

# **Fish and Fish Habitat Inventory for Forest Licences A-16823 and A-16825**

## **Endako Area**

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# TABLE OF CONTENTS

<b>1. INTRODUCTION</b>	<b>1</b>
1.1 Background	1
1.2 Objectives	1
<b>2. STUDY AREA</b>	<b>1</b>
2.1 Location	1
2.2 Access	1
2.3 Resource Use	1
2.4 Historical Fisheries Information	1
<b>3. METHODS</b>	<b>2</b>
3.1 Physical	2
3.2 Biological	3
<b>4. PHYSICAL CHARACTERISTICS</b>	<b>4</b>
4.1 Stream Flow	4
4.2 Water Quality	4
<b>5.0 RESULTS AND DISCUSSION</b>	<b>5</b>
<b>5.1 Endako River</b>	<b>5</b>
5.1.1 Physical	5
5.1.2 Fish	6
5.1.3 Stream Classification	6
5.1.4 Surveyed Reach Summary	6
5.1.5 Tributaries	7
<b>5.2 Creek SH (Shovel Creek Tributary)</b>	<b>8</b>
5.2.1 Physical	8
5.2.2 Fish	8
5.2.3 Stream Classification	9
5.2.4 Surveyed Reach Summary	9
5.2.5 Tributaries	9

<b>5.3 Creek DEC1 (Decker Lake Tributary)</b>	<b>9</b>
5.3.1 Physical	9
5.3.2 Fish	10
5.3.3 Stream Classification	10
<b>5.4 Lakes Creek</b>	<b>10</b>
5.4.1 Physical	10
5.4.2 Fish	12
5.4.3 Stream Classification	12
5.4.4 Surveyed Reach Summary	12
5.4.5 Tributaries	13
<b>5.5 Creek ENDTR1</b>	<b>13</b>
5.5.1 Physical	14
5.5.2 Fish	14
5.5.3 Stream Classification	14
5.5.4 Surveyed Reach Summary	14
5.5.5 Tributaries	15
<b>5.6 Creek ENDTR2 (Allen Creek)</b>	<b>15</b>
5.6.1 Creek ENDTR2A	16
5.6.2 Creek ENDTR2B	16
<b>5.7 Rentoul Creek</b>	<b>16</b>
5.7.1 Physical	16
5.7.2 Fish	17
5.7.3 Stream Classification	17
5.7.4 Surveyed Reach Summary	18
5.7.5 Tributaries	18
<b>5.8 Creek ENDTR3</b>	<b>19</b>
5.8.1 Physical	19
5.8.2 Fish	19
5.8.3 Stream Classification	20
5.8.4 Surveyed Reach Summary	20
5.8.5 Tributaries	20
<b>5.9 Upper Bulkley River</b>	<b>21</b>
5.9.1 Physical	21
5.9.2 Fish	21
5.9.3 Stream Classification	21
5.9.4 Surveyed Reach Summary	21
5.9.5 Tributaries	22
<b>5.10 Taman Creek</b>	<b>22</b>
5.10.1 Physical	22
5.10.2 Fish	23
5.10.3 Stream Classification	23
5.10.4 Surveyed Reach Summary	23
5.10.5 Tributaries	24
<b>5.11 Fish Age, Growth and Other Observations</b>	<b>25</b>
<b>5.12 Rare and Endangered Species Summary</b>	<b>25</b>

<b>5.13 Wildlife Observations</b>	<b>25</b>
<b>5.14 Required Follow-up Sampling</b>	<b>26</b>
<b>6. CONCLUSION AND RECOMMENDATIONS</b>	<b>27</b>
<b>REFERENCES</b>	<b>27</b>
<b>APPENDICES</b>	<b>27</b>
<b>Fish Data</b>	<b>27</b>
<b>Photodocumentation Cards</b>	<b>27</b>

## LIST OF TABLES

<b>Table 1: Stream Summary of Surveyed Reaches on the Upper Endako River</b>	<b>6</b>
<b>Table 1a: Summary of Tributaries to the Upper Endako River above Rose Lake</b>	<b>7</b>
<b>Table 2: Stream Summary of Surveyed Reaches on Creek SH</b>	<b>9</b>
<b>Table 3: Stream Summary of Surveyed Reaches on Lakes Creek</b>	<b>12</b>
<b>Table 3a: Summary of Tributaries to Lakes Creek</b>	<b>13</b>
<b>Table 4: Reach Summary of Creek ENDTR1</b>	<b>14</b>
<b>Table 4a: Summary of Surveyed Tributaries to Creek ENDTR1</b>	<b>15</b>
<b>Table 6: Stream Summary of Surveyed Reaches on Rentoul Creek</b>	<b>18</b>
<b>Table 7: Stream Summary of Surveyed Reaches on Creek ENDTR3</b>	<b>20</b>
<b>Table 8: Stream Summary of Surveyed Reaches on Bulkley River</b>	<b>22</b>
<b>Table 9: Stream Summary of Surveyed Reaches on Taman Creek</b>	<b>23</b>
<b>Table 9a: Summary of Tributaries to Taman Creek</b>	<b>24</b>

## SUMMARY

Nine sub-drainages were surveyed within the area covered by this report. Creek SH is a tributary to Shovel Creek while the Bulkley/Taman system is part of the Skeena River drainage. The remaining systems flow directly into the Upper Endako River above Decker Lake. The Endako River was surveyed starting from its confluence with Rose Lake outlet Creek.

Survey results in creek **SH** confirms the presence of rainbow trout in this system. Upstream distribution in this system is limited by a 5m falls in Reach 2, located 1.6km upstream from its mouth with Shovel creek. All tributaries in this system were located above these falls and were therefore classified as non fish-bearing (S6). Creek SH was assigned an FPC classification of S3 below the falls and S5 above.

Creek **DEC1** flows into Decker Lake and provides little in the way of usable fish habitat. This is exacerbated by the presence of a beaver dam at the mouth of this creek and very low flow potential, with most limited to local runoff during snowmelt and high rainfall events. No fish were found in this system and their presence is considered unlikely given the creek's small size and lack of suitable fish habitat. This creek was assigned an FPC classification of S6.

**Lakes Creek** provided excellent fish habitat and fish sampling results confirmed a very high productivity in this system. Rainbow trout were abundant throughout this system and were present in all reaches. An FPC classification of S3 was assigned to this creek for its entire length. Three tributaries to this creek were surveyed and were also assigned a fish-bearing classification.

Survey results in creek **ENDTR1** confirmed the presence of rainbow trout in Reach 1. The upstream distribution limit has yet to be determined as late season sampling prevented confirmation of fish presence beyond this Reach 1 (8.2km upstream from the mouth). Presence of rainbow trout has been inferred beyond Reach 1 due to the availability of good salmonid rearing habitat, and an FPC classification of S3 has been assigned to the entire mainstem. Further sampling is required in this system to determine fish distribution limits.

Survey results in creek **ENDTR2** confirm the presence of rainbow trout. Upstream distribution in this system is limited by a 2.5m falls at the end of Reach 4, located 5.0km upstream from its mouth with the Endako River. No fish were captured in tributaries to this creek, but presence of rainbow was inferred in creeks below the falls, while absence of fish was assumed in those creeks above the falls. Creek ENDTR2 was assigned an FPC classification of S3 below the falls and S6 above. Further sampling above the falls should be conducted to confirm the non fish-bearing classification.

**Rentoul Creek** provides excellent fish habitat and fish sampling results confirmed a high productivity in this system. Rainbow trout were abundant in fish-bearing reaches. Upstream distribution in this system is limited by a 3m high cascade at the end of Reach 6, located 7.7km upstream from its mouth with the Endako River. Rentoul Creek was assigned an FPC classification of S3 below the cascade obstruction and S6 above.

Survey results in creek **ENDTR3** confirm the presence of rainbow trout in this system. Upstream distribution in this system is limited by a 2.5m falls at the end of Reach 4, located 5.0km upstream from its mouth with the Endako River. No fish were captured in tributaries to this creek, but presence of rainbow was inferred in creeks below the falls, while absence of fish was assumed in those creeks above the falls. Creek ENDTR3 was assigned an FPC classification of S3 below the falls and S6 above.

**Bulkley Creek** above Bulkley Lake was found to contain coho salmon, rainbow trout, longnose sucker and prickly sculpins. Only rainbow trout were found above Reach 1 in this system, suggesting the beaver activity and culvert at the Highway 16 crossing are obstructions and the upper limit of distribution for Coho, prickly sculpin and longnose sucker. Rainbow trout are present in **Taman Creek** to the falls obstruction at the end of Reach 8, 7.8km upstream from the mouth. Bulkley Creek was assigned an FPC classification of S2 while Taman Creek was assigned an S3 FPC classification below the falls.

# **1. INTRODUCTION**

## **1.1 Background**

In June of 1996, RJA Forestry Ltd. was contracted by Babine Forest Products Co. to undertake a Fish and Fish Habitat Inventory, a project funded through Forest Renewal British Columbia (FRBC). A Reconnaissance Level Stream Inventory, as per Resource Inventory Committee (RIC) standards, was initiated to provide fish and fish habitat information on numerous creeks within Forest Licences A16823 and A16825 in the Burns Lake area.

## **1.2 Objectives**

The predominant objectives of this project were to provide a preliminary level of fisheries information on specific streams within the study area that would satisfy both MELP and forest company requirements, while adhering to RIC standards for a Reconnaissance Level Stream Inventory. This translated to providing reach-specific information on fish distribution, habitat and all relevant information on surveyed streams that would facilitate the use of best management practices for proposed forestry activities near surveyed streams. Overall, fish species distribution limits were to be determined and Forest Practices Code (FPC) classifications were to be assigned to all surveyed streams, as per the Fish-Stream Identification Guidebook (FPC, July 1995).

# **2. STUDY AREA**

## **2.1 Location**

The area covered by this report includes several drainages within the Upper Endako River watershed (watershed code 180-3740-952-019) and one drainage within the Bulkley system (watershed code 460). The area is bounded by a drainage within the Shovel Creek watershed to the east (watershed code 180-3740-952-019-409) and the Bulkley River watershed above Bulkley Lake to the west.

## **2.2 Access**

This area was well roaded and access was mainly via forest service roads within the Babine Forest Products/Decker Lake Forest Products forest licences. Site access was usually on foot from these roads, with most sample sites being chosen for their proximity to good road access.

## **2.3 Resource Use**

Resource use within the area is dominated by logging activities. However, presence of numerous roads within the area also provides increased access to areas for recreational activities such as fishing, hiking and hunting. The Lakes Creek watershed, containing numerous high productive lakes also provides excellent opportunities for fishing, given its close proximity and easy access from Burns Lake. The remainder of the creek systems are generally too small to support significant angling opportunities and the lack of lakes within these surveyed watersheds decreases recreational fishing potential. Trap lines were observed within the Shovel Creek area, in addition to a moose blind, suggesting present use of the area by hunters and trappers.

## **2.4 Historical Fisheries Information**

### ***Endako River Drainage***

Not much historical fisheries information is available within this study area. Information contained within DFO/MELP's Fish Habitat Inventory & Information System documents small runs of chinook and sockeye salmon in the Endako River, which spawn between Savory and Shovel Creeks. Main spawning

occurs immediately below Shovel Creek for 400m for both species. No information is available that documents upstream distribution limits for these species in the upper Endako above Shovel Creek. Given the small run sizes and lack of suitable spawning habitat upstream from Shovel Creek, it is assumed that Shovel Creek is the upper limit of salmon distribution. Although no information was found documenting resident species presence within streams in the study area, MELP's Lake Survey Data page on their website had information on Decker Lake and Hanson Lake. Decker Lake is located on the Endako River northwest of Burns Lake and supports populations of rainbow trout, burbot, kokanee and lake whitefish, in addition to lake chub, largescale sucker, longnose sucker, northern squawfish, peamouth chub, and reaside shiner. Hanson Lake is located on Shovel Creek upstream from Shovel Lake and contains rainbow trout, kokanee and mountain whitefish, in addition to lake chub, largescale sucker, longnose sucker and reaside shiner. All subdrainages except for Creek SH flow into the Endako River above Decker Lake. Creek SH flows into Shovel Creek downstream from Shovel Lake.

### ***Bulkley River Drainage***

The portion of the Bulkley River within the study area is limited to the upper Bulkley above Bulkley Lake, to the Taman Creek confluence 3.5km upstream. The Taman Creek watershed is entirely within the study area. The Bulkley River in this area is documented to support runs of coho and chinook salmon, although coho have reportedly not been found in recent years. A falls obstruction exists above Watson Creek, which is passable to chinook at high water only. Bulkley Lake contains resident species of rainbow trout, northern squawfish, peamouth chub and reaside shiner. A report on the Maxan watershed completed by AGRA Earth and Environmental also notes the presence of burbot and sockeye salmon in the system in this area, as well as Dolly Varden char in lower Maxan Creek, a major tributary to Bulkley Lake.

## **3. METHODS**

### ***3.1 Physical***

Prior to the commencement of field work, maps were obtained by Babine Forest Products Company. These maps highlighted all the streams within the study area that required fisheries information under the scope of this project. Maps were 1:20,000 Forest Cover maps. In addition to these maps, aerial photographs were also gathered for the project area. Aerial photograph interpretation was then undertaken to delineate all streams into reaches based on gradient, channel morphology and riparian area (i.e., swamp, wetland, forest). Reach boundaries and stream names were then transferred onto the maps for the entire area. Unnamed creeks were assigned arbitrary names based on their both their destination water and their locations within the surveyed drainage and assigned an appropriate watershed code, if one did not already exist. For example, the creek within the Shovel Creek watershed was assigned the name "SH" and since it did not have an historical watershed code, was assigned one between the two nearest previously coded tributaries to Shovel Creek (180-3740-952-019-409-**300**). All tributaries to Creek SH were then assigned the name SH appended with a number to indicate its location within the SH drainage (i.e., SH1, SH2, etc.). These tributaries were then assigned a watershed code based on the assigned code for Creek SH (i.e., 180-3740-952-019-409-300-**100, -200, -300**). This process was followed for the entire area to partition and name all reaches consistently prior to the commencement of field work. Appendix II documents watershed codes used for all streams within the study area.

Following reach delineation, all historical fisheries information was gathered for the entire area to provide background data on known fish species distributions and use for any streams and lakes within the project area. This information is summarized in section 2.4 above. Areas where field work should be focussed were then identified and specific fish sampling sites were determined and prioritized, based on presence (or lack) of existing information, gradient and proximity to previously determined fish-bearing water. For most reaches, no existing information was available and the survey was conducted beginning in the first reach of higher order streams and continued into upstream reaches. First and second order streams were



generally considered to have lower priority and were usually sampled last within the study area, unless they could be easily included within the mainstem stream survey. In some cases, only the first reach of these lower order creeks were sampled.

In addition to fish sampling and habitat assessments, which is discussed below, the field portion of this project was used to confirm reaches identified during air photo interpretation. In some instances, watershed codes had to be reassigned following true mainstem identification. These changes are documented in the Stream Survey Forms in the first reach of the creek. Further information on data entry and the overall approach and methodology used for the digital Stream Survey Forms is located in Appendix III.

Fish sampling was conducted using a model 12A P.O.W. electroshocker and when logistically possible supplemented by the use of Gee-type minnow traps. Measurements in the field were determined using a Suunto clinometer, hip chain, stick thermometer, Silva compass and ruler, while pH, conductivity and total dissolved solids (TDS) were measured using a Corning Checkmate water sampling kit. Distances determined from maps were measured using a map wheel. Stream depth measurements were made using a meterstick, unless conditions did not allow for this. In these cases, depths were based on a ground estimate. In most cases, turbidity could not be measured due to the shallowness of the creeks. These measurements simply reflect the depth of the deepest pool in the creek.

### **3.2 Biological**

Following reach delineation and fish sampling prioritization, fish collection permits were obtained from the Department of Fisheries and Oceans (DFO) and Ministry of Environment, Lands and Parks. Each stream reach was then sampled for fish in the field using an electroshocker, minnow traps baited with salmon roe, dipnets and/or angling. Where logistically possible, minnow traps were left to fish in reaches where no fish capture occurred from electrofishing, or when conditions were more suited to trapping (deep water, swamps, etc.), when logistically possible. Traps were also used in several fish-bearing reaches to supplement fish population and size data. Reaches where no fish capture occurred were not deemed non fish-bearing unless an obstruction to fish migration was encountered between that reach and downstream fish-bearing reaches. Where an obstruction to fish passage was found, thorough fish sampling above the obstruction took place to confirm absence of fish, as per FPC standards. In addition, barriers above which fish presence was confirmed were noted for their location using a portable GPS unit and photographed. In some cases, reaches were not surveyed if fish were captured in bordering reaches and migration into upstream reaches could be easily predicted, based on gradient and lack of any obstructions to fish migration.

Stream Survey Forms were completed for each surveyed reach, providing fisheries habitat information for each reach. UTM coordinates were transferred onto these forms at sites where the stream card was filled out. In some cases, several stream survey forms were completed for each reach, to supplement fisheries information and document sites where fish sampling occurred. Photographs were taken (upstream and downstream) where each Stream Survey Form was completed, in addition to locations where potential obstructions to fish migration were present. Photographs of other important features (e.g. moose, beaver dams and impoundments) were also taken and referenced for their location in the field using GPS. Conductivity and pH were measured using a hand-held multi-meter. Any other incidental wildlife/amphibian observations during the stream survey process were also noted.

Where field work confirmed upper limits of fish distribution, all previously identified creeks within the study area that entered a non fish-bearing reach were not surveyed but rather assumed to be non fish-bearing based on the non fish-bearing status of the receiving waters. In these cases, creeks were still entered into the Stream Survey Database with an S5 or S6 FPC classification even though they were not officially surveyed. Creeks that were not surveyed that flowed into fish-bearing water were assessed based on gradient and air photo interpretation.

At a minimum, 100m<sup>2</sup> of habitat was sampled in each surveyed reach. However, sampling effort was significantly increased if no fish were captured and the fish sampling was being performed to confirm fish absence. In addition, when no fish were captured, variable settings were used on the electroshocker to conduct fish sampling over a broad range of conductivity conditions and the use of minnow traps was incorporated to support a non fish-bearing classification when logistically possible. Further upstream reaches were also often sampled for fish for the same reason. To increase fish sampling consistency, one person was designated as primary electrofisher within each study area, minimizing the potential for the introduction of bias into survey results. Stream surveys were normally conducted upstream beginning from the mouth to accurately determine upstream distribution limits. Aerial reconnaissance of reaches was also performed when possible to identify potential obstructions and key sampling sites.

Further sampling has been recommended in those areas where fish absence has not been satisfactorily confirmed and a second sampling effort is required. Reaches where fish presence has been inferred but not confirmed may also be revisited to confirm fish presence. This may result in the adjustment of an assigned FPC classification from fish-bearing to non fish bearing if no fish are captured during the second sampling, at the discretion of the proponent.

The photographs included in this report were chosen for their ability to represent overall stream morphology and habitat characteristics of select creeks. Any other significant photographs, such as obstructions, bank failure and wildlife observations, are also included. A copy of all photographs has been compiled and labelled as per the standards in "A Guide to Photodocumentation" (RIC, March 1996), and is available from Babine Forest Products Co.

## **4. PHYSICAL CHARACTERISTICS**

### **4.1 Stream Flow**

No information was available within this study area documenting stream flow characteristics. Measurements to determine discharge were not conducted. However, stream order has been determined for each creek to provide a relative indication of stream magnitude. Any other significant stream flow characteristics (flood signs, channel scouring, debris transport capability) that were observed during the field portion of this project have been noted on the relevant Stream Survey Forms.

### **4.2 Water Quality**

Several water quality parameters were gathered for each surveyed reach. These included pH, conductivity, temperature and total dissolved solids (TDS), in addition to general information on water clarity (turbidity), which was estimated based on maximum pool depth, since most turbidity measurements exceeded the depth of the creek. Any significant findings are noted in the following section. Increased turbidity levels and siltation that were attributed to natural erosion events and any other water quality observations were noted on the appropriate Stream Survey Form.

## 5.0 RESULTS AND DISCUSSION

The area covered by this report has been separated by major creeks (subdrainages) within the Upper Endako and Upper Bulkley watersheds (listed below). The Taman Creek drainage is part of the Upper Bulkley watershed above Bulkley Lake while the remaining systems are all part of the Upper Endako system. This study area was surveyed from October 4 to October 24, 1996. Each section documents overall fish habitat and stream morphology for each subdrainage, summarizing all information on surveyed reaches within that system. This is followed by a description of fish species presence and distribution limits, as well as FPC classification within the mainstem subdrainage. A tabular stream summary which highlights important features in each surveyed reach and a brief description of tributaries is also included. Further detailed information is available in the digital Stream Survey Forms.

### 5.1 Endako River

The section of Endako River surveyed begins approximately 25km west of Burns Lake near Rose Lake at the Highway 16 road crossing. Reach delineation begins from its confluence with Rose Lake outlet creek, located approximately 400m downstream from the Highway 16 crossing. Reach numbers were assigned sequentially upstream starting from this reach. Tributaries to the Endako River in this area were arbitrarily assigned the prefix "END" and numbered upstream according to their location in this drainage (i.e., END1, END2, etc.). Following is a description of this section of the Endako River, summarizing overall fish distribution, habitat and stream morphology. Detailed reach-specific information on fish usage, habitat characteristics and stream channel morphology is available on the digital Stream Survey Forms. A surveyed reach summary is presented in tabular form at the end of this description.

#### 5.1.1 Physical

This section of the Endako River is 9.0km in length from its confluence with Rose Lake outlet creek. The creek was surveyed in Reach 1 at the Highway 16 road crossing and in Reaches 4 and 5.

**Reach 1** measures 2.0 km in length and was surveyed upstream over 130m, starting 100m upstream from the Highway 16 road crossing near Rose Lake. It is a low gradient, forested reach with a moderately deep channel incised into relatively flat surrounding area (Photo 1). Riffles and pools predominate and the substrate consists of large gravels/small cobble. The channel is extremely meandering and has an abundance of undercut banks. Excellent rearing habitat is available in undercut banks and in pool areas. The creek exhibits good flow and likely provides good overwintering habitat. Gravel/cobble substrate and good flow provides good spawning opportunities in this reach. Fish sampling results confirmed relatively high productivity, especially given the lateness of season at the time of sampling.

Debris is limited in this reach, most of which is small woody debris, transported from upstream. LOD present originates primarily as windthrow, as the creek has a low ability to transport debris (low gradient, no significant sideslopes). A local resident near this sampling site mentioned presence of suckers (LSU?) in this creek, although none were captured. He also stated that the culvert at the Highway 16 road crossing (Photo 2) restricts upstream migration and that he has observed numerous fish holding in the pool below the culvert. Further investigation could be done on the impact of poor culvert placement/selection across the highway on upstream productivity as it is currently a possible obstruction to juvenile fish passage. This might be done under the auspices of the Watershed Restoration Program.

**Reach 4** begins 3.5km upstream from the mouth and is 1.9km in length. It was surveyed 100m upstream from the Taman logging road crossing; approximately 3.7 km upstream from the mouth and at 100m downstream from the Reach 5 boundary (5.25km upstream from the mouth). This reach is higher gradient (3%), gullied and frequently confined, forested and is primarily riffle-type over cobble/boulder substrate (Photo 3). Excellent rearing habitat is available in undercut bank areas and in boulder cover, with good flow/size providing good potential overwintering habitat and resident potential. Fair to good spawning gravels are available along the creek fringes, but the substrate is generally too large throughout

most of the channel. Very little debris is present in this reach, either as windthrow or transport. The riparian area is dominated by deciduous trees growing out over the channel, providing good cover during the summer months. The left bank along this reach has been previously logged along the top of the gully, but this doesn't seem to have impacted this creek, as there is no evidence of bank failure or increased windthrow in this area that could be attributed to the logging. The creek is currently undercutting its banks which increases rearing habitat, but there is no sign that this process is affecting sideslope stability.

Near the top end of the reach, the gradient increases to 6-15% and the gully was becoming more entrenched within steep bedrock walls approximately 30m high. This site was typified by boulder step-pools and cascades over larger substrate (boulders). This section of the reach provided good rearing habitat under large overhanging boulders and in pools created below small boulder step-pools. Spawning habitat was poor due to the large substrate and resident potential was good, due to the provision of good flow and the good available rearing habitat. A 5m falls is located at the end of this reach, 5.4km upstream from the mouth (Photo 5), which is an obstruction to upstream fish migration.

**Reach 5** begins 5.35 km upstream from the mouth immediately above the falls which mark the start of reach. Chutes and cascades predominate the stream characteristics, flowing at 10% gradient over large substrate and entrenched within a 20m high vertical concretion wall gully. Rearing habitat is limited due to the high gradient flow over large substrate. The concretion walls of the channel appear to be a major source of gravels for downstream reaches due to continuous erosion, transporting gravels downstream during higher flow periods. Debris in this reach is abundant and made up of both in-channel debris and LOD-span over the channel from extensive windthrow. Degree of stability represents both types of debris, as in channel debris is unstable while the windthrow over the channel is stable.

### 5.1.2 Fish

Fish distribution in this system is limited by a 5m falls located at the end of Reach 4, 5.4km upstream from the Endako confluence with Rose Lake outlet creek. Electroshocking below this obstruction confirmed the presence of rainbow trout. Results of sampling indicate that this is a productive system for rainbow, although it decreases significantly as it approaches the falls. Anecdotal information suggests the presence of suckers (species) below the Highway 16 crossing in Reach 1, but this was not confirmed during this survey. The falls at the end of Reach 4 are a definite obstruction to fish passage and fish sampling above the falls confirmed the absence of fish. The falls are therefore the upstream distribution limit for this creek, with this and all further upstream reaches being non fish-bearing.

### 5.1.3 Stream Classification

An FPC classification of S3 was assigned to the Endako River for its entire fish-bearing length to the falls obstruction at the end of Reach 4. Above the falls, the Endako is non fish-bearing and was accordingly assigned an FPC classification of S6.

### 5.1.4 Surveyed Reach Summary

The table below summarizes all surveyed reaches on the Endako River. Reaches that were not surveyed are presented in the table to provide information on reach lengths and inferred fish presence. The reach summary ends at the first non fish-bearing reach and is not necessarily the final reach on the creek.

**Table 1: Stream Summary of Surveyed Reaches on the Upper Endako River**

Reach No.	Reach Length (km)	Description	Channel Width (m)	Fish Species Present (=inferred)	Reach Grad. (%)	Comments
1	2.0	Low gradient, forested, flat surrounding area. Mainly riffle/pool with large gravels/small cobble. Extremely meandering with abundance of undercut banks.	3.5	RB	2.0	Excellent rearing in undercut banks and pool areas. Good flow - likely provides good overwintering. Gravel/cobble substrate and good flow provides good spawning habitat. Productive creek.

Reach No.	Reach Length (km)	Description	Channel Width (m)	Fish Species Present ( ) = inferred	Reach Grad. (%)	Comments
2	0.6	not surveyed		(RB)		
3	0.8	not surveyed		(RB)		
4	1.9	Higher gradient (3%), gullied, frequently confined, forested - mainly riffle over cobble/boulder substrate.	4.5	RB	3.0	Excellent rearing in undercut banks, and boulder cover. Good overwintering and resident potential. Fair to good spawning gravels along creek fringes, but generally too large throughout most of the channel. 5m falls at top of reach (5.4 km upstream from Rose L Creek) is upper limit of fish distribution.
5	2.1	Chutes/cascades predominate, high gradient over large substrate, entrenched within 20m high vertical concretion wall gully	2.8	none	10.0	Limited available fish habitat due to high gradient/ fast water over large substrate. No fish use due to falls obstruction at end of Reach 4.

### 5.1.5 Tributaries

Although eight tributaries were identified to be included within this section of the Endako River (END1 through END8), only END3, END4, END4A and END5 were surveyed. The following table summarizes tributaries to the Upper Endako River.

**Table 1a: Summary of Tributaries to the Upper Endako River above Rose Lake**

Creek Name	Fish-Bearing Length (km)	Fish Species ( ) = inferred [] = historical	FPC (Fish-bearing)	Comments
END1	NA	none	S6	This 1st order creek not surveyed. Flows into Reach 3 of the Endako River. Air photo interpretation suggested lack of suitable fish habitat and it was accordingly determined to be non fish-bearing.
END2	0.3	(RB)	S4	This 1st order creek not surveyed. Assessed based on gradient and air photo interpretation. The first reach was determined to be accessible to fish (0.3km) although there appeared to be very little suitable habitat. This creek was assigned an FPC classification of S6 above Reach 1.
END3	3.7	RB	S3	See detailed description below.
END4	2.5	(RB)	S4	This 2nd order creek flows SW into Reach 4 of the Endako R (left bank) approximately 4.5 km upstream from the Endako confluence with Rose L outlet creek. Small creek with trickle of flow over gravels. Very little fish habitat as water is shallow and flow is barely evident. Poor to fair rearing habitat in pools under overstream vegetation cover, but flow is generally too low to provide any spawning or resident potential. Habitat likely limited to refuge habitat for fish from Endako during high flow periods. Fish presence inferred for entire length, based on gradient, as results of fish sampling were negative.
END4A	NA	none	S6	1st order creek, flows SW into Reach 1 of END4 (left bank), 0.1 km upstream from mouth with Endako R. Creek is a very small trib. to END4 with trickle of flow over fines. No fish habitat as water is shallow and flow is barely evident. Fish absence based on lack of suitable habitat.
END5	NA	none	S6	1st order creek, flows SW into Reach 4 of Endako R (left bank), 5.1 km upstream from Endako mouth with Rose L. outlet. Creek mouth is 35% gradient rendering it inaccessible to fish.
END6	NA	none	S6	1st order creek- flows into the non fish-bearing section of Endako River above the falls - assigned a non fish-bearing classification
END7	NA	none	S6	2nd order creek-flows into the non fish-bearing section of Endako R. above the falls - assigned a non fish-bearing classification
END8	NA	none	S6	1st order creek-flows into the non fish-bearing section of Endako R. above the falls - assigned a non fish-bearing classification

### Creek END3

This creek is a second order tributary to the upper Endako River, which flows southwest into Reach 4 of the Endako R (left bank), 4.3km upstream from the Endako confluence with Rose Lake outlet creek. It

has a total length of 3.7km, but only the first reach, with a length of 1.3km, was surveyed. This creek is a major tributary to the Endako at this location and flows over a moderate gradient and is confined within a well-defined V-shaped gully. The surrounding area is forested with extensive deciduous trees. Flow is primarily riffle-type over gravels and small cobble substrate (Photo 4). Excellent rearing is provided in a mix of undercut banks, boulder pools and LOD cover. Good spawning gravels are present, but the moderate gradient likely reduces spawning potential. Good spawning habitat is limited to lower gradient sections in gravel bar areas. Presence of deep pools and perennial flow provides good resident potential. Electroshocking in the first reach resulted in the capture of two rainbow trout juveniles. With a channel width of 2.3m, an FPC classification of S3 was assigned to this creek. Upstream reaches were not surveyed due to time constraints, but were assessed to be fish-bearing based on gradient.

## **5.2 Creek SH (Shovel Creek Tributary)**

Creek SH is third order tributary to Shovel Creek, flowing into its right bank approximately 0.9km downstream from Shovel Lake. Tributaries to this creek were arbitrarily assigned the prefix “SH” and numbered upstream according to their location in this drainage (i.e., SH1, SH2, SH3). Following is a description of Creek SH, summarizing overall fish distribution, habitat and stream morphology for this system. Detailed reach-specific information on fish usage, habitat characteristics and stream channel morphology is available on the digital Stream Survey Forms. A surveyed reach summary is presented in tabular form at the end of this description.

### **5.2.1 Physical**

Creek SH is 16km in length from its confluence with Shovel Creek to its headwaters. The first two reaches are fish-bearing to a 5m falls located 1.6km upstream from the mouth. The creek was surveyed in Reach 1, 800m upstream from the mouth and in Reach 2 both below and above the falls.

**Reach 1** measures 1.3km in length and is characterized by a low gradient meandering channel with good flow over mainly small gravel substrate (Photo 6). The channel is not gullied and is within a forested surrounding area. Numerous sidechannels exist within this broad floodplain reach of Creek SH. The first 800m near the confluence with Shovel Creek is a large wetland/flooded complex, heavily covered by deciduous trees. Excellent rearing habitat is available in cover provided by LOD-dependent pools and undercut banks. Good to excellent spawning opportunities are available in abundant small gravels throughout this reach. Numerous redds were observed throughout the reach, confirming the occurrence of spawning. The creek appears to be very productive (many more were observed than captured), with good ability to support a resident population. Excellent rearing habitat is also provided in the numerous side-channels. Most in-channel LOD is as a result of windthrow, although there is evidence of high debris transport, as indicated by numerous debris jams and in-channel SWD accumulations.

**Reach 2** begins 1.3km upstream from the mouth and is 2.7km in length. This reach is similar to Reach 1 except that it is steeper, slightly gullied and not braided. Substrate in this reach is primarily cobble/boulder and flow is characterized by riffles and pools. Good rearing habitat is provided by boulder pool and LOD cover in this reach. The larger substrate reduces spawning opportunities, although fair habitat in some suitable gravel patches is present throughout. There is less debris and windthrow in this reach as transportable debris likely settles downstream in the lower gradient Reach 1. A 5m falls (Photo 7) is located 300m into this reach, 1.6km upstream from the mouth. These falls are definite obstruction to upstream fish migration.

### **5.2.2 Fish**

Numerous rainbow trout fry and juveniles were captured in both reaches of Creek SH below the falls. The presence of fry, excellent spawning gravels and redds confirms the use of this system for spawning by this species. Upstream distribution in this system is limited by the falls in Reach 2 which are impassable and render the rest of this system inaccessible to fish. Negative electrofishing results above these falls, combined with negative minnow trapping results in Reaches 7 and 8 confirmed fish absence above the

falls. In addition, a very large series of falls is also present in Reach 3 (Photo 8), approximately 4km upstream from the mouth.. The first set of falls in Reach 2 are the upstream distribution limit for this creek, with all further upstream reaches being non fish-bearing.

### 5.2.3 Stream Classification

Creek SH was assigned an FPC classification of S3 in Reaches 1 and 2 below the falls (1.6km fish-bearing length) and a classification of S5 above.

### 5.2.4 Surveyed Reach Summary

The table below summarizes all surveyed reaches on Creek SH. The reach summary ends at the first non fish-bearing reach and is not necessarily the final reach on the creek.

**Table 2: Stream Summary of Surveyed Reaches on Creek SH**

Reach No.	Reach Length (km)	Description	Channel Width (m)	Fish Species Present (=inferred)	Reach Grad. (%)	Comments
1	1.3	Low gradient meandering channel, good flow over small gravels; not gullied, forested surrounding area and broad floodplain with numerous sidechannels. First 800m near confluence with Shovel C. is a large wetland/flooded complex, heavily covered by deciduous trees.	4.2	RB	3.0	Excellent rearing in LOD-dependent pools and undercut banks. Good to excellent spawning in abundant small gravels throughout. Numerous redds observed throughout. Very productive creek with good ability to support resident population. Excellent habitat in numerous side-channels
2	2.7	Gullied, frequently confined, forested - mainly riffle over cobble/boulder substrate.	4.8	RB	3.0	Excellent rearing in undercut banks, and boulder cover. Good overwintering and resident potential. Fair to good spawning gravels along creek fringes, but generally too large throughout most of the channel. 5m falls 300m upstream from bottom of reach is upper limit of fish distribution (1.6km u/s from mouth).

### 5.2.5 Tributaries

The tributaries identified to be included within this survey (Creeks SH1, SH2 and SH3) flowed into Creek SH above the falls obstruction in Reach 2. None of these creeks were surveyed since these falls were a barrier to fish passage rendering the system non fish-bearing above this point. The creeks were therefore assigned a non fish-bearing FPC classification of S6.

## 5.3 Creek DEC1 (Decker Lake Tributary)

Creek DEC1 is a small second order tributary to Decker Lake located on the west side of Decker Lake. It flows east into the west shore of Decker Lake, approximately 2.5km southwest of the lake inlet. Reach 1 was surveyed over its entire length of 0.5km. Following is a description of Creek DEC1, summarizing fish distribution, habitat and stream morphology for this system.

### 5.3.1 Physical

**Reach 1** of Creek DEC1 flows at a low gradient through a well-defined forested gully over large gravel/ small cobble substrate (Photo 9). Habitat in this reach is extremely limited due to lack of sufficient flow. The catchment area for this drainage is small, with most flow originating from local sources during high rainfall and snowmelt events. It is unlikely that fish use this creek at any time throughout the year for rearing, due to the lack of sufficient water and suitable habitat. The beaver dam (Photo 10) at the mouth of this creek would also impede access for fish into this creek, but this obstruction is likely not significant

due to the lack of available rearing habitat in the creek. This creek lacks significant ability to transport debris and/or sediment except at higher flow periods, which would be limited to snowmelt and heavy rainfall events. The main concern would be effects of sediment transport during these periods into Decker Lake, although this would not be a great concern given the small size of the creek. Lack of suitable fish habitat in the creek and apparent lack of use by fish limits any potential impacts on fish habitat from logging in the area.

### **5.3.2 Fish**

No fish were captured in Creek DEC1 after extensive electroshocking in Reach 1. Due to the lack of sufficient flow and availability of suitable habitat, there is likely no fish use of this creek at any time of year.

### **5.3.3 Stream Classification**

Extensive fish sampling in this reach yielded no fish capture. Lack of available fish habitat throughout this reach precludes fish presence, which is supported by the negative fish sampling results. It was accordingly assigned a non fish-bearing FPC classification of S6, due to its average channel width of 0.9m.

## **5.4 Lakes Creek**

Lakes Creek is a third order tributary to the Endako River, flowing east into the Endako (right bank), approximately 2km upstream from the Decker Lake inlet. It is comprised of nine reaches with an overall length of 9.2km (to Shuldham Lake). Tributaries to this creek were arbitrarily assigned the prefix “LC” and numbered upstream according to their location in this drainage (i.e., LC1, LC2, LC3). Reaches 1 through 5 are of similar morphology and are located below Lake 431. Reach 6 is a swampy approach reach to the lake, while Reaches 7 through 9 are located between Lake 431 and Shuldham Lake. The Lakes Creek mainstem was originally attributed to the system flowing from Lake 48, but this system was assigned the name LC2, as the field survey confirmed this creek as a tributary to Lakes Creek. The mainstem watershed code was applied to the system flowing from Shuldham Lake. All reaches except Reach 1 of Lakes Creek were surveyed. Following is a description of Lakes Creek, summarizing overall fish distribution, habitat and stream morphology for this system. Detailed reach-specific information on fish usage, habitat characteristics and stream channel morphology is available on the digital Stream Survey Forms. A surveyed reach summary is presented in tabular form at the end of this description.

### **5.4.1 Physical**

**Reach 2** of Lakes Creek begins 1.8km upstream from its mouth with the Endako River and is 1.0km in length. It was surveyed at the Gerow Creek Road crossing, approximately 2.3km upstream from the mouth. This is a low gradient (4%) reach, dominated by riffle-type flow over gravel/cobble substrate through a relatively flat, rolling forested surrounding area. Excellent rearing habitat is available in cover provided by pools, LOD and in undercut bank areas. Good flow and suitable substrate provide areas of excellent spawning habitat, with good ability to support resident populations. Debris in this reach is mainly as a result of windthrow and provides good rearing cover for fish. Presence of small debris jams (SWD) which are not stable, suggests significant ability to transport small debris from upstream reaches.

**Reach 3** begins 2.8km upstream from the mouth and is 0.8km in length. It was surveyed approximately 100m southeast of the 2.2km mark on Maxan road, 3.2km upstream from the mouth. This reach is slightly gullied, frequently confined, low gradient and riffle/pool-type flow over small cobble/large gravel substrate (Photo 11). Excellent rearing habitat is available in pools, undercut bank areas and in LOD-dependent pools, and among SWD. Good spawning is provided in frequent suitable gravel patches and resident potential is good. Debris in this reach is abundant, with most originating as transport from upstream reaches (SWD). These are not obstructions, but are rather providing good cover for rearing. There is a small degree of channel scouring, indicating occasional high flow events, even though the system is lake-regulated.



**Reach 4** begins 3.6km upstream from its mouth and is 1.5km in length. This reach is entrenched and confined within a steep, high gully (sideslopes 60% over 60m). Flow is generally riffle-pool type over large cobble substrate and the surrounding area is forested. Excellent rearing habitat is provided in this reach in abundant boulder, pool, cutbank and overstream vegetation cover. Good spawning gravels distributed throughout the reach provide areas of excellent spawning opportunity. There is abundant debris present throughout the channel, most as SWD piles in the channel. Most of this is unstable, but LOD over channel from windthrow is stable. Sideslopes are largely bedrock and large boulders, providing significant streambank stability.

**Reach 5** begins 5.1km upstream from its mouth and is 1.6km in length. This reach was surveyed approximately 800m downstream from Lake 431, 6.4 km upstream from the mouth. This reach is entrenched within a well-defined gully (sideslopes 70% over 40m), forested, and flow is mainly riffle/pool/run over cobble substrate. Extensive windthrow is present over the channel from gully walls. Excellent rearing habitat is provided in diverse types of cover, while suitable gravels dispersed throughout the reach provide areas of excellent spawning habitat. Extensive windthrow is contributing to in-channel debris, but most of it is stable. Half of the in-channel debris is unstable SWD and is present as transported debris from upstream reaches.

**Reach 6** begins at the old road crossing 6.7km upstream from the mouth and extends for 0.6km to Lake 431. The entire reach is beaver dam impoundment and swamp up to the lake (Photo 12). Rearing habitat is limited to deep pool type cover within the beaver pond/swamp. No suitable spawning habitat is available in this reach due to lack of suitable gravels and flow, while resident potential in the impoundment is good. A 1m beaver dam currently forms the boundary between Reaches 5 and 6, resulting in the impoundment of the entire reach below the lake. The beaver activity is likely a direct result of poor road crossing placement, as the dam is directly above this old road crossing. It appears that the crossing was inadequate in its width, facilitating beaver activity. In addition, the remnants of the old bridge have now collapsed into the creek channel (Photo 13), further obstructing fish passage into upstream reaches.

**Reach 7** begins at the inlet to Lake 431 and extends for 0.35km toward Shuldham Lake. This reach flows through a swampy valley approximately 80m in width before entering the lake. The channel is deeply incised into a flat swampy surrounding area, which consists mainly of willow shrub and grasses. Flow is generally run-type over small gravels/fines and is unconfined. Excellent rearing habitat is available in this reach, provided mainly by undercut banks and overstream vegetation cover. Little spawning habitat exists due to lack of suitable substrate, although there are some suitable gravel patches at the upstream end of the reach from upstream gravel recruitment settling out into the lower gradient reach. The channel is narrower here than in the lower reaches due to the deeply incised nature of the reach.

**Reach 8** begins 0.35km upstream from Lake 431 and is 0.3km in length. This reach is frequently confined within a slight gully and flows through a short forested area (Photo 14). Flow is primarily run over a mix of small cobble/gravels. Excellent rearing habitat is available, primarily in the form of LOD cover, likely facilitated by recent logging adjacent to the reach. Although the reach has suitable spawning substrate, low flow may reduce spawning opportunities in this reach. In addition, the right bank adjacent to the creek in this reach has been recently logged, resulting in total removal of the riparian zone. This may increase potential impacts in this area due to increased water temps and windthrow risk. Low flow and dewatering concerns are exacerbated due to the creek being more prone to higher air temperatures. Excessive debris adjacent to the channel as a result of the recent logging may also contribute to increased beaver activity in the future.

**Reach 9** begins 0.65km upstream from Lake 431 and extends for 0.3km to Shuldham Lake. This reach is unconfined in an 80m valley and has an incised channel in a swampy/grassy plain. Flow is low gradient over fines/small gravel substrate and is primarily run. The channel is extremely braided through the

swamp. The creek has no definitive banks in this reach and is better defined as a flooded wetland. Good rearing habitat is provided in very deep pool areas and under banks and overstream vegetation. Little spawning habitat exists due to lack of suitable substrate and good flow. As the creek is within a low gradient wetland valley in this reach, little debris is present.

#### 5.4.2 Fish

Fish sampling in Lakes Creek confirmed extremely high productivity for rainbow trout in this creek, especially in the first 5 reaches below Lake 431. Fish were generally less abundant in upstream reaches, but this could be attributed to the later season and colder water temperatures at the time of the survey for those reaches. However, the beaver dam and collapsed bridge in the channel at the end of Reach 5 could be obstructing fish passage. Numerous rainbow trout juveniles were observed immediately below the beaver dam among the collapsed bridge debris, as well as surfacing in the pond.

#### 5.4.3 Stream Classification

Lakes Creek was assigned an FPC classification of S3 over its entire length to Shuldham Lake, due to its confirmed fish-bearing status and a consistent channel width of greater than 1.5m.

#### 5.4.4 Surveyed Reach Summary

The table below summarizes all surveyed reaches on Lakes Creek. Reaches that were not surveyed are included in the table to provide information on reach lengths and inferred fish species presence. The reach summary ends at the first non fish-bearing reach or the end point of the survey and is not necessarily the final reach on the creek.

**Table 3: Stream Summary of Surveyed Reaches on Lakes Creek**

Reach No.	Reach Length (km)	Description	Channel Width (m)	Fish Species Present (=inferred)	Reach Grad. (%)	Comments
1	1.8	not surveyed		(RB)		
2	1.0	Low gradient (4%) reach, primarily riffle type over gravel/cobble substrate through forested area with relatively flat, rolling surrounding area.	2.3	RB	4.0	Excellent rearing in pools, LOD-pools and undercut banks. Good flow/suitable substrate provides areas of excellent spawning, with good ability to support resident populations. Fish sampling confirmed very high productivity in this creek (28 fish in 62 seconds).
3	0.8	Very slightly gullied, frequently confined, low gradient, riffle/pool type flow over small cobble/large gravel substrate.	2.5	RB	3.0	Similar to Reach 1 - excellent rearing in pools, bank areas and LOD-dependent pools and among SWD. Good spawning in frequent suitable substrate and good resident potential. Fish abundant (39 fish in 30 seconds of shocking) throughout.
4	1.5	Entrenched/ confined within steep high gully, forested, riffle-pool type flow over large cobble substrate with increased boulder %.	2.7	RB	4.0	Excellent rearing in abundant boulder, pool, cutbank and overstream vegetation cover, good spawning gravels distributed throughout. Good resident potential. Fish abundant (41 fish in 20 seconds of shocking) throughout reach.
5	1.6	Entrenched within well-defined gully (sideslopes 70% over 40m), forested, riffle/pool/run over cobble substrate, with extensive windthrow over channel from gully walls.	2.9	RB	2.0	Excellent rearing in diverse cover, good to excellent spawning gravels dispersed throughout, and excellent resident potential due to good flow and abundant deep pools. Fish abundant (36 fish in 14 seconds of shocking) throughout reach.
6	0.6	Entire reach is beaver dam impoundment/ swamp up to Lake 431.	30	RB	0.5	Rearing is limited to deep pool cover within the beaver pond/swamp. No suitable spawning is available. Resident potential is good. Many fish observed immediately below the beaver dam among collapsed bridge debris, as well as surfacing in the pond.

Reach No.	Reach Length (km)	Description	Channel Width (m)	Fish Species Present ( )=inferred	Reach Grad. (%)	Comments
7	0.3	Flows through a swamp valley approx 80m in width before entering the lake. Channel is deeply incised into flat swampy surrounding area, vegetated by willow shrub and grasses. Flow is generally run-type over small gravels/fines and is unconfined.	1.6	RB	0.5	Excellent rearing available, provided mainly by undercut banks and overstream vegetation cover. Poor spawning due to lack of suitable substrate, although there are some suitable gravel patches at the upstream end of the reach. Fish sampling produced 6 fish in 76 seconds of shocking - not as productive as lower reaches due to the colder water temps/later season at time of sampling.
8	0.3	Frequently confined within a slight gully and flows through forested area. Reach is primarily run over mix of small cobble/ gravels.	2.5	RB	2.0	Excellent rearing, primarily in LOD cover, likely facilitated by recent logging adjacent to the reach. Although the reach has suitable spawning substrate, low flow may reduce spawning opportunities. Decreased productivity - attributed to colder water temps/later season at time of survey.
9	0.3	Unconfined in 80 m valley. Channel incised into swampy plain. Low gradient over fines/small gravel substrate and is mainly run. Channel is extremely braided through the swamp. The creek has no definitive banks - better defined as flooded wetland with numerous channels. Reach extends to Shuldham Lake.	2.6	RB	0.5	Good rearing in very deep pool/ slow run areas and under banks and overstream vegetation. Poor spawning due to lack of suitable substrate/ good flow. RB observed.

### 5.4.5 Tributaries

The following table summarizes tributaries to Lakes Creek

**Table 3a: Summary of Tributaries to Lakes Creek**

Creek Name	Fish-Bearing Length (km)	Fish Species ( ) = inferred [] = historical	FPC (Fish-bearing)	Comments
LC1	1.2	(RB)	S4	1st order creek has fair rearing and poor spawning d/t lack of flow/substrate. No fish captured but fish presence inferred as accessible from fish-bearing water.
LC2	0.4	RB	S4	3rd order creek has excellent rearing and fair spawning in select gravelled areas. RB captured in 1st reach.
LC3	1.4	RB	S4	2nd order creek has good rearing and fair spawning in select gravelled areas and esp at road crossing. RB captured in 1st reach.

### 5.5 Creek ENDTR1

Creek ENDTR1 is a third order tributary to the Upper Endako River, flowing into its right bank approximately 3km upstream from Decker Lake. Tributaries to this creek were arbitrarily assigned the prefix “ENDTR1” and labelled upstream according to their location in this drainage (i.e., ENDTR1A, ENDTR1B, etc.) Following is a description of Creek ENDTR1, summarizing overall fish distribution, habitat and stream morphology for this system. Detailed reach-specific information on fish usage, habitat characteristics and stream channel morphology is available on the digital Stream Survey Forms. A surveyed reach summary is presented in tabular form at the end of this description.

### 5.5.1 Physical

Creek ENDTR1 is 18km in length from its confluence with the Endako River to its headwaters. The creek was surveyed in Reaches 1, 2 and 4.

**Reach 1** is 8.2km in length and is occasionally confined in short forested sections, but for the most part is unconfined through a broad, low gradient valley. The surrounding vegetation is primarily willow shrub and small deciduous trees, while flow is generally run-type over small gravels and fines (Photo 15). Excellent rearing habitat is available in this reach, with most cover provided under banks and in deep. Most of the reach does not possess suitable spawning habitat except in few locations where the channel becomes briefly confined within forested sections and gravel substrate predominates. These sections were not long enough to classify as different reaches and usually limited to lengths of less than 50m. The creek has good resident potential, mostly due to its large size and ability to provide perennial flow. Most debris in this reach has been introduced as a result of the extensive beaver activity in the area (Photo 16). This reach has a low ability to transport debris due to its low gradient and lack of sideslopes.

**Reach 2** begins 8.2km upstream from the mouth and is 0.4km long. The entire reach was surveyed and sampled extensively throughout. The reach is confined/entrenched within a well-defined forested gully (sideslopes 7m high, 65% gradient), and flow is generally type over small gravel substrate (Photo 17). Excellent rearing habitat is provided by abundant and extreme undercut bank areas and in few deep pools. Good to excellent spawning gravels are available throughout the reach and good spawning opportunity is available due to good flow characteristics which keep the channel watered year-round.

**Reach 4** begins 9.4km upstream from the mouth and is 1.5km in length. It was surveyed 40m upstream from the Maxan road crossing, 9.7 km upstream from the mouth. The reach is characterized by frequently confined riffle type flow over large gravel/small cobble substrate, while the surrounding area is relatively flat and forested. Excellent rearing habitat is available under cover provided by deep pools, overstream vegetation and LOD. Fair spawning habitat is available in select gravel patches, although most substrate is generally too large for rainbow spawning.

### 5.5.2 Fish

Rainbow trout juveniles were captured in Reach 1 of this creek. Although extensive fish sampling was conducted in Reaches 2 and 4, no fish were captured, suggesting lack of fish presence due to either downstream beaver dam obstructions or late season sampling at the time of the survey. Further sampling in this and upstream reaches should be undertaken to determine conclusive evidence of fish presence/absence. The creek provides good habitat and ability to support resident populations and but sampling in the early summer would confirm fish-bearing status, which at present has been inferred beyond Reach 1.

### 5.5.3 Stream Classification

Creek ENDTR1 has been assigned an FPC classification of S3 over its entire length from its mouth with the Endako River. However, fish presence was inferred beyond Reach 1, 8.2km upstream from the mouth, due to the availability of excellent rainbow trout rearing habitat and accessibility into upstream reaches.

### 5.5.4 Surveyed Reach Summary

The table below summarizes all surveyed reaches on Creek ENDTR1. Reaches that were not surveyed are presented in the table to provide information on reach lengths and inferred fish presence. The reach summary ends at the first non fish-bearing reach or the end point of the survey and is not necessarily the final reach on the creek.

**Table 4: Reach Summary of Creek ENDTR1**

Reach No.	Reach Length	Description	Channel Width	Fish Species	Reach Grad.	Comments
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	(km)		(m)	Present	(%)	
1	8.2	Mainly unconfined through broad, low gradient valley. Surrounding vegetation is willow shrub and small deciduous trees, and flow is generally run-type over small gravels and fines.	2.5	RB	2.0	Excellent rearing provided under banks and deeper pools/slow run. Most of reach lacks suitable spawning habitat except in few gravelled areas. The creek has good resident potential, mostly due to its large size and ability to provide good year-round flow
2	0.4	Confined/ entrenched within well-defined gully (sideslopes 7m high, 65% gradient), forested, mainly riffle-type over primarily small gravel substrate.	2.8	(RB)	4.0	Excellent rearing in abundant and extreme undercut bank areas and in few deep pools. Good to excellent spawning throughout. Good resident potential. Fish sampling efforts yielded no fish, suggesting lack of fish presence due to either downstream beaver dam obstructions or late season sampling at the time of the survey - further sampling required to confirm presence/absence..
3	0.8	not surveyed		(RB)		
4	1.5	Frequently confined, not gullied, forested and flow type is mainly riffle over large gravel/small cobble substrate.	1.8	(RB)	2.0	Excellent rearing in deep pools, overstream vegetation and LOD cover. Fair spawning in select gravel patches. Good resident potential. Fish sampling efforts yielded no fish, suggesting lack of fish presence due to either downstream beaver dam obstructions or late season sampling at the time of the survey (as above).

### 5.5.5 Tributaries

Only Creeks ENDTR1A and ENDTR1B were surveyed in this system, as negative fish sampling results in ENDTR1 beyond Reach 1 precluded the continuation of the survey as the results would have been inconclusive had no fish been captured. The lateness of the season at the time of sampling may have reduced fish capture probability. Both Creeks ENDTR1A and ENDTR1B flowed into the confirmed fish-bearing section ENDTR, 1 6.5km and 6.3km upstream from the Endako River, respectively.

**Table 4a: Summary of Surveyed Tributaries to Creek ENDTR1**

Creek Name	Fish-Bearing Length (km)	Fish Species ( ) = inferred [] = historical	FPC (Fish-bearing)	Comments
ENDTR1A	4.8	RB	S3	3rd order left bank tributary; RB captured up to the end of Reach 2 (0.24km) in this creek and inferred presence beyond. No upstream distribution limit determined. Excellent rearing in Reach 2 (Photo 18)
ENDTR1Ai	0	none	S6	1st order "Creek" is actually a meltwater channel inaccessible from ENDTR1A due to steep gradient
ENDTR1B	0.7	RB	S3	2nd order right bank tributary; good rearing potential and good spawning gravels throughout fish-bearing section (Photo 19). RB captured in reach 1, but u/s distribution limited by 2.5m falls (20) at the end of Reach 1, 0.7km u/s from the mouth

### 5.6 Creek ENDTR2 (Allen Creek)

Creek ENDTR2 (Allen Creek) is a third order tributary to the Upper Endako River, flowing into its left bank approximately 5km upstream from Decker Lake. Tributaries to this creek were arbitrarily assigned the prefix "ENDTR2" and labelled upstream according to their location in this drainage (i.e., ENDTR2A, ENDTR2B, etc.). Following is a brief description of this system, summarizing overall fish distribution, habitat and stream morphology. As the mainstem of this creek was not actually part of the project area,

the mainstem was not surveyed in entirety. Fish presence was confirmed in Reach 4, 3.9km upstream from its mouth with the Endako River. A 5m falls was located at the end of this reach 5km upstream from the mouth, which is impassable to all species of fish. Extensive sampling reaches above these falls yielded no fish, rendering it non fish-bearing.

### **5.6.1 Creek ENDTR2A**

This second order creek flows into the right bank of Reach 2 on Creek ENDTR2, 3.1 km upstream from its mouth with the Endako River. It has a total length of 6.1km and is comprised of four reaches. This creek was surveyed in Reach 2, which begins 0.8km upstream from its mouth with Creek ENDTR2. This reach is 1.3km long and flows through a slight gully which is forested by small deciduous tree. The channel is occasionally confined and primarily run/riffle type flow over large gravel substrate (Photo 21). This is a good sized creek with brisk flow over gravels and fair to good rearing habitat in few pool areas, although fast water and lack of significant cover reduces the amount of rearing habitat available. Spawning gravels are present throughout the reach, but spawning opportunity may be limited by low flow during the summer months (channel fringes are vegetated). Resident potential is low due to lack perennial flow and deep pool habitat. Recent snowfall and subsequent melt contributed significantly to water levels and increased sediments in the water, reducing visibility for fish sampling.

No fish were captured from thorough electroshocking in this reach, but given the creek's accessibility from downstream fish-bearing reaches and the lack of obstructions to fish passage, presence of rainbow trout was inferred. This reach was assigned an FPC classification of S3, although follow-up sampling could potentially confirm the absence of fish in this creek. Fish presence was also inferred for upstream reaches of this creek, based on gradient and air photo interpretation.

### **5.6.2 Creek ENDTR2B**

This third order creek was previously documented as the mainstem for the ENDTR2 system, but the field survey confirmed it as a tributary. It flows into the non fish-bearing section of Creek ENDTR2 above the falls. It is a right bank tributary, located 5.5km upstream from the Endako River. It has a total length of 6.6km and is comprised of five reaches. This creek was surveyed in Reach 1 at the road crossing, approx 1km upstream from its mouth with ENDTR2. Reach 1 is 1.2km long and flows confined within a forested gully (sideslopes = 8m high at 40% gradient). Flow is primarily as run over cobble substrate and meandering. Debris present in the reach is not extensive and is mainly as a result of windthrow, most of which is stable. Abundant cutbanks provide good rearing cover and good size/flow offers fair resident potential. The substrate is generally too large to provide good spawning opportunities. However, this creek flows into the non fish-bearing section of Creek ENDTR2 above the falls, and was therefore determined to be non fish-bearing. Negative fish sampling in this creek and in ENDTR2 support the assigned non fish-bearing classification of S6.

## **5.7 Rentoul Creek**

Rentoul Creek is a third order tributary to the Upper Endako River, flowing into its right bank approximately 8km upstream from Decker Lake. Tributaries to this creek were arbitrarily assigned the prefix "R" and labelled upstream according to their location in this drainage (i.e., RA, RB, etc.) Following is a description of Rentoul Creek, summarizing overall fish distribution, habitat and stream morphology for this system. Detailed reach-specific information on fish usage, habitat characteristics and stream channel morphology is available on the digital Stream Survey Forms. A surveyed reach summary is presented in tabular form at the end of this description.

### **5.7.1 Physical**

Rentoul Creek is 11.1km in length from its confluence with the Endako River to its headwaters. The creek was surveyed in Reaches 3-7.

**Reach 3** begins 1.6km upstream from the mouth and is 2.5km in length. It was surveyed at the Taman road crossing; 3.3km upstream from the mouth. This reach flows through a low gradient, non gullied area vegetated mainly by small willow trees. Flow is occasionally confined and is generally riffle-type over gravel substrate (Photo 23). Extensive undercut bank areas provide excellent cover for rearing throughout this reach, with few deep pools providing additional cover and rearing habitat. Good to excellent spawning gravels are available throughout the reach, providing excellent spawning opportunity in this fairly large creek. Very little debris is present, either as SWD accumulation or as windthrow. A 0.5m high culvert obstruction (Photo 24) at the Taman road crossing is located near the end of this reach, but this does not limit upstream distribution.

**Reach 4** begins 4.1km upstream from the mouth and is 2.5km in length. This reach is low gradient, confined and gullied, and characterized by riffle-type flow over large gravel substrate. There is little debris present, with most originating as windthrow over the channel. Abundant cover provides excellent rearing habitat provided mainly by cutbank areas and among LOD and pool areas. Few spawning gravels are dispersed throughout the reach with excellent flow to support spawning and incubation opportunity. The creek was very productive given lateness of sampling date. Moderate flow conditions at the survey time were attributed to recent snowmelt, which partially obstructed view for electrofishing and increased wetted width.

**Reach 5** begins 6.6km upstream from the mouth and is 0.6km long. It was surveyed approximately 20m upstream from Creek RD mouth; 6.8km upstream from the Endako River. This low gradient reach is occasionally confined through flat surrounding area vegetated primarily by small deciduous trees. Flow is primarily run over mixed gravel substrate. Excellent rearing habitat is provided under cutbanks, as well as in numerous deep pool areas and under LOD. Numerous gravel bars and suitable gravel substrate in the channel provides excellent spawning habitat throughout. Most in channel debris exists as windthrow with very little debris (SWD) attributed to transport from upstream reaches.

**Reach 6** is 0.4km in length and starts approximately 7.2km upstream from the mouth. This confined reach flows through a well-defined gully which is thickly forested, with extreme levels of windthrow over the channel from the gully walls. Flow is generally low gradient with run/riffle type flow predominating over mainly large gravel substrate. The abundant windthrow is currently creating numerous LOD-dependent pools. These LOD complexes provide excellent cover for rearing salmonids. Good spawning gravels are present throughout the reach, especially along fringes of the channel and in gravel bars. Mid-channel substrate is primarily angular and not suitable for spawning. This reach is considerably less productive than downstream reaches. A 3m high cascade is present at the end of this reach (Photo 26) which limits upstream fish distribution beyond this point.

**Reach 7** is begins at the impassable cascade obstruction, 7.7km upstream from the mouth. It has a length of 0.4km and has the same morphology as Reach 6 except that the cascade obstruction renders this reach inaccessible and non fish-bearing.

### **5.7.2 Fish**

Rentoul Creek provides excellent fish habitat throughout all surveyed reaches and fish sampling results confirmed a high productivity in this system. Rainbow trout were abundant in the fish-bearing reaches. Upstream distribution in this system is limited the impassable cascade at the end of Reach 6.

### **5.7.3 Stream Classification**

Rentoul Creek was assigned an FPC classification of S3 over its entire fish-bearing length to the end of Reach 6 below the cascade obstruction. An FPC classification of and S6 was assigned to Rentoul Creek in Reach 7 and all upstream reaches.

### 5.7.4 Surveyed Reach Summary

The table below summarizes all surveyed reaches on Rentoul Creek. Reaches that were not surveyed are presented in the table to provide information on reach lengths and inferred fish presence. The reach summary ends at the first non fish-bearing reach or the end point of the survey and is not necessarily the final reach on the creek.

**Table 6: Stream Summary of Surveyed Reaches on Rentoul Creek**

Reach No.	Reach Length (km)	Description	Channel Width (m)	Fish Species Present	Reach Grad. (%)	Comments
1	0.6	not surveyed		(RB)		
2	0.9	not surveyed		(RB)		
3	2.5	Flows through low gradient, non gullied area. Riparian area mainly small willows. Flow is occasionally confined and is generally riffle-type over gravel substrate.	2.4	RB	3.0	Extensive undercut bank areas provide excellent cover for rearing throughout, with few deep pools providing additional cover. Good to excellent spawning gravels throughout. Good-size/ year-round flow creates good resident potential.
4	2.5	This reach confined within gully, mainly riffle over large gravel substrate at low gradient, with little debris present, mainly as windthrow.	2.6	RB	3.0	Excellent rearing in abundant cutbank areas and among LOD (windthrown trees) and pool areas. Good spawning gravels dispersed throughout. Large size and presence of deep pools provide good resident potential.
5	0.6	Low gradient, occasionally confined through flatland, riparian area mainly small deciduous trees. Flow is run/riffle over mixed gravel substrate.	2.2	RB	1.0	Excellent rearing in cutbanks, deep pools and under LOD. Numerous gravel bars and suitable gravel patches in channel provides good spawning throughout. Good flow and number of deep pools provides good resident potential.
6	0.4	Confined in well-defined gully, thickly forested with extreme windthrow over channel, low gradient with run/riffle predominating over large gravel substrate. Abundant windthrow creates numerous LOD-dependent pools.	2.3	RB	3.0	LOD complexes provide excellent cover for rearing salmonids, in addition to abundant undercut bank areas. Good spawning gravels throughout, especially along fringes and in gravel bars. Mid-channel substrate is primarily angular and not suitable for spawning. Good flow/ deep pools provide good resident potential. Cascade at top of reach (7.7km u/s from mouth) is impassable to fish and marks the upper limit of distribution in this creek.
7	0.4	Same as Reach 6	2.3	none	3.0	Same as Reach 6 except non fish-bearing due to cascade obstruction at top of Reach 6.

### 5.7.5 Tributaries

Only the first reaches of tributaries RC and RD were surveyed within the Rentoul Creek system. Creeks RA and RB were both assessed based on air photo interpretation and assigned FPC classifications of S6. Creek RC is a second order creek composed of a repeating swamp/gully complex, heavily utilized by beavers. Fish habitat in the creek is minimal, with use likely limited to refuge areas during periods of high flow. No fish were captured in this creek, but presence of rainbow was inferred to the end of Reach 1 70m upstream. At this point, the limited habitat is made inaccessible by the commencement of extensive beaver activity. Upstream reaches of Creek RC were assigned an FPC classification of S6. Creek RD is a tiny first order tributary to Rentoul Creek with a channel frequently composed of shallow, disconnected pools and containing highly mineralized water. No usable fish habitat was present in this creek and it was accordingly assigned an FPC classification of S6.



## **5.8 Creek ENDTR3**

Creek ENDTR3 is a second order tributary to the Upper Endako River, flowing into its right bank approximately 2.7km upstream the Rentoul Creek mouth. Tributaries to this creek were arbitrarily assigned the prefix “ENDTR3” and labelled upstream according to their location in this drainage (i.e., ENDTR3A, ENDTR3B, etc.) Following is a description of Creek ENDTR3, summarizing overall fish distribution, habitat and stream morphology for this system. Detailed reach-specific information on fish usage, habitat characteristics and stream channel morphology is available on the digital Stream Survey Forms. A surveyed reach summary is presented in tabular form at the end of this description.

### **5.8.1 Physical**

Creek ENDTR3 is 12.4km in length from its confluence with the Endako River to its headwaters. The creek is comprised of 11 reaches and was surveyed in Reaches 2,4,5 and 6.

**Reach 2** was surveyed 100m downstream from the Taman road crossing and is 1.2km in length. It begins 1.5km upstream from its mouth with the Endako River and is generally a low gradient, slightly gullied and forested reach with a frequently confined channel (Photo 27). Flow is mostly riffle/run over small gravels. Excellent rearing habitat is provided in undercut bank areas and among LOD. Good flow and availability of small gravels provides areas of excellent spawning opportunity. Consistent perennial flow and availability of deep pool habitat provides excellent resident potential in this creek. A culvert obstruction at Taman road crossing (Photo 27) is currently elevated 1.5m above the channel and potentially impeding upstream access for fish and possibly reducing productivity in upstream reaches.

**Reach 4** begins 3.9km upstream from the mouth and has a length of 0.9km. This reach has a moderate gradient, is slightly gullied, forested, frequently confined and flows briskly mainly riffle/run over primarily small cobble substrate. Abundant debris accumulation is present throughout the reach from both transport and as LOD-span from windthrow over the channel. Excellent rearing is available in undercut bank areas and among abundant LOD (pools) and SWD cover. B risk flow over cobble limits available spawning habitat. Presence of abundant debris suggests susceptibility to transport and potential concerns if logging contributes increased debris into this reach.

**Reach 5** begins 4.9km upstream from the mouth and has a length of 0.6km. This reach has a moderate gradient and is confined through a forested, well defined gully (sideslopes 20m high at 80% gradient). Flow is primarily brisk run/riffle over large gravel/small cobble substrate (Photo 29). Abundant debris accumulation is present in this reach. This creek offers excellent rearing habitat in undercut bank areas and among abundant LOD and SWD cover. Brisk flow over gravels provides good to excellent spawning habitat throughout the reach. A 5m falls located at the end of this reach (Photo 30) is impassable to fish and renders upstream reaches non fish-bearing.

**Reach 6** begins at the impassable falls located 5.4km upstream from the mouth. Any potential fish habitat in this and all further upstream reaches is made inaccessible and unusable due to this falls obstruction.

### **5.8.2 Fish**

Although no fish were captured in Reach 2 of this creek, fish sampling in upstream reaches confirmed the presence of rainbow trout juveniles and adults. Productivity in this system was somewhat low given the excellent habitat available in the system, but this is attributed to low water temperatures and late season at the time of the survey. The falls at the end of Reach 5 are a definite obstruction to fish passage and extensive fish sampling above the falls confirmed the lack of a resident fish population.

### 5.8.3 Stream Classification

Creek ENDTR3 was assigned an FPC classification of S3 from its mouth with the Endako River to the impassable falls at the end of Reach 5, 5.4km upstream. Beyond the falls, the system was assigned a non fish-bearing classification of S6.

### 5.8.4 Surveyed Reach Summary

The table below summarizes all surveyed reaches on Creek ENDTR3. Reaches that were not surveyed are presented in the table to provide information on reach lengths and inferred fish presence. The reach summary ends at the first non fish-bearing reach or the end point of the survey and is not necessarily the final reach on the creek.

**Table 7: Stream Summary of Surveyed Reaches on Creek ENDTR3**

Reach No.	Reach Length (km)	Description	Channel Width (m)	Fish Species Present	Reach Grad. (%)	Comments
1	1.5	not surveyed		(RB)		
2	1.2	Low gradient, slightly gullied, forested, frequently confined - mainly riffle/run over small gravel substrate. Very little debris from transport - rather LOD-span from windthrown trees over channel.	3.3	(RB)	4.0	Good size - offers excellent rearing in undercut bank areas and among LOD (windthrow). Small gravels provide excellent spawning. Perennial flow and deep pools provide excellent resident potential. Fish sampling results negative in this reach, but fish presence confirmed in upstream reaches.
3	1.2	not surveyed		RB		
4	0.9	Moderate gradient, slightly gullied, forested, frequently confined. Flows briskly riffle/run over small cobble substrate. Abundant debris accumulation from transport and as LOD-span from windthrow.	2.8	RB	6.0	Good size/flow - offers excellent rearing habitat in undercut banks, abundant LOD (pools) and SWD cover. Brisk flow over cobble limits spawning to gravel fringes and bars. Perennial flow and deep pools provide excellent resident potential.
5	0.6	Moderate gradient, forested, and confined within a steep, well defined gully (sideslopes 20m high at 80% gradient). Mainly run/riffle over large gravel/small cobble. Abundant debris present.	2.9	RB	4.0	Excellent rearing habitat in undercut bank areas and among LOD and SWD. Good to excellent spawning throughout. Excellent resident potential. Likely more productive during summer months (warmer water) - fish sampling produced only 2 RB. Falls at top of reach (5.4km u/s from mouth) is impassable to fish and marks the upper limit of distribution in this creek.
6	0.2	Same as Reach 5	2.9	none	4.0	Same as Reach 5 except non fish-bearing due to falls obstruction at top of Reach 5.

### 5.8.5 Tributaries

Three tributaries were to be included within this survey. They were assigned names of ENDTR3A, ENDTR3B and ENDTR3C. Creek ENDTR3A flows into the left bank of Reach 2 approximately 1.8km upstream from the mouth while Creek ENDTR3B flows into the left bank of Reach 4 approximately 4.2km upstream from the mouth. Field check of these drainages confirmed the lack of continuous definable banks or fluvial processes. Although not technically creeks, they were assigned FPC classifications of S6, since there was nothing resembling fish habitat present in these systems. Creek ENDTR3C flows into the left bank of Reach 9 approximately 9.5km upstream from the mouth. Since it flows into the non fish bearing section of ENDTR3, this creek was assigned a non fish-bearing classification of S6.

## **5.9 Upper Bulkley River**

The Upper Bulkley River is a fourth order creek within the Skeena watershed. It was surveyed over 3.4km upstream from its mouth at Bulkley Lake to its confluence with Taman Creek. Following is a description of the Upper Bulkley River, summarizing overall fish distribution, habitat and stream morphology for this system. Detailed reach-specific information on fish usage, habitat characteristics and stream channel morphology is available on the digital Stream Survey Forms. A surveyed reach summary is presented in tabular form at the end of this description.

### **5.9.1 Physical**

The section of the Upper Bulkley River surveyed is 3.4km in length from its mouth at Bulkley Lake to the Taman Creek confluence. This section of the system is comprised of 3 reaches, all of which were surveyed.

**Reach 1** begins at Bulkley Lake and extends upstream for 3km. This reach has extensive beaver activity, especially upstream of the Highway 16 crossing. Deciduous forest covers the surrounding area while the lower end of the reach south of the highway is surrounded by agricultural land. This is a low gradient, occasionally confined reach with flow mainly riffle/run type over large gravel substrate (Photo 31). Excellent deep pool rearing habitat available in this reach, in addition to an abundance of cover provided mainly by undercut banks. Although spawning habitat is limited above the highway due to the beaver activity, there are good gravels available immediately downstream from the highway. Consistent perennial flow and availability of deep pool habitat provides excellent resident potential in this creek.

**Reach 2** begins 3km upstream from Bulkley Lake north of Highway 16 and is 0.2km in length. This reach is low gradient, entrenched within a steep well-defined bedrock gully (sideslopes 10m high bedrock at 80% gradient), forested, and flows briskly mainly as riffle/run over cobble substrate (Photo 32). Abundant debris accumulation is present from both transport and as LOD-span from windthrow over channel. This reach offers excellent rearing habitat, especially in deep pool areas created by LOD and in boulder type cover. Brisk flow over cobble limits available spawning habitat to gravel fringes and bars. Consistent perennial flow and availability of deep pool habitat provides excellent resident potential in this creek.

**Reach 3** begins 3.2km upstream from Bulkley Lake and extends 0.3km to Taman Creek. This reach is low gradient, not gullied, forested (mainly willow shrub and deciduous), frequently confined through a broad valley and flows briskly as mainly riffle over cobble substrate. This reach offers excellent rearing habitat in undercut bank areas and under overstream vegetation. Lack of suitable substrate limits available spawning habitat to gravelled fringes and bars.

### **5.9.2 Fish**

Coho salmon, rainbow trout, prickly sculpin and longnose sucker were all captured in Reach 1. However, only rainbow trout were captured in both upstream reaches, suggesting beaver activity in Reach 1 limits upstream distribution of CO, CAS and LSU by impeding fish passage into upstream reaches.

### **5.9.3 Stream Classification**

The Upper Bulkley River was assigned an FPC classification of S2 over its entire length from Bulkley Lake to Taman Creek.

### **5.9.4 Surveyed Reach Summary**

The table below summarizes all surveyed reaches on Bulkley Creek. The reach summary ends at the first non fish-bearing reach or the end point of the survey and is not necessarily the final reach on the creek.

**Table 8: Stream Summary of Surveyed Reaches on Bulkley River<sup>1</sup>**

Reach No.	Reach Length (km)	Description	Channel Width (m)	Fish Species Present	Reach Grad. (%)	Comments
1	3.0	Extensive beaver activity, especially u/s of Highway 16 crossing, deciduous forest surrounding area, low gradient, occasionally confined. Flow is mainly pool and riffle over large gravel.	5.4	RB, CO, CAS, LSU	1.0	Excellent deep pool rearing, in addition to cover provided by undercut banks. Spawning is limited above the highway due to the BD activity, but good gravels available immediately downstream from the highway. Consistent perennial flow and deep pool habitat provide excellent resident potential. Agricultural use on the lower Bulkley south of the highway.
2	0.2	Low gradient, entrenched within a steep well-defined bedrock gully, forested. Flows riffle/run over cobble. Abundant debris from transport and LOD-span from windthrow over channel.	6.1	RB	3.0	Excellent rearing, especially in deep pools created by LOD and in boulder cover. Brisk flow over cobble limits spawning to gravel fringes and bars. Excellent resident potential. Fish sampling returned only RB, suggesting BD activity in Reach 1 limits upstream distribution of CO, CAS and LSU.
3	0.3	Low gradient, not gullied, forested (mainly willow shrub, deciduous), frequently confined through a broad valley. Flows briskly mainly riffle over cobble.	5.6	RB	1.0	Excellent rearing under banks and overstream vegetation. Brisk flow over cobble/boulders limits spawning to gravelled fringes and bars. Consistent perennial flow and availability of deep pool habitat provides excellent resident potential.

## 5.9.5 Tributaries

Taman Creek was the only creek surveyed within the Upper Bulkley drainage and is discussed in the following sections.

## 5.10 Taman Creek

Taman Creek is a third order tributary to the Upper Bulkley River, flowing into its left bank approximately 3.5km upstream from Bulkley Lake. Tributaries to this creek were arbitrarily assigned the prefix “TAM” and numbered upstream according to their location in this drainage (i.e., TAM1, TAM2, etc.) Following is a description of Taman Creek, summarizing overall fish distribution, habitat and stream morphology for this system. Detailed reach-specific information on fish usage, habitat characteristics and stream channel morphology is available on the digital Stream Survey Forms. A surveyed reach summary is presented in tabular form at the end of this description.

### 5.10.1 Physical

Taman Creek is 15km in length and flows south into Reach 3 of Bulkley Creek, 3.5km upstream from Bulkley Lake. Reaches 1 through 6 were not surveyed as there were no obstructions visible from air photo interpretation to limit upstream distribution. FPC classification of these reaches was based on fish sampling results and channel characteristics for Reach 7 of this creek. Fish were captured in both Bulkley Creek immediately downstream and in Reach 7 of Taman Creek. Reaches 7,8 and 9 were surveyed on Taman Creek.

**Reach 7** begins 5.1km upstream from the mouth and extends for 2.6km. This reach is low gradient and gullied, with an incised channel into the valley bottom. Surrounding area is forested while the creek channel is confined and flows briskly mainly riffle over small and large cobbles (Photo 33). This reach provides excellent rearing habitat in undercut bank areas and among abundant LOD pools. Brisk flow

<sup>1</sup> Surveyed only up to confluence with Taman Creek.

over cobble limits available spawning habitat to gravel fringes and bars. Consistent perennial flow and availability of deep pool habitat provides excellent resident potential in this creek.

**Reach 8** begins 7.7km upstream from the mouth and is 0.1km in length. This reach is high gradient and entrenched within a 30m high bedrock canyon (sideslopes 110%). Flow is mainly step-pools, small falls and cascades over large substrate (Photo 34). Some good rearing habitat is available in select areas in pools below boulder falls/cascades. The steep channel with large angular substrate precludes any use of this reach for spawning. A 15m high rock falls is located at the end of this reach (Photo 35) which is impassable to all species of fish and renders the rest of the Taman Creek system as inaccessible and non fish-bearing.

**Reach 9** begins at the falls obstruction, 7.8km upstream from the mouth. Any potential fish habitat in this reach and upstream reaches is inaccessible due to the falls obstruction at the start of the reach.

### 5.10.2 Fish

Fish distribution in the Taman Creek system is limited by an impassable falls obstruction (Photo 35) located at the end of Reach 8, 7.8km upstream from the mouth. These falls are a barrier to all fish species migration and render the rest of Taman Creek inaccessible to fish. Extensive electroshocking below the falls confirmed the presence of rainbow trout. Results of sampling indicate Taman Creek is productive system for rainbow, especially given the lateness of the season at the time of the survey. Negative fish sampling results in Reach 9 above the falls obstruction confirm fish absence beyond this point and mark the upper limit of rainbow trout distribution in Taman Creek.

### 5.10.3 Stream Classification

Fish sampling in Taman Creek below the falls obstruction confirmed the presence of rainbow trout. It was accordingly assigned an FPC classification of S3 due to its average channel width of 3.4m. No fish were captured above the falls, yielding an FPC classification of S5.

### 5.10.4 Surveyed Reach Summary

The table below summarizes all surveyed reaches on Taman Creek. Reaches that were not surveyed are presented in the table to provide information on reach lengths and inferred fish presence. The reach summary ends at the first non fish-bearing reach or the end point of the survey and is not necessarily the final reach on the creek.

**Table 9: Stream Summary of Surveyed Reaches on Taman Creek**

Reach No.	Reach Length (km)	Description	Channel Width (m)	Fish Species Present	Reach Grad. (%)	Comments
1	0.4	not surveyed		(RB)		Inferred fish presence based on upstream fish sampling results.
2	0.8	not surveyed		(RB)		As above.
3	0.5	not surveyed		(RB)		As above.
4	0.6	not surveyed		(RB)		As above.
5	1.3	not surveyed		(RB)		As above.
6	1.6	not surveyed		(RB)		As above.
7	2.6	Low gradient, gullied with an incised channel into valley bottom, forested, confined, flows briskly mainly riffle over small and large cobble substrate.	3.4	RB	3.0	Excellent rearing in undercut banks and among abundant LOD pools. Brisk flow over cobble limits spawning to gravel fringes and bars. Excellent resident potential.
8	0.1	High gradient and entrenched within a 30m high bedrock canyon. Mainly step-pools, small falls and cascades over large substrate.	3.3	RB	15.0	Good rearing in select areas in pools below boulder falls/cascades. Poor spawning due to steep channel with large angular. Excellent resident potential. 15m falls at top of reach (7.8km u/s from mouth) is

						impassable to fish and marks the upper limit of distribution in this creek.
9	0.2	This reach is high gradient and entrenched within a 30m high bedrock canyon (sideslopes 110%). Flow (other) is mainly step-pools, small falls and cascades over large substrate.	3.3	none	10.0	Good rearing in select pool areas below boulder falls/cascades. Poor spawning due to steep channel with large angular substrate. Good resident potential. However, falls at end of Reach 8 render this reach inaccessible to fish and non fish-bearing.

### 5.10.5 Tributaries

The following table summarizes tributaries to Taman Creek. Only Creek TAM1 was surveyed as the remaining creeks were assessed based on gradient, air photo interpretation and fish-bearing status of the receiving waters.

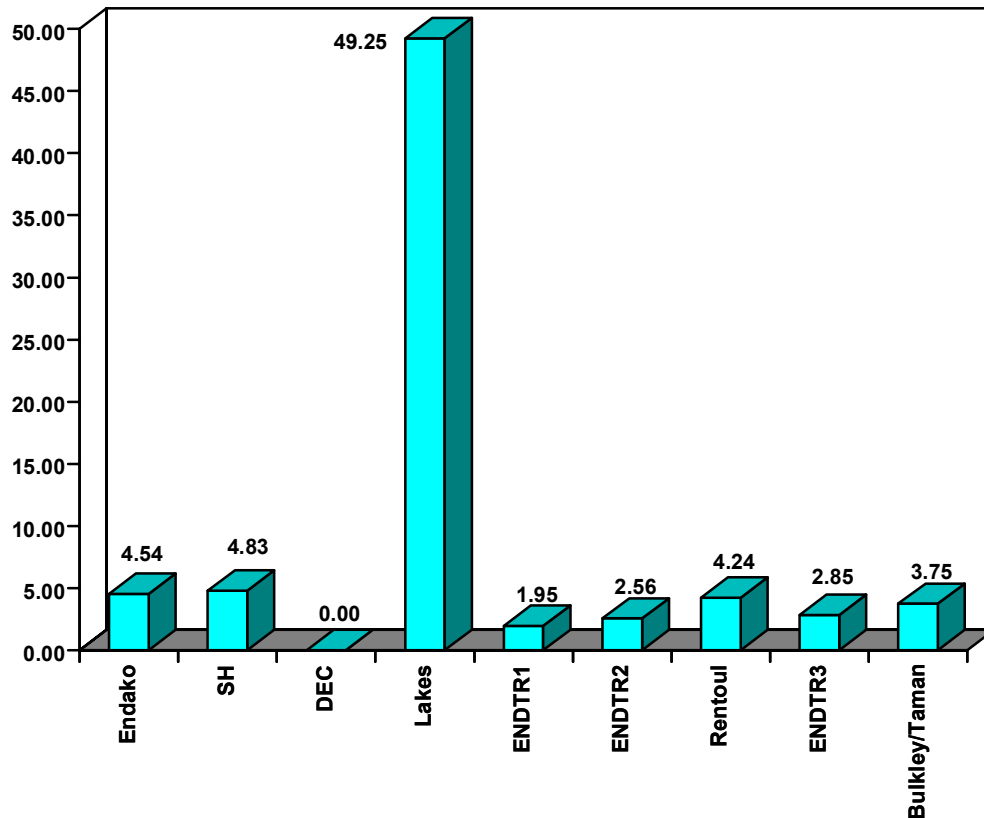
**Table 9a: Summary of Tributaries to Taman Creek**

Creek Name	Fish-Bearing Length (km)	Fish Species ( ) = inferred [] = historical	FPC (Fish-bearing)	Comments
TAM1	0.7	(RB)	S4	Left-bank tributary to Taman Creek., 3.2km u/s from mouth. Low gradient, swampy unconfined reach with extensive beaver activity. Limited rearing, but accessible from Taman. No spawning, no resident potential. Beaver dams and lack of sufficient habitat preclude fish presence beyond this reach.
TAM1A	NA	none	S6	Not surveyed - based on gradient and air photo interpretation.
TAM1B	NA	none	S6	Not surveyed - based on gradient and air photo interpretation.
TAM2	0.8	(RB)	S4	Not surveyed - based on gradient and air photo interpretation.
TAM3	NA	none	S6	Not surveyed - flows into non fish-bearing section of Taman Creek above the falls at the end of Reach 8.
TAM4	NA	none	S6	Not surveyed - flows into non fish-bearing section of Taman Creek above the falls at the end of Reach 8.
TAM5	NA	none	S6	Not surveyed - flows into non fish-bearing section of Taman Creek above the falls at the end of Reach 8.

### 5.11 Fish Age, Growth and Other Observations

For a relative indication of fish abundance in surveyed streams (Figure 1), the number of captured fish in each creek was divided by the total seconds electroshocking effort in fish-bearing reaches and multiplied by 100. The results indicate number of fish captured during 100 seconds of electroshocking. This data should only be used as a tool to provide a relative indication of overall productivity among streams within the study area.

**Number of Fish Captured in Fish-bearing Reaches per 100 Seconds Shocking  
(by sub-drainage)**



### 5.12 Rare and Endangered Species Summary

Although the surveyed area is located within the blue-listed bull trout range, none were encountered during this survey. No other rare or endangered species were noted within this area.

### 5.13 Wildlife Observations

Generally all wetlands with streams flowing through exhibited evidence of beaver and moose activity, and these animals were observed. Many swamps were connected by very well used wildlife trails usually located in close proximity of streams within riparian zones.

## **5.14 Required Follow-up Sampling**

There are three different situations where follow-up sampling has been recommended:

1. To provide further confirmation of fish absence above an obstruction to fish passage that was identified during the field survey, where it was considered possible that a resident population could be sustained above the obstruction
2. To provide confirmation of fish presence in reaches where no fish capture occurred but fish presence was inferred and,
3. When reaches were not sampled due to time constraints but were assessed to be fish-bearing based on gradient and air photo interpretation

The first situation is considered to have the highest priority because it may result in the reclassification of a non fish-bearing stream to a fish-bearing status. The second two situations are considered lower priority because the streams have already been classified as fish-bearing. However, from a forestry perspective, these situations could be considered, as it could result in the downgrading of fish-bearing streams to non fish-bearing, decreasing the required riparian management areas accordingly.

The following identifies where follow-up sampling is recommended in the Endako area.

### **Creek ENDTR2**

- Further sampling above the falls obstruction at the end of Reach 4 (5.0km upstream from the mouth), to confirm fish absence.
- Creek ENDTR2A requires further sampling to confirm fish presence, as it was inferred for its entire length.

### **Rentoul Creek**

- Further sampling above the cascade obstruction at the end of Reach 6 (7.8km upstream from the mouth), to confirm fish absence.

### **Creek END3**

- Further sampling beyond Reach 1 to determine upstream fish distribution limit.

### **Creek ENDTR1**

- Further sampling beyond Reach 1 to determine upstream fish distribution limit.
- Creek ENDTR1A requires further sampling beyond Reach 3 to determine upstream fish distribution limit.



## **6. CONCLUSION AND RECOMMENDATIONS**

Lakes Creek - Due to very high productivity in this creek, it may be susceptible to poor logging practices in the future. Special precautions should be taken in order to preserve the high fisheries values in the creek. As an S3 creek, it requires a 20m reserve zone and a 20m management zone. If possible, logging within the management zone should be avoided to ensure that high fisheries values in the creek are not compromised. Where gullied, harvesting should not occur within 10m of the bank tops adjacent to the creek to preserve stream bank integrity. Consideration should be given to the removal of the old bridge at the lower end of Reach 6 as it is currently a potential obstruction to upstream fish migration. Work should be done at this location to rehabilitate the channel to its original state. Cutblock layout was observed along the left bank of Reach 5 and at times did not provide the required reserve zone for an S3 creek. This should be investigated (Decker Lake Forest Products) to ensure FPC standards are complied with.

## **REFERENCES**

## **APPENDICES**

*Fish Data*

*Photodocumentation Cards*

# **ENDAKO**

**(SHOVEL, DECKER, LAKES, ENDTR, RENTOUL, TAMAN)**

FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/20   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   ENDAKO R.   Alias:            UTM:   09.694040.6031900    
 Lake/Stream/Wetland:   STREAM   Location:   At Hwy 16 crossing    
 Sequence No.                    Weather:   Cloudy, sunny breaks    
 Watershed code:   180-3740-952-019   Reach #:   1  

Area <u>  390  </u> Air tmp (c): <u>  1.0  </u> Wtr tmp(c): <u>  2.0  </u> EC ms/cm: <u>          </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
1	EL	1	RB		117				J	R	
1	EL	1	RB		98				J	R	
1	EL	1	RB		150				A	R	
1	EL	1	RB		71				J	R	
1	EL	1	RB		106				J	R	
1	EL	1	RB		123				J	R	
1	EL	1	RB		50				J	R	
1	EL	1	RB		50				J	R	
1	EL	1	RB		104				J	R	
1	EL	1	RB		99				J	R	
1	EL	1	RB		79				J	R	
1	EL	1	RB		47				J	R	
1	EL	1	RB		58				J	R	
1	EL	1	RB		82				J	R	
1	EL	1	RB		95				J	R	
1	EL	1	RB		77				J	R	
1	EL	1	RB		195				A	R	
1	EL	1	RB		38				F	R	
1	EL	1	RB		113				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

Date (yy/mm/dd): 96/10/20 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: ENDAKOR Alias: \_\_\_\_\_ UTM: 09.694460.6034600  
 Lake/Stream/Wetland: STREAM Location: At Taman M/L crossing - 3.3 km u/s from Hwy 16  
 Sequence No. \_\_\_\_\_ Weather: Cloudy, sunny breaks  
 Watershed code: 180-3740-952-019 Reach #: 4

Area <u>880</u> Air tmp (c): <u>2.0</u> Wtr tmp(c): <u>1.5</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
2	EL	1	RB		126				J	R	
2	EL	1	RB		71				J	R	
2	EL	1	RB		78				J	R	
2	EL	1	RB		112				J	R	
2	EL	1	RB		86				J	R	
2	EL	1	RB		68				J	R	

- Codes:**
1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
  2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
  - 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
  - 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
  4. Species codes: see manual

FISH COLLECTION DATA FORM

Date (yy/mm/dd): 96/10/21 Agency: RJA Crew: SR/MJ/CS  
Gazetted Name: ENDAKOR Alias: \_\_\_\_\_ UTM: 09 694920 6036160  
Lake/Stream/Wetland: STREAM Location: 100 m d/s from falls - 4.9 km u/s from Hwy 16  
Sequence No. \_\_\_\_\_ Weather: Clear  
Watershed code: 180-3740-952-019 Reach #: 4

Area <u>400</u> Air tmp (c): <u>2.0</u> Wtr tmp(c): <u>1.5</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
<b>3</b>	<b>EL</b>	<b>1</b>	<b>RB</b>		<b>91</b>				<b>J</b>	<b>R</b>	

**Codes:**  
1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
4. Species codes: see manual

### FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd): 96/10/04 Agency: RJA Crew: SR/MJ/CS

Gazetted Name: .UNNAMED

Alias: SH UTM: 10.358000.6007220

Lake/Stream/Wetland: STREAM

Location: 800 m u/s from confluence with Shovel Cr.

Sequence No. \_\_\_\_\_

Weather: Mostly sunny

Watershed code: 180-3740-952-019-409-300

Reach #: 1

Area 330 Air tmp (c): 10.0 Wtr tmp(c): 5.0 EC ms/cm: \_\_\_\_\_

Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
1	EL	1	RB		40				J	R	
1	EL	1	RB		60				J	R	
1	EL	1	RB		45				J	R	
1	EL	1	RB		40				J	R	
1	EL	1	RB		38				F	R	
1	EL	1	RB		29				F	R	
1	EL	1	RB		32				F	R	
1	EL	1	RB		70				J	R	
1	EL	1	RB		75				J	R	
1	EL	1	RB		90				J	R	
1	EL	1	RB		85				J	R	

**Codes:**

- Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
- Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
- 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
- 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
4. Species codes: see manual

FISH COLLECTION DATA FORM

Card     of    

Date (yy/mm/dd): 96/10/04

Agency: RJA Crew: SR/MJ/CS

Gazetted Name: .UNNAMED

Alias: SH UTM: 10.357780.6007950

Lake/Stream/Wetland: STREAM  
 Sequence No. \_\_\_\_\_  
 Watershed code: 180-3740-952-019-409-300

Location: 1600 m u/s from confluence with Shovel Cr.  
 Weather: Mostly sunny  
 Reach #: 2

Area <u>210</u> Air tmp (c): <u>10.0</u> Wtr tmp(c): <u>5.0</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
2	EL	1	RB		75				J	R	
2	EL	1	RB		90				J	R	
2	EL	1	RB		85				J	R	
2	EL	1	RB		105				J	R	
2	EL	1	RB		38				F	R	
2	EL	1	RB		125				J	R	
2	EL	1	RB		30				F	R	
2	EL	1	RB		80				J	R	
2	EL	1	RB		75				J	R	
2	EL	1	RB		68				J	R	
2	EL	1	RB		30				F	R	
2	VO		RB		30-100				F,J	R	dozens more observed

- Codes:**
1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
  2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
  - 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
  - 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
  4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card 1 of 2

Date (yy/mm/dd): 96/10/08 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: LAKES CR. Alias: \_\_\_\_\_ UTM: 10.309250.6024970  
 Lake/Stream/Wetland: STREAM Location: At Gerow Cr. M/L crossing  
 Sequence No. \_\_\_\_\_ Weather: Partly cloudy  
 Watershed code: 180-3740-952-019-923 Reach #: 2

Area <u>180</u> Air tmp (c): <u>11.0</u> Wtr tmp(c): <u>6.0</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
1	EL	1	RB		58				J	R	
1	EL	1	RB		59				J	R	
1	EL	1	RB		56				J	R	
1	EL	1	RB		61				J	R	
1	EL	1	RB		60				J	R	
1	EL	1	RB		65				J	R	
1	EL	1	RB		62				J	R	
1	EL	1	RB		64				J	R	
1	EL	1	RB		55				J	R	
1	EL	1	RB		45				J	R	
1	EL	1	RB		62				J	R	
1	EL	1	RB		45				J	R	
1	EL	1	RB		50				J	R	
1	EL	1	RB		70				J	R	
1	EL	1	RB		35				J	R	
1	EL	1	RB		37				J	R	
1	EL	1	RB		43				J	R	
1	EL	1	RB		48				J	R	
1	EL	1	RB		62				J	R	
1	EL	1	RB		38				J	R	
1	EL	1	RB		58				J	R	
1	EL	1	RB		86				J	R	
1	EL	1	RB		47				J	R	
1	EL	1	RB		55				J	R	

**Codes:**

1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).

2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).

3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.

3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).

4. Species codes: see manual



# FISH COLLECTION DATA FORM

Card 2 of 2

Date (yy/mm/dd): 96/10/08 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: LAKES CR Alias: \_\_\_\_\_ UTM: 10.309250.6024970  
 Lake/Stream/Wetland: STREAM Location: At Gerow Cr. M/L crossing  
 Sequence No. \_\_\_\_\_ Weather: Overcast  
 Watershed code: 180-3740-952-019-923 Reach #: 2

Area <u>180</u> Air tmp (c): <u>11.0</u> Wtr tmp(c): <u>6.0</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
1	EL	1	RB		49				J	R	
1	EL	1	RB		63				J	R	
1	EL	1	RB		51				J	R	
1	EL	1	RB		49				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card 1 of 2

Date (yy/mm/dd): 96/10/08 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: LAKES CR Alias: UTM: 10 308640 6024860  
 Lake/Stream/Wetland: STREAM Location: 100 m south-east of Maxan M/L at 2.2 KM mark - 2.1 km u/s from the mouth  
 Sequence No. \_\_\_\_\_ Weather: Overcast  
 Watershed code: 180-3740-952-019-923 Reach #: 3

Area <u>100</u> Air tmp (c): <u>11.0</u> Wtr tmp(c): <u>6.0</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
2	EL	1	RB		83				J	R	
2	EL	1	RB		39				J	R	
2	EL	1	RB		49				J	R	
2	EL	1	RB		42				J	R	
2	EL	1	RB		46				J	R	
2	EL	1	RB		41				J	R	
2	EL	1	RB		48				J	R	
2	EL	1	RB		51				J	R	
2	EL	1	RB		46				J	R	
2	EL	1	RB		35				J	R	
2	EL	1	RB		38				J	R	
2	EL	1	RB		41				J	R	
2	EL	1	RB		39				J	R	
2	EL	1	RB		38				J	R	
2	EL	1	RB		43				J	R	
2	EL	1	RB		40				J	R	
2	EL	1	RB		40				J	R	
2	EL	1	RB		39				J	R	
2	EL	1	RB		43				J	R	
2	EL	1	RB		44				J	R	
2	EL	1	RB		42				J	R	
2	EL	1	RB		43				J	R	
2	EL	1	RB		45				J	R	
2	EL	1	RB		48				J	R	

**Codes:**

1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
- 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
- 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card 2 of 2

Date (yy/mm/dd): 96/10/08 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: LAKES CR Alias: UTM: 10 308640 6024860  
 Lake/Stream/Wetland: STREAM Location: 100 m south-east of Maxan M/L at 2.2 KM mark - 2.1 km u/s from the mouth  
 Sequence No. \_\_\_\_\_ Weather: Overcast  
 Watershed code: 180-3740-952-019-923 Reach #: 3

Area <u>100</u> Air tmp (c): <u>11.0</u> Wtr tmp(c): <u>6.0</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
2	EL	1	RB		39				J	R	
2	EL	1	RB		41				J	R	
2	EL	1	RB		51				J	R	
2	EL	1	RB		48				J	R	
2	EL	1	RB		75				J	R	
2	EL	1	RB		39				J	R	
2	EL	1	RB		48				J	R	
2	EL	1	RB		45				J	R	
2	EL	1	RB		42				J	R	
2	EL	1	RB		40				J	R	
2	EL	1	RB		41				J	R	
2	EL	1	RB		41				J	R	
2	EL	1	RB		47				J	R	
2	EL	1	RB		44				J	R	
2	EL	1	RB		43				J	R	

- Codes:**
- Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
  - Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
  - 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
  - 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
  - Species codes: see manual

# FISH COLLECTION DATA FORM

Card 1 of 2

Date (yy/mm/dd): 96/10/08 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: LAKES CR Alias: \_\_\_\_\_ UTM: 10.308360.6024060  
 Lake/Stream/Wetland: STREAM Location: 4.5 km u/s from the mouth  
 Sequence No. \_\_\_\_\_ Weather: Overcast  
 Watershed code: 180-3740-952-019-923 Reach #: 4

Area <u>100</u> Air tmp (c): <u>12.0</u> Wtr tmp(c): <u>6.0</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
3	EL	1	RB		30				J	R	
3	EL	1	RB		39				J	R	
3	EL	1	RB		90				J	R	
3	EL	1	RB		39				J	R	
3	EL	1	RB		45				J	R	
3	EL	1	RB		44				J	R	
3	EL	1	RB		47				J	R	
3	EL	1	RB		40				J	R	
3	EL	1	RB		39				J	R	
3	EL	1	RB		43				J	R	
3	EL	1	RB		48				J	R	
3	EL	1	RB		48				J	R	
3	EL	1	RB		46				J	R	
3	EL	1	RB		41				J	R	
3	EL	1	RB		41				J	R	
3	EL	1	RB		50				J	R	
3	EL	1	RB		52				J	R	
3	EL	1	RB		70				J	R	
3	EL	1	RB		48				J	R	
3	EL	1	RB		47				J	R	
3	EL	1	RB		51				J	R	
3	EL	1	RB		46				J	R	
3	EL	1	RB		45				J	R	
3	EL	1	RB		55				J	R	

**Codes:**

1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
- 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
- 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
4. Species codes: see manual

FISH COLLECTION DATA FORM

Card 2 of 2

Date (yy/mm/dd): 96/10/08 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: LAKES CR Alias: \_\_\_\_\_ UTM: 10.308360.6024060  
 Lake/Stream/Wetland: STREAM Location: 4.5 km u/s from the mouth  
 Sequence No. \_\_\_\_\_ Weather: Overcast  
 Watershed code: 180-3740-952-019-923 Reach #: 4

Area <u>100</u> Air tmp (c): <u>12.0</u> Wtr tmp(c): <u>6.0</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
3	EL	1	RB		48				J	R	
3	EL	1	RB		52				J	R	
3	EL	1	RB		100				J	R	
3	EL	1	RB		95				J	R	
3	EL	1	RB		42				J	R	
3	EL	1	RB		48				J	R	
3	EL	1	RB		48				J	R	
3	EL	1	RB		51				J	R	
3	EL	1	RB		56				J	R	
3	EL	1	RB		47				J	R	
3	EL	1	RB		45				J	R	
3	EL	1	RB		41				J	R	
3	EL	1	RB		40				J	R	
3	EL	1	RB		40				J	R	
3	EL	1	RB		39				J	R	
3	EL	1	RB		67				J	R	
3	EL	1	RB		65				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card 1 of 2

Date (yy/mm/dd): 96/10/08 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: LAKES CR Alias: \_\_\_\_\_ UTM: 10.307930.6022600  
 Lake/Stream/Wetland: STREAM Location: 6.4 km u/s from the mouth  
 Sequence No. \_\_\_\_\_ Weather: Overcast  
 Watershed code: 180-3740-952-019-923 Reach #: 5

Area <u>70</u> Air tmp (c): <u>12.0</u> Wtr tmp(c): <u>6.0</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
4	EL	1	RB		50				J	R	
4	EL	1	RB		38				J	R	
4	EL	1	RB		112				J	R	
4	EL	1	RB		45				J	R	
4	EL	1	RB		119				J	R	
4	EL	1	RB		49				J	R	
4	EL	1	RB		41				J	R	
4	EL	1	RB		43				J	R	
4	EL	1	RB		46				J	R	
4	EL	1	RB		51				J	R	
4	EL	1	RB		120				J	R	
4	EL	1	RB		110				J	R	
4	EL	1	RB		41				J	R	
4	EL	1	RB		45				J	R	
4	EL	1	RB		41				J	R	
4	EL	1	RB		40				J	R	
4	EL	1	RB		46				J	R	
4	EL	1	RB		47				J	R	
4	EL	1	RB		43				J	R	
4	EL	1	RB		42				J	R	
4	EL	1	RB		42				J	R	
4	EL	1	RB		45				J	R	
4	EL	1	RB		44				J	R	
4	EL	1	RB		46				J	R	

**Codes:**

1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
- 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
- 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card 2 of 2

Date (yy/mm/dd): 96/10/08 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: LAKES CR Alias: \_\_\_\_\_ UTM: 10.307930.6022600  
 Lake/Stream/Wetland: STREAM Location: 6.4 km u/s from the mouth  
 Sequence No. \_\_\_\_\_ Weather: Overcast  
 Watershed code: 180-3740-952-019-923 Reach #: 5

Area <u>70</u> Air tmp (c): <u>12.0</u> Wtr tmp(c): <u>6.0</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
4	EL	1	RB		51				J	R	
4	EL	1	RB		47				J	R	
4	EL	1	RB		48				J	R	
4	EL	1	RB		45				J	R	
4	EL	1	RB		42				J	R	
4	EL	1	RB		44				J	R	
4	EL	1	RB		43				J	R	
4	EL	1	RB		44				J	R	
4	EL	1	RB		48				J	R	
4	EL	1	RB		47				J	R	
4	EL	1	RB		49				J	R	
4	EL	1	RB		41				J	R	

**Codes:**

1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
- 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
- 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card \_\_\_ of \_\_\_

Date (yy/mm/dd): 96/10/17 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: LAKES CR Alias: \_\_\_\_\_ UTM: 10.308280.6020940  
 Lake/Stream/Wetland: STREAM Location: 200 m u/s from lake 431 - 8.2 km u/s from the mouth  
 Sequence No. \_\_\_\_\_ Weather: Overcast  
 Watershed code: 180-3740-952-019-923 Reach #: 7

Area <u>320</u> Air tmp (c): <u>2.5</u> Wtr tmp(c): <u>2.5</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
6	EL	1	RB		50				J	R	
6	EL	1	RB		32				J	R	
6	EL	1	RB		38				J	R	
6	EL	1	RB		35				J	R	
6	EL	1	RB		48				J	R	
6	EL	1	RB		65				J	R	

- Codes:**
- Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
  - Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
  - 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
  - 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
  - Species codes: see manual



# FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/17   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   LAKES CR.   Alias:                    UTM:   10 308050 6021050    
 Lake/Stream/Wetland:   STREAM   Location:   350 m d/s from Shuldham L. - 8.8 km u/s from the mouth    
 Sequence No.                      Weather:   Overcast    
 Watershed code:   180-3740-952-019-923   Reach #:   8  

Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
Area <u>  220  </u> Air tmp (c): <u>  2.5  </u> Wtr tmp(c): <u>  2.5  </u> EC ms/cm: <u>                </u>											
7	EL	1	RB		52				J	R	
7	EL	1	RB		57				J	R	
7	EL	1	RB		41				J	R	
7	EL	1	RB		49				J	R	
7	EL	1	RB		49				J	R	
7	EL	1	RB		43				J	R	
7	EL	1	RB		50				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/17   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   LAKES CR   Alias:            UTM:   10.307800.6021100    
 Lake/Stream/Wetland:   STREAM   Location:   100 m d/s from Shuldham L. - 9.1 km u/s from the mouth    
 Sequence No.                      Weather:   Overcast    
 Watershed code:   180-3740-952-019-923   Reach #:   9  

Area		<u>  N/A  </u>	Air tmp (c):	<u>  2.5  </u>	Wtr tmp(c):	<u>  2.5  </u>	EC ms/cm:		<u>                    </u>		
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
8	VO	1	RB		80-110				J	R	5 fish observed

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card \_\_ of \_\_

Date (yy/mm/dd): 96/10/19 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: UNNAMED Alias: LC 2 UTM: 10.308580.6020710  
 Lake/Stream/Wetland: STREAM Location: 100 m u/s from lake 431  
 Sequence No. \_\_\_\_\_ Weather: Sunny  
 Watershed code: 180-3740-952-019-923-780 Reach #: 1

Area <u>270</u> Air tmp (c): <u>-1.0</u> Wtr tmp(c): <u>2.0</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
1	EL	1	RB		62				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

FISH COLLECTION DATA FORM

Card \_\_ of \_\_

Date (yy/mm/dd): 96/10/17 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: UNNAMED Alias: LC 3 UTM: 10.307650.6020920  
 Lake/Stream/Wetland: STREAM Location: At road crossing - 300 m u/s from the mouth  
 Sequence No. \_\_\_\_\_ Weather: Sunny  
 Watershed code: 180-3740-952-019-923-790 Reach #: 1

Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
	Area <u>120</u> Air tmp (c): <u>2.5</u> Wtr tmp(c): <u>1.5</u> EC ms/cm: _____										
<u>1</u>	<u>EL</u>	<u>1</u>	<u>RB</u>		<u>26</u>				<u>F</u>	<u>R</u>	
<u>1</u>	<u>EL</u>	<u>1</u>	<u>RB</u>		<u>29</u>				<u>F</u>	<u>R</u>	
<u>1</u>	<u>EL</u>	<u>1</u>	<u>RB</u>		<u>52</u>				<u>J</u>	<u>R</u>	
<u>1</u>	<u>EL</u>	<u>1</u>	<u>RB</u>		<u>48</u>				<u>J</u>	<u>R</u>	
<u>1</u>	<u>EL</u>	<u>1</u>	<u>RB</u>		<u>48</u>				<u>J</u>	<u>R</u>	
<u>1</u>	<u>EL</u>	<u>1</u>	<u>RB</u>		<u>51</u>				<u>J</u>	<u>R</u>	

**Codes:**

- 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
- 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
- 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
- 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
- 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/18   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   UNNAMED   Alias:   END TR 1   UTM:   09 694500 6025330    
 Lake/Stream/Wetland:   STREAM   Location:   At old road crossing - 200 m d/s from lake 673    
 Sequence No.                    Weather:   Cloudy    
 Watershed code:   180-3740-952-019-933   Reach #:   1  

Area <u>  310  </u> Air tmp (c): <u>  -2.0  </u> Wtr tmp(c): <u>  3.0  </u> EC ms/cm: <u>          </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
1	EL	1	RB		117				J	R	

- Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/18   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   UNNAMED   Alias:   END TR 1A   UTM:   09.694400.6025350    
 Lake/Stream/Wetland:   STREAM   Location:   50 m u/s from the mouth    
 Sequence No.                                  Weather:   Cloudy    
 Watershed code:   180-3740-952-019-933-725   Reach #:   1  

Area <u>  120  </u> Air tmp (c): <u>  -2.0  </u> Wtr tmp(c): <u>  4.5  </u> EC ms/cm: <u>                        </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
1	EL	1	RB		40				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/18   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   UNNAMED   Alias:   END TR 1A   UTM:   09 694200 6025640    
 Lake/Stream/Wetland:   STREAM   Location:   450 m u/s from the mouth - 200 m d/s from confluence with ENDTR 1A    
 Sequence No.                      Weather:   Cloudy    
 Watershed code:   180-3740-952-019-933-725   Reach #:   2  

Area <u>  310  </u> Air tmp (c): <u>  -2.0  </u> Wtr tmp(c): <u>  4.5  </u> EC ms/cm: <u>                    </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
2	EL	1	RB		56				J	R	
2	EL	1	RB		71				J	R	
2	EL	1	RB		59				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/18   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   UNNAMED   Alias:   END TR 1B   UTM:   09.694480.6025110    
 Lake/Stream/Wetland:   STREAM   Location:   300 m u/s from the mouth    
 Sequence No. \_\_\_\_\_ Weather:   Cloudy    
 Watershed code:   180-3740-952-019-933-750   Reach #:   1  

Area <u>  980  </u> Air tmp (c): <u>  -1.0  </u> Wtr tmp(c): <u>  1.0  </u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
1	EL	1	RB		120				J	R	
1	EL	1	RB		68				J	R	
1	EL	1	RB		75				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual



FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/20   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   RENTOUL CR.   Alias:                    UTM:   10.308810.6032270    
 Lake/Stream/Wetland:   STREAM   Location:   At Taman Rd. crossing - 3.3 km u/s from the mouth    
 Sequence No.                    Cloudy, sunny  
 Weather:   breaks    
 Watershed code:   180-3740-952-019-980   Reach #:   3  

Area <u>  525  </u> Air tmp (c): <u>  1.5  </u> Wtr tmp(c): <u>  2.0  </u> EC ms/cm: <u>          </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
1	EL	1	RB		80				J	R	
1	EL	1	RB		90				J	R	
1	EL	1	RB		88				J	R	
1	EL	1	RB		42				J	R	
1	EL	1	RB		45				J	R	
1	EL	1	RB		44				J	R	
1	EL	1	RB		104				J	R	
1	EL	1	RB		46				J	R	
1	EL	1	RB		49				J	R	
1	EL	1	RB		73				J	R	
1	EL	1	RB		93				J	R	
1	EL	1	RB		50				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/20   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   RETOUL CR.   Alias:                      UTM:   10.309940.6033960    
 Lake/Stream/Wetland:   STREAM   Location:   50 m d/s from confluence with RC    
 Sequence No.                      Weather:   Cloudy, sunny breaks    
 Watershed code:   180-3740-952-019-980   Reach #:   4  

Area <u>  525  </u> Air tmp (c): <u>  1.0  </u> Wtr tmp(c): <u>  2.0  </u> EC ms/cm: <u>                    </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
2	EL	1	RB		81				J	R	
2	EL	1	RB		80				J	R	
2	EL	1	RB		102				J	R	
2	EL	1	RB		76				J	R	
2	EL	1	RB		41				J	R	
2	EL	1	RB		81				J	R	
2	EL	1	RB		91				J	R	
2	EL	1	RB		52				J	R	
2	EL	1	RB		64				J	R	

- Codes:**
- Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
  - Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
  - 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
  - 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
  - Species codes: see manual

# FISH COLLECTION DATA FORM

Card \_\_ of \_\_

Date (yy/mm/dd): 96/10/22 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: RETOUL CR. Alias: \_\_\_\_\_ UTM: 10.309940.6034600  
 Lake/Stream/Wetland: STREAM Location: At the confluence with RD- 6.8km u/s from the mouth  
 Sequence No. \_\_\_\_\_ Weather: Partly cloudy  
 Watershed code: 180-3740-952-019-980 Reach #: 5

Area <u>440</u> Air tmp (c): <u>1.0</u> Wtr tmp(c): <u>1.5</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
3	EL	1	RB		110				J	R	
3	EL	1	RB		60				J	R	
3	EL	1	RB		120				J	R	
3	EL	1	RB		65				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/22   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   RETOUL CR.   Alias:            UTM:   10.309950.6035170    
 Lake/Stream/Wetland:   STREAM   Location:   7.5 km u/s from the mouth    
 Sequence No.                    Weather:   Partly cloudy    
 Watershed code:   180-3740-952-019-980   Reach #:   6  

Area <u>  720  </u> Air tmp (c): <u>  2.0  </u> Wtr tmp(c): <u>  1.0  </u> EC ms/cm: <u>          </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
4	EL	1	RB		120				J	R	
4	EL	1	RB		150				A	R	
4	EL	1	RB		160				A	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

FISH COLLECTION DATA FORM

Card \_\_\_ of \_\_\_

Date (yy/mm/dd): 96/10/22 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: UNNAMED Alias: ENDIR 3 UTM: 10 308220 6034400  
 Lake/Stream/Wetland: STREAM Location: 4.6 km u/s from the mouth - 150 d/s from spur rd. crossing between cutblock 05101 and 05102  
 Sequence No. \_\_\_\_\_ Weather: Partly cloudy  
 Watershed code: 180-3740-952-019-991 Reach #: 4

Area <u>375</u> Air tmp (c): <u>1.0</u> Wtr tmp(c): <u>1.5</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
2	EL	1	RB		144				A	R	
2	EL	1	RB		73				J	R	
2	EL	1	RB		98				J	R	
2	EL	1	RB		93				J	R	
2	EL	1	RB		68				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/22   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   UNNAMED   Alias:   ENDIR 3   UTM:   10.308250.6034610    
 Lake/Stream/Wetland:   STREAM   Location:   4.9 km u/s from the mouth - 100 u/s from spur rd. crossing between cutblock 05101 and 05102    
 Sequence No.                      Weather:   Partly cloudy    
 Watershed code:   180-3740-952-019-991   Reach #:   5  

Area <u>  310  </u> Air tmp (c): <u>  1.0  </u> Wtr tmp(c): <u>  1.5  </u> EC ms/cm: <u>          </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
3	EL	1	RB		104				A	R	
3	EL	1	RB		82				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card     of    

Date (yy/mm/dd): 96/10/21 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: UNNAMED Alias: END 3 UTM: 10\_306280\_6035390  
 Lake/Stream/Wetland: STREAM Location: 210 m u/s from the confluence with Endako R. in Reach 4  
 Sequence No. \_\_\_\_\_ Weather: Clear  
 Watershed code: 180-3740-952-019-994 Reach #: 1

Area		<u>460</u>	Air tmp (c):	<u>2.0</u>	Wtr tmp(c):	<u>1.5</u>	EC ms/cm: _____				
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
1	EL	1	RB		113				J	R	
1	EL	1	RB		105				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/20   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   BULKLEY CR.   Alias:                    UTM:   09.692550.6032090    
 Lake/Stream/Wetland:   STREAM   Location:   At Hwy 16 crossing    
 Sequence No.                    Cloudy, sunny  
 Weather:   breaks    
 Watershed code:   460-0000   Reach #:   1  

Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
	Area <u>  480  </u> Air tmp (c): <u>  1.0  </u> Wtr tmp(c): <u>  2.0  </u> EC ms/cm: <u>          </u>										
1	EL	1	CO		82				J	R	
1	EL	1	RB		67				J	R	
1	EL	1	RB		52				J	R	
1	EL	1	RB		78				J	R	
1	EL	1	RB		168				A	R	
1	EL	1	RB		99				J	R	
1	EL	1	RB		66				J	R	
1	EL	1	RB		72				J	R	
1	EL	1	RB		132				J	R	
1	EL	1	RB		69				J	R	
1	EL	1	RB		77				J	R	
1	EL	1	RB		73				J	R	
1	EL	1	CAS		56				J	R	
1	EL	1	LSU		125				J	R	

- Codes:**
- Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
  - Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
  - 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
  - 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
  - Species codes: see manual



# FISH COLLECTION DATA FORM

Card \_\_\_ of \_\_\_

Date (yy/mm/dd): 96/10/21 Agency: RJA Crew: SR/MJ/CS  
 Gazetted Name: BULKLEY CR. Alias: \_\_\_\_\_ UTM: 09.692400.6031860  
 Lake/Stream/Wetland: STREAM Location: At Rose Lake Cutoff Rd crossing  
 Sequence No. \_\_\_\_\_ Weather: Clear  
 Watershed code: 460-0000 Reach #: 1

Area <u>600</u> Air tmp (c): <u>1.0</u> Wtr tmp(c): <u>2.0</u> EC ms/cm: _____											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
2	EL	1	CO		82				J	R	
2	EL	1	CO		80				J	R	
2	EL	1	RB		143				J	R	
2	EL	1	RB		160				A	R	
2	EL	1	CAS		105				A	R	
2	EL	1	CAS		90				A	R	
2	EL	1	LSU		110				J	R	

**Codes:**  
 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).  
 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).  
 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.  
 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).  
 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/20    
 Gazetted Name:   BULKLEY CR.    
 Lake/Stream/Wetland:   STREAM    
 Sequence No.                     
 Watershed code:   460-0000  

Agency:   RJA   Crew:   SR/MJ/CS    
 Alias:                    UTM:   09.692280.6032270    
 Location:   180 m u/s from Hwy 16 crossing    
             Clody, sunny    
 Weather:   breaks    
 Reach #:   2  

Area <u>  270  </u> Air tmp (c): <u>  1.0  </u> Wtr tmp(c): <u>  2.0  </u> EC ms/cm: <u>          </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
3	EL	1	RB		65				J	R	
3	EL	1	RB		136				J	R	
3	EL	1	RB		110				J	R	
3	EL	1	RB		50				J	R	
3	EL	1	RB		63				J	R	
3	EL	1	RB		80				J	R	
3	EL	1	RB		111				J	R	
3	EL	1	RB		108				J	R	
3	EL	1	RB		58				J	R	
3	EL	1	RB		103				J	R	
3	EL	1	RB		68				J	R	

**Codes:**

- 1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
- 2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
- 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
- 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
- 4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/20   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   BULKLEY CR.   Alias:                    UTM:   09.692170.6032300    
 Lake/Stream/Wetland:   STREAM   Location:   400 m u/s from Hwy 16 crossing    
 Sequence No.                    Weather:   Cloudy, sunny breaks    
 Watershed code:   460-0000   Reach #:   3  

Area <u>  780  </u> Air tmp (c): <u>  2.0  </u> Wtr tmp(c): <u>  1.5  </u> EC ms/cm: <u>          </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
4	EL	1	RB		62				J	R	
4	EL	1	RB		78				J	R	
4	EL	1	RB		167				A	R	
4	EL	1	RB		143				A	R	
4	EL	1	RB		49				J	R	
4	EL	1	RB		52				J	R	
4	EL	1	RB		98				J	R	
4	EL	1	RB		49				J	R	
4	EL	1	RB		51				J	R	
4	EL	1	RB		63				J	R	
4	EL	1	RB		145				A	R	
4	EL	1	RB		118				J	R	
4	EL	1	RB		127				J	R	
4	EL	1	RB		100				J	R	
4	EL	1	RB		53				J	R	
4	EL	1	RB		64				J	R	
4	EL	1	RB		59				J	R	
4	EL	1	RB		54				J	R	
4	EL	1	RB		47				J	R	
4	EL	1	RB		69				J	R	
4	EL	1	RB		67				J	R	
4	EL	1	RB		78				J	R	
4	EL	1	RB		82				J	R	

**Codes:**

1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
- 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
- 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card    of   

Date (yy/mm/dd):   96/10/20   Agency:   RJA   Crew:   SR/MJ/CS    
 Gazetted Name:   TAMAN CR   Alias:                    UTM:   09 691510 6036080    
 Lake/Stream/Wetland:   STREAM   Location:   100 m u/s from Taman Rd. crossing - 5.4 km u/s from the mouth    
 Sequence No.                    Weather:   Cloudy, sunny breaks    
 Watershed code:   460-9516   Reach #:   7  

Area <u>  610  </u> Air tmp (c): <u>  1.0  </u> Wtr tmp(c): <u>  1.5  </u> EC ms/cm: <u>          </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
1	EL	1	RB		146				A	R	
1	EL	1	RB		93				J	R	
1	EL	1	RB		80				J	R	

- Codes:**
1. Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
  2. Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
  - 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
  - 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
  4. Species codes: see manual

# FISH COLLECTION DATA FORM

Card    of   

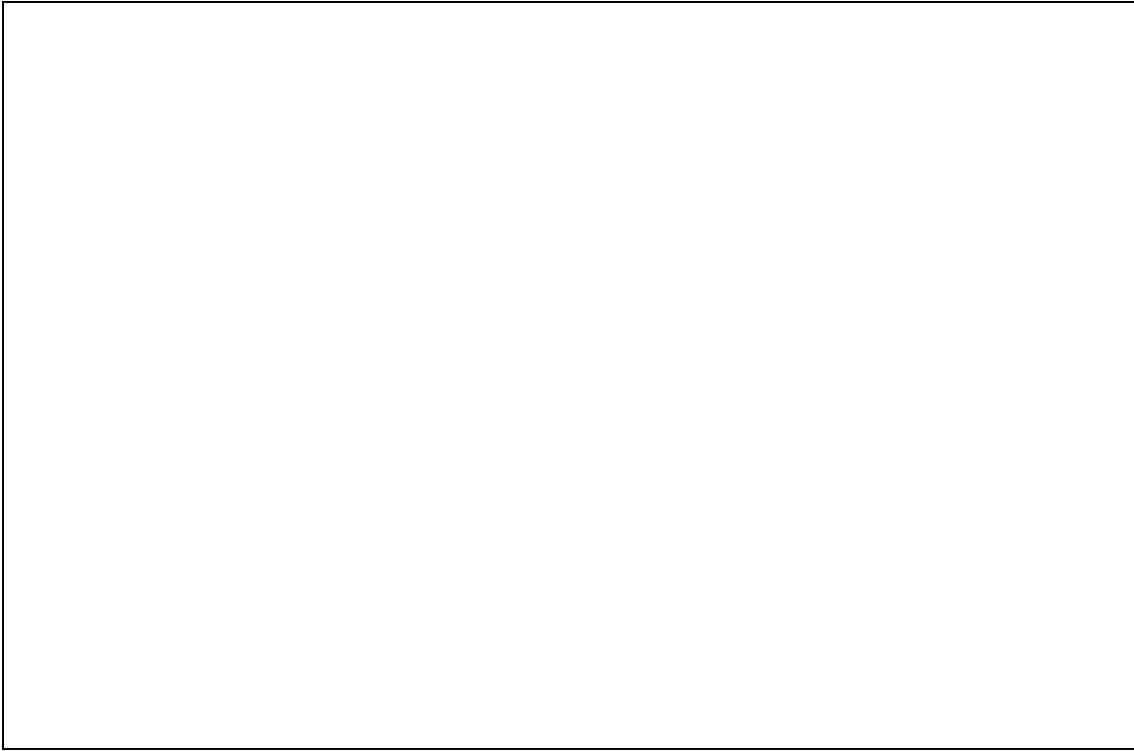
Date (yy/mm/dd):   96/10/21   Agency:   RJA   Crew:   SR/MJ/CS    
Gazetted Name:   TAMAN CR   Alias:                  UTM:   09.692290.6037790    
Lake/Stream/Wetland:   STREAM   Location:   50 m d/s from falls - 7.8 km u/s from the mouth    
Sequence No.                          Weather:   Clear    
Watershed code:   460-9516   Reach #:   8  

Area <u>  200  </u> Air tmp (c): <u>  6.0  </u> Wtr tmp(c): <u>  1.0  </u> EC ms/cm: <u>                </u>											
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex [code]	Maturity (code)	Activity (code)	Comments:
<u>  2  </u>	<u>  EL  </u>	<u>  1  </u>	<u>  RB  </u>		<u>  185  </u>				<u>  A  </u>	<u>  R  </u>	
<u>  2  </u>	<u>  EL  </u>	<u>  1  </u>	<u>  RB  </u>		<u>  175  </u>				<u>  A  </u>	<u>  R  </u>	

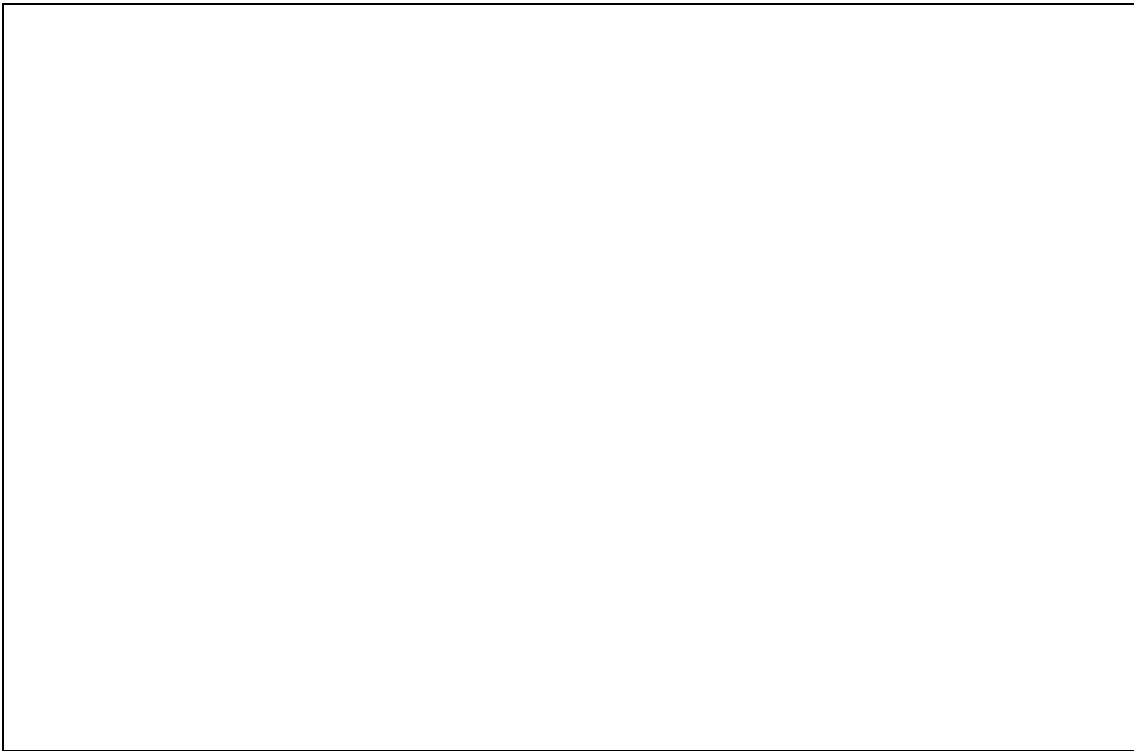
- Codes:**
- Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
  - Activity: migration (M), spawning (S), incubation (I), rearing (feeding or resting) (R).
  - 3a. Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
  - 3b. Level of maturity Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
  - Species codes: see manual

## List of Photos

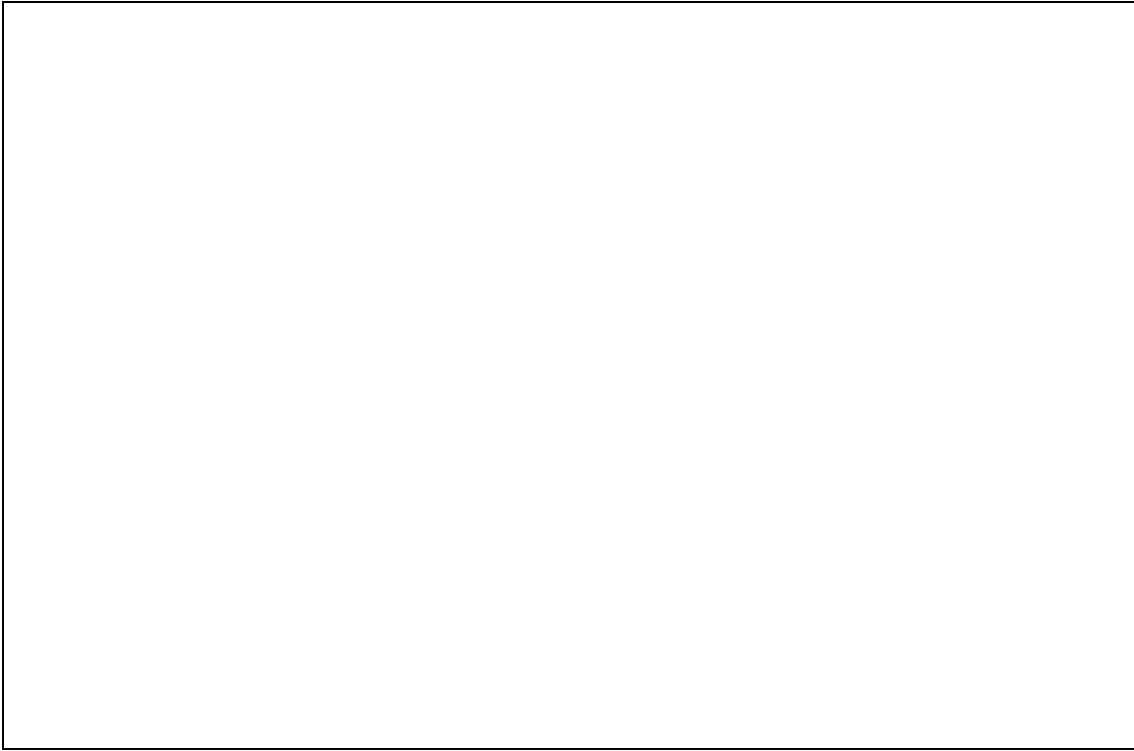
- Photo 1: upstream view of typical section of Endako River in Reach 1 above Rose Lake outlet creek.*
- Photo 2: upstream view of potential culvert obstruction at Highway 16 road crossing in Reach 1.*
- Photo 3: downstream view of typical section of Endako River in Reach 4.*
- Photo 4: upstream view of typical section of Creek END3 in Reach 1.*
- Photo 5: upstream view of 5m falls obstruction at end of Reach 4 of Endako R*
- Photo 6: downstream view of typical section of Creek SH in Reach 1.*
- Photo 7: upstream view of falls obstruction in Creek SH in Reach 2.*
- Photo 8: upstream view of large falls in Reach 3 of Creek SH.*
- Photo 9: downstream view of typical section of Creek DEC1 in Reach 1.*
- Photo 10: upstream view of beaver dam at mouth of Creek DEC1.*
- Photo 11: downstream view of typical section of Lakes Creek in Reach 3.*
- Photo 12: upstream view of Lakes Creek from beginning of Reach 6 (from old road crossing remains).*
- Photo 13: Cross channel view of old bridge remains in Lakes Creek channel at start of Reach 6 below Lake 431.*
- Photo 14: downstream view typical section of Lakes Creek in Reach 8 below Shuldham Lake.*
- Photo 15: upstream view of typical section of Creek ENDTR1 in Reach 1.*
- Photo 16: upstream view of beaver dam and impoundment in Reach 1 of Creek ENDTR1.*
- Photo 17: upstream view of typical section of Creek ENDTR1 in Reach 2.*
- Photo 18: upstream view of typical section of Creek ENDTR1A in Reach 2.*
- Photo 19: upstream view of typical section of Creek ENDTR1B in Reach 1.*
- Photo 20: upstream view of falls obstruction in Creek ENDTR1B at end of Reach 1.*
- Photo 21: upstream view of typical section of Creek ENDTR2A in Reach 2.*
- Photo 22: downstream view of typical section of Creek ENDTR2B in Reach 1.*
- Photo 23: upstream view of typical section of Rentoul Creek in Reach 3.*
- Photo 24: upstream view of culvert at Taman Road crossing in Reach 3 of Rentoul Creek.*
- Photo 25: upstream view of typical section of Rentoul Creek in Reach 6.*
- Photo 26: upstream view of cascade obstruction in Rentoul Creek at end of Reach 6.*
- Photo 27: downstream view of typical section of Creek ENDTR3 in Reach 2.*
- Photo 28: upstream view of culvert at Taman road crossing in Reach 6 of Creek ENDTR3.*
- Photo 29: upstream view of typical section of Creek ENDTR3 in Reach 5.*
- Photo 30: upstream view of falls obstruction in Creek ENDTR3 at end of Reach 5.*
- Photo 31: upstream view of typical section of Bulkley Creek in Reach 1 at Rose Lake cutoff road crossing.*
- Photo 32: upstream view of typical section of Bulkley Creek in Reach 2.*
- Photo 33: downstream view of typical section of Taman Creek in Reach 7.*
- Photo 34: upstream view of typical section of Taman Creek in Reach 8.*
- Photo 35: upstream view of falls obstruction at end of Reach 8 on Taman Creek.*



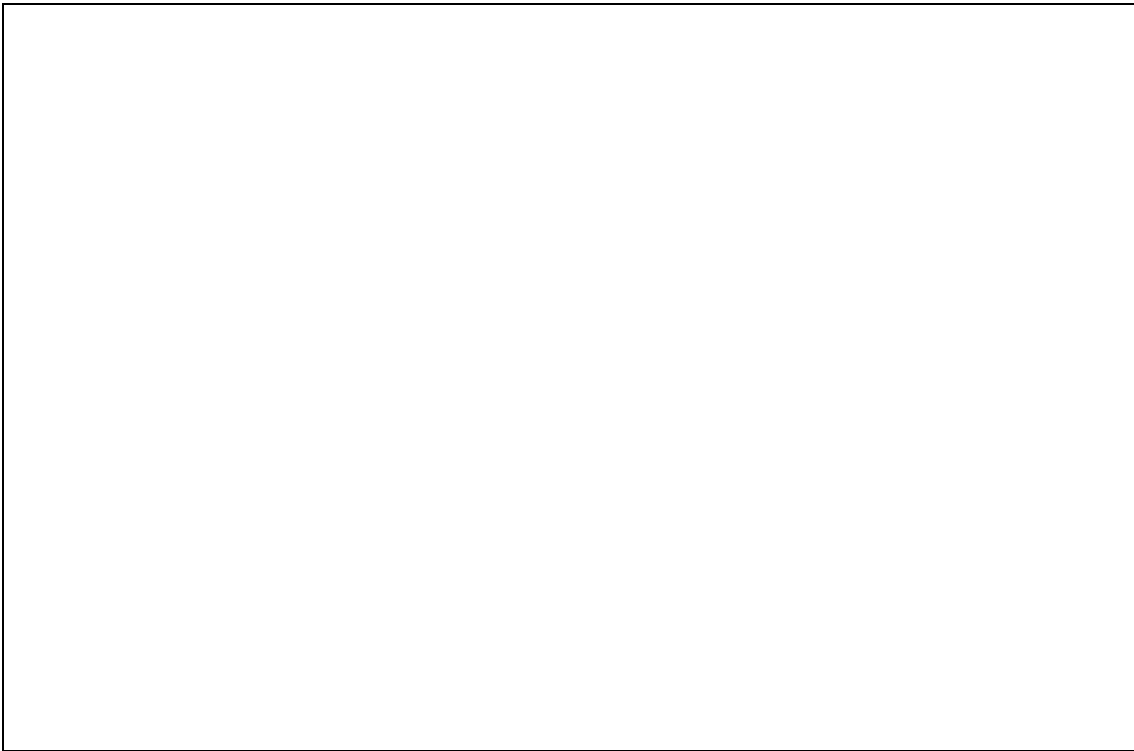
*Photo 1: upstream view of typical section of Endako River in Reach 1 above Rose Lake outlet creek.*



*Photo 2: upstream view of potential culvert obstruction at Highway 16 road crossing in Reach 1.*

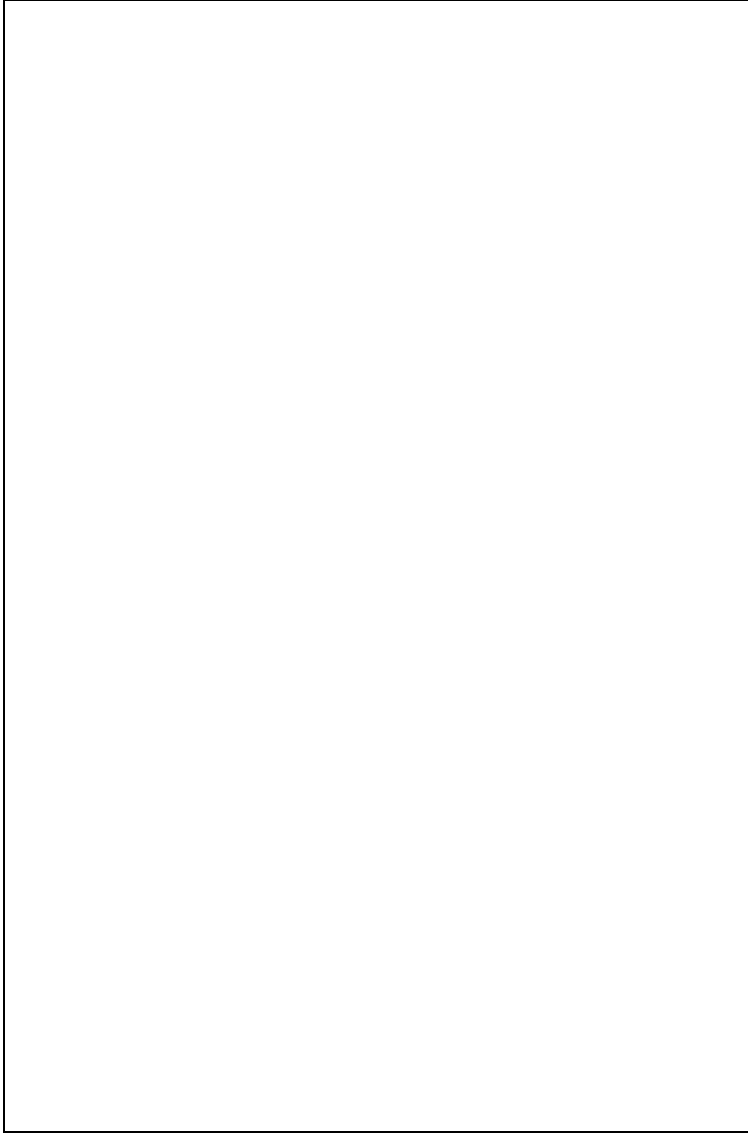


*Photo 3: downstream view of typical section of Endako River in Reach 4.*

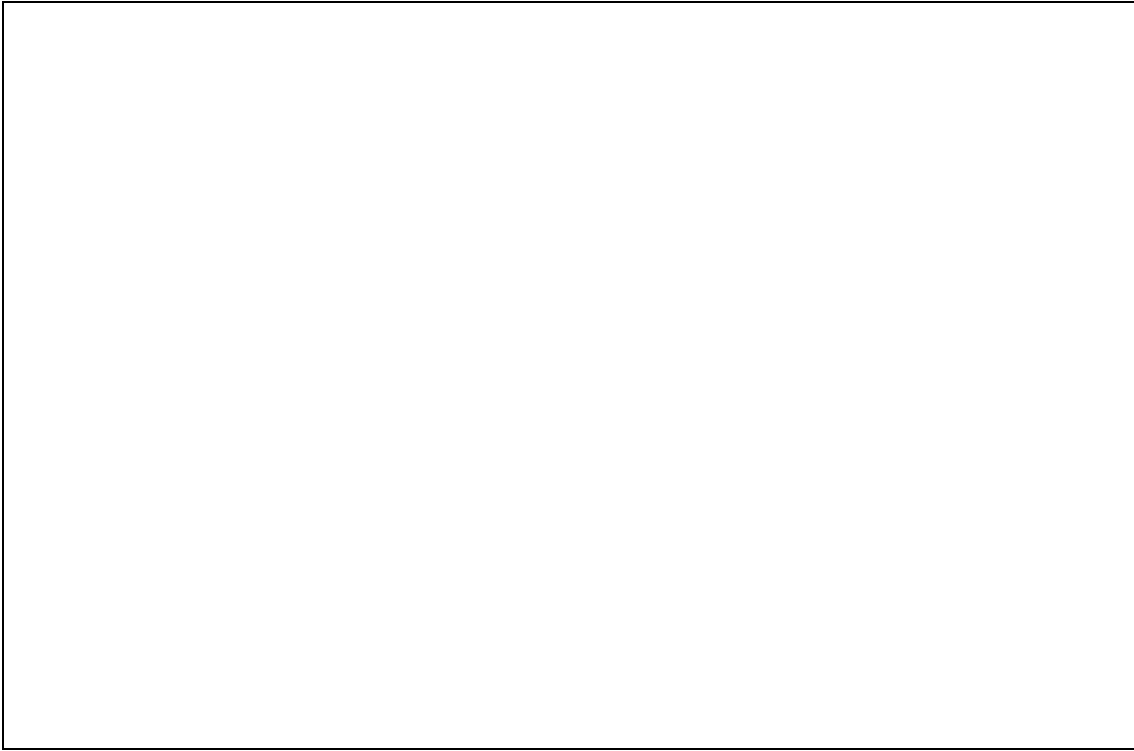


*Photo 4: upstream view of typical section of Creek END3 in Reach 1.*

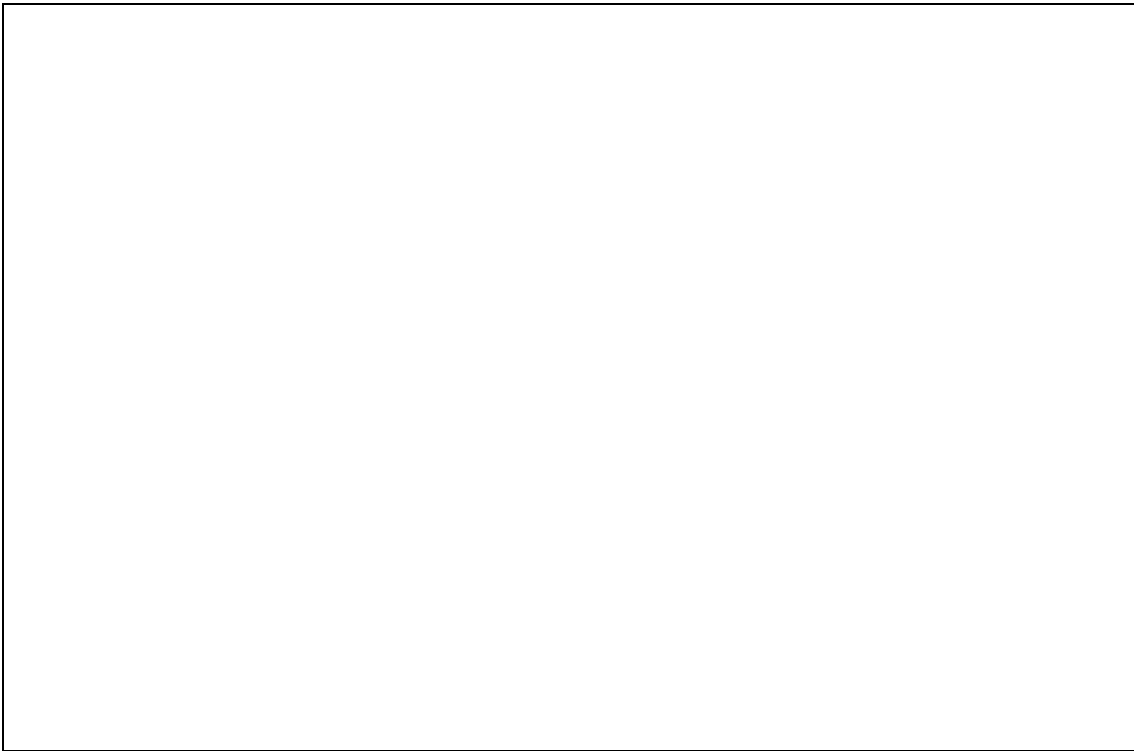




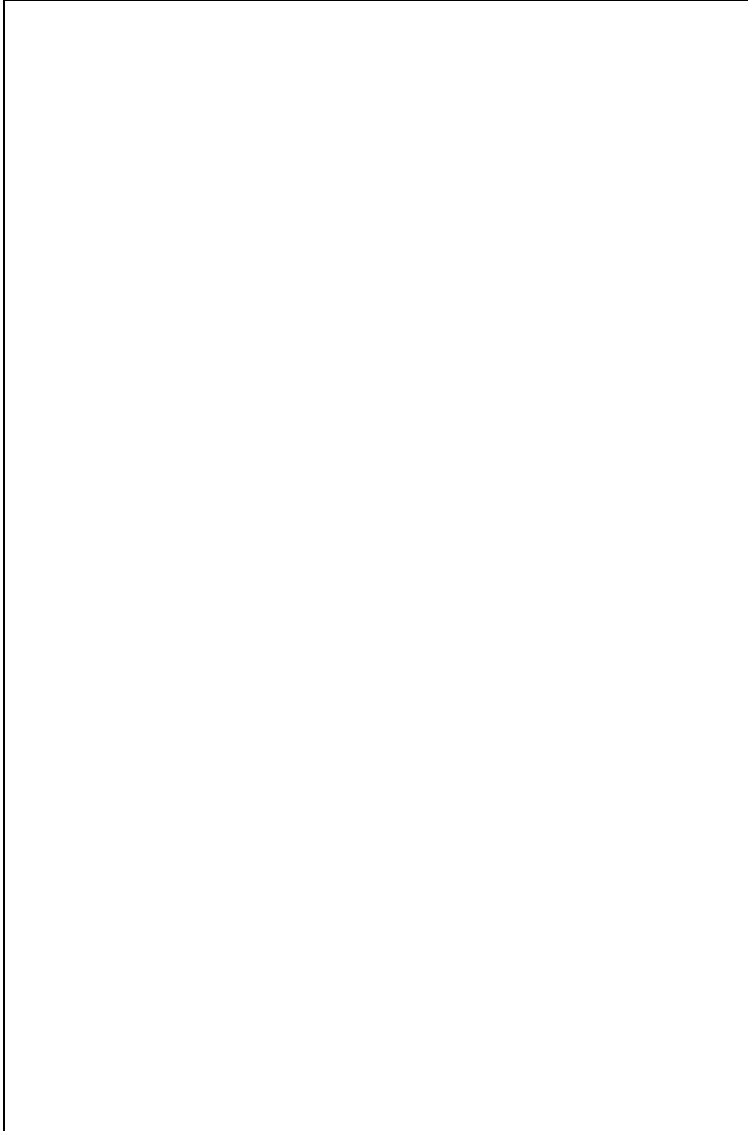
*Photo 5: upstream view of 5m falls obstruction at end of Reach 4 of Endako R*



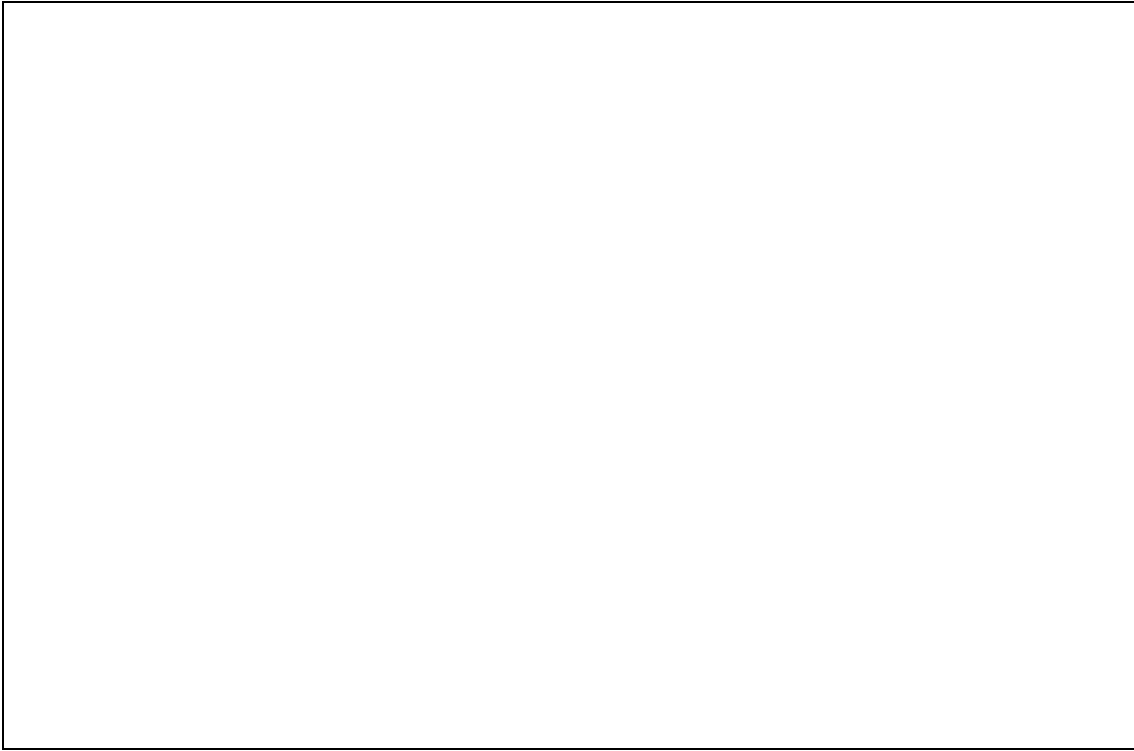
*Photo 6: downstream view of typical section of Creek SH in Reach 1.*



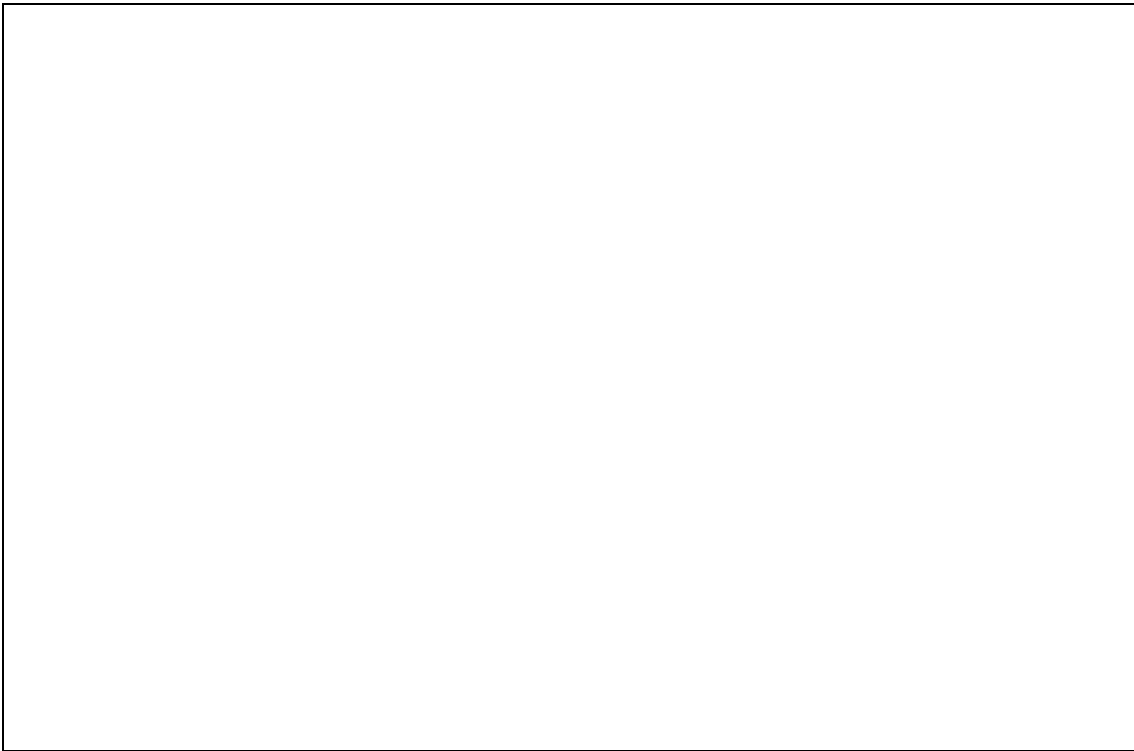
*Photo 7: upstream view of falls obstruction in Creek SH in Reach 2.*



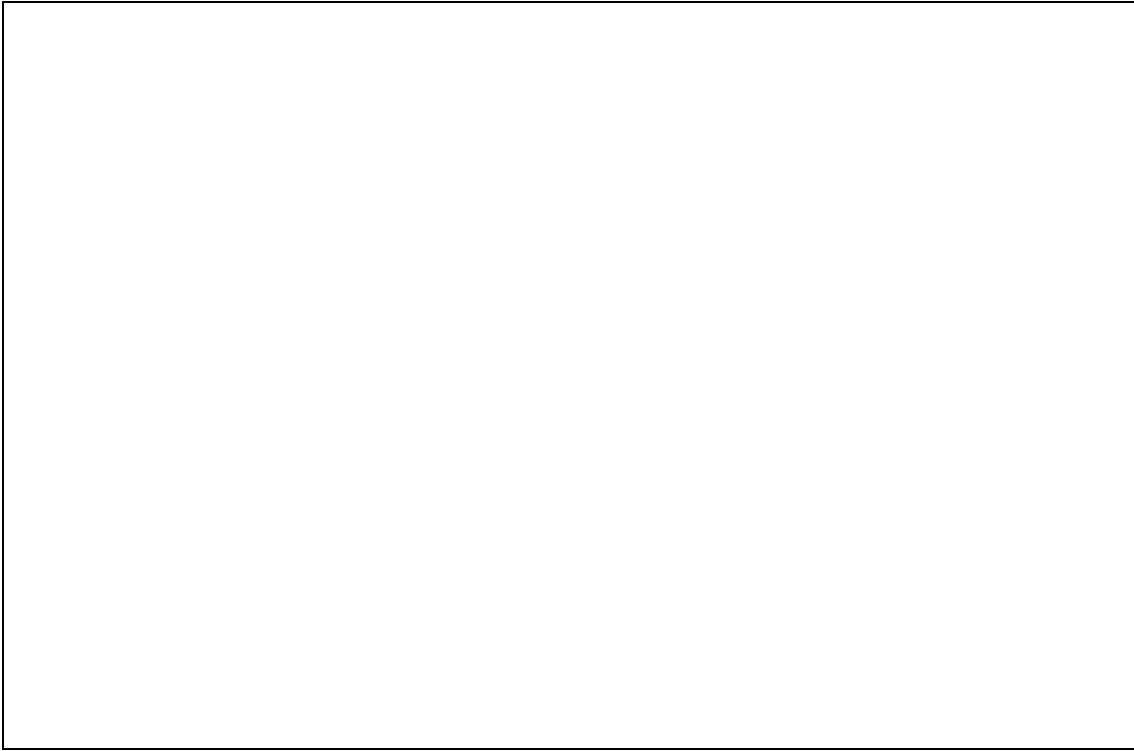
*Photo 8: upstream view of large falls in Reach 3 of Creek SH.*



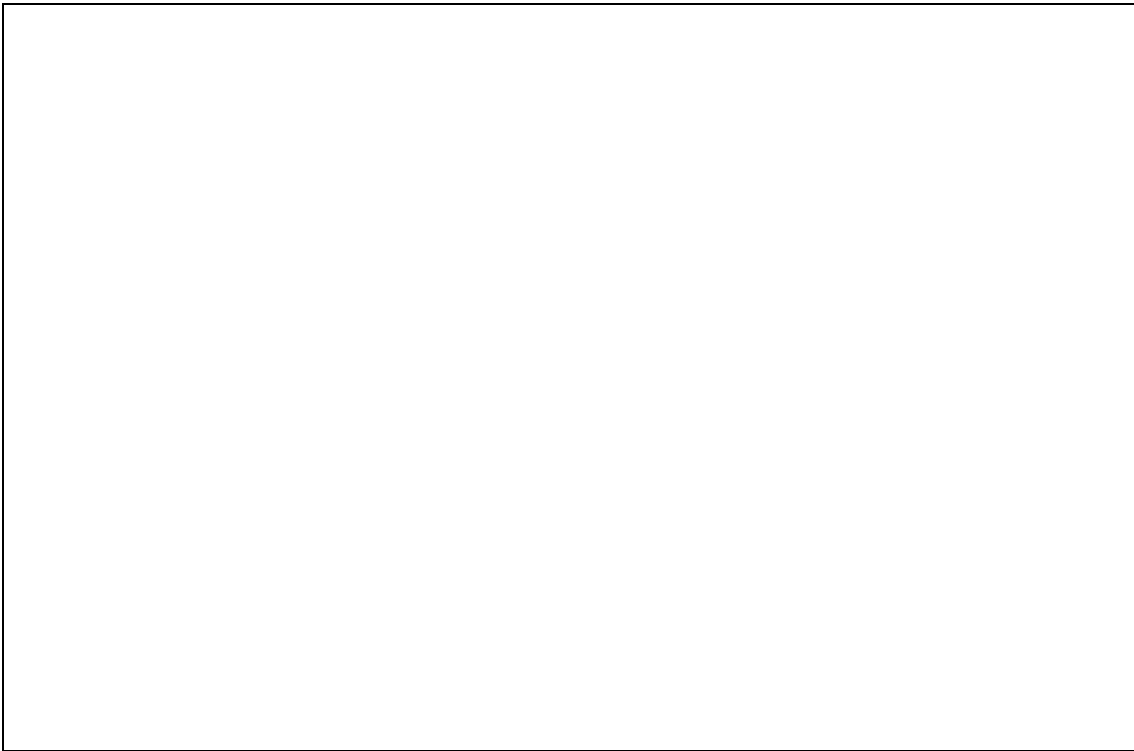
*Photo 9: downstream view of typical section of Creek DEC1 in Reach 1.*



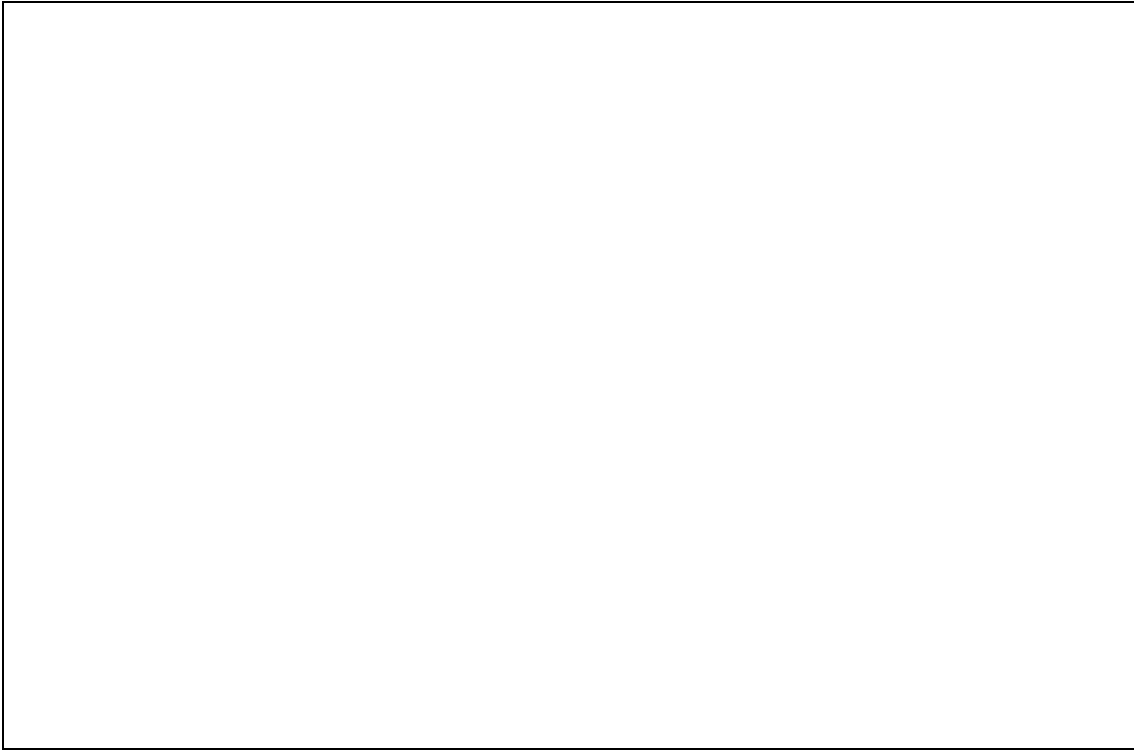
*Photo 10: upstream view of beaver dam at mouth of Creek DEC1.*



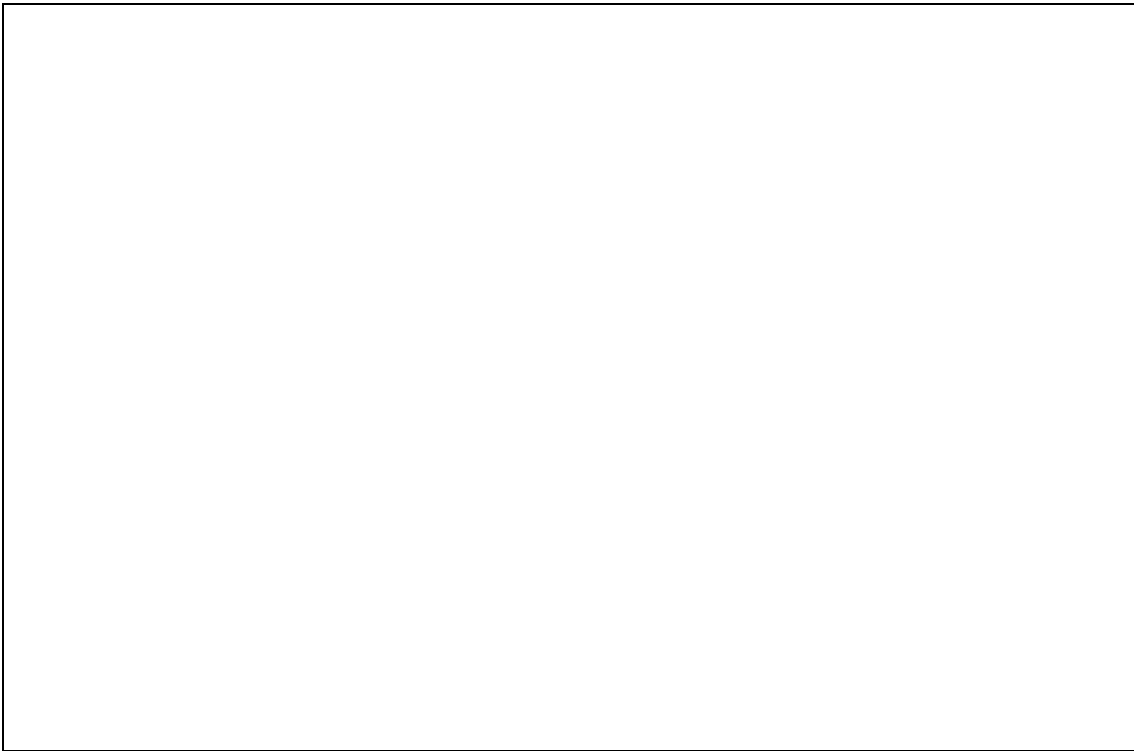
*Photo 11: downstream view of typical section of Lakes Creek in Reach 3.*



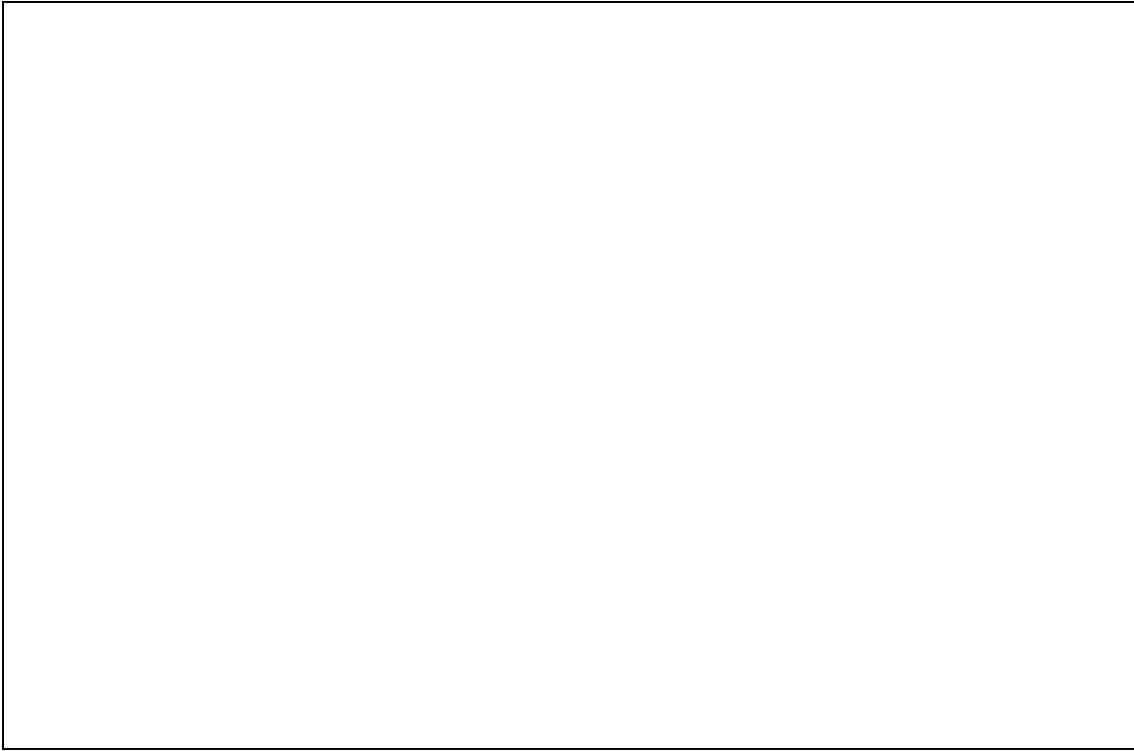
*Photo 12: upstream view of Lakes Creek from beginning of Reach 6 (from old road crossing remains).*



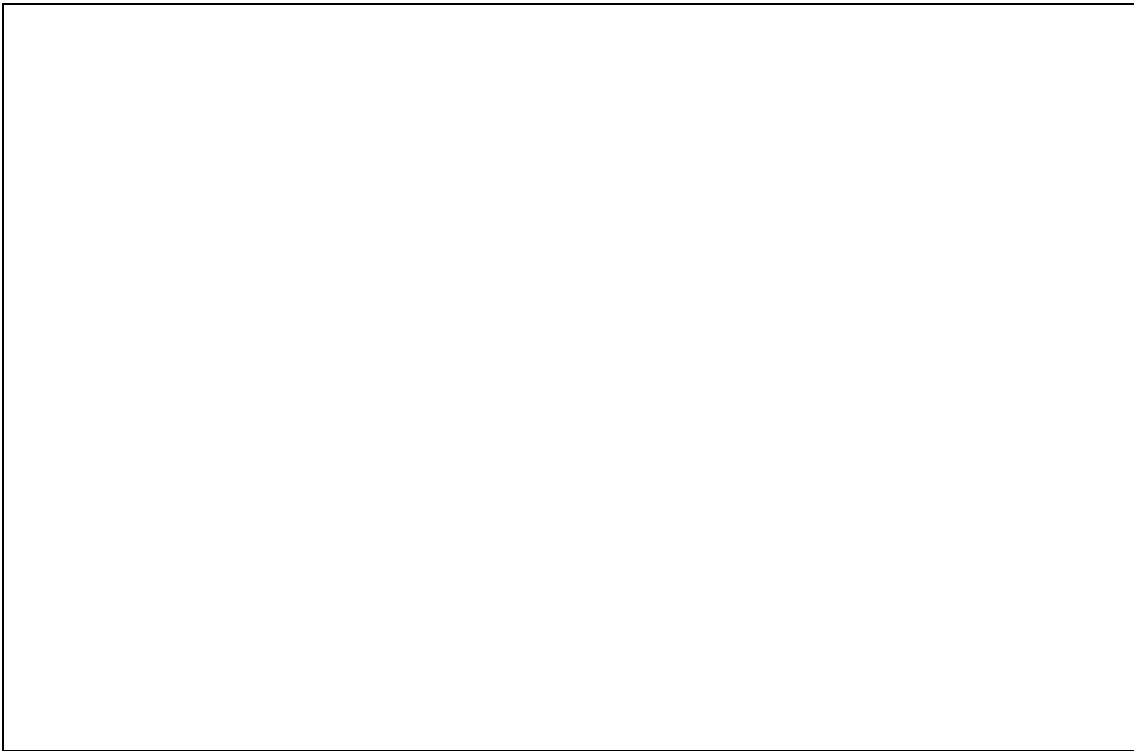
*Photo 13: Cross channel view of old bridge remains in Lakes Creek channel at start of Reach 6 below Lake 431.*



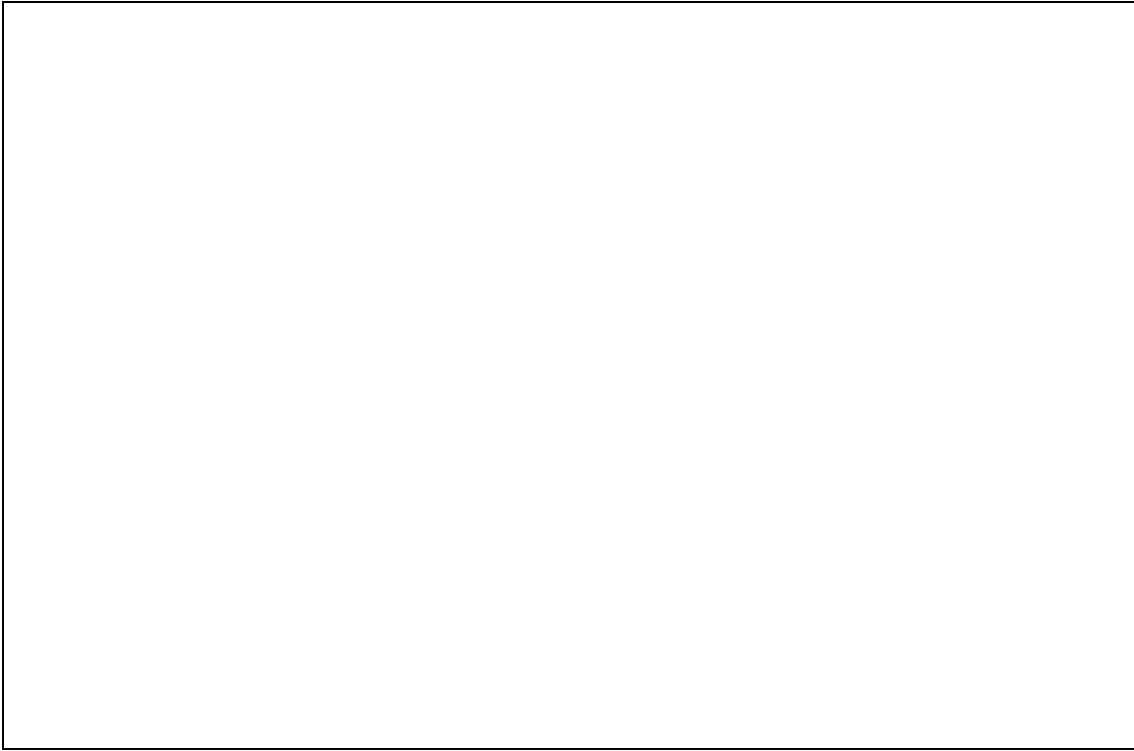
*Photo 14: downstream view typical section of Lakes Creek in Reach 8 below Shuldham Lake.*



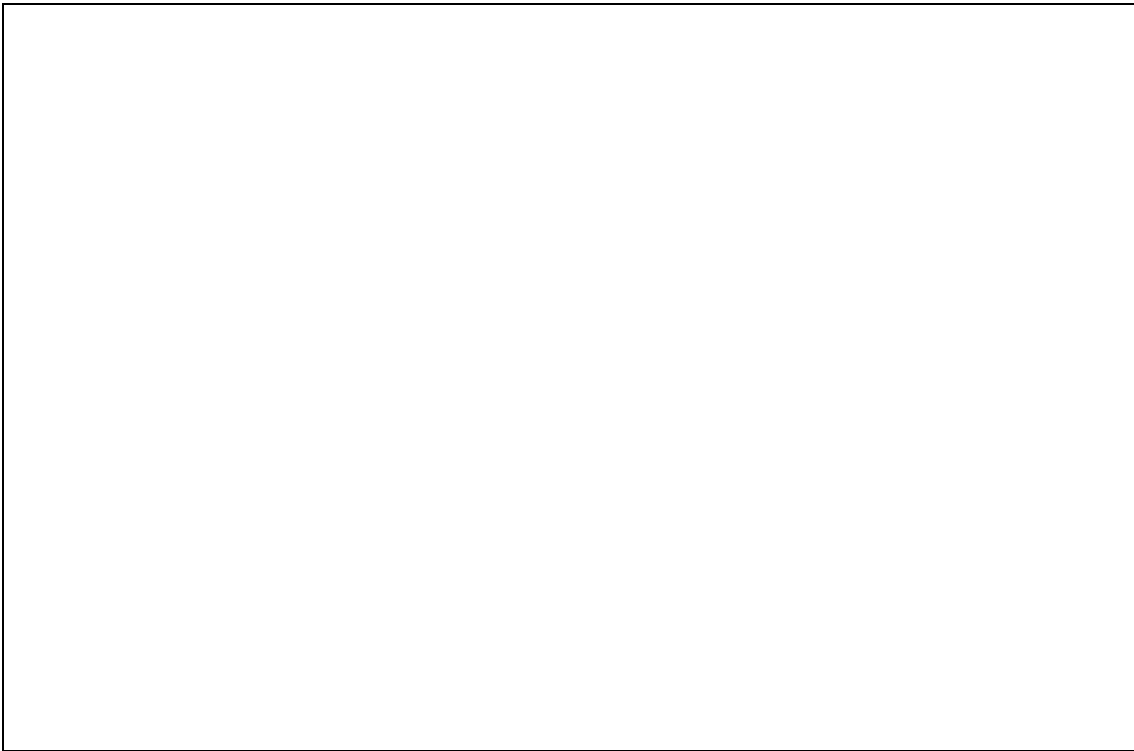
*Photo 15: upstream view of typical section of Creek ENDTRI in Reach 1.*



*Photo 16: upstream view of beaver dam and impoundment in Reach 1 of Creek ENDTRI.*

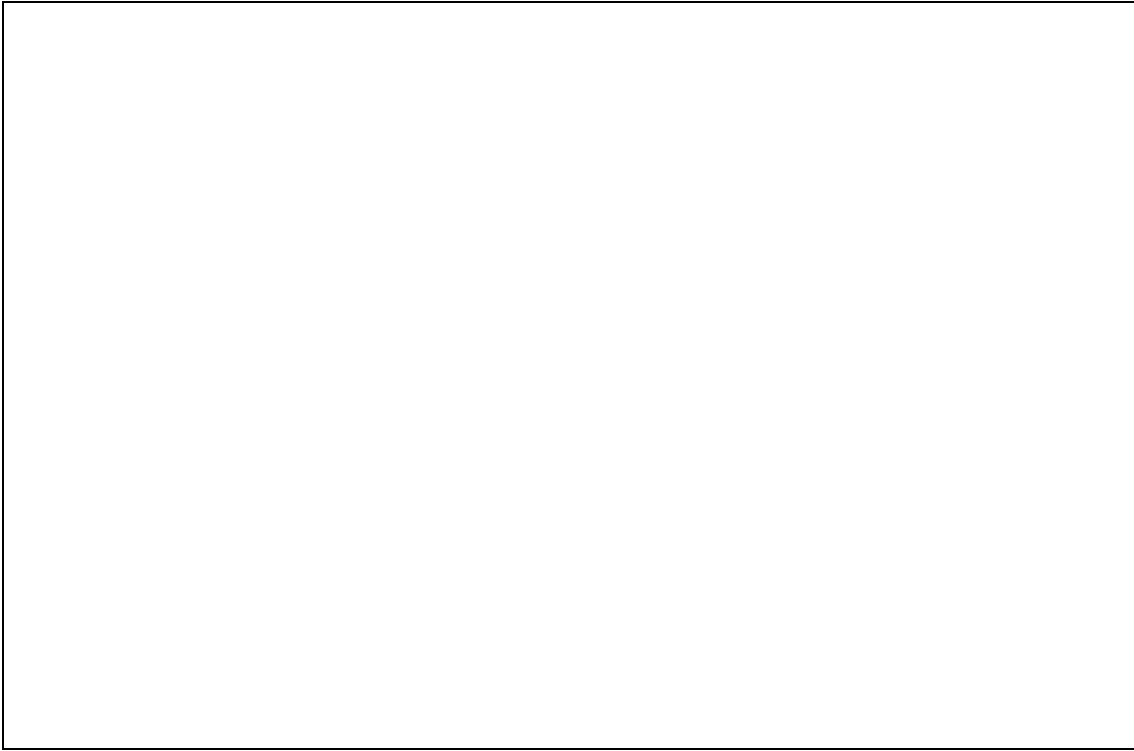


*Photo 17: upstream view of typical section of Creek ENDTR1 in Reach 2.*

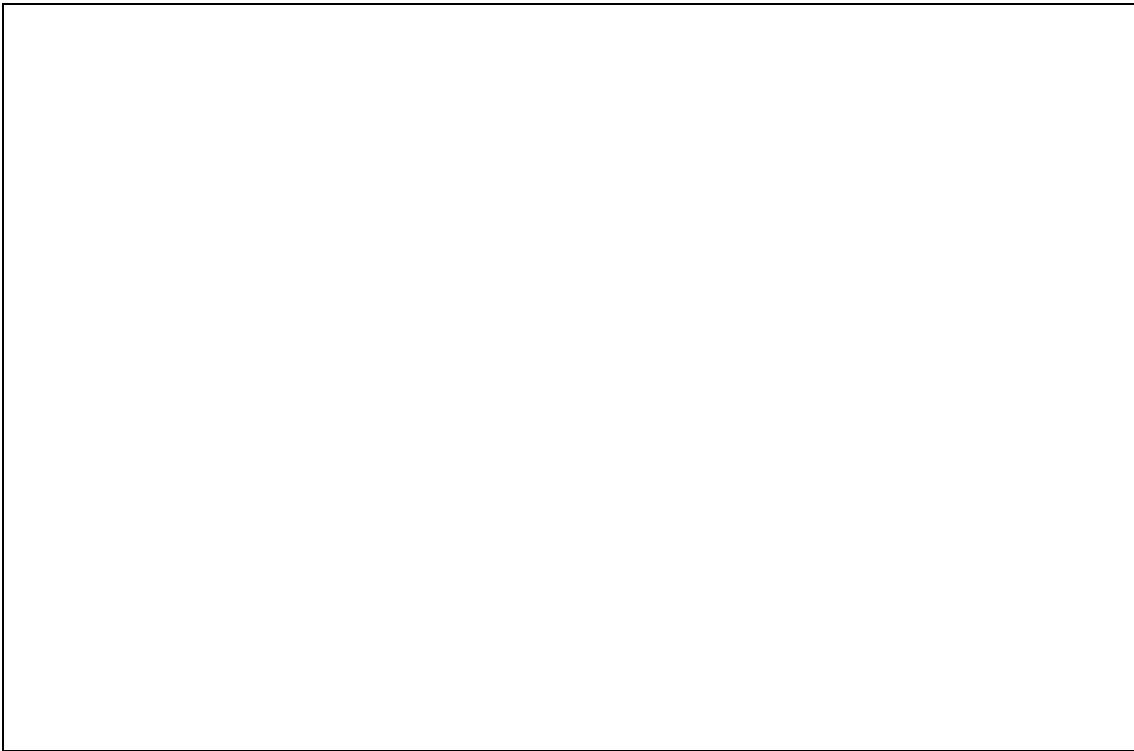


*Photo 18: upstream view of typical section of Creek ENDTR1A in Reach 2.*

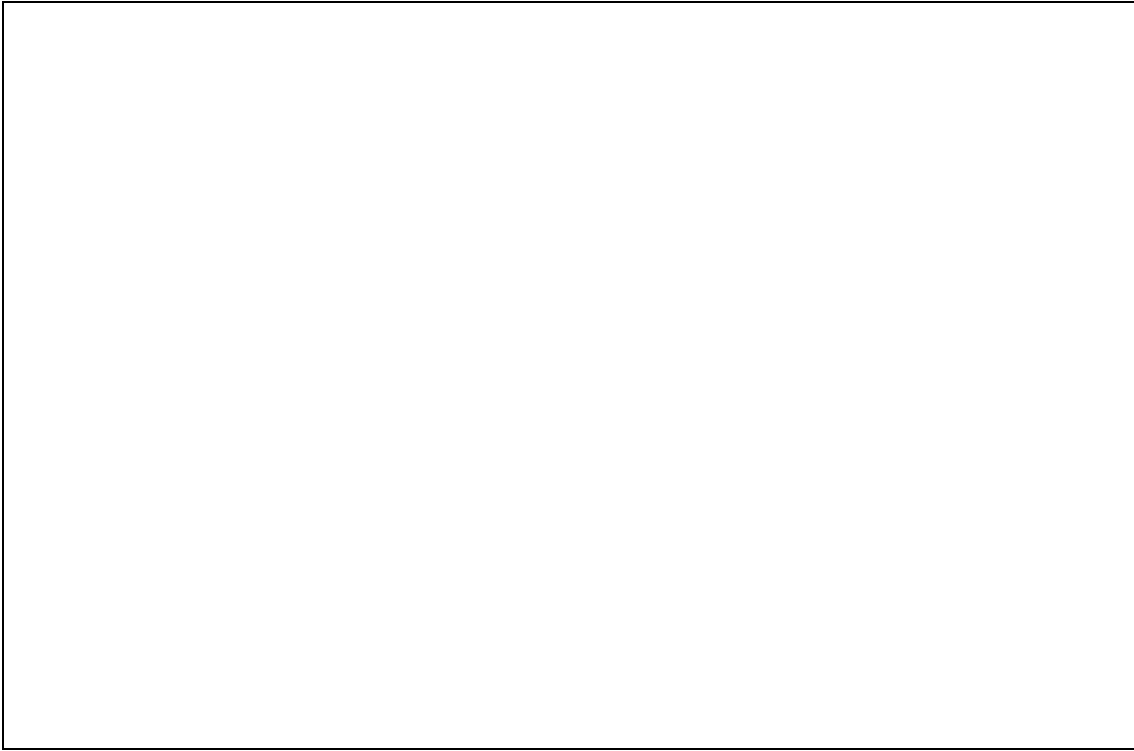




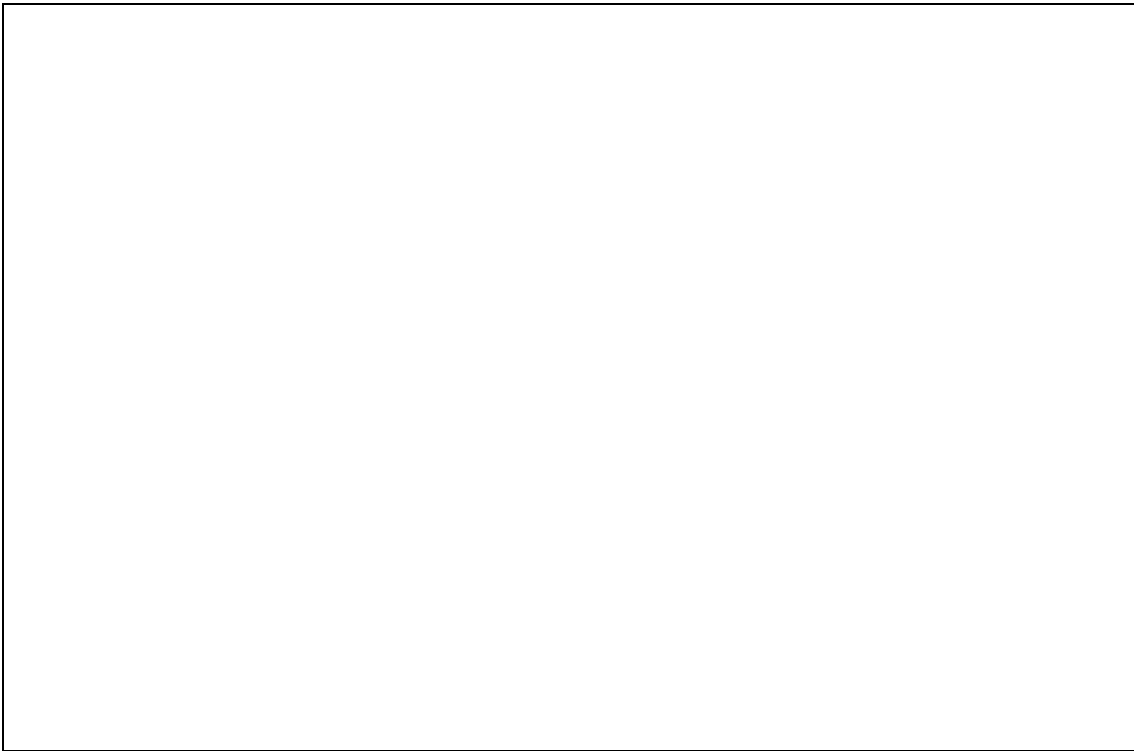
*Photo 19: upstream view of typical section of Creek ENDTR1B in Reach 1.*



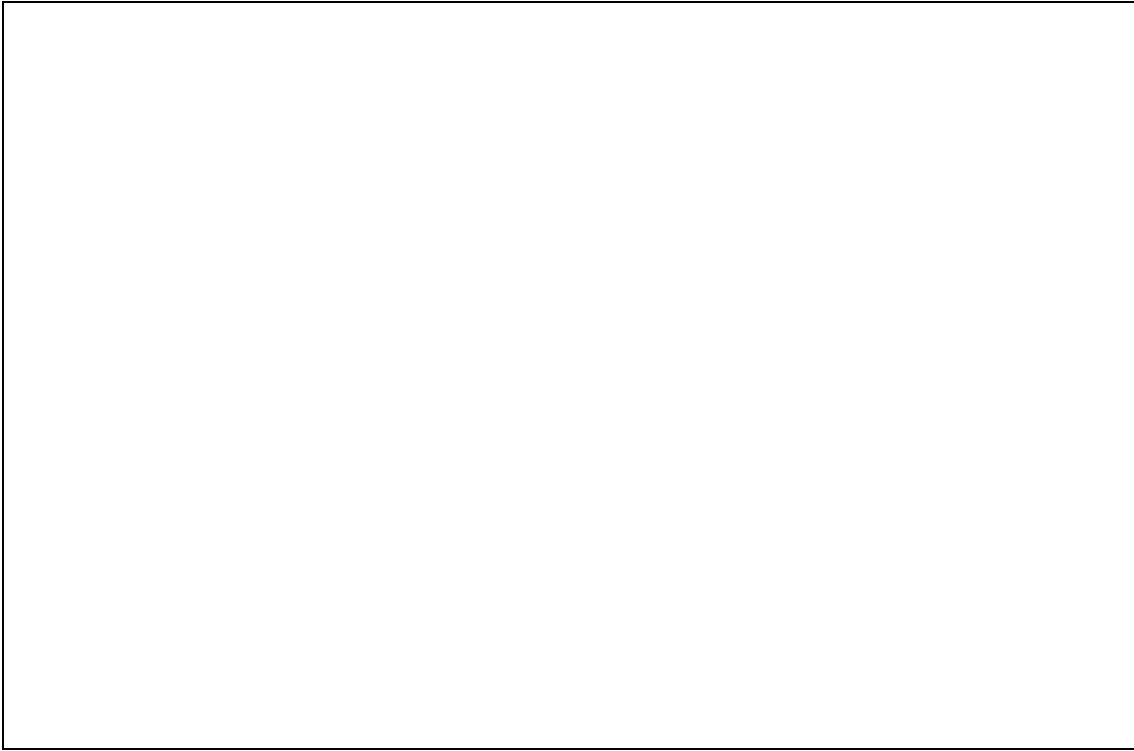
*Photo 20: upstream view of falls obstruction in Creek ENDTR1B at end of Reach 1.*



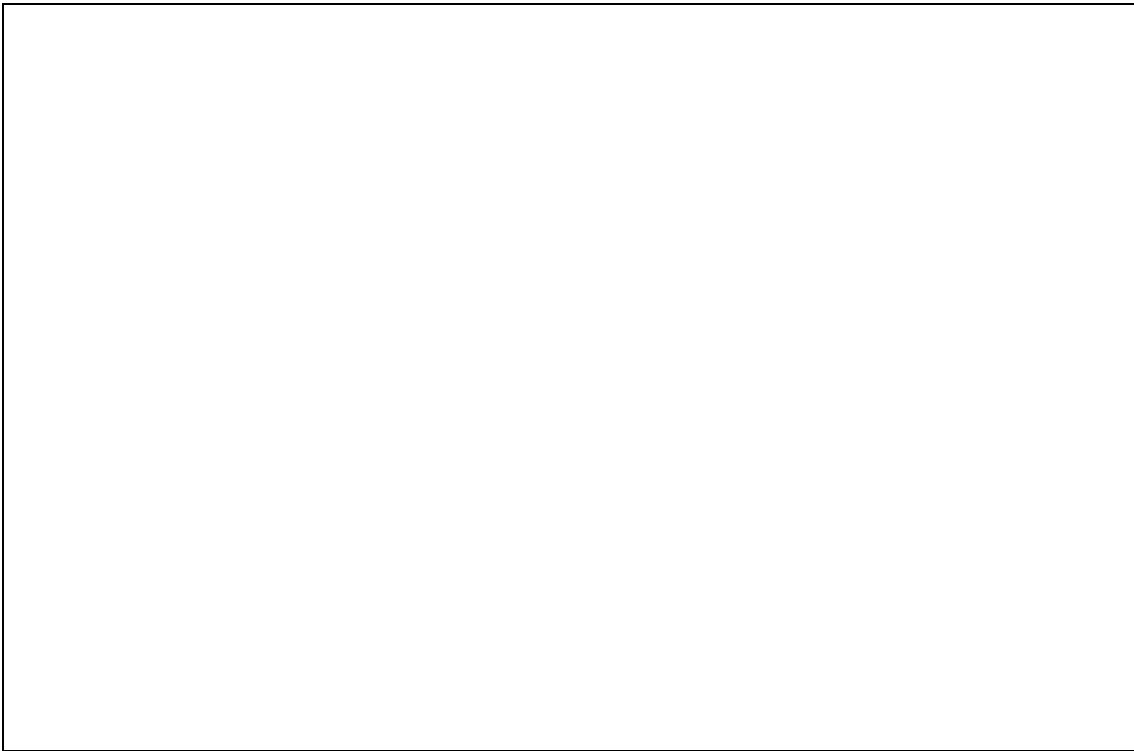
*Photo 21: upstream view of typical section of Creek ENDTR2A in Reach 2.*



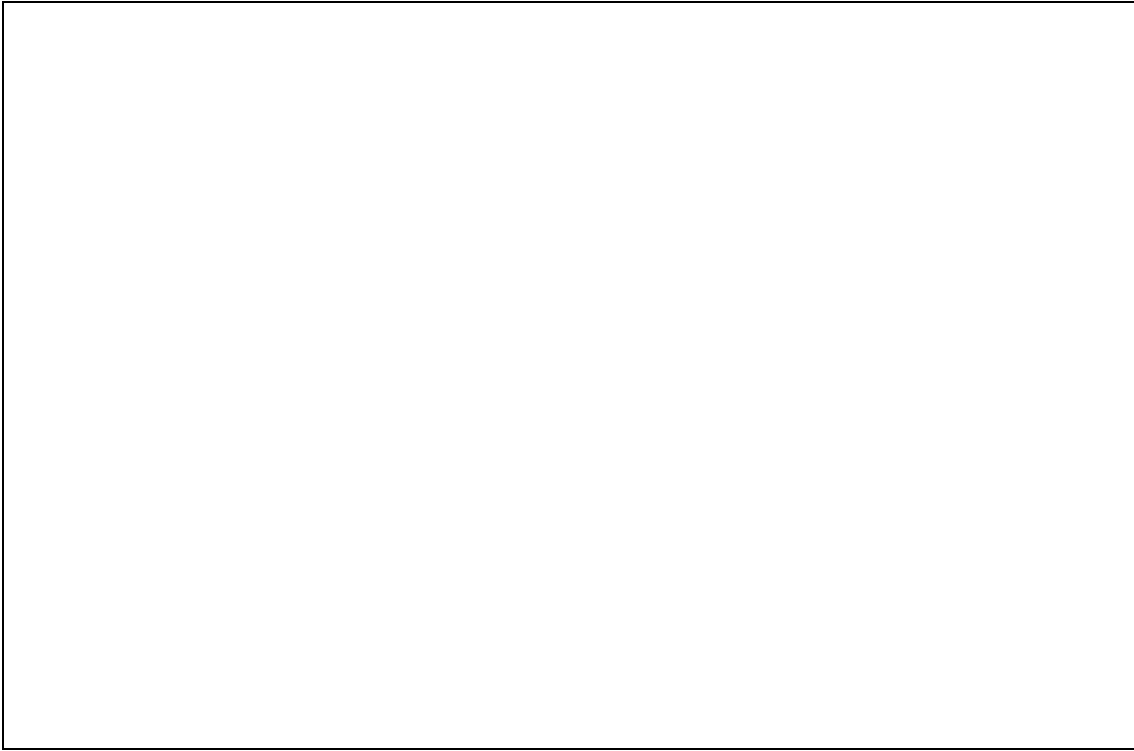
*Photo 22: downstream view of typical section of Creek ENDTR2B in Reach 1.*



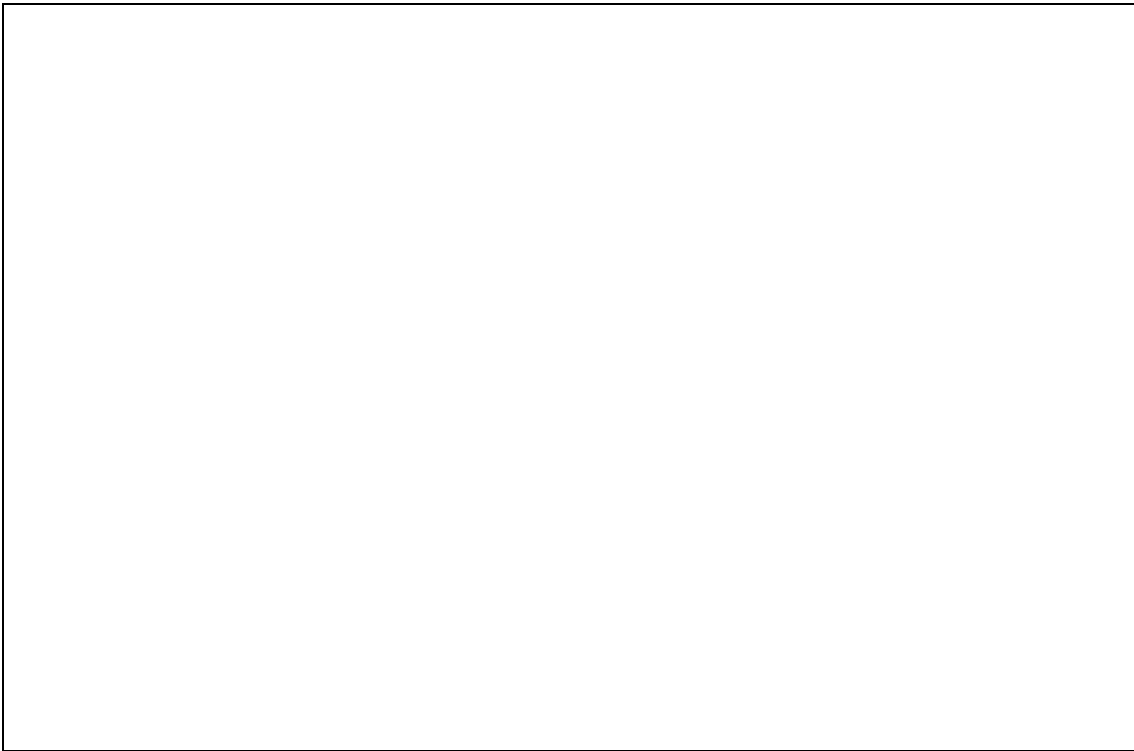
*Photo 23: upstream view of typical section of Rentoul Creek in Reach 3.*



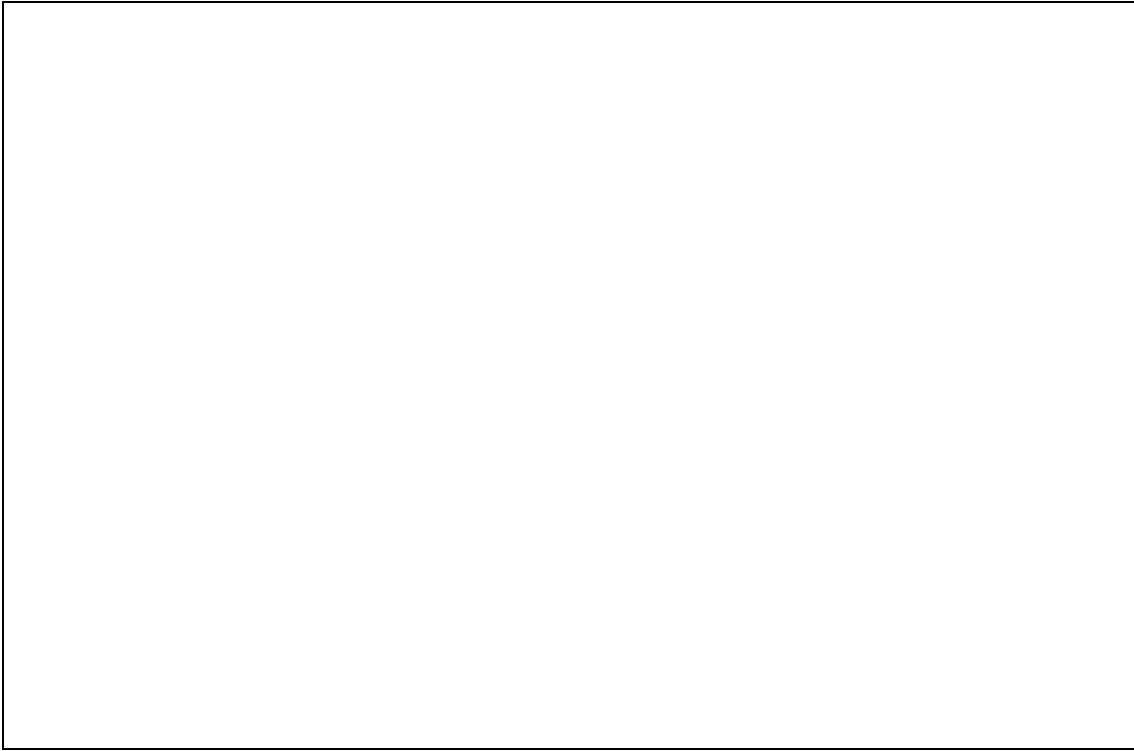
*Photo 24: upstream view of culvert at Taman Road crossing in Reach 3 of Rentoul Creek.*



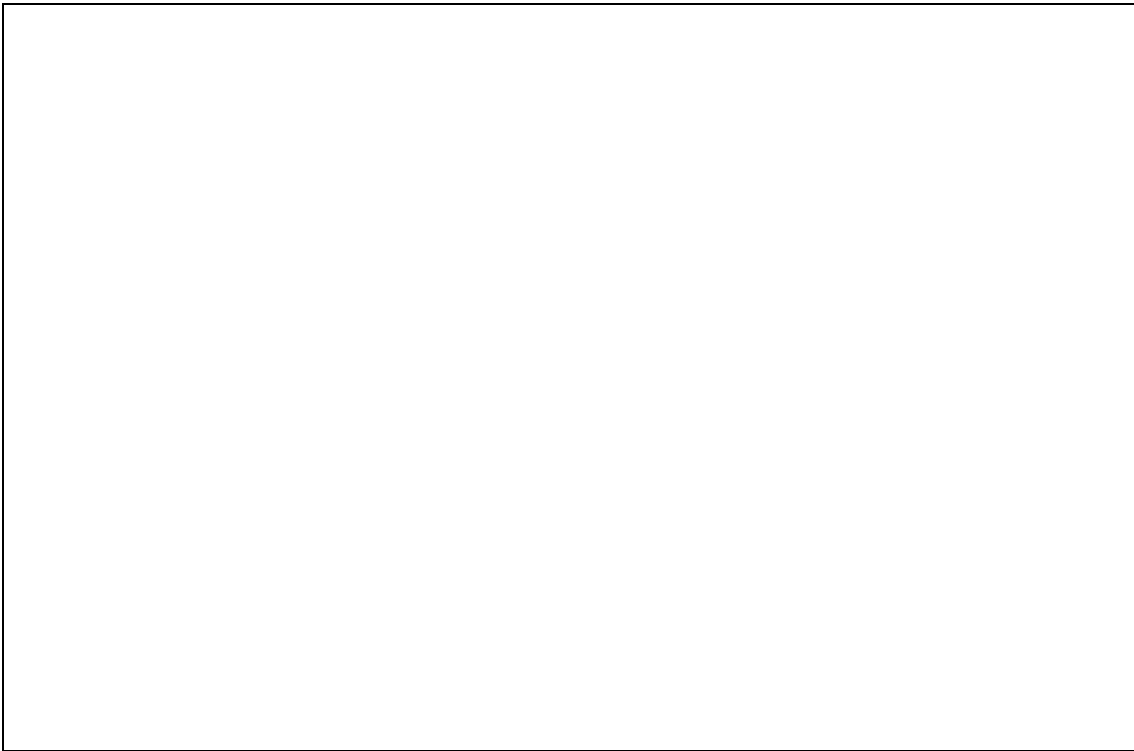
*Photo 25: upstream view of typical section of Rentoul Creek in Reach 6.*



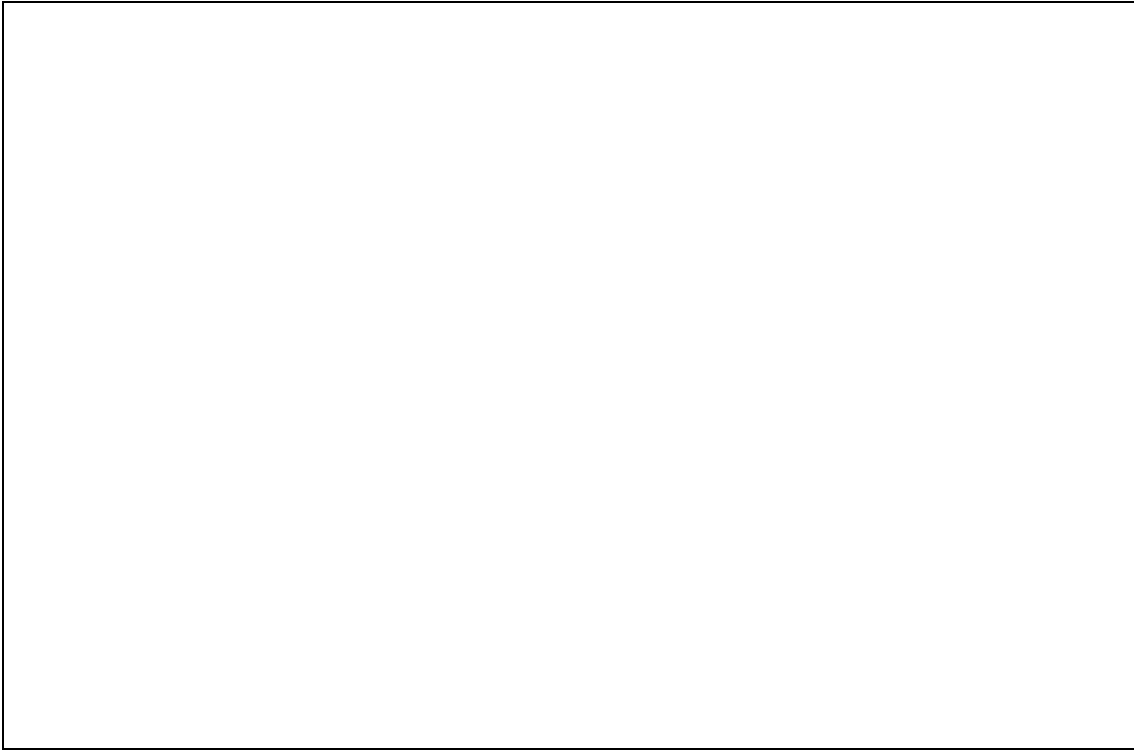
*Photo 26: upstream view of cascade obstruction in Rentoul Creek at end of Reach 6.*



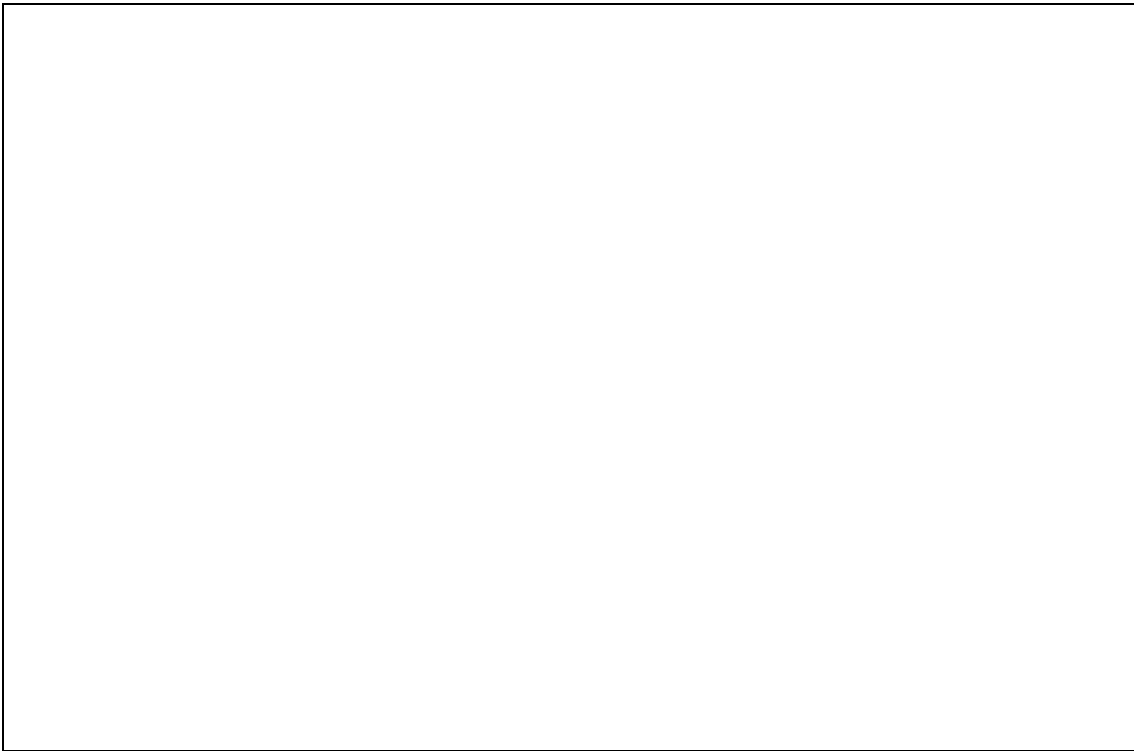
*Photo 27: downstream view of typical section of Creek ENDTR3 in Reach 2.*



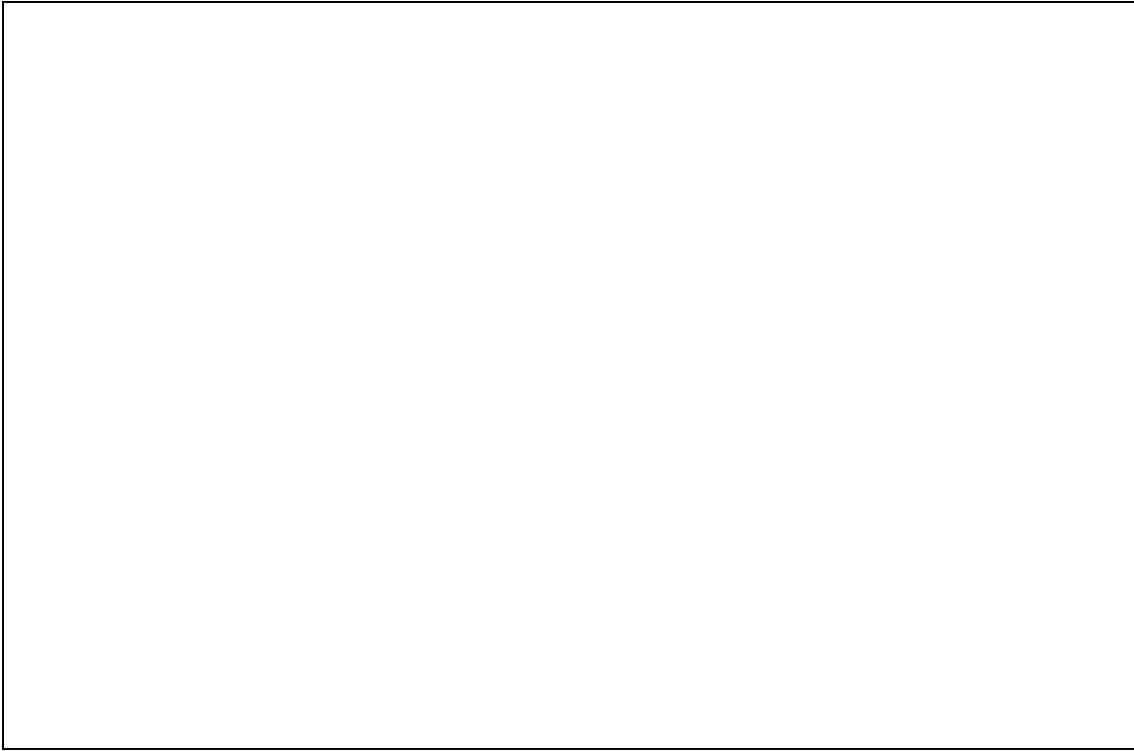
*Photo 28: upstream view of culvert at Taman road crossing in Reach 6 of Creek ENDTR3.*



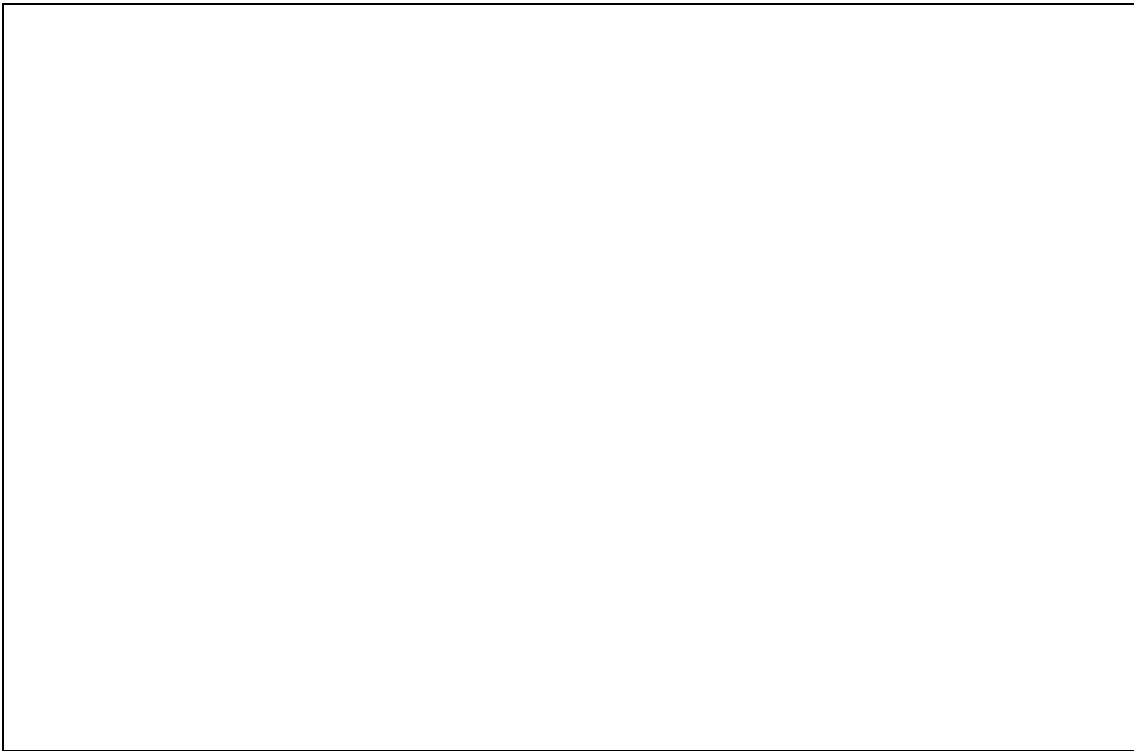
*Photo 29: upstream view of typical section of Creek ENDTR3 in Reach 5.*



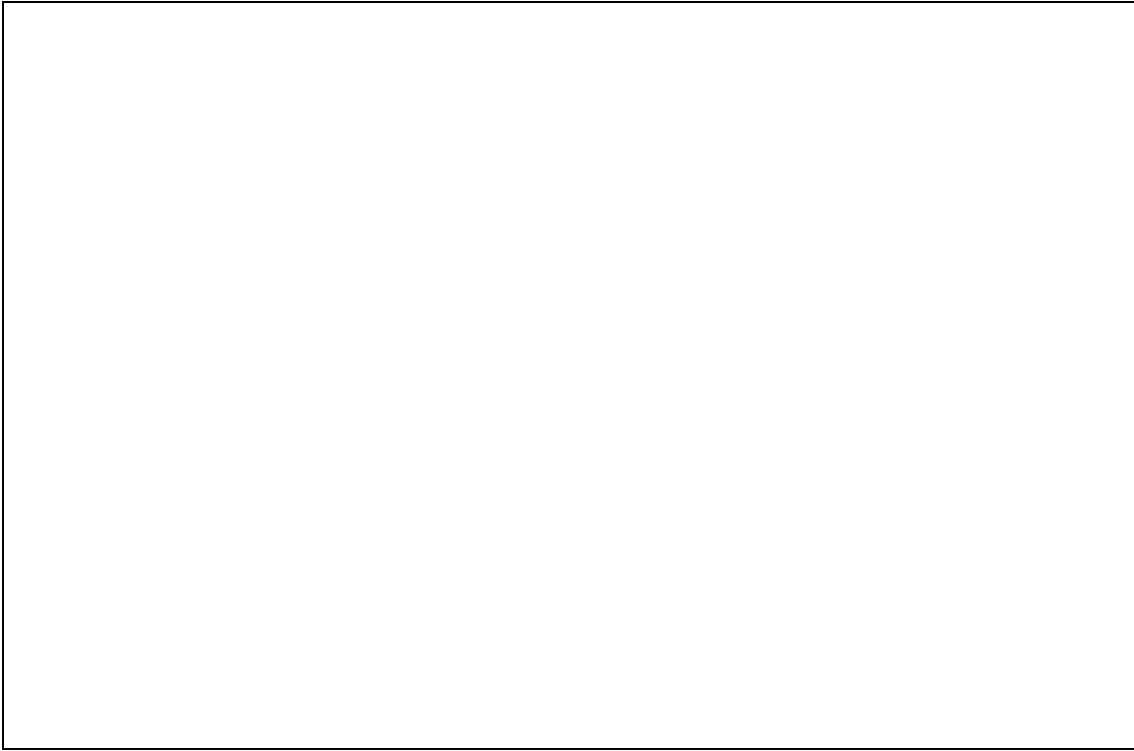
*Photo 30: upstream view of falls obstruction in Creek ENDTR3 at end of Reach 5.*



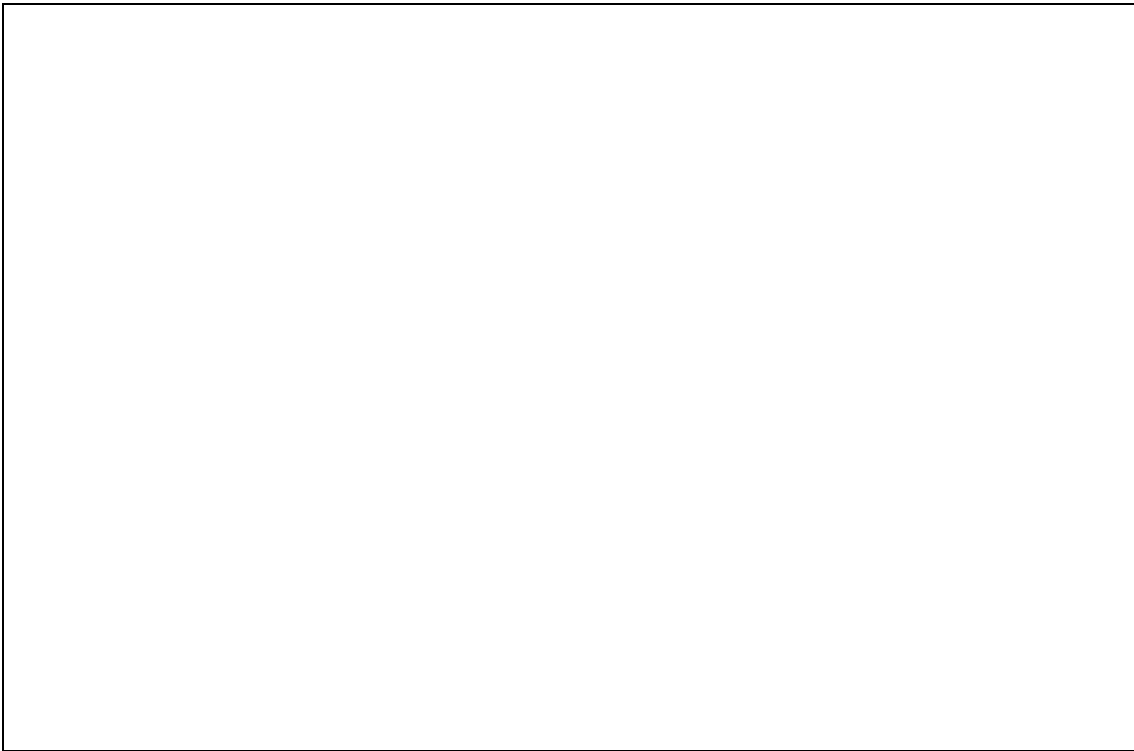
*Photo 31: upstream view of typical section of Bulkley Creek in Reach 1 at Rose Lake cutoff road crossing.*



*Photo 32: upstream view of typical section of Bulkley Creek in Reach 2.*



*Photo 33: downstream view of typical section of Taman Creek in Reach 7.*



*Photo 34: upstream view of typical section of Taman Creek in Reach 8.*





*Photo 35: upstream view of falls obstruction at end of Reach 8 on Taman Creek.*

Sheet2

ENDAKO--1	09.693680.6031273 (GPS) 09.694040.6031900 (map)
ENDAKO--4	10.305977.6034700 (GPS) 09.694460.6034600 (map)
ENDAKO--4	No GPS lock; 09.694920.6036160 (map)
ENDAKO--5	10.305779.6036620
SH--1	10.357762.6006730 (GPS); 10.358000.6007220
SH--2	10.357553.6007970 (GPS); 10.357780.6007950 (map)
DEC1--1	10.312417.6021768
LAKES--2	10.309188.6024000 (GPS) 10.309250.6024970 (map)
LAKES--3	10.308581.6024604 (GPS); 10.308640.6024860 (map)
LAKES--4	no GPS lock; 10.308360.6024060 (map)
LAKES--5	10.307895.6022573 (GPS); 10.307930.6022600 (map)
LAKES--6	10.308091.6022401
LAKES--7	10.308137.6021051 (GPS); 10.308280.6020940 (map)
LAKES--8	10.308023.6021017 (GPS); 10.308050.6021050 (map)
LAKES--9	10.307790.6021131 (GPS); 10.307800.6021100 (map)
LC1	10.308680.6020897
LC2	10.308553.6020844 (GPS); 10.308580.6020710 (map)
LC3	10.307647.6021098 (GPS); 10.307650.6020920 (map)
ENDTR1--1	09.694562.6025387 (GPS); 09.694500.6025330 (map)
ENDTR1--2	09.629846.6024634
ENDTR1--4	09.691851.6024378
ENDTR1A--1	09.694410.6025439 (GPS); 09.694400.6025350 (map)
ENDTR1A--2	09.694239.6025572 (GPS); 09.694200.6025640 (map)
ENDTR1A--3	09.693737.6025631
ENDTR1Ai--1	09.694061.6025533
ENDTR1B--1	09.694509.6025275 (GPS); 09.694480.6025110 (map)
ENDTR2A--2	10.310227.6031392
ENDTR2B--1	10.311993.6033078
RENTOUL--3	10.308759.6032196 (GPS); 10.308810.6032270 (map)
RENTOUL--4	10.309920.6034000 (GPS); 10.309940.6033960 (map)
RENTOUL--5	No GPS possible; 10.309940.6034600 (map)
RENTOUL--6	10.309950.6035170 (map)
RENTOUL--7	
RC--1	No GPS possible (30 m upstream from mouth with Rentoul C)
RD--1	No GPS possible here - 30m upstream from its mouth with Rentoul C.
ENDTR3--2	10.306868.6033319
ENDTR3--4	10.308279.6034420 (GPS) 10.308220.6034400 (map)
ENDTR3--5	10.308345.6034430 (GPS); 10.308250.6034610 (map)
END3--1	10.306302.6035477 (GPS) 10.306280.6035390 (map)
END4--1	10.306163.6035576
END4A--1	10.306163.6035576
END5--1	10.306050.6036040
BULKLEY--1	09.692415.6032177 (GPS) 09.692550.6032090 (map)
BULKLEY--1	09.692228.6031774 (GPS) 09.692280.6032270 (map)
BULKLEY--2	09.692172.6032327 (GPS) 09.692170.6032300 (map)
BULKLEY--3	09.692238.6031820 (GPS) 09.692400.6031860 (map)
TAMAN--7	09.691566.6036196 (GPS) 09.691510.6036080 (map)
TAMAN--8	09.692372.6037851 (GPS) 09.692290.6037790 (map)
TAMAN--9	09.692360.6037951
TAM1--1	09.692699.6035214





**Endako River Tributaries (180-3740-952-019-\*\*\*) & Bulkley (460)/ Taman (460-9516) Creeks**

Creek	Watershed Code	Comments
<b>Shovel Creek System (180-3740-952-019-409)</b>		
SH	180-3740-952-019-409-300	Historical watershed code
SH1	180-3740-952-019-409-300-100	Assigned code between creeks -263 and - 324 on Shovel Creek system
SH2	180-3740-952-019-409-300-200	Assigned code as tributary to Creek SH
SH3	180-3740-952-019-409-300-300	Assigned code as tributary to Creek SH after SH1
<b>Decker Lake System</b>		
DEC1	180-3740-952-019-885	Assigned code as tributary to Creek SH after SH2
<b>Lakes Creek System</b>		
Lakes Creek	180-3740-952-019-923	Historical watershed code
LC1	180-3740-952-019-923-776	Historical watershed code
LC2	180-3740-952-019-923-780	Previously coded as mainstem, but Lakes Creek reach 7 is mainstem-assigned this code to reflect that it comes after LC1
LC3	180-3740-952-019-923-790	Assigned code as tributary to Lakes Creek after LC2
<b>ENDTR1 System</b>		
ENDTR1	180-3740-952-019-933	Historical watershed code
ENDTR1A	180-3740-952-019-933-725	Historical watershed code (last coded creek on system)
ENDTR1Ai	180-3740-952-019-933-725-100	Assigned code as tributary to ENDTR1A
ENDTR1Aii	180-3740-952-019-933-725-200	Assigned code as tributary to ENDTR1A after ENDTR1 Ai
ENDTR1B	180-3740-952-019-933-750	Assigned code as tributary to ENDTR1 after ENDTR1A
ENDTR1Bi	180-3740-952-019-933-750-100	Assigned code as tributary to ENDTR1B
ENDTR1C	180-3740-952-019-933-800	Assigned code as tributary to ENDTR1 after ENDTR1B
ENDTR1D	180-3740-952-019-933-850	Assigned code as tributary to ENDTR1 after ENDTR1C
ENDTR1E	180-3740-952-019-933-900	Assigned code as tributary to ENDTR1 after ENDTR1D
<b>ENDTR2 system</b>		
ENDTR2	180-3740-952-019-956	Historical watershed code
ENDTR2A	180-3740-952-019-956-306	Historical watershed code
ENDTR2Ai	180-3740-952-019-956-306-100	Assigned code as tributary to ENDTR2A
ENDTR2B	180-3740-952-019-956-472	Historical watershed code , but ENDTR2B previously coded as mainstem, but field confirmed as not, and adjusted codes
ENDTR2Bi	180-3740-952-019-956-472-100	Assigned code as tributary to ENDTR2B. Previously coded as -956-629
ENDTR2BiA	180-3740-952-019-956-472-100-100	Assigned code as tributary to ENDTR2Bi
ENDTR2BiA1	180-3740-952-019-956-472-100-100-100	Assigned code as tributary to ENDTR2BiA
ENDTR2C	180-3740-952-019-956-700	Assigned code as tributary to ENDTR2 after ENDTR2B
<b>Rentoul Creek System</b>		
Rentoul Creek	180-3740-952-019-980	Historical watershed code
RA	180-3740-952-019-980-100	Assigned code as tributary to Rentoul Creek
RB	180-3740-952-019-980-200	Assigned code as tributary to Rentoul Creek after RA
RC	180-3740-952-019-980-300	Assigned code as tributary to Rentoul Creek after RB
RCi	180-3740-952-019-980-300-100	Assigned code as tributary to RC
RD	180-3740-952-019-980-400	Assigned code as tributary to Rentoul Creek after RC
<b>ENDTR3 System</b>		
ENDTR3	180-3740-952-019-991	This system previously coded -994, but more than 5 additional tribs, so moved it to -991 (one above prev. stream) to make room
ENDTR3A	180-3740-952-019-991-100	Assigned code as tributary to ENDTR3
ENDTR3B	180-3740-952-019-991-200	Assigned code as tributary to ENDTR3 after ENDTR3A
ENDTR3C	180-3740-952-019-991-300	Assigned code as tributary to ENDTR3 after ENDTR3B
<b>Upper Endako System</b>		
Endako River	180-3740-952-019	Historical watershed code
END1	180-3740-952-019-992	Assigned code as tributary to Endako River
END2	180-3740-952-019-993	Assigned code as tributary to Endako River after END1
END3	180-3740-952-019-994	Assigned code as tributary to Endako River after END2
END4	180-3740-952-019-995	Assigned code as tributary to Endako River after END3
END4A	180-3740-952-019-995-100	Assigned code as tributary to END4
END5	180-3740-952-019-996	Assigned code as tributary to Endako River after END4
END6	180-3740-952-019-997	Assigned code as tributary to Endako River after END5
END7	180-3740-952-019-998	Assigned code as tributary to Endako River after END6
END7A	180-3740-952-019-998-100	Assigned code as tributary to END7
END7B	180-3740-952-019-998-200	Assigned code as tributary to END7 after END7A
END8	180-3740-952-019-999	Assigned code as tributary to Endako River after END7
<b>Taman/Bulkley Creeks</b>		
Bulkley Creek	460-0000	Historical watershed code
Taman Creek	460-9516	Historical watershed code
TAM1	460-9516-100	Assigned code as tributary to Taman Creek
TAM1A	460-9516-100-100	Assigned code as tributary to TAM1
TAM1B	460-9516-100-200	Assigned code as tributary to TAM1 after TAM1A
TAM2	460-9516-538	Historical watershed code
TAM3	460-9516-600	Assigned code as tributary to Taman Creek after TAM2
TAM4	460-9516-700	Assigned code as tributary to Taman Creek after TAM3
TAM4A	460-9516-700-100	Assigned code as tributary to TAM4
TAM4B	460-9516-700-200	Assigned code as tributary to TAM4 after TAM4A
TAM5	460-9516-800	Assigned code as tributary to Taman Creek after TAM4