

Al Irvine
New Graph Environment Ltd.
al@newgraphenvironment
250-777-1518
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Ministry of Environment
and Fisheries and Oceans Canada

Re: Fish Permit Application

This permit application can also be viewed online [at this link](#). A summary of sites to be potentially assessed is included as Tables [1](#) - [2](#), details of fish species potentially encountered is presented in Table [3](#) and an overview map displaying potential sample locations is included as Figure 1. A kml file of the sites is included as an attachment to the application and can also be downloaded [from here at this link](#). Please note that there is an extensive amount of information contained in the kml file (accessed by clicking on sites) including brief summaries of background reporting data (when available).

This work is a collaboration of many groups and an initiative of the Society for Ecosystem Restoration Northern BC. Funding for the project is through the Habitat Conservation Trust Fund, the Provincial Fish Passage Technical Working Group, the BC Ministry of Transportation and the Canadian Wildlife Federation. Al Irvine, R.P.Bio from New Graph Environment Ltd. is leading the fieldwork with field and office collaboration with teams from the Office of Wet'suwet'en, Gitksan Development Corporation and Nico Ridge Consulting Ltd.

Rationale for sampling is to inform fish presence/absence, species composition/density, abundance estimates, movement, growth, and survival as part of habitat confirmations and monitoring related to fish passage restoration at barrier culverts as per the [Fish Passage Technical Working Group Phase 2 protocol](#). Presence/absence of fish, species composition/abundance, distribution limits and fish movement can be useful for prioritizing which crossings are a best fit for fish passage restoration and inform follow up effectiveness monitoring.

Sampling is proposed at a maximum of 10 streams included in Tables 1 - 2 where we will be performing habitat confirmations and follow up site visits related to past habitat confirmations/fish passage remediation. The list of potential sample sites have been selected through manual review of sites from past Skeena Fisheries Commission reporting, through an assessment of the potential value of sampling of past habitat confirmation sites, a review of [bcfishpass](#) modelling outputs and (for a selection of sites in the Bulkley River watershed), from Canadian Wildlife Federation review of [bcfishpass](#) outputs.

As a maximum of 10 streams will be sampled, the current list of candidate streams will be narrowed down through the results of field assessments (ie. sample the streams with the greatest potential fish passage remediation benefits), modeling, ongoing communications with First Nations representatives; Land, Water and Resource Stewardship; Ministry of Environment, Department of Fisheries and Oceans and other partners/stakeholders. Sampling methodologies will be dependent on the site, fish species suspected, type of habitat encountered, risks to aquatic organisms potentially present and ongoing communications. Sampling methods may include minnowtrapping, electrofishing, and dipnetting upstream and downstream of barrier culvert locations.

As part of this permit application we are proposing tagging. Our study plan is (when time allows and PIT tagging is expected to increase our state of knowledge about the subject system) to electrofish sites up to 200 - 300m long (likely shorter - but dependent on fish density) both upstream and downstream of priority culvert "barrier" sites and insert biotag APT12 PIT tags into the body cavity of all fish captured over 65mm. Fish location (UTM), length and weight will also be collected. The length of sites will be determined by the number of fish captured as we have a limit number of tags total (450) and we wish to tag all fish captured within a site to facilitate abundance estimates. When possible we will return to the sites a minimum of 1 day later to re-sample to inform an analysis of our capture efficiency. In addition to providing information on abundance upstream and downstream of potential culvert restoration sites, the study will also provide baseline information for monitoring programs to document fish movement, growth and survival at these sites over multi-year timeframes (ie. to evaluate if 1. fish are moving into restored areas, 2. through sites where stream crossing structures (culverts) likely causing connectivity issues before any remediation is conducted and to 3. evaluate if productivity of the systems are increasing following bridge installation and/or if fish are moving upstream/downstream of where replaced/removed structures are located). As we wish to tag all fish over 65mm in each site sampled (up to 10 sites) we would like to apply for a permit allowing a maximum of 450 fish with a maximum of 150 fish/stream. Although we are requesting a maximum of 150 fish/stream, we have listed 150 fish of each species per stream because we will not know the species composition of the sites until the sampling occurs.

Please note that the sampling will be completed before October 31 (end of August till mid-September however the end-date of the sampling period is listed as Dec 31 on the application to allow time outside of the busy field season for the data to be processed, QA'd and organized so that required reporting can be as informative as possible when submitted. An example of how we have been presenting results and methodologies from past assessments can be referenced [here at this link](#).

Please do not hesitate to contact me if you need more information or have any questions or concerns.



Al Irvine, R.P.Bio

Figure 1. Location of potential sample sites.

Table 1: Potential sampling locations.

id	stream_name	wsc_code	lat	long	watershed_group_code
8530	Trib to Copper	440-767000-07400-00000-0000-000-000-000-000-000	54.80518	-127.7129	ZYMO
8545	Trib to Copper	440-813000-00000-00000-0000-000-000-000-000-000	54.79016	-127.6451	ZYMO
57793	Vallee Creek	460-528000-00000-00000-0000-000-000-000-000-000	54.52438	-126.8141	BULK
58067	Tributary to Gramophone Creek	460-223800-00000-00000-0000-000-000-000-000-000	54.97087	-127.2858	BULK
123377	Thompson Creek	460-517700-00000-00000-0000-000-000-000-000-000	54.57223	-126.8090	BULK
197365	Tributary to Owen Creek	460-600600-23900-32500-0000-000-000-000-000-000	54.15719	-126.8005	MORR
197653	Perow Creek	460-750400-02200-00000-0000-000-000-000-000-000	54.51824	-126.4428	BULK
197962	Peacock Creek	460-600600-07100-00000-0000-000-000-000-000-000	54.36065	-126.7918	MORR
1008302257	Pinenut Creek	400-465300-00000-00000-0000-000-000-000-000-000	55.38699	-127.6258	KISP
1024600895	Silvern Creek	440-955300-00000-00000-0000-000-000-000-000-000	54.77358	-127.4035	ZYMO

Table 2: Potential sample site details.

id	stream_name	sp_upstr	fish_tags	followup_comments
8530	Trib to Copper	–	150	Duplicate. Matched to wrong modelled crossing so corrected in bcfishpass.
8545	Trib to Copper	{RB}	150	RB confirmed upstream. SFC recommends habitat assessment
57793	Vallee Creek	{CAL,CT,LSU,RB}	150	–
58067	Tributary to Gramophone Creek	{RB,ST}	150	–
123377	Thompson Creek	{CT,DV,RB}	150	Would be good to get baseline conditions for species composition and abundance.
197365	Tributary to Owen Creek	–	150	Flow looks good in photos.
197653	Perow Creek	–	150	–
197962	Peacock Creek	–	150	Site remediated. Long term monitoring required but could wait another year as work was conducted late last summer and we might expect CO moving in this fall..
1008302257	Pinenut Creek	–	150	No fisheries information.
1024600895	Silvern Creek	{CO,DV,ST}	150	Silvern Creek. Not yet assessed. Large system.

species recorded.

Scientific Name	Species Name	Species Code	BC List	Provincial FRPA	COSEWIC	SARA
Scientific Name	Species Name	Species Code	BC List	Provincial FRPA	COSEWIC	SARA
<i>Catostomus catostomus</i>	Longnose Sucker	LSU	Yellow	–	–	–
<i>Catostomus commersonii</i>	White Sucker	WSU	Yellow	–	–	–
<i>Catostomus macrocheilus</i>	Largescale Sucker	CSU	Yellow	–	–	–
<i>Chrosomus eos</i>	Northern Redbelly Dace	RDC	Yellow	–	–	–
<i>Coregonus clupeaformis</i>	Lake Whitefish	LW	Yellow	–	–	–
<i>Cottus aleuticus</i>	Coastrange Sculpin (formerly Aleutian Sculpin)	CAL	Yellow	–	–	–
<i>Cottus asper</i>	Prickly Sculpin	CAS	Yellow	–	–	–
<i>Couesius plumbeus</i>	Lake Chub	LKC	Yellow	–	DD	–
<i>Entosphenus tridentatus</i>	Pacific Lamprey	PL	Yellow	–	–	–
<i>Hybognathus hankinsoni</i>	Brassy Minnow	BMC	No Status	–	–	–
<i>Lota lota</i>	Burbot	BB	Yellow	–	–	–
<i>Mylocheilus caurinus</i>	Pearmouth Chub	PCC	Yellow	–	–	–
<i>Oncorhynchus clarkii</i>	Cutthroat Trout	CT	No Status	–	–	–
<i>Oncorhynchus clarkii</i>	Cutthroat Trout (Anadromous)	ACT	No Status	–	–	–
<i>Oncorhynchus clarkii clarkii</i>	Coastal Cutthroat Trout	CCT	Blue	–	–	–
<i>Oncorhynchus gorbuscha</i>	Pink Salmon	PK	Yellow	–	–	–
<i>Oncorhynchus keta</i>	Chum Salmon	CM	Yellow	–	–	–
<i>Oncorhynchus kisutch</i>	Coho Salmon	CO	Yellow	–	–	–
<i>Oncorhynchus mykiss</i>	Rainbow Trout	RB	Yellow	–	–	–
<i>Oncorhynchus mykiss</i>	Steelhead	ST	Yellow	–	–	–
<i>Oncorhynchus mykiss</i>	Steelhead (Summer-run)	SST	Yellow	–	–	–
<i>Oncorhynchus nerka</i>	Kokanee	KO	Yellow	–	–	–
<i>Oncorhynchus nerka</i>	Sockeye Salmon	SK	Yellow	–	–	–
<i>Oncorhynchus tshawytscha</i>	Chinook Salmon	CH	Yellow	–	–	–
<i>Prosopium coulterii</i>	Pygmy Whitefish	PW	Yellow	–	NAR (Nov 2016)	–
<i>Prosopium coulterii</i> pop. 3	Giant Pygmy Whitefish	GPW	Yellow	–	–	–
<i>Prosopium williamsoni</i>	Mountain Whitefish	MW	Yellow	–	–	–
<i>Ptychocheilus oregonensis</i>	Northern Pikeminnow	NSC	Yellow	–	–	–
<i>Pungitius pungitius</i>	Ninespine Stickleback	NSB	Unknown	–	–	–
<i>Rhinichthys cataractae</i>	Longnose Dace	LNC	Yellow	–	–	–
<i>Rhinichthys falcatus</i>	Leopard Dace	LDC	Yellow	–	NAR (May 1990)	–

Scientific Name	Species Name	Species Code	BC List	Provincial FRPA	COSEWIC	SARA
Richardsonius balteatus	Redside Shiner	RSC	Yellow	–	–	–
Salvelinus confluentus pop. 26	Bull Trout	BT	Blue	–	–	–
Salvelinus fontinalis	Brook Trout	EB	Exotic	–	–	–
Salvelinus malma	Dolly Varden	DV	Yellow	–	–	–
Salvelinus namaycush	Lake Trout	LT	Yellow	–	–	–
–	Arctic Char	AC	–	–	–	–
–	Cutthroat/Rainbow cross	CRS	–	–	–	–
–	Dace (General)	DC	–	–	–	–
–	Lamprey (General)	L	–	–	–	–
–	Minnow (General)	C	–	–	–	–
–	Salmon (General)	SA	–	–	–	–
–	Sculpin (General)	CC	–	–	–	–
–	Sucker (General)	SU	–	–	–	–
–	Whitefish (General)	WF	–	–	–	–