

FINAL REPORT

Coastal Tailed Frog Inventory and Habitat Assessment

BCRP project number: 09.W.BRG.01

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EXECUTIVE SUMMARY

Coastal Tailed Frogs (*Ascaphus truei*) breed in cool, clear, fast-flowing mountain streams and they are Blue listed in British Columbia (BC). The Bridge-Seton area is the eastern range of the Coastal Tailed Frog, and populations appear sparse and patchy in the area due to habitat conditions. Past dam and reservoir construction in the Bridge-Seton area may have interrupted migration pathways for Coastal Tailed Frogs populations originating from the west. The objectives of the 2009 project were to: 1) assess the distribution of the species within the Bridge-Seton compensation area and parts of the Lillooet TSA, 2) identify “core” population areas and migration pathways used by Coastal Tailed Frogs in order to direct management practices that help maintain local populations, and 3) identify potential habitat restoration opportunities.

The study area was located in the mountainous region between the towns of Pemberton and Lillooet, in southwestern BC. Basic reconnaissance sampling was followed to survey for Coastal Tailed Frogs, with surveys concentrated south of the Bridge River and with a few select watersheds targeted to the north. Within the Seton system, basins in the Gates pass area and along both shores of Seton and Anderson Lakes targeted. Creeks were sampled at low flow from July 1 to 18, 2009 using 30-person minute time-constrained searches as outlined in the RISC standards.

Coastal Tailed Frogs were observed in only 8% of the 125 streams and reaches surveyed in the Bridge-Seton area in 2009. In total, 58 tadpoles were observed during the surveys. Tailed frogs were not found in any creeks near the two historic most north-easterly localities (Shulaps Creek and Tommy Creek watersheds). The closest locality where tailed frogs were found in 2009 relative to these latter points was approximately 27 km south. Coastal Tailed Frogs were found in only one of the dispersal corridor areas predicted for coastal populations into the Bridge-Seton area.

The absence of tailed frogs from the majority of the study area including historic locations was unexpected. Few streams surveyed in the Bridge-Seton area in 2009 contained Coastal Tailed Frogs, despite the fact that many appeared to have suitable habitat. A patchy distribution was expected to some degree as the habitat in the Bridge-Seton area is less suitable for tailed frogs compared to coastal areas. Previous, limited surveys support this. We are fairly confident from our extensive surveys in 2009 that the species has had a range contraction and is now absent from at least two historic locations in the most northeast part of the range in this area. Recolonization is not likely given the distance between historic and current sites. Less suitable habitat, population isolation, and/or lack of dispersal from coastal populations may have contributed to the distribution trends observed for the species in the area. Without more extensive historic inventory data it is difficult to predict what may have precipitated the contraction or to determine whether the construction of the dams and reservoirs was a major factor.

Due to low detections of Coastal Tailed Frogs in the Bridge-Seton area and the fact that current populations were identified well south of the two reservoirs, habitat restoration opportunities were not identified for future work as the known locality sites were assumed to be out of the scope of the current project and funding base. Surveys should be conducted at regular intervals in the area to confirm absence from historic sites and to update the species’ distribution. Given the low density of tailed frogs and their proximity to BC Hydro operations in the Bridge-Seton area, BCRP might consider making projects for other at risk species a higher priority.

Table of Contents

Executive Summary	2
1.0 Introduction.....	4
2.0 Goals and Objectives	4
3.0 Study Area	4
4.0 Methods	6
5.0 Results.....	7
6.0 Discussion	10
7.0 Recommendations	11
8.0 Acknowledgements	11
9.0 References.....	11
Appendices	12
I. Coastal Tailed Frog Survey Data Results for 2009.....	12
II. Financial Statement.....	17
III. Performance Measures-Actual Outcomes.....	18
IV. Confirmation of BCRP Recognition.....	18

List of Figures and Tables

Figure 1. Proven and possible range of the Coastal Tailed Frog near Lillooet, BC (as of 2004), as well as potential dispersal corridors for populations from the west to eastern areas of the range based on surveys and habitat models.....	5
Figure 2. Overview map showing the distribution of reaches and creeks surveyed in the study area.....	8
Figure 3. Locations where Coastal Tailed Frogs were found in the Bridge-Seton area in 2009, as well as from surveys conducted in 2000, 2004, and 2008.....	10
Table 1. Habitat features of streams/reaches with Coastal Tailed Frogs versus no detection.....	10

1.0 INTRODUCTION

Tailed frogs are uniquely adapted for breeding in cool, clear, fast-flowing mountain streams. Coastal Tailed Frogs (*Ascaphus truei*) are Blue listed in British Columbia (BC), as populations are sensitive to habitat disturbances that alter water quantity and quality or result in the loss of riparian forest cover. Limited field surveys (e.g., Lupine 2000) and recent habitat modeling (Friele and Dupuis 2007) raise two important issues in relation to Coastal Tailed Frog populations in the Lillooet area: 1) the Bridge-Seton area is the eastern range of the Coastal Tailed Frog and populations likely originated from, and are maintained by, source populations to the west via a limited number of pathways linked to the Bridge River (see Friele and Dupuis 2007 for review); 2) populations appear sparse and patchy in the area due to a cold, continental climate and elevation, both of which create unsuitable water temperature regimes in many creeks especially towards the east.

Threats to tailed frogs include forest harvesting, road building, water intakes and diversions for run-of-river power projects, and introductions of non-native fish. Past dam and reservoir construction may have interrupted migration pathways, isolating tailed frog populations north and east of Bridge River (e.g., Shulaps). Tailed Frogs are stream obligate species residing in basins less than about 100 km². They are dependent on perennial streams with step-pool morphology and adjacent riparian habitat. In the leeward Coast Mountains where the climate is drier, dispersal between these 3rd to 4th order tributaries is via mainstems (such as the Bridge River) or over select divides. Thus, valley inundation may limit gene flow between populations and threaten the viability of Coastal Tailed Frog populations on the eastern range limit. The Bridge-Seton area has the greatest length of mainstem and tributary habitat affected by dams of all of the BCRP facilities (Conlin et al. 2000). Populations on the fringe of a species' range such as Coastal Tailed Frogs in the Lillooet area (Friele and Dupuis 2007), are critical to maintaining overall genetic fitness of a species (Lesica and Allendorf 1994) and are particularly vulnerable to population stressors. Potentially isolated populations are extremely vulnerable to habitat disturbances and local extirpation. Besides extensive logging, additional threats to populations in the Lillooet area include the five existing and over 40 proposed independent power projects (IPP). Tailed frog populations exist at the watershed scale, which is the scale at which forestry operations and IPPs operate. Therefore, these habitat disturbances have the potential to impact an entire tailed frog breeding population. To minimize impacts from landscape-level disturbances such as these, likely dispersal routes through the landscape should be identified.

2.0 GOALS AND OBJECTIVES

The goal of this project was to maintain Coastal Tailed Frog populations in the Bridge-Seton area. This goal would best be met through a two-tiered approach: 1) inventory and assessment, and 2) restoration. The objectives of the inventory and assessment stage of the project in 2009 were to: 1) assess the distribution of the species within the Bridge-Seton compensation area and parts of the Lillooet TSA, 2) identify "core" population areas and migration pathways used by Coastal Tailed Frogs in order to direct management practices that help maintain local populations, and 3) identify potential habitat restoration opportunities.

3.0 STUDY AREA

The study area was located in the mountainous region between the towns of Pemberton and Lillooet in southwestern BC, where the eastern range limit of the Coastal Tailed Frog is thought to exist (Fig. 1). The area was bounded by the divide into the Lillooet and Birkenhead Rivers on the southwest, the southern Chilcotin Mountains on the northwest, the Shulaps Range on the northeast, and by the Cayoosh Range on

the southeast. The area encompasses the watershed upstream of the Terzagi Dam on the Bridge River and upstream of the mouth of Seton Lake near Lillooet. This area is referred to as the Bridge-Seton study area.

Surveys were conducted throughout the Bridge-Seton area. Since it is a large area lacking detailed reconnaissance mapping, basic inventory was required. To maximize benefit from limited resources, sampling followed guidance from an existing habitat suitability model and followed a biogeographic approach, targeting watersheds on suspected migration/dispersal corridors on either side of divides (jurisdictional constraints pertained) and by examining physiographic effects (basin size, relief, aspect, mean elevation, etc.) on habitat suitability. Sampling occurred along step-pool type streams, typical of basins less than 10 km². We surveyed as many creeks as possible, focusing primarily on tributary drainages to the Bridge River (e.g., McParlon & Hurley Creeks and either side of the Cadwallader Range) and secondarily on creeks in the Seton area (where access permitted). Sampling north of Bridge River was secondary due to limited access and because these areas were thought to be too cold to support tailed frogs.

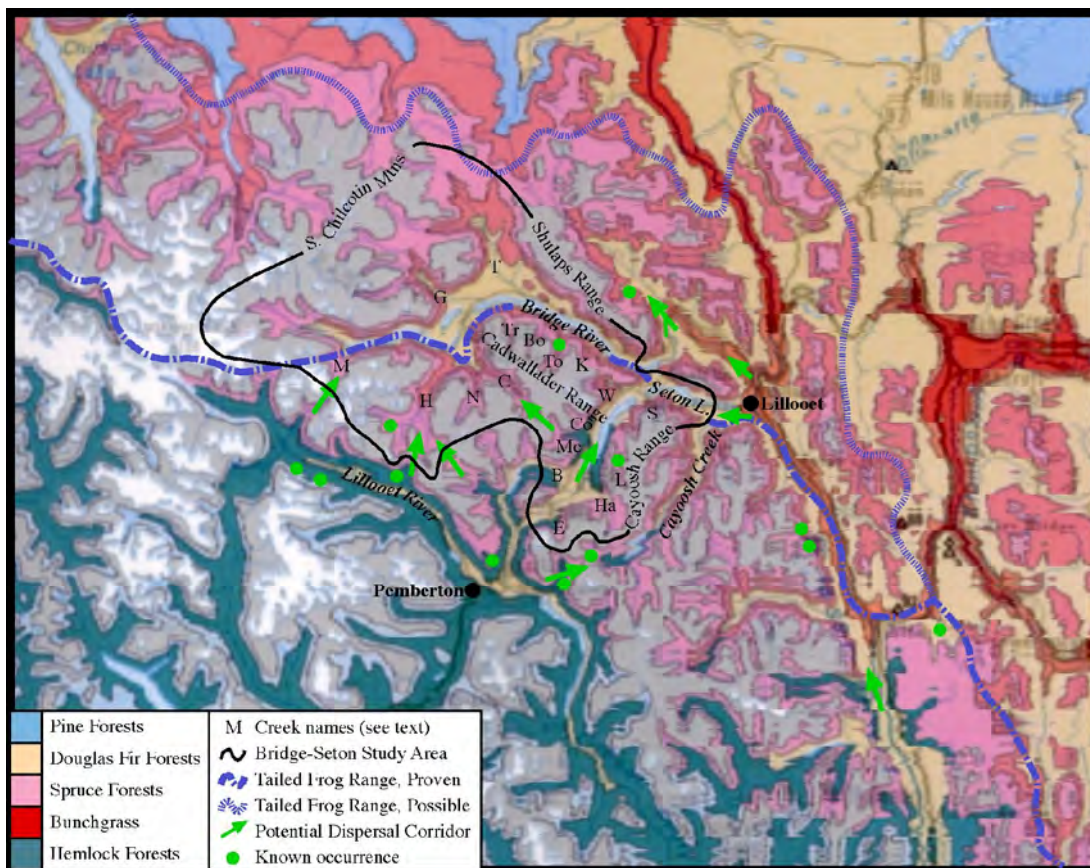


Figure 1. Proven and possible range of the Coastal Tailed Frog near Lillooet, BC (as of 2004), as well as potential dispersal corridors for populations from the west to eastern areas of the range based on surveys and habitat models. Letters designate creek names: M-McParlon; H-Hurley; N,-Noel; C-Cadwallader; Mc-McGillivray; B-Blackwater; E-Eight Mile; Ha-Haylmore; L-Lost Valley; S-Spider; Co-Connel; W-Whitecap; K-Keary; To-Tommy; Bo-Bobb; Tr-Truax;; G-Gun; T-Tyaughton. Map not to scale.

4.0 METHODS

Basic reconnaissance sampling was followed to survey for Coastal Tailed Frogs in the Bridge-Seton area in summer 2009. Sampling was concentrated south of the Bridge River (e.g., McParlon, Hurley, Noel, Cadwallader, and basins along the south shore of Carpenter Lake), with a few select watersheds targeted to the north (e.g., Brett Creek). Within the Seton system, basins in the Gates Pass area (Eight Mile, Blackwater and Haylmore) and along both shores of Seton and Anderson Lakes (McGillivray, Connel, Whitecap, and Spider) were targeted (see Fig. 1).

Guiding the reconnaissance sampling were several research questions, including: 1) the identification of potential dispersal corridors, 2) evaluation of microclimate effects (contrasting basins with north versus south aspects, or those with and without headwater lakes), and 3) the evaluation of basin morphometric variables (basin size, ruggedness, geology) on distribution. Multiple reaches were surveyed per creek whenever possible in order to have greater confidence in species occurrence and to compare the relative abundance of tadpoles among creeks. Habitat characteristics for each sampling site were described from field and map-based observations. The location of each reach was recorded using a hand-held GPS and mapped via GIS.

Sampling locations were determined based on the general goals outlined above, and on access and cost constraints. Sampling from roads is cost affective, allowing up to 10 samples per day, but in many situations allows only one sample per creek. Foot traverse is time consuming, reducing productivity to 3 to 4 samples per day, but is necessary for thorough sampling in specific drainages. Initial sampling focused on areas of known occurrence, and branched out from there. Because the distribution pattern was not proven and road access was not known in detail, the sampling locations were not specified in any detail in advance.

Creeks were sampled at low flow from July 1 to 18, 2009. Sites were located far enough apart to ensure sample independence from the perspective of tailed frogs (e.g., tadpole drift and site fidelity; Wahbe and Bunnell 2001 and Daugherty and Sheldon 1982 respectively). Sites located far apart on the same creek were considered independent because channel conditions vary widely over short distances along the stream length (Knighton 1984). A number of samples per drainage are required to confirm absence. In some instances, creeks were not sampled if the temperature was deemed too cold to sustain tailed frogs (e.g., less than 6°C; Bull and Snook 2005) or too large to survey safely and effectively (e.g., main stem creeks with high flow in deep chasms).

At all sites, 30-person minute time-constrained searches were conducted as outlined in the RISC standards (RISC 2000). Searching consisted of flipping cobbles and smaller boulders, sweeping the underside of large boulders and undercut stream banks, and hand raking through pebbles while holding a hand net downstream to capture released tadpoles. Visual surveys were conducted in microhabitats with low flow (e.g., pools). All captured individuals were kept in a shaded bucket of cold water until the given search was complete and the channel bed roughly reassembled. Tadpoles were assigned to four developmental stages that reflect their 3 to 4 year in-stream residency.

Habitat parameters measured or estimated at each survey site included:

- Creek ID, date, weather, and recorder
- Handheld GPS location
- Elevation
- Aspect
- Reach gradient
- Water temperature

- Description of channel condition including geologic processes (floods, sediment floods, debris flows, snow avalanches, braiding, avulsion) and supporting evidence; channel units (step-pool, cascade, riffle, pool); degree of formation (good, moderate, poor); and step forming materials (logs, boulder, rock).
- Channel geometry and substrate including; bankful width and depth; low flow width and depth; texture (% rock, boulder, cobble, pebble, sand), and embeddedness (none, low, moderate, high).
- Streamside vegetation including logging history (Y/N), buffer dimensions, stand age (0-10, 10-50, 50-100, 100+ years, or subalpine-alpine).
- Tailed frog data (number, sex, size, by cohort) and time to first detection.

5.0 RESULTS

In total, 125 reaches and creeks distributed throughout the study area were surveyed for tailed frogs in 2009 (Fig. 2). Coastal Tailed Frogs were observed in only 8% of the streams and reaches surveyed in the Bridge-Seton area (11 of 125). In total, 58 tadpoles were observed during the surveys, with a maximum of 12 tadpoles detected during a given survey, a minimum of 1, and a median of 4 (see Appendix I for raw data).

Tailed frogs were not found in any creeks near the two historic north-easterly localities—Shulaps Creek watershed west of the Yalakom River and in the Tommy Creek watershed south of Carpenter Lake (Leupin 2000; see Fig. 3a). The closest locality where tailed frogs were found in 2009 relative to these latter points was in the Phelix Creek watershed approximately 27 km south of Tommy Creek (Fig. 3b). Tailed frogs were not observed in any creeks north or east of Carpenter Lake. Creeks were not surveyed north or west of Downton Lake due to limited access and cold temperatures.

Coastal Tailed Frogs were found in only one of the dispersal corridor areas predicted for coastal populations into the Bridge-Seton area—the Railroad and Hope Creek valleys along the south end of the Hurley River Forest Road (see Creek “H” Fig. 1; and Fig. 3b and c).

In general, streams with tailed frogs were slightly warmer (average 10.7°C versus 9.5°C), less steep (gradient average of 11.5% versus 17.6%), and contained more boulders (average 18.9% cover versus 17.2%) and less sand (average 1.3% cover versus 7.4%) than creeks where none were observed (Table 1).

Due to low detections of tailed frogs in the Bridge-Seton area and the fact that current populations appear to be well south of the two reservoirs, habitat restoration opportunities were not identified for future work. It was assumed that the locality sites identified were out of the scope of the current project and funding base.

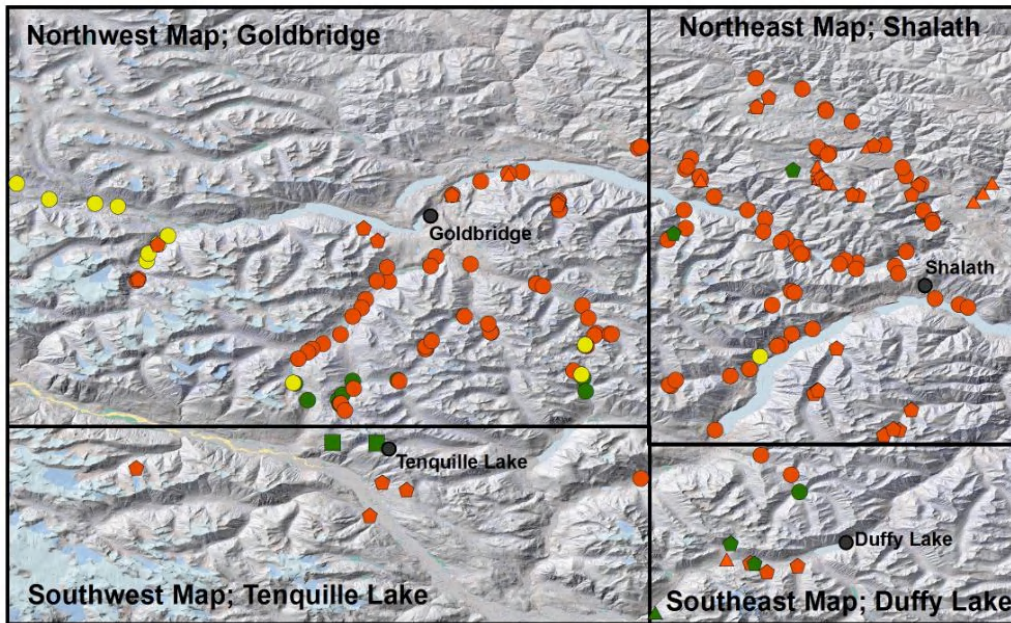
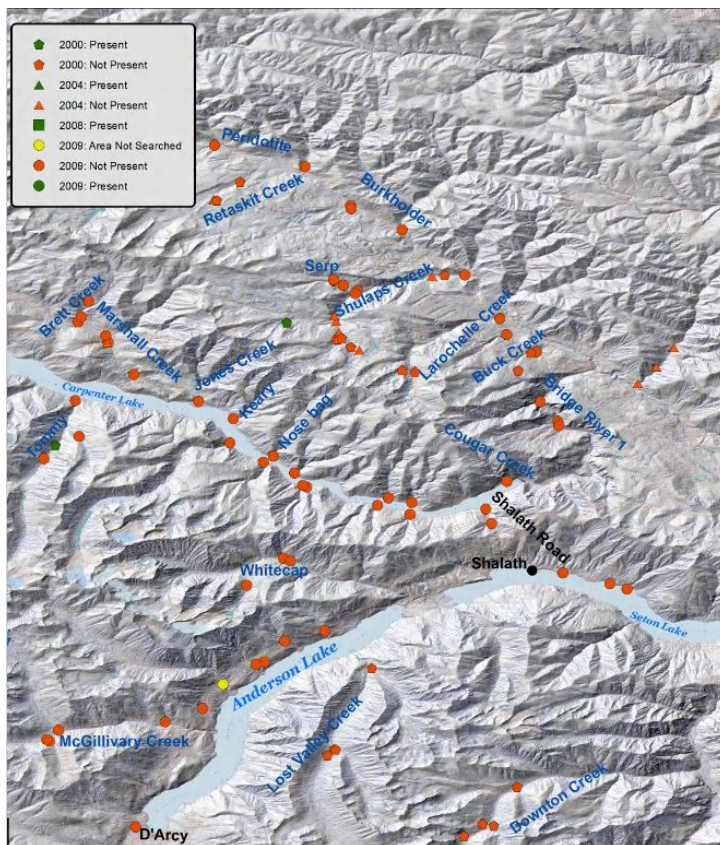
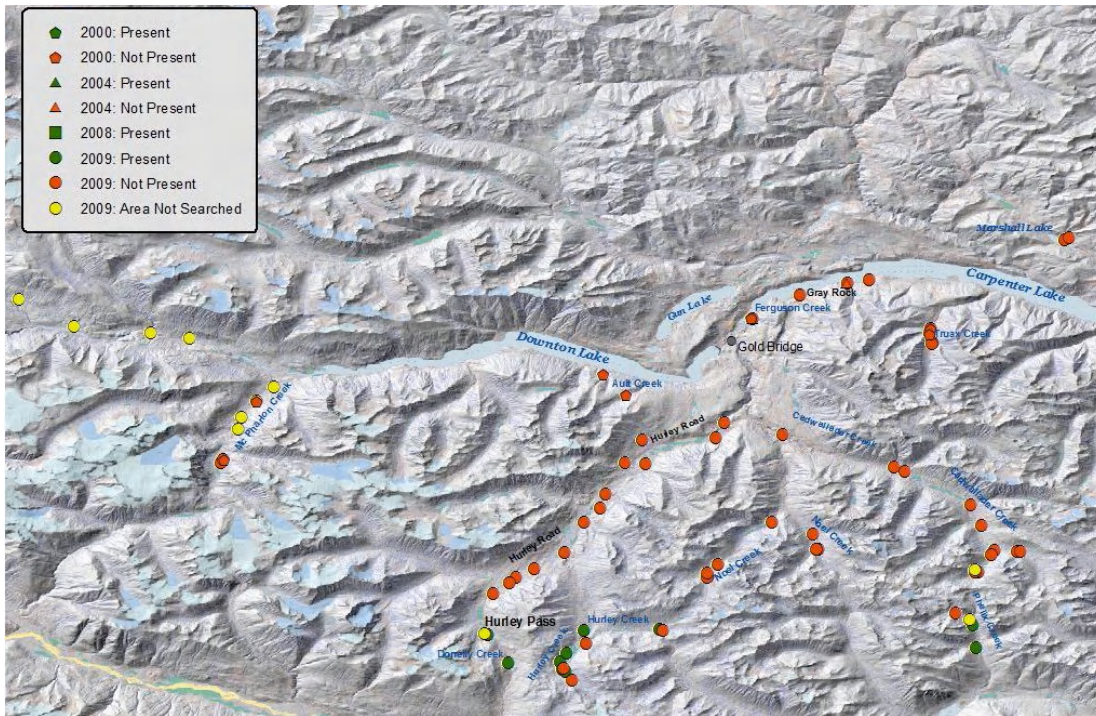


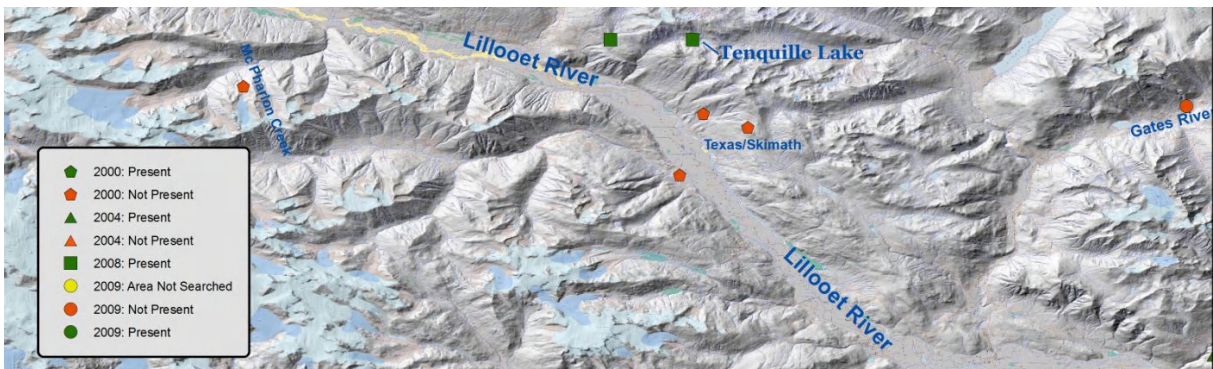
Figure 2. Overview map showing the distribution of reaches and creeks surveyed in the study area.



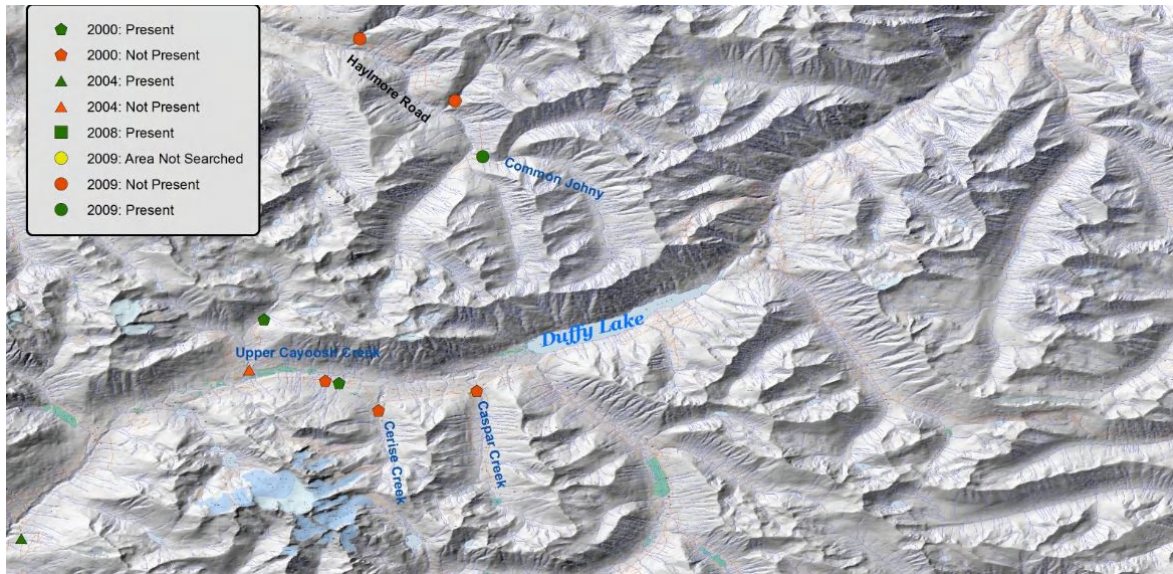
a) Survey results from the northeast section of the study area



b) Survey results from the northwest section of the study area



c) Survey results from the southwest section of the study area



d) Survey results from the southeast section of the study area

Figure 3. Locations where Coastal Tailed Frogs were found in the Bridge-Seton area in 2009, as well as from surveys conducted in 2000, 2004, and 2008.

Table 1. Habitat features of streams/reaches with Coastal Tailed Frogs versus no detection.

		# Tailed Frogs	Elevation	Water temp.	Reach gradient	Bankful width	Bankful depth	% Cover			
								Boulders	Cobbles	Pebbles	Sand
With Tailed Frogs	<i>max</i>	12	1561	15	27	1000	87	30	70	70	5
	<i>min</i>	1	1181	8	1	100	10	5	20	5	0
	<i>aver</i>	5.27	1392.64	10.66	11.47	400.00	29.27	18.89	50.00	29.22	1.33
	<i>median</i>	4.00	1393.00	10.50	10.00	300.00	25.00	20.00	50.00	25.00	0.00
No Tailed Frogs	<i>max</i>		1704	16	62	2000	300	60	80	75	90
	<i>min</i>		249	3	1	40	10	0	0	5	0
	<i>aver</i>		1054.18	9.47	17.55	386.93	36.73	17.21	45.17	30.96	7.39
	<i>median</i>		1078.00	9.25	14.00	310.00	25.00	10.00	50.00	25.00	5.00

6.0 DISCUSSION

The absence of tailed frogs from the majority of the study area including historic locations was unexpected. Few streams surveyed in the Bridge-Seton area in 2009 contained Coastal Tailed Frogs, despite the fact that many appeared to have suitable habitat. Occurrence was not confirmed for any creeks north, east, or immediately south of Carpenter Lake. We are fairly confident from our extensive surveys in 2009 that the species has had a range contraction and is now absent from at least two historic locations in the most northeast part of the range in this area. Recolonization is not likely given the distance between historic and current sites.

If previous surveys were accurate, the results suggest that the species' was relatively patchy and in low density historically as well (e.g., Leupin 2000). A patchy distribution was expected to some degree as the habitat in the Bridge-Seton area is less suitable for tailed frogs compared to coastal areas. The Bridge-Seton area has a relatively dry climate, so suitable upland habitat for this coastal, riparian species is somewhat limited. As well, the mountains in the area are relatively high and steep sided, and many of the

creeks are glacially or groundwater fed resulting in cold temperatures. Less suitable habitat, population isolation, and/or lack of dispersal from coastal populations may have contributed to the distribution trends observed for the species in the area. Without more extensive historic inventory data for the area it is difficult to predict what may have precipitated the contraction or to determine whether the construction of the dams and reservoirs may have been a factor (e.g., through isolation).

7.0 RECOMMENDATIONS

Surveys should be conducted at regular intervals and in the area to confirm absence from historic sites and to update the species' distribution. Given the low density of tailed frogs and their proximity to BC Hydro operations in the Bridge-Seton area, BCRP might consider making projects for other at risk species a higher priority.

8.0 ACKNOWLEDGEMENTS

This project was made possible by the financial support of BC Hydro Bridge Coastal Fish and Wildlife Restoration Program. Pierre Friele helped in the development of the project, provided maps, led field investigations, and donated previous survey data results. The Lillooet Naturalist Society provided a letter of support for this project, and advertised and organized a public presentation. Ida Peter from the Seton Lake Indian Band provided a letter of support for the project, the name of a field assistant, and local information. John Surgenor provided locality information for past tailed frog survey results. Don Brown from Ainsworth Engineered Canada LP provided a letter or support for the project and maps for driving on logging roads. Clint Ely from the Lillooet TSA provided a letter of support. Thanks to Dan Kerslake and Kaley Shields for their help in the field.

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Date	Weather	Area and Creek ID	Zone	Easting	Northing	Error	Aspect	Elev.	Water	Reach	Bankful	Bankful	Wet	Wet	Embedded	Boulders	Cobbles	Pebbles	Sand	Logged	TAFR	Development Stage					
									T	Grad.	width	depth	width	depth								H	1	2	3	4	Meta
02/07/2009	clear	Sebring Creek	10	548486	5625210	14	S	655	11	23.1	550	88	265	25	M	30	55	10	5	N	N						
02/07/2009	clear	Cedar(vale) Creek	10	543981	5627039	7	SW	661	11	14	2000	82	200	18	M	0	55	35	10	N	N						
02/07/2009	clear	Falls (Fells) Creek)	10	542964	5628302	6	SSW	721	11	62	350	105	125	15	M	5	80	10	5	N	N						
03/07/2009	clear	Carpenter 2	10	541011	5631122	9	WNW	675	9	34.4	633	167	234	17	L	5	80	10	5	N	N						
03/07/2009	clear	Jones Creek	10	539342	5632425	13	S	664	8.9	14	1500	52	250	18	L	10	70	15	5	N	N						
03/07/2009	clear	Marshall Creek 1	10	536246	5634411	17	SSE	842	8	8.7	550	54	400	24	M	20	55	20	5	N	N						
03/07/2009	clear	Marshall Creek 2?	10	534993	5636821	8	SSE	1005	11	5.2	600	50	400	28	L	5	80	10	5	N	N						
03/07/2009	clear	Marshall Lake 1	10	534888	5637325	10	SW	1022	10	17.6	1000	90	250	20	L	10	70	15	5	Y	N						
03/07/2009	clear	Brett Creek	10	533557	5638357	11	S	1069	9	12.3	450	40	400	20	M	10	70	15	5	N	N						
03/07/2009	clear	Marshall Lake 2	10	529140	5641405	7	SSW	1174	9.8	15.8	250	65	200	15	M	30	50	10	5	N	N						
03/07/2009	clear	Marshall Lake 3	10	529392	5641601	6	SW	1204	9	36	500	300		60	M	60	30	10	T	N	N						
04/07/2009	clear	Shalath 1	10	553142	5624407	8	NW	666	8	4	90	20	75	15	M	T	60	35	5	Y	N						
04/07/2009	clear	Shalath 2	10	553443	5623333	15	E	961	7.9	26.8	80	12	80	5.5	M	5	50	40	5	Y	N						
04/07/2009	clear	Shalath 3	10	556897	5619637	7	SSW	264	10.2	28.7	100	20	55	8	M	T	50	40	10	N	N						
04/07/2009	clear	Shalath 4	10	559154	5618844	7	SSW	256	11.7	28.7	90	22	64	11	M	5	70	20	5	N	N						
04/07/2009	clear	Shalath 5	10	559965	5618437	12	S	249	13.2	21.2	250	39	170	21	L	20	45	30	5	N	N						
05/07/2009	clear	Brett Creek 1	10	534059	5639932	13	SE	1462	7	32.5	300	25	225	12	M	30	50	15	5	N	N						
05/07/2009	clear	Brett Creek 2	10	533707	5638757	18	SSE	1126	9.5	30.6	500	62	350	31	M	25	40	30	5	N	N						
13/07/2009	clear	Cadwallader 1	10	513678	5624387	7	WSW	1078	10.8	40	140	16	137	14	M	10	70	15	5	N	N						
13/07/2009	clear	Cadwallader 2	10	519807	5621578	11	SSW	1288	11.2	17.6	150	43	96	21	L	T	50	45	5	N	N						
13/07/2009	clear	Cadwallader 3	10	520405	5621257	9	SSW	1300	10	24.9	825	80	800	60	M	50	35	10	5	N	N						
13/07/2009	clear	Cadwallader 4	10	524107	5618367	12	W	1323	10	19.4	400	40	350	30	M	35	45	15	5	N	N						
13/07/2009	clear	Cadwallader 5	10	524664	5616534	10	WNW	1412	11.5	21.2	250	40	225	15	M	15	65	10	10	Y	N						
13/07/2009	clear	Cadwallader 6	10	525424	5614373	7	SSW	1464	14.5	14	600	80	500	60	M	40	20	25	15	N	N						
13/07/2009	clear	Cadwallader 7	10	525238	5614021	7	NW	1461	13.8	8.7	450	57	450	42	M	10	60	20	10	N	N						
14/07/2009	clear	Truax 2	10	521921	5632487	7	W	1550	7	8.7	101	11	95	8	L	0	80	15	5	Y	N						
14/07/2009	clear	Truax 1	10	521864	5632348	8	W	1533	6	8.7	357	30	147	17	L	T	80	15	5	Y	N						
14/07/2009	clear	Truax 3	10	521828	5633674	13	E	1472	10	19.4	360	30	350	18	L	40	45	10	5	Y	N						
14/07/2009	clear	Truax 4	10	521728	5633252	11	NNE	1517	8.9	40	370	35	350	14	L	60	30	5	5	Y	N						
14/07/2009	clear	Gray Rock 1	10	518404	5637905	11	NNW	689	15	10.5	133	20	79	3	M	0	70	20	10	N	N						
14/07/2009	clear	Gray Rock 2	10	517178	5637592	11	NW	668	11.8	12.3	179	18	157	8	M	10	70	15	5	N	N						

Date	Weather	Area and Creek ID	Zone	Easting	Northing	Error	Aspect	Elev.	Water	Reach	Bankful	Bankful	Wet	Wet	Embedded	Boulders	Cobbles	Pebbles	Sand	Logged	TAFR	Development Stage					
									T	Grad.	width	depth	width	depth								H	1	2	3	4	Meta
14/07/2009	clear	Gray Rock 3	10	514572	5636552	10	NNE	677	14	10.5	200	25	195	12	M-H	10	70	15	5	Y	N						
02/07/2009	clear	Shulaps/Serp	10	546869	5640804	11	130	1155	5.5	35	400	20			H	5	20	70	5	N	N						
02/07/2009	clear	Serp outlet	10	546182	5641224	15	110		5	20	400	15			M	5	25	65	5	N	N						
02/07/2009	clear	Serp outlet	10	545737	5641552	11	95		6	15	100	15			H	5	20	70	5	N	N						
02/07/2009	clear	Serp	10	545720	5641640	10	160	1528	6	10	200	20			M	8	50	40	2	N	N						
02/07/2009	clear	Shulaps (can't read rest)	10	546755	5640593	10	55	1192	8.5		700	40			L-M	10	70	20	0	Y	N						
02/07/2009	clear	Holbrook	10	545945	5637147	10	10	1655	7	9	150	20			M	15	55	30	0	Y	N						
03/07/2009	clear	Doc Creek	10	554004	5637562	10	50		5	30	180	15			H	30	20	40	10	N	N						
03/07/2009	clear	LaRochelle	10	553666	5638776	13	70		7	10	450	25				5	25	65	5	Y	N						
03/07/2009	clear	Shulaps (can't read rest)	10	551975	5642060	15	80	743	7		630	25			L-M	15	55	25	5	Y	N						
03/07/2009	clear	Burkholder 2	10	546469	5647249	8	60	1037	9.5	10	100	10			H	20	5	70	5	Y	N						
03/07/2009	clear	Burkholder 1	10	546498	5647001	10			13		213	29				20	5	70	5	Y	N						
03/07/2009	clear	Peridotite	10	539963	5651719	10	70	70	11	5	420	25			M	5	55	35	5	N	N						
03/07/2009	clear	Beaver Dam	10	544287	5650136	10	170	1082	6.5	3	300	20			H	0	29	70	1	N	N						
03/07/2009	clear	Junction	10	548946	5645429	9	200	932	7	3	450	20			H	5	20	70	5	N	N						
04/07/2009	clear	Tommy	10	533456	5632415	13	330	693	6.5	7	700	80			M	50	30	17	3	Y	N						
04/07/2009	clear	Tommy	10	531985	5628034	12	25	1303	8	5	1200	50			M-H	25	35	35	5	N	N						
04/07/2009	clear	right trib. Tommy	10	533655	5629719	13	310	1317	7.5	35	300	20			H	25	20	50	5	N	N						
05/07/2009	clear	Keary	10	540866	5629290	9	95	671	11	7	750	60			M-H	25	35	35	5	N	N						
05/07/2009	clear	Nose bag	10	542488	5627843	13	10	632	8.5	9	750	25			H	25	25	40	10	N	N						
05/07/2009	clear	Unnamed	10	544572	5625994	15	5	673	9	20	140	20			H	0	30	65	5	N	N						
05/07/2009	clear	Unnamed	10	544367	5626106	15	60	673	10		200	15			H	5	25	60	10	N	N						
05/07/2009	clear	Unnamed	10	547971	5624625	9	15	665	9	20	100	10			H	0	25	70	5	N	N						
05/07/2009	clear	Unnamed	10	549533	5623961	9	45	665	9	25	150	15			H	10	20	60	10	N	N						
06/07/2009	clear	Whitecap T1	10	543502	5620598	8	175	1006	11	25	210	15			H	5	30	60	5	N	N						
06/07/2009	clear	Whitecap T2	10	541751	5618556	11	10	1336	8	5	300	20			M	5	30	50	15	N	N						
06/07/2009	clear	Whitecap T3	10	543825	5620412	15	75	962	12	35	100	10			H	40	15	30	15	N	N						
13/07/2009	clear	right fork Noel	10	515654	5614460	8	0		8	3	700	25			L	7	50	40	3	Y	N						
13/07/2009	clear	Noel left right fork	10	515537	5614475	8	60	1440	7.5	10	650	25			L	15	50	30	5	Y	N						
13/07/2009	clear	Noel RB trib	10	515344	5615714	10	270	1397	10	2	320	15			L	5	60	33	2	Y	N						
13/07/2009	clear	Noel right left fork	10	509564	5612037	9	5	1669	14.5	5	450	20			M	15	50	30	5	N	N						

Date	Weather	Area and Creek ID	Zone	Easting	Northing	Error	Aspect	Elev.	Water	Reach	Bankful	Bankful	Wet	Wet	Embedded	Boulders	Cobbles	Pebbles	Sand	Logged	TAFR	Development Stage						
									T	Grad.	width	depth	width	depth								H	1	2	3	4	Meta	Juv
13/07/2009	clear	Noel centre left fork	10	509508	5611993	10	5	1656	15	8	550	20			M	15	50	32	3	N	N							
13/07/2009	clear	Noel left left	10	509501	5612339	9	80	1656	14	6	550	30			L-M	20	50	28	2		N							
13/07/2009	clear	Noel left fork trib	10	510083	5613151	10	130	1585	10	10	250	15			L-M	10	60	27	3	Y	N							
13/07/2009	clear	Noel left fork trib	10	513105	5616812	10	300	1453	10.5	20	300	10			H	5	45	40	10	Y	N							
14/07/2009	clear		10	482630	5622010	8	310	1363	5	25	110	10			H					Y	N							
14/07/2009	clear		10	482752	5622275	12	34	1305	7	10	340	15			H	0	30	7		Y	N							
14/07/2009	clear		10	483555	5624894	12	305	1213	4	25	50	10								not searched								
14/07/2009	clear		10	483729	5625978	10		1035	7		50	10								not searched								
14/07/2009	clear		10	484625	5627348	10			5.5		50	10			H					not searched								
14/07/2009	clear		10	485569	5628565	10	305	886	10.5	20	400	50			H					not searched								
14/07/2009			10	471518	5636266	10	240	1225	10.5	10	150	15			H	2	33	65			N							
14/07/2009			10	474553	5633896	10	185	1062	10	15	250	20			H	25	25	25	25		N							
14/07/2009			10	478802	5633304	20			12.5		1000										not searched							
14/07/2009			10	480922	5632849	10	165	888	12	15	150	20			H						N							
15/07/2009	clear	Hurley RL fork	10	502785	5606206	9	295	1430	6	8	150	10			M	5	20	70	5	Y	N							
15/07/2009	clear	Hurley L fork	10	501380	5604586	8	25	1444	10	8	470	20			L	20	50	23	2	Y	Y				2			
15/07/2009	clear	Hurley left	10	501581	5604062	13		1550	7.5		800	25			H	15	30	50	5	Y	N							
15/07/2009	clear	Hurley left Tr.	10	501510	5603970	10	60	1525	9	10	240	20			L	20	50	30	0	N	Y		1	4				
15/07/2009	clear	Hurley left F Trib.	10	501673	5603741	13	50	1561	10.5	1	100	10			M	5	20	70	5	N	Y			1				
15/07/2009	clear	Hurley left F. Trib.	10	502002	5603032	12	340	1593	11	10	150	10			H	5	40	50	5	N	N							
15/07/2009	clear	Hurley left F. Trib.	10	501756	5605366	10	150	1453	15	20	200	20			M	20	60	20	0	Y	Y		3	6	3			
15/07/2009	clear	Hurley left F. Trib.	10	502719	5607319	8	45	1325	11	8	400	25			M	15	50	35	0	N	Y			2				
15/07/2009	clear	Hurley RF R Trib.	10	506905	5607448	15		1552	12.5	10	300	25			N-L	25	50	25	0	N	Y			4	4			
15/07/2009	clear		10	507034	5607350		260	1568	12	1	400	15			M	0	40	60	0	N	N							
16/07/2009	overcast	Cadwallader	10	524517	5612499	10	320	1533	9.5	20	200	15			M	25	25	25	25	N	N							
16/07/2009	overcast	Cadwallader	10	524359	5612518	10		1530	8		600	20			M	25	30	20	25	N	N							
16/07/2009	overcast	Cadwallader	10	526651	5614271	13	35	1561	13	8	150	20			H	10	25	60	5	N	N							
16/07/2009	overcast	Cad. Trib.	10	526832	5614253	10	280	1534	10	2	400	25			H						N	N						
17/07/2009	overcast	Hurley pass	10	497369	5606985	8	320	1277	8	5	215	20			L	10	45	45	0	N	Y		2	9	1			
17/07/2009	clear	Phelix	10	523318	5608881	5	75	1704	12		410	20			H						N	N						
17/07/2009	clear	Phelix mast	10	524226	5607878	12	180	1393	12	10	1000	25			M						N	Y			1	3		

Date	Weather	Area and Creek ID	Zone	Easting	Northing	Error	Aspect	Elev.	Water T	Reach Grad.	Bankful width	Bankful depth	Wet width	Wet depth	Embedded	Boulders	Cobbles	Pebbles	Sand	Logged	TAFR	Development Stage														
																						H	1	2	3	4	Meta	Juv								
17/07/2009	clear	Phelix trib	10	524445	5605878	10	140	1232	10	8	600	40			N						N	Y		1												
18/07/2009	clear	McGillivary Trib	10	537925	5608229	20	140	809	8.5	5	200	10			H						N	N														
18/07/2009	clear	McGillivary Trib	10	532394	5606728	9	310	1363	7.5		450	20			H						N	N														
18/07/2009	clear	McGillivary mainstem	10	532249	5606858	8	55	13.8	9.5	5	500	30			L						N	N														
18/07/2009	clear	McGillivary pass	10	532821	5607550	15	120	1250	9	5	600	30			H						N	N														
18/07/2009	clear	D'Arcy Creek	10	536562	5600286		145	310	11.5	6	160	15			H						N	N														
			10	524360	5612666	10	110	1538	7		100	15			H						<i>not searched</i>															
			10	497185	5607029	10		1303	7												<i>not searched</i>															
			10	524043	5608354	15	120	1464	3	35	100	10									N															

II. FINANCIAL STATEMENT

	BUDGET		ACTUAL	
	BCRP	Other	BCRP	Other
INCOME				
<i>Total Income by Source</i>	\$27,650.00	\$3,800.00	\$23,421.75	\$3,800.00
Grand Total Income (BCRP + other)	\$31,450.00		\$27,221.75	
EXPENSES				
Note: Expenses must be entered as negative numbers (e.g. – 1000, etc.) in order for the formulas to calculate correctly.				
<i>Project Personnel</i>				
Wages	-\$22,500.00	-\$2,800.00	-\$18,895.20	-\$2,600.00
Consultant Fees				
(List others as required)				
<i>Materials & Equipment</i>				
Equipment Rental			-\$112.00	
Materials Purchased		-\$1000.00		-\$1,000.00
Travel Expenses	-\$5,150.00		-\$4,414.55	-\$200.00
Permits				
(List others as required)				
Administration				
Office Supplies				
Photocopies & printing				
Postage				
(List others as required)				
Total Expenses	-\$27650.00	-\$2800.00	-\$23421.75	-\$3800.00
Grand Total Expenses (BCRP + other)	-\$31,450.00		-\$27,221.75	
BALANCE (Grand Total Income – Grand Total Expenses)	The budget balance should equal \$0 \$0		The actual balance might not equal \$0* \$0	

III. PERFORMANCE MEASURES-ACTUAL OUTCOMES

Results of the Coastal Tailed Frog survey were provided to BC Hydro, the Seton Lake Band, the Ministry of Environment, and the Lillooet TSA Committee via a copy of this final report.

Results were communicated to the public in the Lillooet area via a Powerpoint presentation given by E. Wind Oct. 15, 2009. This event was organized by the Lillooet Naturalist Society, who advertised it in the local paper and via posters (see Section IV), and it was held at the Seton Indian Band Lillooet Friendship Centre. The event was attended by approximately 15 people of varying ages and backgrounds.

Project Outcomes:

- A greater understanding of the distribution of Coastal Tailed Frogs in the Bridge-Seton area, which is important information for the future direction of BCRP. The low density of records in 2009, and lack of records from historic sites, suggests that this species no longer occurs in most of the area including creeks northeast of the dammed lakes/reservoirs. It is unclear why the species' is likely locally extirpated (e.g., did reservoir creation isolate populations; do natural conditions, such as cold streams, make the area largely unsuitable), and historic information is lacking (surveys and monitoring). As such, BC Hydro may consider giving this species a lower priority for conservation and funding allocation in terms of the Bridge Coastal Restoration Program compared to other local species at risk.
- Distribution maps showing creeks where Coastal Tailed Frogs are confirmed to occur in the Bridge-Seton area and an associated database of creeks surveyed that includes location information and habitat descriptions. Results shows possible migration routes into the area from coastal areas.
- Amphibian field survey training for a member of the Seton Lake Indian Band.
- One objective of the project was to identify habitat restoration opportunities for tailed frogs (i.e., this project was viewed as a pilot project for future restoration work). However, the results from this survey (i.e., lack of tailed frog records) do not support further work. Future restoration work is likely beyond the scope of the BCRP (e.g., a reintroduction effort).

IV. CONFIRMATION OF BCRP RECOGNITION

Results were communicated via an oral presentation to the public via an event organized by the Lillooet Naturalists' Club. This event was advertised in the local paper and via posters (see below).

Come learn about Coastal Tailed Frogs!



Have you ever heard of a frog having a “tail”? Did you know that there are amphibians that can live and breed in cool, fast flowing, mountain streams? The Coastal Tailed Frog (*Ascaphus truei*) is a Blue listed or *threatened* species in BC and Canada. This unique frog lives in specific types of creeks and is sensitive to habitat disturbance. We knew that the edge of the species’ coastal range occurred near Lillooet, but few surveys had been conducted in the area. To ensure the species’ continued survival in the Lillooet area and to encourage land practices that protect creeks used by this species for breeding, information was needed on the species’ distribution. We conducted stream surveys in the area, looking for tailed frogs, in July 2009. Information about amphibians, tailed frogs, and the results of our survey work will be presented. Everyone is welcome.

Date: Thursday October 15th, 2009

Time: 7:00-8:30 pm

Location: Lillooet Friendship Centre

Admission: Donation to the food bank

Everyone welcome!

Sponsored by Lillooet Naturalist Society and Tsal’almec (Seton Lake Indian Band)

Funded By: BC Hydro’s Bridge Coastal Restoration Program (BCRP)

BCRP Project Title: Coastal Tailed Frog Inventory and Habitat Assessment in the Bridge-Seton Area

Project Lead: Elke Wind (E. Wind Consulting, Nanaimo, BC)

Supported by Tsal’almec (Seton Lake Indian Band), Lillooet Naturalist Society, Ainsworth Engineered Canada LP, Ministry of Environment, and the Lillooet TSA Association.