

**Reconnaissance (1:20,000) Fish and Fish Habitat
Inventory
of
Several Slocan River Tributaries and
Falls and Bird Creeks
WSC: 340**

Prepared for:
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Approved by:

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March, 2006

Project Reference Information

FIA Project Number	4433002
FDIS Project Number	13302
MoE Region	Kootenay - 04
FW Management Unit	4-8, 4-16, 4-17
DFO Sub-District	South East British Columbia
Forest Region	Nelson
Forest District	Arrow/Boundary, Kootenay Lake
Forest Licensee and Tenure #	Kalesnikoff Lumber Co. Ltd.
First Nations Claim Area	Okanagan, Shuswap and Ktunaxa/Kinbasket Nations

Watershed Information

Watershed Group	Kootenay River
Watershed Name	Goose Creek, Wolverton Creek, Falls Creek, Bird Creek
Watershed Code	Goose Creek: 340-047200- 047500, Wolverton Creek: 340- 047200-17200, Falls Creek: 340- 075500, Bird Creek: 340-071700
UTM at Mouth	Goose Creek: 11.459917.5476658 Wolverton: 11.454352.5485335 Falls Creek: 11.466108.5479938 Bird Creek: 11.466256.5478618
Watershed Area	Goose Creek: 136.7 Wolverton: Falls Creek: 32.9 Bird Creek: 7.0
Total of All Stream Lengths	Kootenay = 69,735 m Arrow = 230,987 m TOTAL = 300,722 m or 300.7km
Stream Order	Wolverton, Goose, Falls & Bird Creeks – 3 rd Order
NTS Map	82F5, 82F6 and 82F 12
TRIM Map	82F.042; 82F.043; 82F.052; 82F.053
BEC Zone	ESSFwc4, ICHmw2, ICHdw

Sampling Design Summary

Total Number of Reaches	2092
Random Sampling Sites	16
Discretionary Sample Sites	13
Total Sample Sites	29
Field Sampling Dates	August 4 th , 2005 to October 9 th , 2005

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Contractor Information

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Disclaimer

This product has been accepted as being in accordance with the approved standards within the limits of Ministry quality assurance procedures. Users are cautioned that interpreted information on this product developed for the purposes of the Forest and Range Practices Act and Regulations, for example stream classification, is subject to review by a statutory decision maker for the purposes of determining whether or not to approve an operational plan.

Acknowledgments

Funding for this inventory was provided by the FIA. Maps and material developed through the Phases I to III were provided by Sylvie Masse. Thanks are also extended to Karl Koerber of Kalesnikoff Lumber Co. Ltd. and Mr. Albert Chirico of the Ministry of Environment.

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Reconnaissance (1:20,000) Fish and Fish Habitat Inventory of Several Slocan River Tributaries and Falls and Bird Creeks

1. Introduction

The project objectives were to complete a Reconnaissance (1:20,000) Fish and Fish Habitat Inventory and determine stream classification to assist Kalesnikoff Lumber with forest development planning and operations. The project plan for this project was developed from the Phase I thru III Report (Masse, 2005) completed for Kalesnikoff's chart area.

Only partial funding was received, therefore only a portion of the identified streams in the project plan were completed in the Phase IV thru VI this year. Streams covered in this report include numerous tributary streams to the Slocan River within the Arrow/Boundary Forest Districts and 2 tributary streams to the lower Kootenay River (Falls and Bird Creeks) located within the Kootenay Lake Forest District (FD).

1.1 Location

The project area is located in the West Kootenay region of South Eastern British Columbia (see figure 1). The two primary tributary streams of the Slocan River that are the focus of this reconnaissance are Goose and Wolverton Creeks. Goose Creek is a moderately large order 3 stream entering the Slocan River in its lower reach. Wolverton Creek is the next significant fish bearing tributary up stream of Goose Creek, entering the Slocan River near the community of Slocan Park.

The other two major tributaries of interest for this study are Bird and Falls Creek. They are tributaries to the Kootenay River. Their confluences are just up stream from the Confluence of the Slocan River with the Kootenay River.

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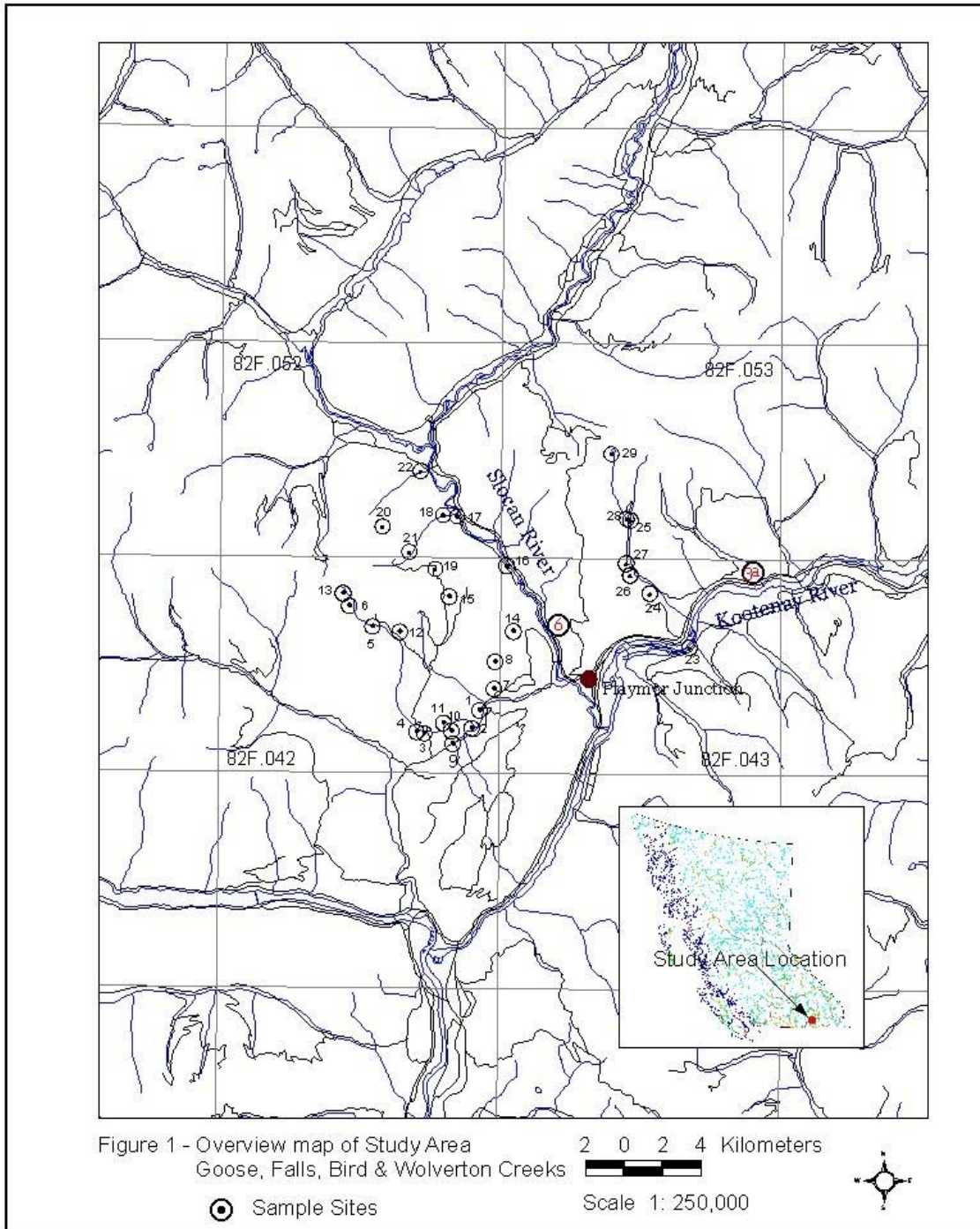


Figure 1. Key overview map of the location of the Project Study Area within the Slocan and Lower Kootenay River watersheds.

1.2 Access

Falls Creek

Direction from Nelson are as follows:

- Driving West on Highway 3a towards Castlegar, drive 13 km to Beasley
- At Beasley, take county access road north, which switches back east before it turns toward the Falls Creek access road, total of 2.7 km
- Leaving paved road, go north-west on unmaintained access road for approximately 5 km to end of road (beginning of trail) on Falls Creek

Bird Creek

Direction from Nelson are as follows:

- Driving West on Highway 3a towards Castlegar, drive 17 km to South Slocan
- Take “Fortis” access road south-east (it crosses the Kootenay River) for 3.8 km, where the access road crosses Bird Creek

Goose Creek

Direction from Nelson are as follows:

- Driving West on Highway 3a towards Castlegar, drive 20 km to Playmor Junction (Junction of Hwy 3a and Hwy 6)
- Drive 2 km north on Hwy 6 to the Slocan River Bridge at Crescent Valley
- After crossing Slocan River, turn left onto Pass Creek Road
- Drive south-west for 3.4 km to McDermid Creek access road (crossing Goose Creek once)
- Continue driving west on the Pass Creek Road for 8.2 km to the Goose Creek access road, following Goose Creek (Reaches 3 & 4)

Wolverton Creek

Direction from Nelson are as follows:

- Driving West on Highway 3a towards Castlegar, drive 20 km to Playmor Junction (Junction of Hwy 3a and Hwy 6)
- Drive 10.7 km north on Hwy 6 to the turnoff for the Slocan River Bridge at Slocan Park
- After crossing the bridge, turn right, drive 500 meters until crossing Wolverton Creek bridge.
- For the Site on the tributary to Slocan River, turn left after crossing bridge and travel 3.5 km south on Slocan Park west access road.

Cowie Creek

- Direction from Nelson are as follows:
- Driving West on Highway 3a towards Castlegar, drive 20 km to Playmor Junction (Junction of Hwy 3a and Hwy 6)
 - Drive 13.5 km north on Hwy 6 to the turnoff for the Slocan River (Passmore) Bridge at Passmore
 - After crossing Passmore Bridge, take 1st access road to the left, for 400 meters to the bridge crossing Cowie Creek (Private Property surrounds lower reaches)

2. Resource Information

i) First Nations

The Okanagan, Shuswap and Ktunaxa/Kinbasket Nations all have interest in the Slocan Valley. In addition, the Sinix't Nation, while considered extinct by the Canadian Government, still occupies land in the Slocan Valley. The primary fish interests for first nations in the area are with traditional bull trout use in the area and once plentiful salmon that migrated to the Slocan River

ii) Development and Land Use

The area is under Kalesnikoff's forest tenure. Recreational use, especially of Goose Creek is considered to be high, with a focus on hunting, snowmobiling/quads, fishing, berry picking and mountain biking.

iii) Other developments

The area has a high density of rural development. All of the creeks in the study are used for domestic water. There is also a historic foot print of mining in the region; however most of this activity was further north in the Slocan Valley with concentrations around the communities of Slocan City, Silverton and New Denver. There is an old exploratory road along the valley bottom of Falls Creek but it is currently deactivated.

iv) Wildlife

The lower slopes of Goose Creek (associated with reaches 6 through 8) are considered to be ungulate winter range supporting both white-tailed and mule deer as well as elk.

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v) Existing Water Quality Data

Water quality data has been collected throughout the Slokan Valley in both the main stem of the river as well as a variety of tributaries. Jennifer Yeow is the contact person for this data.

vi) Previous Presence of Fish

Slimy Sculpin	CCG	<i>Cottus cognatus</i>
Long-nosed Dace	LNC	<i>Rhinichthys cataractae</i>
Long-nosed Sucker	LSU	<i>Catostomus catostomus</i>
Mountain Whitefish	MW	<i>Prosopium williamsoni</i>
Rainbow Trout	RB	<i>Oncorhynchus mykiss</i>
Red-sided Shiner	RSC	<i>Richardsonius balteatus</i>
Westslope Cutthroat Trout	WCT	<i>Oncorhynchus clarki lewisi</i>
Bull Trout	BT	<i>Salvelinus confluentus</i>
Eastern Brook Trout	EB	<i>Salvelinus fontinalis</i>
Kokanee	KO	<i>Oncorhynchus nerka</i>

3. Methods

This project was completed following the methods and standards established by the Resource Inventory Committee (RIC) for the Reconnaissance (1:20,000) Fish and Fish Habitat Inventory; Standards and Procedures (2001) and guided by the Reconnaissance (1:20,000) Fish and Fish Habitat Inventory and Gap Analysis of the Kalesnikoff Lumber Co. Ltd. Chart Area Phases 1-3 Arrow and Kootenay Lake Forest Districts (Masse, 2003).

Equipment specifications are as follows:

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Type	Equipment
Fish Sampling	<ul style="list-style-type: none"> • Smithroot backpack electrofisher/anode/cathode - Model 15-C
	<ul style="list-style-type: none"> • Rubber gloves
	<ul style="list-style-type: none"> • Polarized sunglasses
	<ul style="list-style-type: none"> • Hat with a brim
	<ul style="list-style-type: none"> • Chest waders with belt and wading shoes
	<ul style="list-style-type: none"> • Salt blocks
	<ul style="list-style-type: none"> • Holding/recovery bucket
Water Quality	<ul style="list-style-type: none"> • Measuring board
	<ul style="list-style-type: none"> • Dip net(s)
Physical Parameters	<ul style="list-style-type: none"> • Minnow traps
	<ul style="list-style-type: none"> • Angling equipment
	<ul style="list-style-type: none"> • Oakton conductivity meter (Model:
	<ul style="list-style-type: none"> • Hanna Thermometer (Model:
	<ul style="list-style-type: none"> • Clinometer
Transportation	<ul style="list-style-type: none"> • Compass
	<ul style="list-style-type: none"> • Garmin GPS
	<ul style="list-style-type: none"> • Pentax Optio S digital camera
	<ul style="list-style-type: none"> • Eslon 30 meter tape
	<ul style="list-style-type: none"> • 4X4 vehicle with two-way radio

4. Results and Discussion

4.1 Logistics

At the time of sampling, where conditions were optimum for sampling fish in order 3 streams, many of the order 1 streams were dry or had significant portions of the creek dewatered. Where these streams flowed directly into a fish bearing stream, the stream in question was considered to be fish bearing for the first reach. Where the stream in question flowed into a non fish bearing stream, the stream in question was also considered to be non fish bearing.

Many of the sample reaches were bordered by private land. It was often difficult to gain permission to access the sample reaches because often no one at the residence was home at the time of our work and we did not always have a contact number to reach the owners. This issue could be addressed in the Phase I thru III by obtaining property owner' contact information prior to the commencement of field work or allowances made during the Phase IV thru VI.

4.2 Habitat and Fish Distribution

The study area covers two distinct watersheds located in two different forest districts; the Arrow Boundary FD and the Kootenay Lake FD. They will be discussed independently.

4.2.1 Arrow/Boundary Forest District: Slokan River

The Slokan River is considered a large order 5 stream with Slokan Lake located at its headwaters. Major tributaries include the Little Slokan River as well as Lemon and Goose Creeks. The mainstem is considered to be low gradient as are the lower reaches of Goose Creek and the Little Slokan River. All the remaining tributaries are considered to be relatively steep mountain streams. The most productive reaches in the system are the lower gradient reaches. Almost all of terrestrial habitat associated with these productive reaches are owned privately and occupied by rural residents, hobby farms and small scale agriculture.

Fish species present are BT, CS, EB, KO, MW and RB (FISS)

The mainstem of the Slokan River supports a significant population of rainbow trout. Results from the 2005 population assessment estimated that there are approximately 70 trout/km, > 30 cm in fork length in the upper reaches of the river (Corbett, 2006). The river has been closed to angling since 1993 but will be opened in the summer of 2006 with a mandatory trout release restriction. The tributaries to the Slokan provide excellent rearing habitat for trout that may

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eventually return to the river as well as providing habitat for resident stream populations. Distribution of trout in these mountain streams is often limited to the lower reaches as barriers are common in the steeper sections of the stream such as Goose Creek, which has a fish barrier falls in reach 6. The few trout populations that do exist above a barrier are likely the result of headwater stocking. Cooley Lake has been stocked with rainbow trout for many years and is likely the source of trout found above the barrier falls in reach 1 of Wolverton Creek.

The tributaries also provide a much needed source of cold water to the mainstem, which can often approach lethal temperatures for trout during the summer months.

Several tributaries provide excellent spawning habitat for bull trout, especially Hoder and Lemon Creeks. The bull trout are not residence of the river but of Slocan Lake where water temperatures are cooler and kokanee are abundant, their preferred prey species.

The Slocan River was once spawning and rearing habitat for chinook and sockeye salmon as well as for steelhead. Their migration to the river was stopped with the construction of the Grand Coulee Dam downstream on the Columbia River in the 1940s.

The most significant fish population sampled during this study in the Slocan River watershed was the rainbow trout found in the lower reaches of Goose Creek. The lower fish bearing reaches pass through a relatively wide valley. The creek is characterized by low stream gradients, warm temperatures and a high density of rural development along its stream bank. The relative abundance of juvenile trout was considered high compared to that found in the mainstem of the Slocan River. It is unclear if these fish eventually contribute to the adult mainstem population. Juvenile production does appear to be a bottleneck in recruitment in the Slocan River rainbow trout population; therefore Goose Creek does have the potential to contribute significantly to this population. High densities were found throughout all of the lower reaches up to the barrier falls (see Table 1) with the highest concentrations associated with deep pool habitat. The deep pools found throughout the lower reaches are the most valued habitat, providing sufficient water during summer draw down and protection during the winter months. Goose Creek would be more productive if water temperatures were cooler and there were less riparian impacts from rural development.

The rainbow trout population found in Wolverton Creek is likely the product of stocking Cooley Lake as a high density of young of the year fish were found in the outlet stream to the lake. There is limited over-wintering and spawning habitat in Wolverton Creek above the falls (see Table 1) as the habitat often cascading with small boulder plunge pools. This population is not ecologically significant.

4.2.2 Kootenay Lake Forest District

The lower Kootenay River, between Kootenay Lake and its confluence with the Columbia River at Castlegar, is a large order 6 stream. Human settlement patterns are similar to the Slocan Valley with the added exception of extensive hydro-electric development. There are 3 major dams on this reach of the Kootenay River along with a series of canals to provide sufficient water to the facilities. The river no longer functions in a truly ecological manner. This has led to serious impacts to fish habitat and distribution.

Fish species present in the Lower Kootenay River are CCG, LNC, LSU, MW, RB and RSC (FISS)

Similar to the Slocan River, the lower reaches of the tributary streams are the most productive for fish after they have descended from the steep mountain terrain that is their headwaters. Many tributaries have barriers to fish passage in the lower reaches as the streams flow into the Kootenay Valley, often passing through a steep headwall. The barrier falls on Falls Creek prevents upstream migration of fish from the Kootenay River. In doing so it has protected an isolated population of westslope cutthroat trout from hybridization and eventual extirpation from rainbow trout. Westslope cutthroat trout are currently on the BC provincial blue list (threatened).

The most productive fisheries are for rainbow trout, most notably at Slocan Pool and through Grohman narrows, both on the mainstem of the Kootenay River.

The westslope cutthroat trout population found in Falls Creek is very significant as the species is provincial blue listed. The Falls Creek population has been isolated from the Kootenay River for thousands of years, prior to the inland migration of rainbow trout into Kootenay Lake after the last glacial retreat. The headwater basin of Falls Creek has no significant alpine terrain, thereby void of glaciers and heavy snow runoff. There is also a small lake (Rockslide) and its headwaters. These conditions provide relatively clear water to the trout population and likely provide a higher nutrient concentration to the stream. This was evident in the relatively high density of aquatic invertebrate observed while sampling. These conditions have sustained this isolated population in light of the fact that the trout habitat can not be considered exceptional due to the relative steep gradients and lack of large pools.

It is unclear the up-stream extent of the WCT population. We observed cutthroat trout up to reach 5 in the mainstem and reach 1 of the outlet stream to Rockslide Lake, however at the outlet of Rockslide Lake, only brook trout were observed. No brook trout were captured at any other site in the watershed. Relatively high

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numbers of cutthroat were found throughout all reaches sampled with the exception of the outlet of Rockslide Lake.

Table 1. Summary of historic and new barriers to fish migration found on the Project Area streams.

Stream name	Watershed Code	TRIM map #	Reach	Barrier Type	Height of barrier (m)	Verified in Field	Description of Barrier
Goose Creek	340-047200-04500	82F.042	6	Falls	10	y	A 10 m vertical falls imbedded in a 100 m cascade. No fish sampled above falls at 6 different sample sites.
Wolverton Creek	340-047200-17200-50500	82F.052	1	Falls	30 and 15	y	Two falls in series. Barrier to fish; however, isolated population of RB, likely originating from Cooley Lake (stocked).
Bird Creek	340-071700	82F.043	1	Falls	30	y	No fish sampled above falls.
Falls Creek	340-075500	82F.043	2	Falls	unknown	n	Isolated population of WCT above the falls.

4.3 Fish Age, Size and Life History

There were 3 streams that through our sampling were found to be fish bearing; Goose and Wolverton Creeks, both tributaries to the Slocan River and Falls Creek, a tributary of the lower Kootenay River. A summary of age and size data for each species by stream can be found in Table 2 below. Fork-length histograms can be found for each corresponding population.

4.3.1 Goose Creek

Most of the fish sampled in Goose Creek were considered to be juvenile trout (fingerlings and parr). It is not clear if these fish are residents or are a component of the mainstem population migrating into Goose Creek to rear. The results of a radio-telemetry project undertaken on the Slocan River (Corbett, 1995; Baxter and Roane, 1996) showed no evidence of the mainstem trout population spawning in tributaries with the majority of spawning trout found in the upper reaches of the Slocan River.

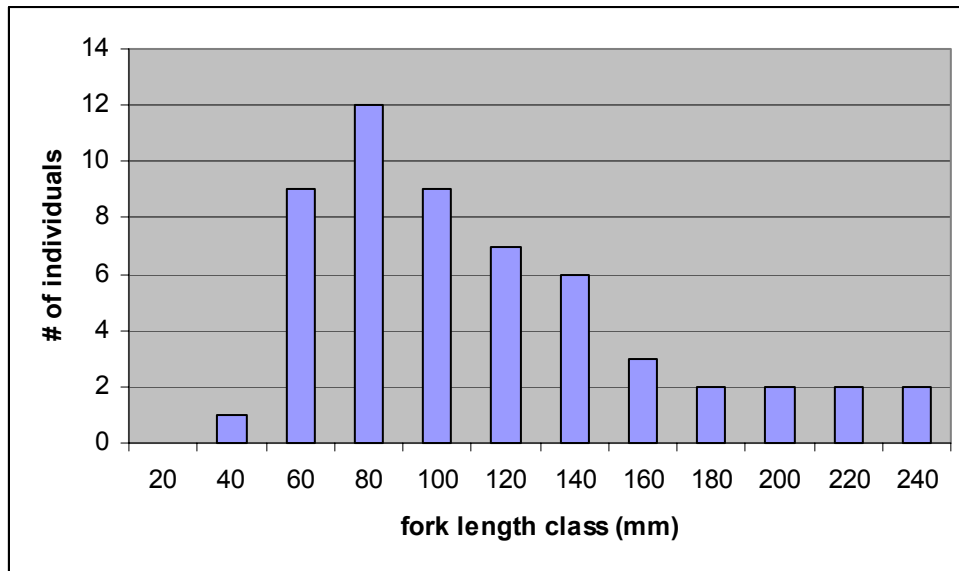


Figure 2. Fork-length frequency histogram of rainbow trout captured in Goose Creek, 2005. Fork-length classes are in increments of 20 mm, starting at 1-20 mm.

There are few over-wintering pools in Goose thereby limiting the number of adult trout that could reside in the Creek as residents. It is likely that both a small resident population and a migratory population originating in the Slocan River co-exist within the stream. This may explain the lack of age class associated spikes in the above histogram as the two populations overlap reflecting the difference in size between the two populations with the migratory population being associated with larger individuals of the same age class.

4.3.2 Wolverton Creek

A waterfall fish barrier exists on Wolverton Creek between reaches 1 and 2. Only one adult fish was captured in all of the reaches sampled. This was in reach 2 above the falls. The source for fish in Reach 2 is likely from Cooley Lake which has been stocked with rainbow trout. The outlet of Cooley Lake (reach 5) was found to have a significant population of fingerling trout. It is unlikely that the population of trout above the falls in Wolverton Creek is self-sustaining and requires input from the lake in order to survive.

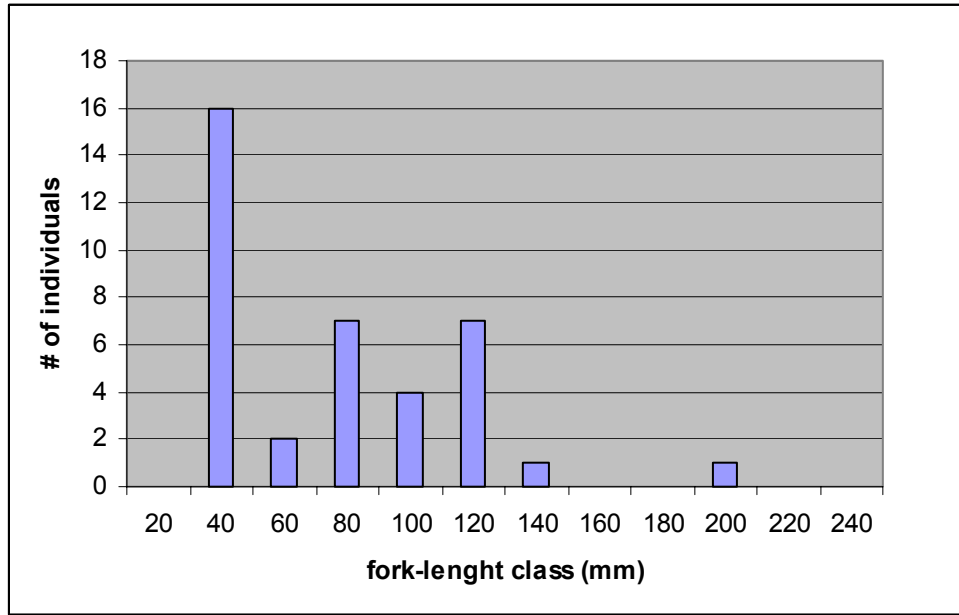


Figure 3. Fork-length frequency histogram of rainbow trout captured in Wolverton Creek, 2005. Fork-length classes are in increments of 20 mm, starting at 1-20 mm.

Reach 1 of Wolverton Creek is open to the Slocan River. The trout population in reach 1 is therefore likely to be a product of both upstream and downstream migration.

4.3.3 Falls Creek

As stated previously, a barrier falls in the lower reaches of Falls Creek has isolated a population of westslope cutthroat trout above the falls. This is a unique and significant population and has likely been self-sustaining for thousands of years, having never been exposed to the more recent migration of rainbow trout into the Kootenay River. Several adult fish were captured and another was observed. Adults are represented by the spike associated with the 180 mm fork-length class (age class 3+) and the spike associated with the 240 fork-length class (age class 4+). This is undoubtedly a resident population as all age class and life histories were observed.

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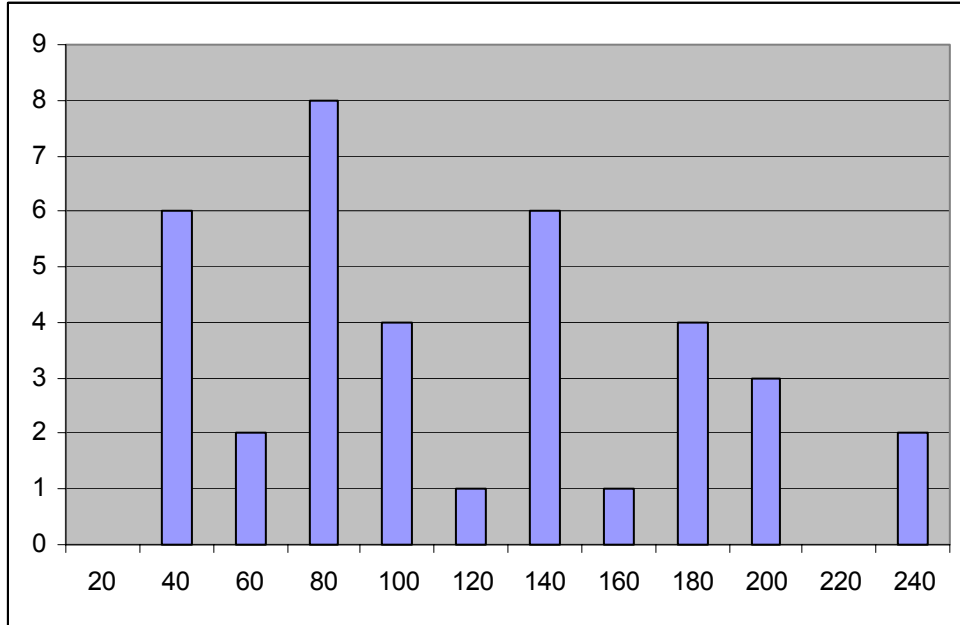


Figure 4. Fork-length frequency histogram of westslope cutthroat trout captured in Falls Creek, 2005. Fork-length classes are in increments of 20 mm, starting at 1-20 mm.

Rockslide Lake, found at the headwaters of Falls Creek, has been stocked with eastern brook trout and rainbow trout. Fortunately, it does not appear that the rainbow stocking has been successful as no rainbow trout were found in the outlet stream (reach 4) or at any other site throughout the stream. The eastern brook trout were found in the outlet but at no other site in the watershed. The population in the outlet stream appears to be originating directly from the lake as no adults were found and no over-wintering habitat was observed.

Table 2. Summary of length-at-age data from fish sampled in the Project Area streams, 2005.

Stream Name	Watershed Code	Spp.	Age	Number of fish	Mean length (mm)	Range of Lengths (mm)
Goose Creek	340-047200-04500	RB	0+	35	85.9	30-180
			1+	27	130.9	60-230
			3+	8	205.0	180-230
Wolverton Creek	340-047200-17200	RB	0+	25	60.5	32.3 - 68.5
			1+	14	110.8	84 - 145.7
			3+	1	185.0	185 - 185
Falls Creek	340-075500	WCT	0+	19	63.8	23-96
			1+	4	116.5	100-123
			2+	6	142.5	110-175
			3+	5	194.8	180-231
		EB	0+	5	51.8	25-85
			1+	1	120	120-120

4.4 Significant Features and Fisheries Observations

4.4.1 Fish and Fish Habitat

Much work has been done on the Slocan River and is on-going to better understand the ecological requirements of the fish populations and opportunities to improve the capacity of the river to support trout. Critical spawning habitats have been identified and it is recognized that the density of trout in the upper reaches of the river could support a catch and release sport fishery. Restoration efforts are also on-going with annual funding being provided by the Columbia Power Corporation to address riparian restoration on private land as well as developing in-stream structures to improve trout habitat.

The cutthroat trout population in Falls Creek is very unique and sensitive, due to its small size and isolation from other cutthroat trout populations (McPhail and Carveth, 1992). Due to the limited amount of habitat that is sustaining this isolated population, all habitats should be considered critical. These values should be recognized in any development or management of the area.

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As previously stated, the most significant habitat features of Goose Creek are the larger, deeper pools, especially those associated with cover. Unfortunately, these are all associated with private land.

Reach 1 of Wolverton Creek provides potential rearing habitat for the rainbow trout population in the Slocan River. Unfortunately, we do not know if the juvenile trout observed in this reach are a product of the stocking of Cooley Lake or if they are of the Slocan River stock.

No sport fishing opportunities exist in any of the streams sampled due to the limited number of adult fish observed. The adult cutthroat trout in Falls Creek should be protected and not harvested due to their limited numbers and high value.

4.4.1 Habitat Protection Concerns

No fishery sensitive zones were observed.

As previously stated, two populations were observed above 20% gradients; Wolverton Creek, with a barrier falls between reaches 1 and 2 and a barrier on Falls Creek within the first reach.

Restoration efforts could focus on the fish bearing reaches of Goose Creek where riparian values have been compromised due to rural housing and agricultural development. Restoration could focus on adding large wood debris into the stream that has been reduced over time with deforestation of the riparian areas and by planting conifers, cottonwood and native shrubs in the affected riparian zones thereby providing shade and cover as well as contributing to in-stream large woody debris in the future. The value of these efforts would be increased if it was determined that the juvenile trout of Goose Creek have the potential to make a significant contribution to the Slocan River population.

Both Falls and Wolverton Creek are functioning in a relative natural condition, with little to no impacts observed that would warrant restoration effort. There is a water intake on Falls Creek in reach 4 but it does not appear to be restricting fish passage; however, it has the potential of collecting debris and may pose a threat in the future. Regular maintenance of the intake, as required by the users, would likely identify any problems as they arise.

4.5 Fish Bearing Status

4.5.1 Fish Bearing Reaches

Of all the streams sampled in the project area, only Goose Creek and its tributaries, Wolverton Creek and Falls Creek supported fish (see Table 3). Goose and Wolverton creeks are tributaries to the Slocan River. Falls Creek is a tributary to the Kootenay River and supports an isolated population of westslope cutthroat trout (provincially blue listed).

Table 3. Summary of data from surveyed fish bearing reaches in the Goose, Wolverton and Falls Creek Watersheds, September 2005.

Stream name	Watershed code	Site	Reach	Species	Channel		Proposed Riparian Class *	Follow-up Sampling (y or n)	Comments
					Width (m)	Site gradient (%)			
Goose Creek	340-047200-04500	1	3	RB	10.7	2.5	S2	N	
		2	4	RB	12.3	2.5	S2	N	
		3	6	RB	10.4	12.0	S2	N	
McDermid Creek	340-047200-04500-21400	7	3	RB	4.9	6.7	S3	N	Trib to Goose
	340-047200-04500-21400	8	4	NS	3.5	4.2	S3	N	Water is being drawn down for irrigation with insufficient volume to sample. Above fish bearing reach, therefore fish bearing.
Goose trib #60	340-047200-04500-31700	9	1	RB	4.6	1.5	S3	N	
Slocan trib #67	340-047200-12661	16	1	NS	1.6	8.0	S3	N	Intermittent and dewatered. Open to Slocan therefore fish bearing
Wolverton	340-047200-17200	17	1	RB	6.3	11.3	S2	N	
		18	2	RB	6.6	12.0	S2	N	Above barrier, rb from Coley Lake
		19	5	RB	3.2	2.3	S3	N	Above barrier, rb from Coley Lake
Cowie Creek	340-047200-21900	22	1	NS	3.7	3.0	S3	N	No water except at culvert. Open to Slocan therefore fish bearing.
Falls Creek	340-075500	24	3	WCT	10.2	3.0	S2	N	
	340-075500	25	5	WCT	5.1	8.3	S2	N	
	340-075500-63400	28	2	WCT	7.5	9.7	S2	N	
		29	4	EB	1.9	1.0	S3	N	EB from Rockslide Lk

* Proposed Stream Classification is from the FPC Fish-stream Identification Guidebook (1998).

Reconnaissance (1:20,000) Fish and Fish Habitat Inventory of Several Slocan River Tributaries and Falls and Bird Creeks

There were 3 streams where no fish were captured due to lack of water but the reaches were all above a fish bearing reach with no barriers present. These streams include Reach 4 of McDermid Creek and two tributaries to the Slocan River; unnamed trib # 67 and Cowie Creek. For the purposes of riparian classification, they have been assumed to be fish bearing.

4.5.2 Non-Fish Bearing Reaches

All of the non-fish bearing reaches presented in Table 4, are above known barriers except Langill Creek. Reach 2 may be a cascade barrier. While the overall gradient of the reach is only 17%, there are steeper sections with many short drops that may be considered barriers. The water also travels underground for substantial portions of the creek as it passes through large boulder substrate.

Table 4. Summary of data from surveyed non-fish bearing reaches in the Project Study Area, 2005

Stream name	Watershed code	Site #	Channel Width (m)	Rch #	Stream Class	Gradient (%)	Electrofishing Specifications				Other Methods		Comments
							Dist. (m)	Time (s)	Cond (uS)	Temp (C)	Type	Effort	
Goose Creek	340-047200-04500	4	12.0	7	S5	9.6	210	310	10	9.0			Above a barrier falls. Remote canyon reach. Above a barrier falls Very remote, above barrier falls
		5	7.4	10	S5	12.8	208	290	10	7	mt	4	
		6	2.7	14	S5	8.7	204	286	20	7			
Goose trib #61	340-047200-04500-31700-1929	10	0	2	S6								No visible channel
Goose trib #62	340-047200-04500-40409	11	2.3	1	S6	6.3							Dewatered and intermittent.
Goose trib #63	340-047200-04500-74769	12	0.8	2	S6	23.3							Intermittent. Above a barrier
Goose trib #64	340-047200-04500-89860	13	1.0	1	S6	3.6							Intermittent. Above a barrier
Langill Creek	340-047200-09400	14	6.0	2	S5	17.0	205	352	80	13	mt	4	Very limited fish habitat. Steep plunge pool habitat. Marsh, < 10 cm at deepest. No fish habitat.
	340-047200-09400	15	0.5	8	S6	8.5							
Wolverton trib # 71	340-047200-17200-44928	20	4.1	2	S5	27.7							Intermittent. High elevation, no fish habitat Very remote and steep with many falls, no fish habitat
	340-047200-17200-50500	21	6.6	1	S5	36.7	200	307	30	9			
Bird Creek	340-071700	23	3.1	1	S5	11.0	215	496	220	8	mt	2	Fish habitat present but confluence with a canal. A 30 m falls in reach 1.

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Appendices

Appendix I - FDIS Summary and Photographs

Appendix II - Hardcopy Maps

Attachments

Attachment I - Field Notes

Attachment II - Photo Documentation

Attachment III - Digital Data