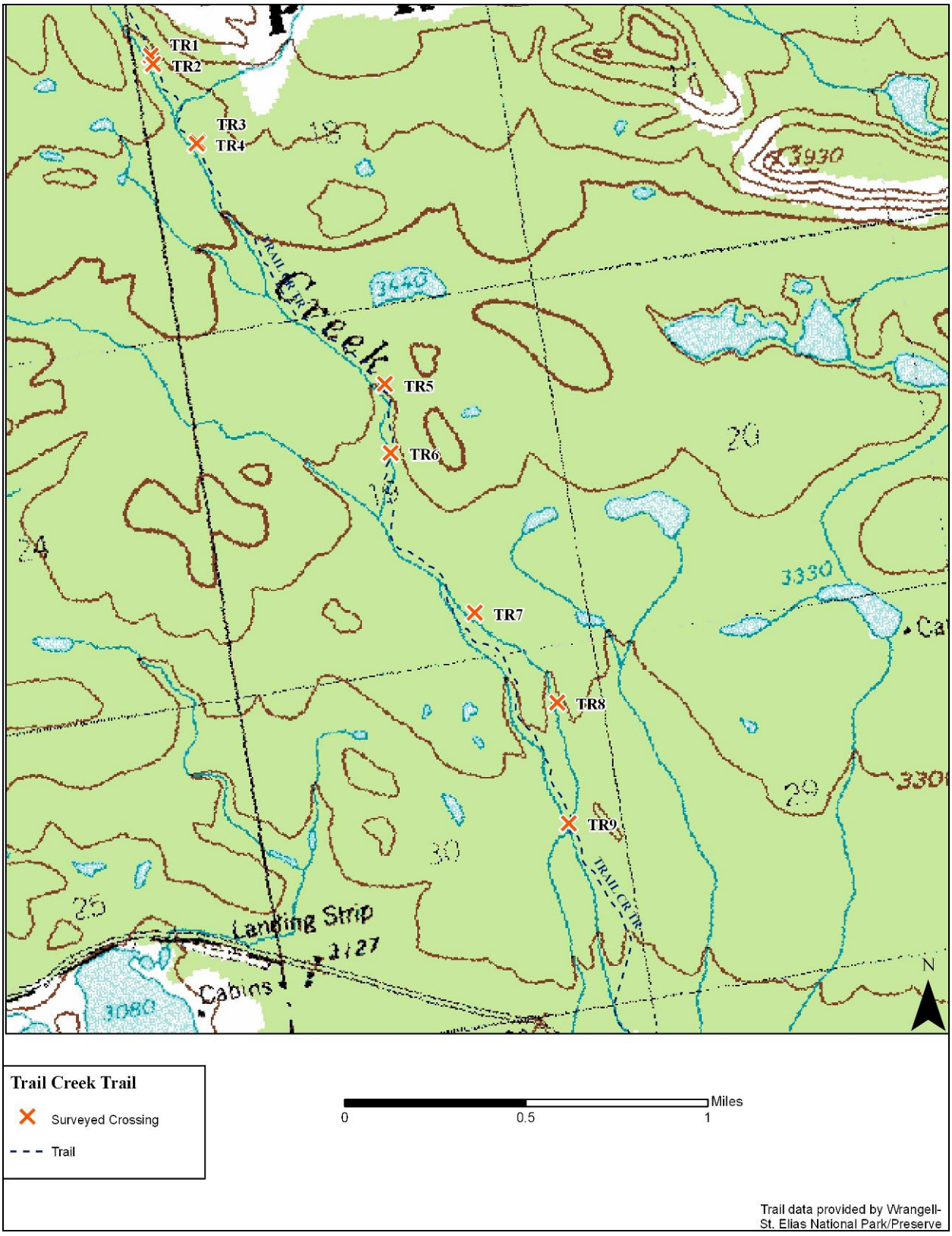


Figure 7: Map of survey points on Trail Creek Trail.

Upstream view from crossing TR-1.

Downstream view from crossing TR-1.

Left bank.

Right bank.

DATE: 7/17/08 **TIME**: 1:10 pm **STATION NO.** TR-1 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Trail Creek (no fish data available)
GPS LATITUDE: 62° 33.909 **GPS LONGITUDE**: 143° 14.959 **RIPARIAN VEGETATION:** Functional
WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** B **H_2O STAGE:** 2
WATERBODY SLOPE: 1.5 % **BANKFULL WIDTH**: 30 (ft.) **FLOODPLAIN WIDTH**: 100 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder _20_ Cobble _40_ Gravel _40_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Crossing in good condition. There may be an additional crossing or two upstream from this point, but increasing size of boulders precluded use by ATV's. Assumption was made that any additional upstream crossings would be very similar to this one because of the streambed substrate composition that has been observed up to this point.

Upstream view from crossing TR-2.

Downstream view from crossing TR-2.

Left bank.

Right bank.

DATE: 7/17/08 **TIME**: 1:25 pm **STATION NO.** TR-2 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Trail Creek (no fish data available)
GPS LATITUDE: 62° 33.8778 **GPS LONGITUDE**: 143° 14.9436 **RIPARIAN VEGETATION:** Functional
WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** B **H_2O STAGE:** 2
WATERBODY SLOPE: 1.5 % **BANKFULL WIDTH**: 35 (ft.) **FLOODPLAIN WIDTH**: 100 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder _20_ Cobble _ 40_ Gravel _40_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: This crossing was within 100 feet downstream of TR-1 and was in good condition.

Upstream view from crossing TR-3.

Downstream view from crossing TR-3.

Left bank.

Right bank.

DATE: 7/17/08 **TIME**: 1:45 pm **STATION NO.** TR-3 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Trail Creek (no fish data available)
GPS LATITUDE: 62° 33.684 **GPS LONGITUDE**: 143° 14.798 **RIPARIAN VEGETATION:** Functional
WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** B **H_2O STAGE:** 2
WATERBODY SLOPE: 2 % **BANKFULL WIDTH**: 30 (ft.) **FLOODPLAIN WIDTH**: 150 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder _10_ Cobble _40__ Gravel _50__ Sand ____ Silt/Clay ____ Organic ___
COMMENTS: Crossing in good condition.

Upstream view from crossing TR-4.

Downstream view from crossing TR-4.

Left bank.

Right bank.

DATE: 7/17/08 **TIME**: 1:50 pm **STATION NO.** TR-4 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Trail Creek (no fish data available)
GPS LATITUDE: 62° 33.675 **GPS LONGITUDE**: 143° 14.787 **RIPARIAN VEGETATION:** Functional
WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** B **H_2O STAGE:** 2
WATERBODY SLOPE: 2 % **BANKFULL WIDTH**: 30 (ft.) **FLOODPLAIN WIDTH**: 150 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder _10_ Cobble 40__ Gravel _50_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Crossing in good condition. Between TR-1 and TR-4, 4 random crossings were made, all having similar conditions to the previous crossing. All of the random crossings were in good condition.

Upstream view from crossing TR-5.

Downstream view from crossing TR-5.

Left bank.

Right bank.

DATE: 7/17/08 **TIME**: 2:10 pm **STATION NO.** TR-5 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Trail Creek (no fish data available)
GPS LATITUDE: 62° 33.037 **GPS LONGITUDE**: 143° 14.025 **RIPARIAN VEGETATION:** Functional
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 2
WATERBODY SLOPE: 2 % **BANKFULL WIDTH**: 15 (ft.) **FLOODPLAIN WIDTH**: 300 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _70_ Gravel _30_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Crossing indistinguishable so estimated approximate crossing location. Good condition. Trail is now located entirely in the streambed and no longer on banks (uplands) and continues to follow the streambed until the end of the trail (TR-9 last site documented).

Upstream view from crossing TR-6.

Downstream view from crossing TR-6.

Right bank.

DATE: 7/17/08 **TIME**: 2:25 pm **STATION NO.** TR-6 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Trail Creek (no fish data available)
GPS LATITUDE: 62° 32.872 **GPS LONGITUDE**: 143° 14.050 **RIPARIAN VEGETATION:** Functional – at risk
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 2
WATERBODY SLOPE: 2 % **BANKFULL WIDTH**: 25 (ft.) **FLOODPLAIN WIDTH**: 250 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _70_ Gravel _30_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Crossing in good condition. Made 4 random crossings between TR-5 and TR-6 as there was no distinguishable trail. All of the random crossings were in good condition and were very similar to the conditions found at TR-5.

Upstream view from crossing TR-7.

Downstream view from crossing TR-7.

Left bank.

Right bank.

DATE: 7/17/08 **TIME**: 2:45 pm **STATION NO.** TR-7 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Trail Creek (no fish data available)
GPS LATITUDE: 62° 32.470 **GPS LONGITUDE**: 143° 13.763 **RIPARIAN VEGETATION:** Functional for channel type
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** D **H_2O STAGE:** 2
WATERBODY SLOPE: 1.5 % **BANKFULL WIDTH**: 25 (ft.) **FLOODPLAIN WIDTH**: 300 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _70_ Gravel _30_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Trail was undefined. From TR-6 to TR-7, 5 random crossings were made, all of which were very similar to the crossing at TR-6. All of the random crossings were in good condition

Upstream view from crossing TR-8.

Downstream view from crossing TR-8.

Left bank.

Right bank.

DATE: 7/17/08 **TIME**: 2:55 pm **STATION NO.** TR-8 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Trail Creek (no fish data available)
GPS LATITUDE: 62° 32.225 **GPS LONGITUDE**: 143° 13.410 **RIPARIAN VEGETATION:** Non-functional
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** C **H_2O STAGE:** 2
WATERBODY SLOPE: 1 % **BANKFULL WIDTH**: 30 (ft.) **FLOODPLAIN WIDTH**: 300 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _50__ Gravel _50__ Sand ____ Silt/Clay ____ Organic ___
COMMENTS: Made 3 random crossings between TR-7 and TR-8, all of which have similar conditions to the crossing at TR-7. Trail was undefined. All random crossings were in good condition.

Upstream view from crossing TR-9.

Downstream view from crossing TR-9.

Left bank.

Right bank.

DATE: 7/17/08 **TIME**: 3:10 pm **STATION NO.** TR-9 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Trail Creek (no fish data available)
GPS LATITUDE: 62° 31.940 **GPS LONGITUDE**: 143° 13.438 **RIPARIAN VEGETATION:** Non-functional
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** C **H_2O STAGE:** dry
WATERBODY SLOPE: no data collected **BANKFULL WIDTH**: no data collected **FLOODPLAIN WIDTH**: no data collected **SUBSTRATE (%):** no data collected
COMMENTS: End of trail on the north side of the Nabesna Road, where stream goes subterranean. Between TR-8 and TR-9, made 7 random crossings with similar conditions to TR-8. All random crossing were in good condition. From TR-5 to TR-9, the trail is in the streambed and not on the banks as it was upstream from TR-5.

SODA CREEK TRAIL

Figure 8: Map of survey point on Soda Creek Trail.

Upstream of crossing SC-1.

Downstream of crossing SC-1.

Left bank.

Right bank.

DATE: 7/22/08 **TIME**: 2:41 pm **STATION NO.** SC-1 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Soda Creek – Fork leading to the mineral springs and Soda Lake (no fish data available).
GPS LATITUDE: 62° 32.255 **GPS LONGITUDE**: 142° 55.790 **RIPARIAN VEGETATION:** Non-functional
WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** B **H_2O STAGE:** 3
WATERBODY SLOPE: 3 % **BANKFULL WIDTH**: 5 (ft.) **FLOODPLAIN WIDTH**: 75 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _10_ Gravel _90_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: There are 2 crossings in this location, each about 30 feet apart; both are in good condition. **NOTE:** data collection was started at the fork to the mineral springs and Soda Lake. Assumption was made that there may be approximately 6 more crossings upstream from this junction and that they should be very similar to crossing SC-3 (see below). The composition of the substrate we have been seeing in the streambed is most likely the condition further upstream. We do not anticipate that there will be issues with any additional crossings that may be located upstream.

Upstream view from crossing SC-2.

Downstream view from crossing SC-2.

Left bank.

Right bank.

DATE: 7/22/08 **TIME**: 3:00 pm **STATION NO.** SC-2 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Soda Creek (no fish data available)
GPS LATITUDE: 62° 32.232 **GPS LONGITUDE**: 142° 56.105 **RIPARIAN VEGETATION:** Non-functional
WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** B **H_2O STAGE:** 3
WATERBODY SLOPE: 5 % **BANKFULL WIDTH**: 15 (ft.) **FLOODPLAIN WIDTH**: 300 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _10_ Gravel _90_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Crossing in good condition.

Upstream view from crossing SC-3.

Downstream view from crossing SC-3.

Left bank.

Right bank.

DATE: 7/22/08 **TIME**: 3:07 pm **STATION NO.** SC-3 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Soda Creek (no fish data available)
GPS LATITUDE: 62° 32.193 **GPS LONGITUDE**: 142° 56.172 **RIPARIAN VEGETATION:** Functional – at risk
WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** B **H_2O STAGE:** 3
WATERBODY SLOPE: 4 % **BANKFULL WIDTH**: 20 (ft.) **FLOODPLAIN WIDTH**: 250 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder _5__ Cobble _20__ Gravel _75_ Sand ____ Silt/Clay ____ Organic ____
COMMENTS: Upstream from this point (excluding the fork to Mineral Springs) there are approximately 6 more crossings. Based on topography and general characteristics of the area, the assumption was made that the crossings upstream are very similar to that which is found in this location (see note under crossing SC-1 above).

Upstream view from crossing SC-4.

Downstream view from crossing SC-4.

Left bank.

Right bank.

DATE: 7/22/08 **TIME**: 3:26 pm **STATION NO.** SC-4 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Unnamed tributary to Soda Creek (no fish data available)
GPS LATITUDE: 62° 31.167 **GPS LONGITUDE**: 142° 57.600 **RIPARIAN VEGETATION:** Functional - at risk
WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** B **H_2O STAGE:** 3
WATERBODY SLOPE: 4 % **BANKFULL WIDTH**: 25 (ft.) **FLOODPLAIN WIDTH**: 50 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _20_ Gravel _80__ Sand ____ Silt/Clay ____ Organic ___
COMMENTS: Made 9 random crossings between SC-3 and SC-4, which were very similar to SC-3. All were in good condition.

Upstream view from crossing SC-5.

Downstream view from crossing SC-5.

Left bank.

Right bank.

DATE: 7/22/08 **TIME**: 3:44 pm **STATION NO.** SC-5 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed tributary to Platinum Creek (no fish data available for this tributary or for Platinum Creek)

GPS LATITUDE: 62° 31.103 **GPS LONGITUDE**: 142° 58.157 **RIPARIAN VEGETATION:** Functional – at risk

WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** B **H_2O STAGE:** 3

WATERBODY SLOPE: 2.5 % **BANKFULL WIDTH**: 25 (ft.) **FLOODPLAIN WIDTH**: 500 (ft.)

SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _10_ Gravel _90_ Sand ____ Silt/Clay ____ Organic ____

COMMENTS: Crossing in good condition.

SURVEY METHOD: ❑ Visual Ground ❑ Visual Plane ❑ Visual Helicopter ❑ Net ✗ Trap ❑ Electroshocker

TRAP ID: SCT006 **TRAP CATCH:** 0 **TRAP IN:** 12:41 pm **TRAP OUT:** 3:45 pm **TOTAL TRAP TIME:** 3 hours

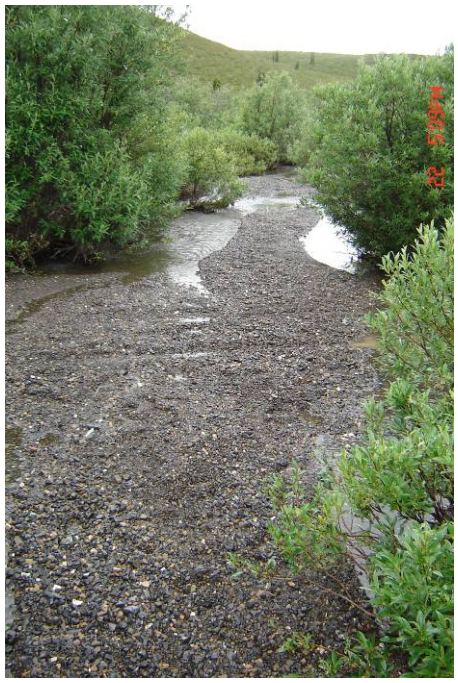
Upstream view from crossing SC-6.

Downstream view from crossing SC-6.

Left bank.

Right bank.

DATE: 7/22/08 **TIME**: 4:37 pm **STATION NO.** SC-6 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Platinum Creek (no fish data available)
GPS LATITUDE: 62° 31.797 **GPS LONGITUDE**: 143° 02.105 **RIPARIAN VEGETATION:** Functional – at risk
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 3
WATERBODY SLOPE: 2.5 % **BANKFULL WIDTH**: 6 (ft.) **FLOODPLAIN WIDTH**: 100 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble ____ Gravel _100__ Sand ___ Silt/Clay ___ Organic ____
COMMENTS: Crossing in good condition.



Downstream view from crossing SC-7.

Left bank.

Right bank. Notice shoe print in the soft substrate.

Upstream view from crossing SC-7.

DATE: 7/22/08 **TIME**: 5:04 pm **STATION NO.** SC-7 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed tributary to Chalk Creek (no fish data for this tributary but Chalk Creek supports round whitefish and grayling near the Nabesna Road)

GPS LATITUDE: 62° 32.323 **GPS LONGITUDE**: 143° 05.988

RIPARIAN VEGETATION: Functional, but some degradation at both bank approaches

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 3

WATERBODY SLOPE: 3.5 % **BANKFULL WIDTH**: 20 (ft.) **FLOODPLAIN WIDTH**: 200 (ft.)

SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble ____ Gravel _70_ Sand _30_ Silt/Clay ____ Organic ____

COMMENTS: Substrate here is very soft (very fine gravels and sand) and releases a lot of fines when disturbed.

SURVEY METHOD: ❑ Visual Ground ❑ Visual Plane ❑ Visual Helicopter ❑ Net ✗ Trap ❑ Electroshocker

TRAP ID: SCT005 **TRAP CATCH:** 0 **TRAP IN:** 12:16 pm **TRAP OUT:** 5:05 pm **TOTAL TRAP TIME:** 5 hours

Additional minnow traps set:

- At 10:17 am set a trap (trap ID: SCT004) on Lost Creek in a random location, not at a crossing where data was collected. Pulled the trap at approximately 6:00 pm. There were no fish in the trap.
- At 12:55 pm a trap (trap ID: SCT008) was set in a random location on Soda Creek, not at a crossing where data was collected. The trap was pulled at approximately 3:15 pm. There were no fish in the trap.

SUSLOTA LAKE TRAIL

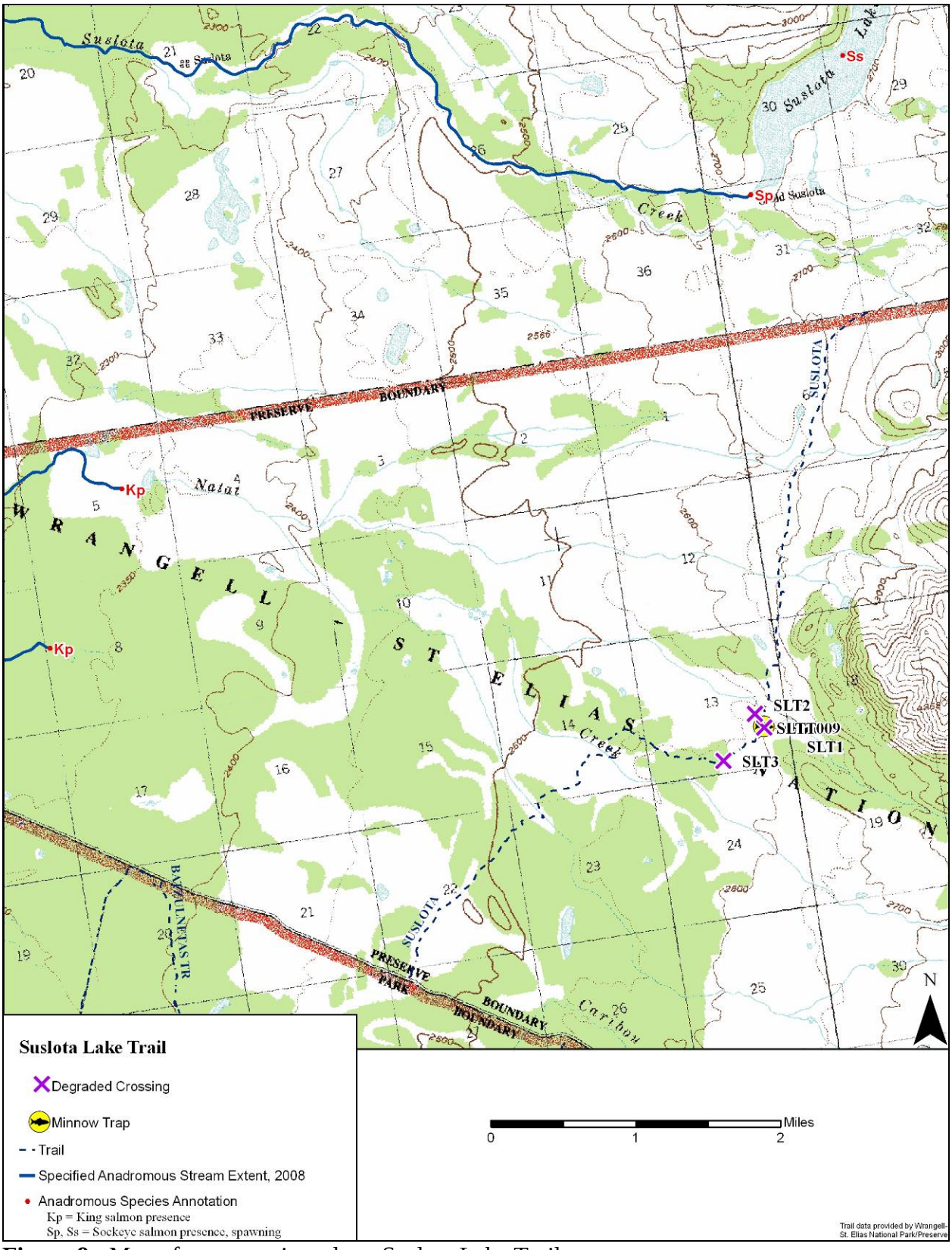


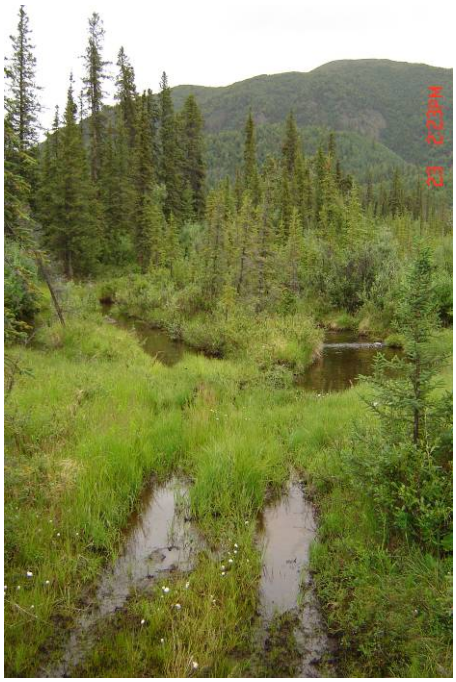
Figure 9: Map of survey points along Suslota Lake Trail.

Downstream view from SLT-1.

Right bank.

Additional view of right bank.

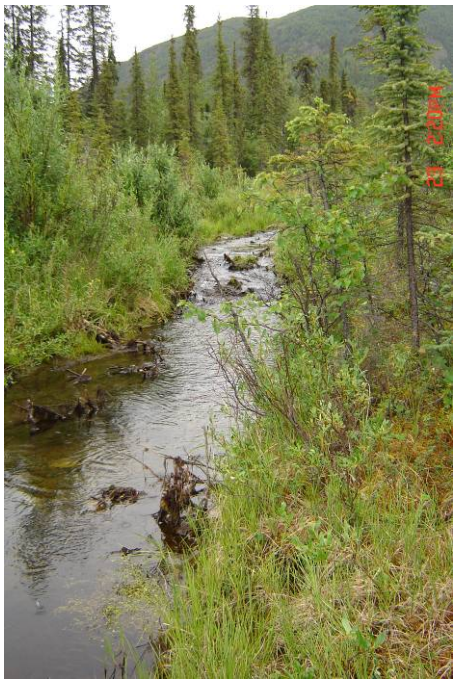
Third view of right bank.



Right bank from SLT-1.

View from further upstream of crossing.

Upstream view from SLT-1.



Additional upstream view.

DATE: 7/23/08 **TIME**: 2:05 pm **STATION NO.** SLT-1 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Natat Creek (no fish data available for this portion of the creek, but this tributary leads to a portion of Natat Creek that is cataloged as king present and king spawning, approximately 4 miles downstream)

GPS LATITUDE: 62° 38.669 **GPS LONGITUDE**: 143° 37.850

RIPARIAN VEGETATION: Functional, but degradation at both bank approaches

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 5

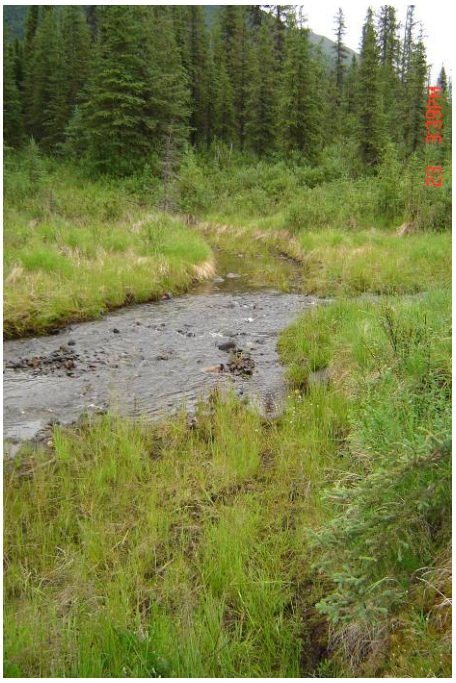
WATERBODY SLOPE: 4 % **BANKFULL WIDTH**: 5 (ft.) **FLOODPLAIN WIDTH**: 150 (ft.)

SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble ____ Gravel __ Sand _50_ Silt/Clay __ Organic 50

COMMENTS: Crossing in very poor condition. There are three cuts perpendicular to the stream from ATV use, each cut less than 50 ft. apart. These cuts are causing rutting in the streambed as the substrate is somewhat soft and altering water flow where water backs up into the cuts during high flows.

SURVEY METHOD: ❑ Visual Ground ❑ Visual Plane ❑ Visual Helicopter ❑ Net ✗ Trap ❑ Electroshocker

TRAP ID: SLTT009 **TRAP CATCH:** 0 **TRAP IN:** 2:00 pm **TRAP OUT:** 3:30 pm **TOTAL TRAP TIME:** 3 hours



Right bank of SLT-2.

Downstream view from crossing SLT-2.

Left bank.

Upstream view from crossing.

DATE: 7/23/08 **TIME**:3:35 pm **STATION NO.** SLT-2 **HABITAT :** Riffle, pool **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Natat Creek (no fish data available for this portion of the creek, but this tributary leads to a portion of Natat Creek that is cataloged as king present and king spawning, approximately 4 miles downstream).

GPS LATITUDE: 62° 38.758 **GPS LONGITUDE**: 143° 37.941 **RIPARIAN VEGETATION:** Functional

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 5

WATERBODY SLOPE: 4 % **BANKFULL WIDTH**: 3 (ft.) **FLOODPLAIN WIDTH**: 125 (ft.)

SUBSTRATE (%): Bedrock ____ Boulder __5_ Cobble _25__ Gravel _20_ Sand _30_ Silt/Clay _10_ Organic 10

COMMENTS: This crossing is located approximately 100 ft downstream from the previous crossing (SLT-1). This crossing appears to be much more suitable and in better condition than the upstream crossing. The approaches are mildly steep, but the crossing itself is naturally hardened with cobbles.

Upstream view from crossing SLT-3.

Downstream view from crossing SLT-3.

Left bank.

Right bank.

DATE: 7/23/08 **TIME**: 4:05 pm **STATION NO.** SLT-3 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Natat Creek (no fish data available for this portion of the creek, but this tributary leads to a portion of Natat Creek that is cataloged as king present and king spawning, approximately 4 miles downstream).

GPS LATITUDE: 62° 38.510 **GPS LONGITUDE**: 143° 38.439

RIPARIAN VEGETATION: Functional, but degradation at both bank approaches

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 4

WATERBODY SLOPE: 3 % **BANKFULL WIDTH**: 3 (ft.) **FLOODPLAIN WIDTH**: 75 (ft.)

SUBSTRATE (%): Bedrock ___Boulder ___ Cobble ___ Gravel ___ Sand _20_ Silt/Clay _70__ Organic _10__

COMMENTS: Heavily scarred crossing, much like the conditions found at SLT-1, although much drier right before the approaches. Like SLT-1, there are 3 cuts at the crossing, each about 25 feet apart, with very deep ruts, approximately 1-2 feet deep. It was difficult to ascertain where the stream channel location is at the crossing.

TANADA LAKE TRAIL

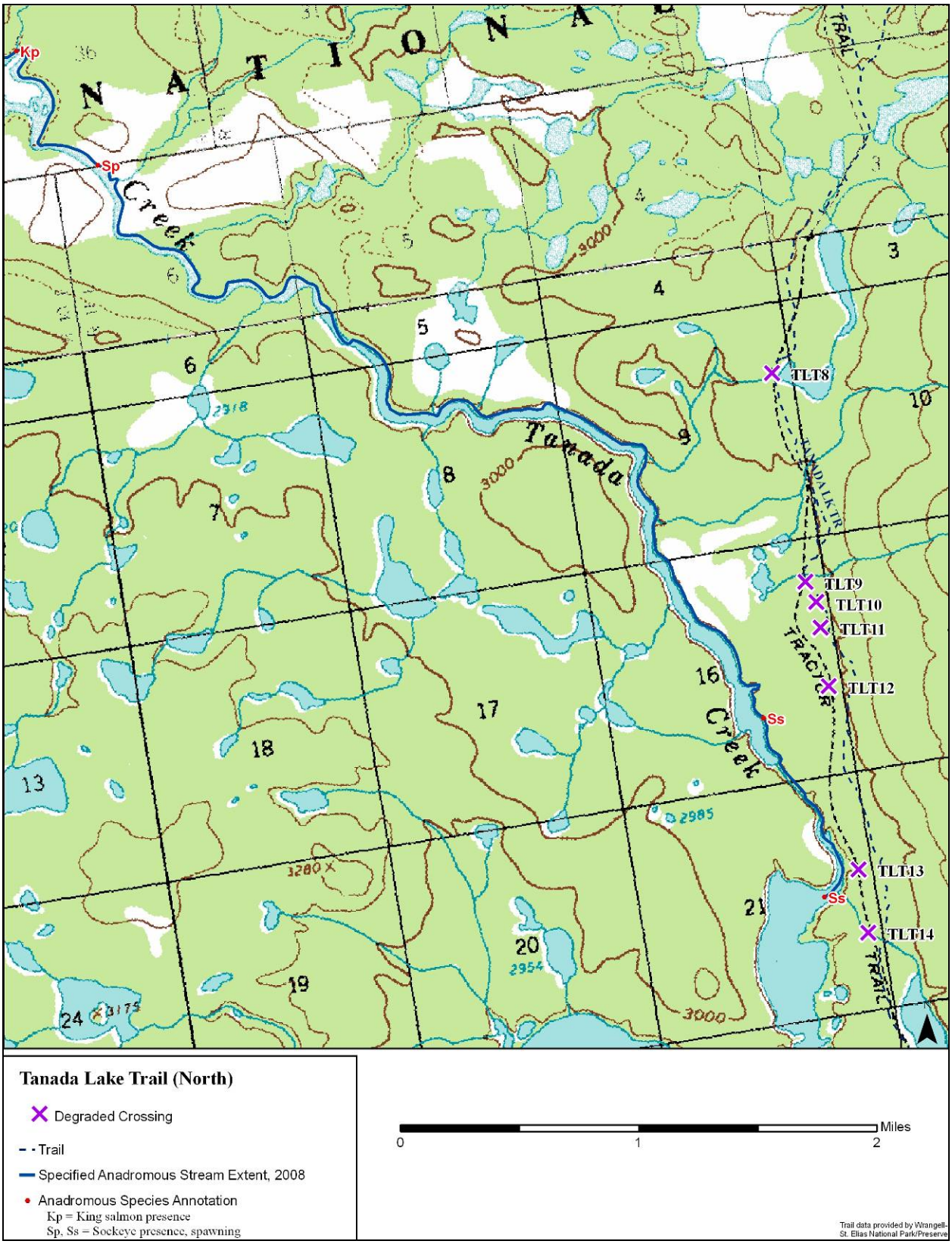


Figure 10: Map of survey points along the northern portion of Tanada Lake Trail.

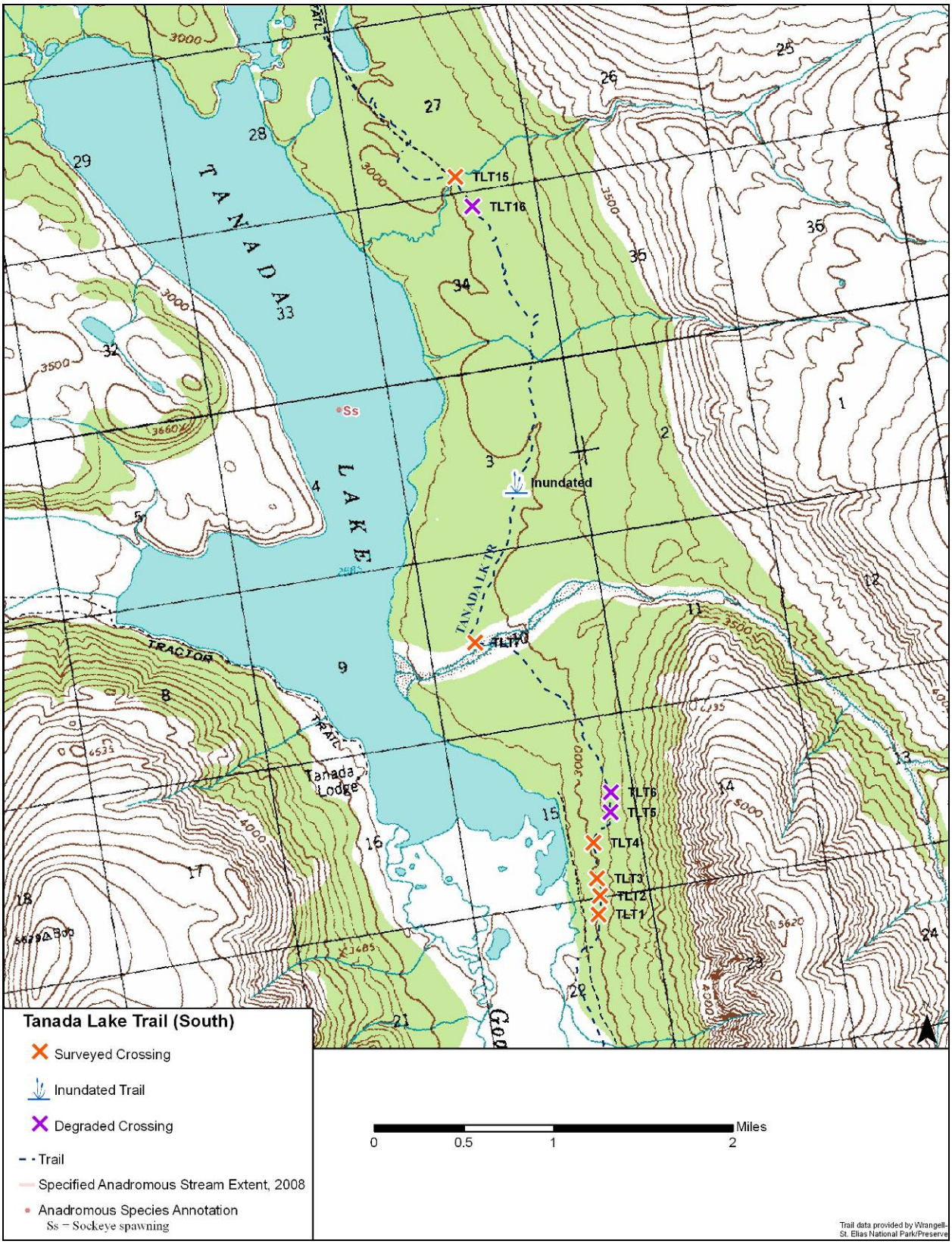


Figure 11: Map of survey points along the southern portion of Tanada Lake Trail.

*Errata: Figure 11 should have crossings TLT1 and TLT4 denoted in purple instead of orange.

Downstream view from crossing TLT-1.

Left bank.

Right bank.

Upstream view.

DATE: 8/22/08 **TIME**: 12:30 pm **STATION NO.** TLT-1 **HABITAT :** Seep, Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed, intermittent tributary to Tanada Lake (no fish data available for this tributary but it leads to Tanada Lake which is cataloged as sockeye spawning and also supports burbot, slimy sculpin and grayling).

GPS LATITUDE: 62° 22.751 **GPS LONGITUDE**: 143° 20.755

RIPARIAN VEGETATION: Functional, but rutting at both approaches

WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** A **H_2O STAGE:** 4

WATERBODY SLOPE: 12 % **BANKFULL WIDTH**: 1 (ft.) **FLOODPLAIN WIDTH**: 1 (ft.)

SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _5__ Gravel _5__ Sand _10__ Silt/Clay _80_ Organic ___

COMMENTS: There may be about 6 more crossings south of this one. Suspect that any additional crossings would drain through wetlands and into the south end of Tanada Lake, which is a large wetland area with some distance to Goat Creek.

Upstream view from crossing TLT-2.

Downstream view from crossing.

Left bank.

Right bank.

DATE: 8/22/08 **TIME**: 12:46 pm **STATION NO.** TLT-2 **HABITAT :** Seep, Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed, intermittent tributary to Tanada Lake (no fish data available for this tributary but it leads to Tanada Lake which is cataloged as sockeye spawning and also supports burbot, slimy sculpin and grayling).

GPS LATITUDE: 62° 22.838 **GPS LONGITUDE**: 143° 20.707 **RIPARIAN VEGETATION:** Functional

WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** A **H_2O STAGE:** 4

WATERBODY SLOPE: 12 % **BANKFULL WIDTH**: 1 (ft.) **FLOODPLAIN WIDTH**: 1 (ft.)

SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _50_ Gravel _30_ Sand _20_ Silt/Clay __ Organic___

COMMENTS: Approaches to the crossing are soft, but crossing is in good condition.

Upstream view from crossing TLT-3.

Downstream view from crossing.

Left bank.

Right bank.

DATE: 8/22/08 **TIME**: 1:01 pm **STATION NO.** TLT-3 **HABITAT :** Seep, Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed, intermittent tributary to Tanada Lake (no fish data available for this tributary but it leads to Tanada Lake which is cataloged as sockeye spawning and also supports burbot, slimy sculpin and grayling).

GPS LATITUDE: 62° 22.928 **GPS LONGITUDE**: 143° 20.709 **RIPARIAN VEGETATION:** Functional

WATERBODY TYPE: stream **FLOODPLAIN:** V-shaped **STREAM MORPHOLOGY:** A **H_2O STAGE:** 4

WATERBODY SLOPE: 15 % **BANKFULL WIDTH**: 1 (ft.) **FLOODPLAIN WIDTH**: 1 (ft.)

SUBSTRATE (%): Bedrock ___Boulder ____ Cobble _20__ Gravel _30_ Sand _10__ Silt/Clay _20_ Organic _20_

COMMENTS: Much like the previous crossings, water from the trail drains into the stream at the crossing.

Upstream view from crossing TLT-4.

Downstream view.

Left bank.

Right bank.

DATE: 8/22/08 **TIME**: 1:17 pm **STATION NO.** TLT-4 **HABITAT :** Seep, Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed, intermittent tributary to Tanada Lake (no fish data available for this tributary but it leads to Tanada Lake which is cataloged as sockeye spawning and also supports burbot, slimy sculpin and grayling).

GPS LATITUDE: 62° 23.096 **GPS LONGITUDE**: 143° 22.687

RIPARIAN VEGETATION: Functional, but rutting at both approaches

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** A **H_2O STAGE:** 4

WATERBODY SLOPE: 7 % **BANKFULL WIDTH**: 1 (ft.) **FLOODPLAIN WIDTH**: 3 (ft.)

SUBSTRATE (%): Bedrock ___Boulder ____ Cobble ___ Gravel _10_ Sand __ Silt/Clay _20_ Organic _70_
COMMENTS: Stream drains through a wetland.

Upstream view from crossing TLT-5.

Downstream view from crossing TLT-5.

Left bank.

Right bank.

DATE: 8/22/08 **TIME**: 1:45 pm **STATION NO.** TLT-5 **HABITAT :** Undefined seep **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed, intermittent tributary to Tanada Lake (no fish data available for this tributary but it leads to Tanada Lake which is cataloged as sockeye spawning and also supports burbot, slimy sculpin and grayling).

GPS LATITUDE: 62° 23.227 **GPS LONGITUDE**: 143° 20.461

RIPARIAN VEGETATION: Functional – at risk, with extensive rutting at both approaches

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** A **H_2O STAGE:** 4

WATERBODY SLOPE: 9 % **BANKFULL WIDTH**: 1 (ft.) **FLOODPLAIN WIDTH**: 3 (ft.)

SUBSTRATE (%): Bedrock ___Boulder ____ Cobble ___ Gravel ___ Sand ___ Silt/Clay __ Organic _100_

COMMENTS: Crossing very soft and with multiple tracks running through it. Additional crossing only 50 feet away from this one and in similar condition.

Upstream view from crossing TLT-6.

Downstream view from crossing.

Left bank.

Right bank.

DATE: 8/22/08 **TIME**: 1:55 pm **STATION NO.** TLT-6 **HABITAT :** Undefined seep **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed, intermittent tributary to Tanada Lake (no fish data available for this tributary but it leads to Tanada Lake which is cataloged as sockeye spawning and also supports burbot, slimy sculpin and grayling).

GPS LATITUDE: 62° 23.322 **GPS LONGITUDE**: 143° 20.424 **RIPARIAN VEGETATION:** Functional

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** A **H_2O STAGE:** 4

WATERBODY SLOPE: 14 % **BANKFULL WIDTH**: 1 (ft.) **FLOODPLAIN WIDTH**: 1 (ft.)

SUBSTRATE (%): Bedrock ___Boulder ____ Cobble ___ Gravel _10_ Sand _70_ Silt/Clay _10_ Organic _10_

COMMENTS: This crossing could be an impediment to passage for juveniles, if present. Additional crossing only 50 feet away from this one and in similar condition, but without the potential passage issue.

Upstream view from crossing TLT-7.

Downstream view from crossing.

Left bank.

Right bank.

DATE: 8/22/08 **TIME**: 2:42 pm **STATION NO.** TLT-7 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Large, unnamed tributary to Tanada Lake (no fish data available for this tributary but it leads to Tanada Lake which is cataloged as sockeye spawning and also supports burbot, slimy sculpin and grayling).

GPS LATITUDE: 62° 24.144 **GPS LONGITUDE**: 143° 21.587 **RIPARIAN VEGETATION:** Functional-At Risk

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 4

WATERBODY SLOPE: 2.5 % **BANKFULL WIDTH**: 25 (ft.) **FLOODPLAIN WIDTH**: 140 (ft.)

SUBSTRATE (%): Bedrock ___Boulder ____ Cobble _50_ Gravel _40_ Sand _10_ Silt/Clay __ Organic __

COMMENTS: Large tributary to Tanada Lake which is obvious on quad map. Crossing in good condition.

Inundated portion of trail located between crossings TLT-7 and TLT-16 (see Figure 9 above)

A portion of Tanada Lake Trail (located between crossings TLT-7 and TLT-16) is inundated with runoff from wetlands to the east of the trail. There was no discernible crossing. Refer to Figure 10 above for the location of this site. It appears that water from the adjacent wetland has been intercepted by the trail, and a portion of the trail has essentially become a new streambed. This could also simply be sheet flow from above average precipitation this year.

Upstream view from crossing TLT-8.

Downstream view from crossing.

Left bank.

Right bank.

DATE: 8/23/08 **TIME**: 1:52 pm **STATION NO.** TLT-8 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed tributary to Tanada Creek (no fish data available for this tributary but it leads to a portion of Tanada Creek which is cataloged as sockeye present and king present. Tanada Creek also supports grayling and slimy sculpin).

GPS LATITUDE: 62° 29.503 **GPS LONGITUDE**: 143° 22.230

RIPARIAN VEGETATION: Functional, with rutting at both approaches

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** A **H_2O STAGE:** 5

WATERBODY SLOPE: 5 % **BANKFULL WIDTH**: 7 (ft.) **FLOODPLAIN WIDTH**: 20 (ft.)

SUBSTRATE (%): Bedrock ___Boulder _10_ Cobble _50_ Gravel _30_ Sand _10_ Silt/Clay __ Organic __

COMMENTS: This crossing is located at the northernmost part of the trail (even though it is labeled #8). Weakened approaches on both banks. This crossing is less than a mile from Tanada Creek. **NOTE:** There was one crossing about 100 ft. north of this crossing that was discovered during the aerial recon done the next day. It appeared to be in the same condition of this crossing.

Upstream view from crossing TLT-9.

Downstream view from crossing.

Right bank.

Left bank.

Additional view of left bank.

DATE: 8/23/08 **TIME**: 2:32 pm **STATION NO.** TLT-9 **HABITAT :** Undefined seep **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Unnamed, intermittent tributary to unnamed pond (no fish data available).
GPS LATITUDE: 62° 28.735 **GPS LONGITUDE**: 143° 22.231
RIPARIAN VEGETATION: Functional – at risk, with severe rutting at both approaches
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 5
WATERBODY SLOPE: 4 % **BANKFULL WIDTH**: n/a **FLOODPLAIN WIDTH**: n/a
SUBSTRATE (%): Bedrock ___Boulder __ Cobble __ Gravel _10_ Sand _50_ Silt/Clay __ Organic _40_
COMMENTS: Channel fans out into wetland, therefore no defined bed and bank. Drains into unnamed pond and not into Tanada Lake. Degraded approaches on both banks may contribute to water quality issues in the pond.

Upstream view from crossing TLT-10.

Downstream view from crossing TLT-10.

Left bank.

Right bank.

DATE: 8/23/08 **TIME**: 2:50 pm **STATION NO.** TLT-10 **HABITAT :** Seep, Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Unnamed, intermittent tributary to Tanada Creek (no fish data available for this tributary but it leads to a portion of Tanada Creek that is cataloged as sockeye present and king present. Tanada Creek also supports grayling and slimy sculpin).
GPS LATITUDE: 62° 28.659 **GPS LONGITUDE**: 143° 22.166
RIPARIAN VEGETATION: Functional, with moderate rutting at both approaches
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 5
WATERBODY SLOPE: 2 % **BANKFULL WIDTH**: 1 (ft.) **FLOODPLAIN WIDTH**: 6 (ft.)
SUBSTRATE (%): Bedrock ___Boulder __ Cobble __ Gravel _80_ Sand __ Silt/Clay _10_ Organic _10_
COMMENTS: Degraded crossing may contribute to water quality issues.

Upstream view from crossing TLT-11.

Downstream view from crossing.

Left bank.

Right bank.

DATE: 8/23/08 **TIME**: 3:04 pm **STATION NO.** TLT-11 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed, intermittent tributary to Tanada Creek (no fish data available for this tributary but it leads to a portion of Tanada Creek that is cataloged as having sockeye present and king present. Tanada Creek also supports grayling and slimy sculpin).

GPS LATITUDE: 62° 28.565 **GPS LONGITUDE**: 143° 22.169

RIPARIAN VEGETATION: Functional, with moderate rutting at both approaches

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 5

WATERBODY SLOPE: 4 % **BANKFULL WIDTH**: 1 (ft.) **FLOODPLAIN WIDTH**: 3 (ft.)

SUBSTRATE (%): Bedrock ___Boulder __ Cobble __ Gravel _50_ Sand __ Silt/Clay _50_ Organic __

COMMENTS: Degraded crossing may contribute to water quality issues.

Upstream view from crossing TLT-12.

Downstream view from crossing.

Left bank.

Right bank.

DATE: 8/23/08 **TIME**: 3:17 pm **STATION NO.** TLT-12 **HABITAT :** Undefined seep **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed, intermittent tributary to Tanada Creek (no fish data available for this tributary but it leads to a portion of Tanada Creek that is cataloged as having sockeye present, sockeye spawning and king present. Tanada Creek also supports grayling and slimy sculpin).

GPS LATITUDE: 62° 28.350 **GPS LONGITUDE**: 143° 22.179

RIPARIAN VEGETATION: Functional – at risk, with moderate rutting at both approaches

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 5

WATERBODY SLOPE: 4 % **BANKFULL WIDTH**: 1 (ft.) **FLOODPLAIN WIDTH**: 6 (ft.)

SUBSTRATE (%): Bedrock ___Boulder __ Cobble __ Gravel __ Sand __ Silt/Clay __ Organic _100_

COMMENTS: Drains through a wetland and into Tanada Creek where there is sockeye spawning habitat. The crossing, which is located approximately 1500 feet from the creek, is degraded and may contribute to water quality issues and have potential negative impact to spawning habitat.

Upstream view from crossing TLT-13.

Downstream view from crossing TLT-13.

Left bank.

Right bank.

DATE: 8/23/08 **TIME**: 4:00 pm **STATION NO.** TLT-13 **HABITAT :** Undefined seep **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed, intermittent tributary to Tanada Creek (no fish data available for this tributary but it leads to a portion of Tanada Creek that is cataloged as having sockeye present, sockeye spawning and king present. Tanada Creek also supports grayling and slimy sculpin).

GPS LATITUDE: 62° 27.676 **GPS LONGITUDE**: 143° 22.179

RIPARIAN VEGETATION: Functional – at risk, with moderate rutting on both approaches

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 5

WATERBODY SLOPE: 3 % **BANKFULL WIDTH**: 2 (ft.) **FLOODPLAIN WIDTH**: 20 (ft.)

SUBSTRATE (%): Bedrock ___Boulder __ Cobble __ Gravel _10_ Sand _40_ Silt/Clay __ Organic _50_

COMMENTS: Stream runs through a wetland, into the crossing and then channels into Tanada Creek where there is sockeye spawning habitat. The crossing, which is located approximately 400 feet from the creek, is degraded and may contribute to water quality issues and have potential negative impact to spawning habitat.

Upstream view from crossing TLT-14.

Downstream view from crossing.

Left bank.

Additional view of left bank.

DATE: 8/23/08 **TIME**: 4:30 pm **STATION NO.** TLT-14 **HABITAT :** Undefined seep **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed tributary to Tanada Lake (no fish data available for this tributary but it leads to Tanada Lake which is cataloged as sockeye spawning. Tanada Lake also supports burbot, grayling and slimy sculpin).

GPS LATITUDE: 62° 27.444 **GPS LONGITUDE**: 143° 22.180

RIPARIAN VEGETATION: Functional - at risk, with significant rutting on left bank approach

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 5

WATERBODY SLOPE: 2 % **BANKFULL WIDTH**: 1 (ft.) **FLOODPLAIN WIDTH**: 20 (ft.)

SUBSTRATE (%): Bedrock ___Boulder __ Cobble __ Gravel __ Sand __ Silt/Clay __ Organic _100_

COMMENTS: Crossing very degraded and located within 1500 ft. of Tanada Lake. Not possible to cross with high water conditions and unsure about ability to cross with lower water levels. Current conditions contribute to water quality issues.

Upstream view from crossing TLT-15.

Downstream view from crossing.

Left bank.

Right bank.

DATE: 8/24/08 **TIME**: 10:41 am **STATION NO.** TLT-15 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed tributary to Tanada Lake (no fish data available for this tributary but it leads to Tanada Lake which is cataloged as sockeye spawning. Tanada Lake also supports burbot, grayling and slimy sculpin).

GPS LATITUDE: 62° 26.375 **GPS LONGITUDE**: 143° 20.998 **RIPARIAN VEGETATION:** Functional

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 1

WATERBODY SLOPE: 4 % **BANKFULL WIDTH**: 30 (ft.) **FLOODPLAIN WIDTH**: 60 (ft.)

SUBSTRATE (%): Bedrock ___Boulder _30_ Cobble _50_ Gravel _20_ Sand __ Silt/Clay __ Organic __

COMMENTS: Partially degraded left bank.

Upstream view from crossing TLT-16.

Downstream view from crossing.

Left bank.

Right bank.

DATE: 8/24/08 **TIME**: 11:00 am **STATION NO.** TLT-16 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed tributary to Tanada Lake (no fish data available for this tributary but it leads to Tanada Lake which is cataloged as sockeye spawning. Tanada Lake also supports burbot, grayling and slimy sculpin).

GPS LATITUDE: 62° 26.219 **GPS LONGITUDE**: 143° 20.871 **RIPARIAN VEGETATION:** Functional

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 4

WATERBODY SLOPE: 2 % **BANKFULL WIDTH**: 1 (ft.) **FLOODPLAIN WIDTH**: 3 (ft.)

SUBSTRATE (%): Bedrock ___Boulder __ Cobble _5_ Gravel _20_ Sand __ Silt/Clay __ Organic _95_
COMMENTS: Approaches are short but steep, and slightly eroded.

REEVE FIELD TRAIL

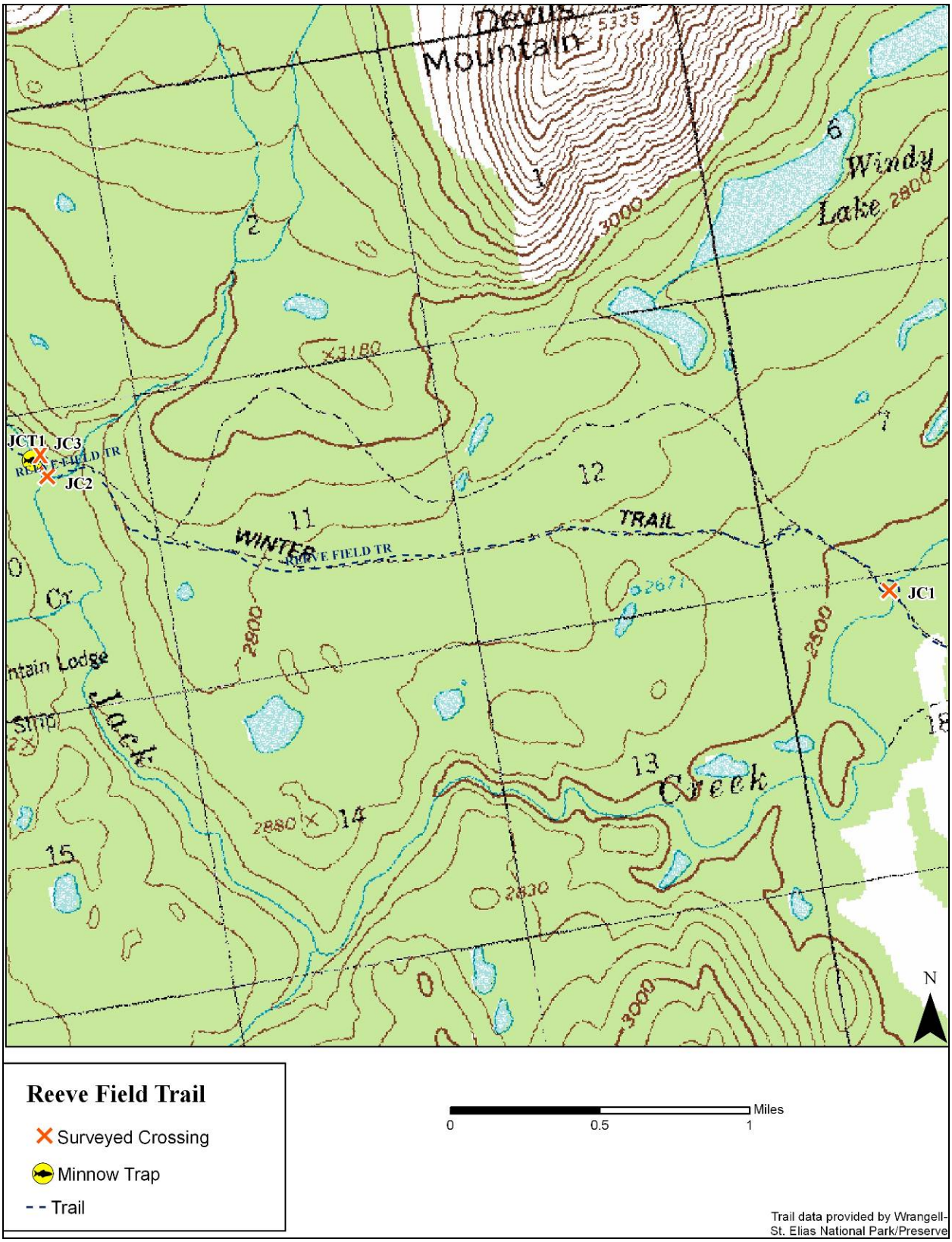


Figure12: Map of survey points on Reeve Field Trail.

Upstream view from crossing JC-1.

Downstream view.

Left bank.

Right bank.

DATE: 9/20/08 **TIME**: 1:15 pm **STATION NO.** JC-1 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Jack Creek (supports grayling, slimy sculpin and burbot)
GPS LATITUDE: 62° 23.649 **GPS LONGITUDE**: 142°53.490 **RIPARIAN VEGETATION:** Functional
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** C **H_2O STAGE:** 3
WATERBODY SLOPE: 1.5 % **BANKFULL WIDTH**: 85 (ft.) **FLOODPLAIN WIDTH**: 120 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _15_ Gravel _60_ Sand _20_ Silt/Clay _5__ Organic ____
COMMENTS: Crossing in good condition.

Upstream view from crossing JC-2.

Downstream view.

Left bank.

Right bank.

DATE: 9/20/08 **TIME**: 3:20 pm **STATION NO.** JC-2 **HABITAT :** Riffle **WATER COLOR:** Clear

WATERBODY NAME/DESCRIPTION: Unnamed tributary to Jack Creek (no fish data for this tributary but it leads to Jack Creek which supports grayling, slimy sculpin and burbot).

GPS LATITUDE: 62° 24.378 **GPS LONGITUDE**: 142°58.572 **RIPARIAN VEGETATION:** Functional

WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** B **H_2O STAGE:** 3

WATERBODY SLOPE: 3.5 % **BANKFULL WIDTH**: 16 (ft.) **FLOODPLAIN WIDTH**: 60 (ft.)

SUBSTRATE (%): Bedrock ___ Boulder _15__ Cobble _35_ Gravel _50_ Sand _10_ Silt/Clay ___ Organic _____

COMMENTS: Crossing in good condition.

Upstream view from crossing JC-3.

Downstream view.

Left bank.

Right bank.

DATE: 9/20/08 **TIME**: 3:40 pm **STATION NO.** JC-3 **HABITAT :** Riffle **WATER COLOR:** Clear
WATERBODY NAME/DESCRIPTION: Jack Creek (supports grayling, slimy sculpin and burbot).
GPS LATITUDE: 62° 24.424 **GPS LONGITUDE**: 142°58.628 **RIPARIAN VEGETATION:** Functional
WATERBODY TYPE: stream **FLOODPLAIN:** flat **STREAM MORPHOLOGY:** C **H_2O STAGE:** 3
WATERBODY SLOPE: 2 % **BANKFULL WIDTH**: 120 (ft.) **FLOODPLAIN WIDTH**: 180 (ft.)
SUBSTRATE (%): Bedrock ____ Boulder ____ Cobble _40_ Gravel _40_ Sand _20_ Silt/Clay ___ Organic _____
COMMENTS: Crossing in good condition.

SURVEY METHOD: ❑ Visual Ground ❑ Visual Plane ❑ Visual Helicopter ❑ Net ✗ Trap ❑ Electroshocker

TRAP ID: JCT1 **TRAP CATCH:** 0 **TRAP IN:** 10:45 am **TRAP OUT:** 3:45 pm **TOTAL TRAP TIME:** 5 hours

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APPENDIX B

Site						Fish Data			
Site ID	Trail	Stream Name	Latitude (N) NAD 83	Longitude (W) NAD 83	Date Surveyed	Fish Inventor-ied	Habitat Features	ADF&G Cataloged Fish Data **Kp**=king present; **Ks**=king spawning; **Sp**=sockeye present; **Ss**=sockeye spawning	NPS Fish Data **LT**=lake trout, **GR**=grayling, **CN**=slimy sculpin, **RB**=burbot, **KO**=kokanee, **RW**=round whitefish, **C**=coho salmon, **K**=king salmon, **S**=sockeye salmon
CC1	Caribou Creek Trail	Unnamed trib to Natat Creek	62.60543	-143.469600	7/18/2008	none	Riffle	No data available for this portion of Natat Creek, but this trib leads to the portion of Natat Creek (212-20-10080-2605-3023) that has Kp, Ks	No data available
CC2	Caribou Creek Trail	Unnamed trib to Natat Creek	62.59503	-143.472770	7/18/2008	none	Riffle	No data available for this portion of Natat Creek, but this trib leads to the portion of Natat Creek (212-20-10080-2605-3023) that has Kp, Ks	No data available
CC3	Caribou Creek Trail	Unnamed Trib to Caribou Creek	62.57737	-143.48918	39647	none	Pool, Side Channel	No data available	No data available but this tributary leads to Caribou Creek where CN have been collected
CL1	Copper Lake Trail	Unnamed trib from Tanada Peak Glacier to Copper River	62.33508	-143.67883	7/22/2008	none	Riffle, Pool	No data available but this unnamed trib leads to an uncataloged portion of the Copper River	No data available
CL2	Copper Lake Trail	Unnamed trib from Tanada Peak Glacier to Copper River	62.39251	-143.698890	7/22/2008	none	Riffle	No data available but this unnamed trib leads to an uncataloged portion of the Copper River	No data available
CL3	Copper Lake Trail	Copper Lake Outlet to Copper River	62.41454	-143.661130	7/22/2008	none	Riffle, Pool	No data available, but this unnamed trib leads to the Copper River (212-20-10080) which is cataloged as having Sp in the stretch of river where this trib enters	No data available in the creek but it is the outlet to Copper Lake where RB, LT, KO, S, GR have been collected
CL4	Copper Lake Trail	Unnamed trib to Copper River	62.45632	-143.640790	7/22/2008	none	Riffle, Pool	No data available, but this unnamed trib leads to the Copper River (212-20-10080) which is cataloged as having Sp in the stretch of river where this trib enters	No data available
CL5	Copper Lake Trail	Unnamed trib to Copper River	62.49068	-143.629130	7/22/2008	none	Riffle	No data available, but this unnamed trib leads to the Copper River (212-20-10080) which is cataloged as having Sp in the stretch of river where this trib enters	No data available
CL6	Copper Lake Trail	Unnamed trib to Copper River	62.52738	-143.641910	7/22/2008	none	Riffle, Pool	No data available, but this unnamed trib leads to the Copper River (212-20-10080) which is cataloged as having Sp in the stretch of river where this trib enters	No data available
CL7	Copper Lake Trail	Unnamed trib to Copper River	62.56690	-143.680990	7/22/2008	none	Riffle	No data available, but this unnamed trib leads to the Copper River (212-20-10080) which is cataloged as having Sp in the stretch of river where this trib enters	No data available
TC1	Copper Lake Trail	Tanada Creek	62.34851	-143.416640	7/23/2008	none	Pool	At the location of this crossing, Tanada Creek (212-20-10080-2655) is cataloged as having Kp and Sp. However further upstream towards Tanada Lake it also has Ss	GR (juvenile/adult, juvenile); CN (adult)
BT1	Boomerang Lake Trail	Copper River	62.53993	-143.67371	7/21/2008	none	Riffle, Side Channel	This portion of the Copper River (212-20-10080) is cataloged as having Sp	K, S, C (adult)
DC1	Boomerang Lake Trail	Drop Creek	62.56063	-143.8058	39650	none	Riffle	No data available	K (adult)

Site	Stream							Substrate Composition (%)					
Site ID	Bankfull Width (ft)	Flood-plain width (ft)	Waterbody Slope (%)	Rosgen Stream Morphology Classification	Water Color	Riparian Vegetation	Water Level 1-5 (1=low, 5=high)	Boulder	Cobble	Gravel	Sand	Silt/Clay	Organic
CC1	15	50	6	A	Clear	Functional	1	10	40	50			
CC2	30	45	5	A	Clear	Functional	3	10	40	50			
CC3	20	50-100	1	unknown	Clear	Functional	1			10	20	70	
CL1	75	300+	est. 2* *Slope is a visual estimate; clinometer was unavailable	C	Clear	Functional	3		50	50			
CL2	50	100+	est. 2*	B	Clear	Functional	3	5	40	55			
CL3	50	150	est. 2*	C (at flood stage therefore difficult to assess morphology)	Clear	Functional	4			100			
CL4	20	50	est. 2*	B	Clear, Stained	Functional	3	20	60	20			
CL5	10	25	est. 2*	B	Clear, Stained	Functional	3		50	50			
CL6	10	25	est. 2*	B	Clear	Functional	4		50	50			
CL7	15	30	est. 2*	B	Clear, Stained	Functional	4		50	40	10		
TC1	30	75	1.5	C	Clear, Stained	Functional	4			100			
BT1	50	500	1	D	Glacial	Functional for channel type	3		25	25		50	
DC1	variable	variable	0.5	D	Glacial	Functional for channel type	3		75	20		5	

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Site	Crossing		Comments
Site ID	Negative Impact to Fish Habitat	Barrier to Fish Passage	
CC1	No	None	
CC2	No	None	Appears that the original north-bound crossing has washed out and an alternate path created
CC3	No	None	Crossing has been hardened.
CL1	No	None	Steep entry on left bank.
CL2	No , but may need to be improved with increased use	None	Adequate for current level of use, but right hand trail approach is partially degraded.
CL3	No	None	No discernable crossing (trail fans out). May be a crossing toward the Copper River near a private cabin.
CL4	No	None	Trail approaches mostly rock. Stream dropping off a high bench into the Copper River.
CL5	No	None	Trail approaches gradual and rock/sand and both approaches are downcut and partially degraded. Stream dropping off high bench into the Copper.
CL6	No , but may need to be improved with increased use	None	3 crossings at site. Approaches are set back 10 ft. from channel and both are downcut and degraded. Flooded with semi-solid, muddy base. Some entrenchment from ATV tracks. Possible run-off from upland portion of trail.
CL7	No , but may need to be improved with increased use	None	Trail approaches to stream are set back, mostly sand, low grade with minor run-off from upland portion of trail. Both are downcut and partially degraded.
TC1	Possible - further assessment suggested	None	to high water, but appears to be in good condition with little to no erosion. Unable to get photo of left bank due to inability to cross stream. . Additionally, the trail leading down to the crossing runs close along the bank of the stream in a few areas. Over time, there could be bank erosion
BT1	No	None	Trailhead, but old crossing, appears to be a better crossing a few hundred feet upstream. It was very difficult to identify an actual crossing since the trail is not heavily used. The data collected was taken from a representative reach within the general area of the suspected crossing.
DC1	No	None	It was very difficult to identify an actual crossing since the trail is not heavily used. The data collected was taken from a representative reach within the general area of the suspected crossing. Tried to locate Latitude: 62° 33'36.8", Longitude: 143° 48'34.8" and believe we were in close proximity to this location, but were not able to specifically identify trail location.

Site						Fish Data			
Site ID	Trail	Stream Name	Latitude (N) NAD 83	Longitude (W) NAD 83	Date Surveyed	Fish Inventor-ied	Habitat Features	ADF&G Cataloged Fish Data **Kp**=king present; **Ks**=king spawning; **Sp**=sockeye present; **Ss**=sockeye spawning	NPS Fish Data **LT**=lake trout, **GR**=grayling, **CN**=slimy sculpin, **RB**=burbot, **KO**=kokanee, **RW**=round whitefish, **C**=coho salmon, **K**=king salmon, **S**=sockeye salmon
TLT1	Tanada Lake Trail	Unnamed, intermittent trib to Tanada Lake	62.37919	-143.345926	8/22/2008	none	Seep, Riffle	No data available, but this unnamed trib leads to Tanada Lake (212-20-10080-2655-0010) which is cataloged as Ss	No data available for this unnamed tributary but it flows into Tanada Lake where RB, GR, RW, S, CN and LT have been found.
TLT2	Tanada Lake Trail	Unnamed, intermittent trib to Tanada Lake	62.38064	-143.345149	8/22/2008	none	Seep, Riffle	No data available, but this unnamed trib leads to Tanada Lake (212-20-10080-2655-0010) which is cataloged as Ss	No data available for this unnamed tributary but it flows into Tanada Lake where RB, GR, RW, S, CN and LT have been found.
TLT3	Tanada Lake Trail	Unnamed, intermittent trib to Tanada Lake	62.38207	-143.345150	8/22/2008	none	Seep, Riffle	No data available, but this unnamed trib leads to Tanada Lake (212-20-10080-2655-0010) which is cataloged as Ss	No data available for this unnamed tributary but it flows into Tanada Lake where RB, GR, RW, S, CN and LT have been found.
TLT4	Tanada Lake Trail	Unnamed, intermittent trib to Tanada Lake	62.38494	-143.344785	8/22/2008	none	Seep, Riffle	No data available, but this unnamed trib leads to Tanada Lake (212-20-10080-2655-0010) which is cataloged as Ss	No data available for this unnamed tributary but it flows into Tanada Lake where RB, GR, RW, S, CN and LT have been found.
TLT5	Tanada Lake Trail	Unnamed, intermittent trib to Tanada Lake	62.38712	-143.341025	8/22/2008	none	Seep, Undefined	No data available, but this unnamed trib leads to Tanada Lake (212-20-10080-2655-0010) which is cataloged as Ss	No data available for this unnamed tributary but it flows into Tanada Lake where RB, GR, RW, S, CN and LT have been found.
TLT6	Tanada Lake Trail	Unnamed, intermittent trib to Tanada Lake	62.38870	-143.340396	8/22/2008	none	Seep, Undefined	No data available, but this unnamed trib leads to Tanada Lake (212-20-10080-2655-0010) which is cataloged as Ss	No data available for this unnamed tributary but it flows into Tanada Lake where RB, GR, RW, S, CN and LT have been found.
TLT7	Tanada Lake Trail	Large, unnamed trib to Tanada Lake	62.40234	-143.359569	8/22/2008	none	Riffle	No data available, but this unnamed trib leads to Tanada Lake (212-20-10080-2655-0010) which is cataloged as Ss	No data available for this unnamed tributray but it flows into Tanada Lake where RB, GR, RW, S, CN and LT have been found.
TLT8	Tanada Lake Trail	Unnamed trib to Tanada Creek	62.49171	-143.370463	8/22/2008	none	Riffle	No data available, but this unnamed trib leads to a stretch of Tanada Creek (212-20-10080-2655) that is cataloged as having Sp and Kp. Approximately 1 mile upstream from this area there is also a small stretch with Ss.	No data available for this unnamed tributary but it flows into Tanada Creek between Batzulnetas and Tanada Lake and GR, RW, CN and S have been found at both of these locations.
TLT9	Tanada Lake Trail	Unnamed intermittent trib to unnamed pond	62.47893	-143.370502	8/22/2008	none	Seep, Undefined	No data available.	No data available for this unnamed tributary.
TLT10	Tanada Lake Trail	Unnamed intermittent trib to Tanada Creek	62.477633	-143.3694975	39682	none	Seep, Riffle	No data available, but this unnamed trib leads to a stretch of Tanada Creek (212-20-10080-2655) that is cataloged as having Sp and Kp. Less than 1 mile upstream from this area there is also a small stretch with Ss.	No data available for this unnamed tributary but it flows into Tanada Creek between Batzulnetas and Tanada Lake and GR, RW, CN and S have been found at both of these locations. Its confluence is about 1/4 mile downstream from documented sockeye spawning grounds.

Site	Stream							Substrate Composition (%)					
Site ID	Bankfull Width (ft)	Flood-plain width (ft)	Waterbody Slope (%)	Rosgen Stream Morphology Classification	Water Color	Riparian Vegetation	Water Level 1-5 (1=low, 5=high)	Boulder	Cobble	Gravel	Sand	Silt/Clay	Organic
TLT1	1	1	12	A	Clear	Functional	4		5	5	10	80	
TLT2	1	1	12	A	Clear	Functional	4		50	30	20		
TLT3	1	1	15	A	Clear	Functional	4		20	30	10	20	20
TLT4	1	3	7	A	Clear	Functional	4			10		20	70
TLT5	1	3	9	A	Clear	Functional - at risk	4						100
TLT6	1	1	14	A	Clear	Functional	4			10	10	70	10
TLT7	25	140	2.5	B	Clear	Functional - at risk	4		50	40	10		
TLT8	7	20	5	A	Clear	Functional	5	10	50	30	10		
TLT9	stream fans out into wetland, no defined bank or channel.	difficult to measure	4	B	Clear	Functional - at risk	5			10	50		40
TLT10	1	6	2	B	Clear	Functional - at risk	5			80		10	10

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Site	Crossing		Comments
Site ID	Negative Impact to Fish Habitat	Barrier to Fish Passage	
TLT1	No	None	Rutting at both approaches. There may be about 6 more crossings south of this crossing. Suspect that any additional crossings would drain through wetlands and into the south end of Tanada Lake, which is a large wetland area with some distance to Goat Creek.
TLT2	No	None	Trail approaches are soft and muddy.
TLT3	No	None	Much like the other crossings, water from the trail drains into the stream at the crossing.
TLT4	No	None	Rutting at both approaches. Stream drains through a wetland.
TLT5	Possible - may need to be hardened	None	Crossing very soft and scarred with extensive rutting at both approaches. There is an additional crossing 50 ft. away from this one and is very similar.
TLT6	No	Yes - for juveniles only, if present	There was an additional crossing less than 50 ft. away which was very similar to this one but without the passage issue.
TLT7	No	None	
TLT8	Yes - should be repaired	None	This crossing is located at the northernmost part of the trail (even though it is labeled #8). Weakened and rutted approaches on both banks. This crossing is less than a mile from Tanada Creek. **NOTE:** There was one crossing about 100 ft. north of this crossing that was discovered during the aerial recon done the next day. It appeared to be in the same condition of this crossing.
TLT9	Yes - should be repaired if this channel actually drains into Tanada Creek	None	Stream fans out into a wetland therefore no defined stream bed or streambank. Degraded approaches with severe rutting on both banks which may contribute to water quality issues.
TLT10	Yes - should be repaired if this channel actually drains into Tanada Creek	None	Degraded crossing with moderate rutting on both approaches which may contribute to water quality issues.

Site						Fish Data			
Site ID	Trail	Stream Name	Latitude (N) NAD 83	Longitude (W) NAD 83	Date Surveyed	Fish Inventor-ied	Habitat Features	ADF&G Cataloged Fish Data **Kp**=king present; **Ks**=king spawning; **Sp**=sockeye present; **Ss**=sockeye spawning	NPS Fish Data **LT**=lake trout, **GR**=grayling, **CN**=slimy sculpin, **RB**=burbot, **KO**=kokanee, **RW**=round whitefish, **C**=coho salmon, **K**=king salmon, **S**=sockeye salmon
TLT11	Tanada Lake Trail	Unnamed intermittent trib to Tanada Creek	62.47607	-143.369490	8/22/2008	none	Riffle	No data available, but this unnamed trib leads to a stretch of Tanada Creek (212-20-10080-2655) that is cataloged as having Sp and Kp. Less than 1 mile upstream from this area there is also a small stretch with Ss.	No data available for this unnamed tributary but it flows into Tanada Creek between Batzulnetas and Tanada Lake and GR, RW, CN and S have been found at both of these locations. Its confluence is about 1/4 mile downstream from documented sockeye spawning grounds.
TLT12	Tanada Lake Trail	Unnamed intermittent trib to Tanada Creek	62.47249	-143.369674	8/22/2008	none	Seep, Undefined	No data available, but this unnamed trib leads to a stretch of Tanada Creek (212-20-10080-2655) that is cataloged as having Sp, Kp and Ss.	No data available for this unnamed tributary but it flows into Tanada Creek between Batzulnetas and Tanada Lake and GR, RW, CN and S have been found at both of these locations. There are documented sockeye spawning grounds directly across from its confluence.
TLT13	Tanada Lake Trail	Unnamed intermittent trib to Tanada Creek	62.46127	-143.369636	8/22/2008	none	Seep, Undefined	No data available, but this unnamed trib leads to a stretch of Tanada Creek (212-20-10080-2655) that is cataloged as having Sp, Kp and Ss.	No data available for this unnamed tributary but it flows into Tanada Creek between Batzulnetas and Tanada Lake and GR, RW, CN and S have been found at both of these locations. It is about a mile upstream of documented sockeye spawning grounds.
TLT14	Tanada Lake Trail	Unnamed trib to Tanada Lake	62.45740	-143.369679	8/22/2008	none	Seep, Undefined	No data available, but this unnamed trib leads to Tanada Lake (212-20-10080-2655-0010) which is cataloged as Ss	No data available for this unnamed tributary but it flows into Tanada Creek between Batzulnetas and Tanada Lake and GR, RW, CN and S have been found at both of these locations. It is about a mile upstream of documented sockeye spawning grounds.
TLT15	Tanada Lake Trail	Unnamed trib to Tanada Lake	62.43957	-143.349991	8/22/2008	none	Riffle	No data available, but this unnamed trib leads to Tanada Lake (212-20-10080-2655-0010) which is cataloged as Ss	No data available for this unnamed tributary but it flows into Tanada Lake where RB, GR, RW, S, CN, and LT have been found.
TLT16	Tanada Lake Trail	Unnamed intermittent trib to Tanada Lake	62.436994	-143.3478825	39682	none	Riffle	No data available, but this unnamed trib leads to Tanada Lake (212-20-10080-2655-0010) which is cataloged as Ss	No data available for this unnamed tributary but it flows into Tanada Lake where RB, GR, RW, S, CN, and LT have been found.

Site	Stream							Substrate Composition (%)					
Site ID	Bankfull Width (ft)	Flood-plain width (ft)	Waterbody Slope (%)	Rosgen Stream Morphology Classification	Water Color	Riparian Vegetation	Water Level 1-5 (1=low, 5=high)	Boulder	Cobble	Gravel	Sand	Silt/Clay	Organic
TLT11	1	3	4	B	Clear	Functional - at risk	5			50	50		
TLT12	1	6	4	B	Clear	Functional - at risk	5						100
TLT13	2	20	3	B	Clear	Functional - at risk	5			10	40		50
TLT14	1	20	2	B	Clear	Functional - at risk	5						100
TLT15	30	60	4	B	Clear	Functional	1	30	50	20			
TLT16	**1**	3	2	B	Clear	Functional	4		5				95

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Site	Crossing		Comments
Site ID	Negative Impact to Fish Habitat	Barrier to Fish Passage	
TLT11	Yes - should be repaired if this channel actually drains into Tanada Creek	None	Degraded crossing with moderate rutting on both approaches which may contribute to water quality issues.
TLT12	Yes - should be repaired	None	Stream drains through a wetland and into Tanada Creek where there is sockeye spawning habitat. Crossing is degraded with moderate rutting on both approaches. Current conditions may contribute to water quality issues and have a potential negative impact on spawning habitat.
TLT13	Yes - should be repaired	None	Stream runs through a wetland, into the crossing and then channels into Tanada Creek where there is sockeye spawning habitat. The crossing, which is located approximately 400 feet from the creek, is degraded with moderate rutting on both approaches. Current condition may contribute to water quality issues and have potential negative impact to spawning habitat.
TLT14	Yes - should be repaired	None	Crossing very degraded with significant rutting on left bank approach. This crossing is located within 1500 ft. of Tanada Lake. Not possible to cross with high water conditions and unsure about ability to cross with lower water levels. Current conditions contribute to water quality issues.
TLT15	No	None	Partially degraded left bank.
TLT16	Partially; will worsen with increased use	None	Right bank cut deep. Some erosion.

Site						Fish Data			
Site ID	Trail	Stream Name	Latitude (N) NAD 83	Longitude (W) NAD 83	Date Surveyed	Fish Inventor-ied	Habitat Features	ADF&G Cataloged Fish Data **Kp**=king present; **Ks**=king spawning; **Sp**=sockeye present; **Ss**=sockeye spawning	NPS Fish Data **LT**=lake trout, **GR**=grayling, **CN**=slimy sculpin, **RB**=burbot, **KO**=kokanee, **RW**=round whitefish, **C**=coho salmon, **K**=king salmon, **S**=sockeye salmon
LC1S	Lost Creek Trail	Lost Creek	62.50328	-143.180260	7/17/2008	none	Riffle	No data available	No data available but this portion of Lost Creek flows into Jack Creek where RB, GR and CN have been collected.
LC1	Lost Creek Trail	Lost Creek	62.56125	-143.136090	7/18/2008	none	Riffle	No data available	No fish found
LC2	Lost Creek Trail	Lost Creek	62.54892	-143.149760	7/18/2008	none	Riffle	No data available	No fish found
LC3	Lost Creek Trail	Lost Creek	62.54609	-143.161340	7/18/2008	none	Riffle	No data available	No fish found
LC4	Lost Creek Trail	Lost Creek	62.54131	-143.175120	7/18/2008	none	Riffle	No data available	No fish found
LC5	Lost Creek Trail	Lost Creek	62.52898	-143.179330	7/18/2008	none	Riffle	No data available	No fish found
LC6	Lost Creek Trail	Lost Creek	62.52592	-143.176620	7/18/2008	none	Riffle	No data available	No fish found
LC7	Lost Creek Trail	Lost Creek	62.51297	-143.17755	39647	none		No data available	No fish found
TR1	Trail Creek Trail	Trail Creek	62.56498	-143.249140	7/17/2008	none	Riffle	No data available	No data available
TR2	Trail Creek Trail	Trail Creek	62.56463	-143.249060	7/17/2008	none	Riffle	No data available	No data available
TR3	Trail Creek Trail	Trail Creek	62.56130	-143.246340	7/17/2008	none	Riffle	No data available	No data available
TR4	Trail Creek Trail	Trail Creek	62.56125	-143.24645	7/17/2008	none	Riffle	No data available	No data available
TR5	Trail Creek Trail	Trail Creek	62.55064	-143.233730	7/17/2008	none	Riffle	No data available	No data available
TR6	Trail Creek Trail	Trail Creek	62.54792	-143.234210	7/17/2008	none	Riffle	No data available	No data available
TR7	Trail Creek Trail	Trail Creek	62.54113	-143.229270	7/17/2008	none	Riffle	No data available	No data available
TR8	Trail Creek Trail	Trail Creek	62.53709	-143.223490	7/17/2008	none	Riffle	No data available	No data available
TR9	Trail Creek Trail	Trail Creek	62.5323	-143.22419	39646	none	no data collected	No data available	No data available
JC1	Reeve Field Trail	Jack Creek	62.39415	-142.891490	9/20/2008	none	Riffle	No data available	GR (adult); CN (adult, juvenile); RB (juvenile)
JC2	Reeve Field Trail	Unnamed trib to Jack Creek	62.40630	-142.976200	9/20/2008	none	Riffle	No data available	GR (adult); CN (adult, juvenile); RB (juvenile)
JC3	Reeve Field Trail	Jack Creek	62.40706	-142.97712	39711	none	Riffle, Pool	No data available	GR (adult); CN (adult, juvenile); RB (juvenile)

Site ID	Bankfull Width (ft)	Flood-plain width (ft)	Waterbody Slope (%)	Rosgen Stream Morphology Classification	Water Color	Riparian Vegetation	Water Level 1-5 (1=low, 5=high)	Boulder	Cobble	Gravel	Sand	Silt/Clay	Organic
LC1S	8	20	3	B	Muddy	Functional, but functional-at risk on right bank trail approach	4			100			
LC1	15	200	2	D	Clear	Non-functional	3	10	70	20			
LC2	25	300	1.5	D	Clear	Functional for channel type	3	10	70	20			
LC3	25	300	1.5	D	Clear	Functional for channel type	3	10	70	20			
LC4	15	200	3.5	D	Clear	Functional for channel type	3		70	30			
LC5	20	250	1	D	Clear	Functional for channel type	3		50	50			
LC6	50	300	1.5	D	Clear	Functional for channel type	3		50	50			
LC7	no data collected	no data collected	no data collected	D	Clear	Functional for channel type	3	no data collected	no data collected	no data collected	no data collected	no data collected	no data collected
TR1	30	100	1.5	B	Clear	Functional	2	20	40	40			
TR2	35	100	1.5	B	Clear	Functional	2	20	40	40			
TR3	30	150	2	B	Clear	Functional	2	10	40	50			
TR4	30	150	2	B	Clear	Functional	2	10	40	50			
TR5	15	30	2	B	Clear	Functional	2		70	30			
TR6	25	250	2	B	Clear	Functional - at risk	2		70	30			
TR7	25	300	1.5	D	Clear	Functional for channel type	2		70	30			
TR8	30	300	1	C	Clear	Non-functional	2		50	50			
TR9	no data collected	no data collected	no data collected	C	Dry	Non-functional	Dry	no data collected	no data collected	no data collected	no data collected	no data collected	no data collected
JC1	85	120	1.5	C	Clear	Functional	3		15	60	20	5	
JC2	16	60	3.5	B	Clear	Functional	3	15	35	40	10		
JC3	**120**	180	2	C	Clear	Functional	3		20	40	40		

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Site	Crossing		Comments
Site ID	Negative Impact to Fish Habitat	Barrier to Fish Passage	
LC1S	No, but may become a problem for passage in the future.	None	Partial plunge not a barrier to fish passage now . Crossing appears to be degraded. Re-evaluate condition of crossing at low water.
LC1	No	None	
LC2	No	None	Made 3 random crossings between LC1 and LC2 which have similar conditions to the previous crossing.
LC3	No	None	
LC4	No	None	Made 4 random crossings between LC3 and LC4 which have similar conditions to the previous crossing.
LC5	No	None	Made 12 random crossings between LC4 and LC5 which have similar conditions to the previous crossing. Most of these random crossings were of ephemeral streams with cobble and gravels and very shallow water (less than 6 inches deep).
LC6	No	None	
LC7	No	None	Unconfined crossing at the Nabesna Road which shifts with flood events. AK DOT/PF maintains this crossing within the road right-of-way. Could be hardened.
TR1	No	None	Due to rough terrain, unable to travel further upstream from this point to determine if there are additional crossings; suspect there are none. If there are, it is assumed they would have conditions similar to this site.
TR2	No	None	
TR3	No	None	
TR4	No	None	Made 4 random crossings between TR1 and TR4 which have similar conditions to the previous crossings.
TR5	No	None	Crossing indistinguishable - made an approximation of crossing location. Trail now appears to run along streambed and no long on the banks. This continues till end of trail at Nabesna Road.
TR6	No	None	
TR7	No	None	Unable to determine if this is a regular crossing. Made 5 random crossings between TR6 and TR7, all having similar conditions to TR6.
TR8	No	None	Made 3 random crossings between TR7 and TR8, all of which have similar conditions to the crossings at TR7.
TR9	No	None	End of the trail on the north side of the Nabesna Road where the creek goes subterranean.
JC1	No	None	
JC2	No	None	
JC3	No	None	Fairly large crossing running fast and deep.

Site						Fish Data			
Site ID	Trail	Stream Name	Latitude (N) NAD 83	Longitude (W) NAD 83	Date Surveyed	Fish Inventor-ied	Habitat Features	ADF&G Cataloged Fish Data **Kp**=king present; **Ks**=king spawning; **Sp**=sockeye present; **Ss**=sockeye spawning	NPS Fish Data **LT**=lake trout, **GR**=grayling, **CN**=slimy sculpin, **RB**=burbot, **KO**=kokanee, **RW**=round whitefish, **C**=coho salmon, **K**=king salmon, **S**=sockeye salmon
SC1	Soda Creek Trail	Soda Creek	62.89596	-142.929835	7/22/2008	none	Riffle	No data available	No data available
SC2	Soda Creek Trail	Soda Creek	62.5372	-142.93508	7/22/2008	none	Riffle	No data available	No data available
SC3	Soda Creek Trail	Soda Creek	62.53655	-142.9362	7/22/2008	none	Riffle	No data available	No data available
SC4	Soda Creek Trail	Unnamed Trib to Soda Creek	62.51945	-142.96	7/22/2008	none	Riffle	No data available	No data available
SC5	Soda Creek Trail	Trib to Platinum Creek	62.51838	-142.96928	7/22/2008	none	Riffle	No data available	No data available
SC6	Soda Creek Trail	Platinum Creek	62.52995	-143.03508	7/22/2008	none	Riffle	No data available	No data available
SC7	Soda Creek Trail	Unnamed trib to Chalk Creek	62.53871	-143.0998	39651	none	Riffle	No data available	No data available for this unnamed tributary but Chalk Creek has RW (juv/adult) and GR (juvenile).
SLT1	Suslota Lake Trail	Natat Creek	62.64448	-143.63083	7/23/2008	none	Riffle, Pool	No data available for this portion of Natat Creek, but this trib leads to the portion of Natat Creek (212-20-10080-2605-3023) that has Kp, Ks	K (adult)
SLT2	Suslota Lake Trail	Natat Creek	62.64596	-143.63235	7/23/2008	none	Riffle	No data available for this portion of Natat Creek, but this trib leads to the portion of Natat Creek (212-20-10080-2605-3023) that has Kp, Ks	K (adult)
SLT3	Suslota Lake Trail	Natat Creek	62.64183	-143.64065	7/23/2008	none	Pool	No data available for this portion of Natat Creek, but this trib leads to the portion of Natat Creek (212-20-10080-2605-3023) that has Kp, Ks	K (adult)

Site	Stream							Substrate Composition (%)					
Site ID	Bankfull Width (ft)	Flood-plain width (ft)	Waterbody Slope (%)	Rosgen Stream Morphology Classification	Water Color	Riparian Vegetation	Water Level 1-5 (1=low, 5=high)	Boulder	Cobble	Gravel	Sand	Silt/Clay	Organic
SC1	5	75	3	B	Clear	Non-functional	3		10	90			
SC2	15	300	5	B	Clear	Non-functional	3		10	90			
SC3	20	250	4	B	Clear	Functional - at risk	3	5	20	75			
SC4	25	50	4	B	Clear	Functional - at risk	3		20	80			
SC5	25	500	2.5	B	Clear	Functional - at risk	3		10	90			
SC6	6	100	2.5	B	Clear	Functional - at risk	3			100			
SC7	20	200	3.5	B	Clear	Functional - at risk	3			70	30		
SLT1	5	150	4	B	Clear	Functional	5				50		50
SLT2	3	125	4	B	Clear	Functional	5	5	25	20	30	10	10
SLT3	3	75	3	B	Clear	Functional	4			10	20	70	

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Site	Crossing		Comments
Site ID	Negative Impact to Fish Habitat	Barrier to Fish Passage	
SC1	No	None	
SC2	No	None	
SC3	No	None	Expect an additional 6 crossing upstream from this point. Expect that any additional crossings upstream will be similar to this one.
SC4	No	None	
SC5	No	None	
SC6	No	None	
SC7	No - may need to improve with increased use	None	Minor degradation on both approaches. Crossing very soft with fines being released with disturbance. Monitor crossing and re-evaluate condition of crossing with increased use.
SLT1	Yes - if fish bearing	None	Crossing in very poor condition. There are three cuts perpendicular to the stream from ATV use, each cut less than 50 ft. apart. These cuts are causing rutting in the streambed as the substrate is somewhat soft and altering water flow where water backs up into the cuts during high flows
SLT2	Yes	None	This crossing is located approximately 100 ft downstream from the previous crossing (SLT-1). This crossing appears to be much more suitable and in better condition than the upstream crossing.. The approaches are mildly steep, but the crossing itself is naturally hardened with cobbles.
SLT3	Yes	None	Heavily scarred crossing, much like the conditions found at SLT-1, although much drier right before the approaches. Like SLT-1, there are 3 cuts at the crossing, each about 25 feet apart, with very deep ruts, approximately 1-2 feet deep. It was difficult to ascertain where the stream channel location at the crossing.