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Safety Plan - 2025-076-sern-skeena-fraser-fish-passage

The latest version of this pdf can be downloaded here.

The goal of this fieldwork is to evaluate fish passage and establish baseline data. We will be completing fish passage (Phase 1) and habitat confirmation (Phase 2) assessments, as well as conducting baseline monitoring at previously assessed and/or remediated crossings in the Bulkley, Morice, Kispiox, and Zymoetz River watershed groups. Fieldwork will include electrofishing at permitted sites and collection of environmental DNA (eDNA) samples.

Field activities will be completed with support from the Office of the Wet'suwet'en, Gitsxan Environmental Services, and other partner organizations. A summary of potential sites for fish passage assessments, habitat confirmation assessments, and electrofishing is provided in Table 7 and Figure 5. Google Earth (KML) and Garmin (GPX) files for the proposed sites are available for download here. Georeferenced pdf maps for select watershed groups can be accessed and downloaded below:

- https://hillcrestgeo.ca/outgoing/fishpassage/projects/bulkley/
- https://hillcrestgeo.ca/outgoing/fishpassage/projects/kisp/
- https://hillcrestgeo.ca/outgoing/fishpassage/projects/zymo/
- https://hillcrestgeo.ca/outgoing/fishpassage/projects/morr/

New Graph Environment Employee Information

Al Irvine
Vehicle: 2013 Toyota Tundra black w/flatdeck and yellow can-am quad
Accommodation: 7 Avenue A3885, Smithers, BC, V0J 2N3

Lucy Schick
Vehicle: 2006 Pontiac Vibe red
Accommodation: 1515 Main Street, Smithers, British Columbia, V0J 2N0

Crew Members

New Graph Employees Al Irvine and Lucy Schick will be joined by crews from the Office of the Wet'suwet'en and Gitsxan Environmental Services. All crew member information and emergency contacts can be found below.

Table 1: Crew members details and emergency contacts

name	email	phone	satellite	emerg_name	emerg_email	emerg_phone
Allan Irvine	al@newgraphenvironment.com	250-777-1518	must be contacted by inreach first. Cannot cold call	Tara Stark	tara@newgraphenvironment.com	250-505-9854
Vern Joseph	vernon.joseph@wetsuweten.com	250-842-8204	truck radio equiped to call out	Brett Tripp	Brett.tripp@wetsuweten.com	250-847-3630 ext. 2246
Tiesha Pierre	pierretieasha@icloud.com	250-877-0849	truck radio equiped to call out	Brett Tripp	Brett.tripp@wetsuweten.com	250-847-3630 ext. 2246
Jesse Olson	jesse.olson@gitxsanbusiness.com	778-202-0250	–	Chaz Ware	chaz.ware@gitxsanbusiness.com	250-877-7225
Lucy Schick	lucy@newgraphenvironment.com	604-741-2032	807-790-9843	Sa Boothroyd	saboothroyd@gmail.com	604-740-7199
Jessica Doyon	jessica.doyon@gitxsanbusiness.com	514- 778-2907	–	Chaz Ware	chaz.ware@gitxsanbusiness.com	250-877-7225

Equipment Checklists

PLEASE NOTE THAT EQUIPMENT CHECKLISTS ARE PROVIDED FOR THE OVERALL TEAM AND NOT ALL CREWS ARE REQUIRED TO HAVE ALL EQUIPMENT. ALTHOUGH ENCOURAGED FOR ALL ENVIRONMENTAL SCIENCE TECHNICIANS AND MONITORS TO HAVE THE PERSONAL EQUIPMENT NEW GRAPH ENVIRONMENT WILL HAVE ALL EQUIPMENT NECESSARY TO COMPLETE THE WORK.

MINIMUM REQUIREMENTS FOR EACH CREW MEMBER INCLUDES GOOD QUALITY AND APPROPRIATELY FITTING LIGHT WEIGHT WADERS AND SEPERATE WADING BOOTS (RUBBER SOLED), HAT, WATER AND A FOOD.

MINIMUM REQUIREMENTS FOR FIELD TRUCKS INCLUDE A QUALITY RADIO APPROPRIATE FOR FOREST SERVICE ROADS, OFF-ROAD CAPABLE TIRES IN GOOD CONDITION, SPARE TIRE, JACK, AND TOOLS.

Table 2: Personal Equipment Checklist - SEE NOTE ABOVE FOR MINIMUM REQUIREMENTS

Equipment	·	·	·
GPS	Suncreen	Bugspray	Polarized glasses
Bear Spray	phone/camera	battery pack booster for phone	Hat
first aid kit personal	Waders	Wading Boots (Rubber-soled only)	Ski poles
water	food	gloves work	headlamp
clinometer	field vest (surveyors)	note book	Extra clothes
rain gear	hand lens	range finder	–

Table 3: Crew Equipment Checklist - SEE NOTE ABOVE FOR MINIMUM REQUIREMENTS

Crew Equipment Checklist	·	·	·
glasses safety	Oakton Multimeter	Hand saw	Backpack Electrofisher

Crew Equipment Checklist	•	•	•
stop nets x 4	salt blocks	loose salt	dip nets x 2
Linesman Gloves x 3	tape measure hand	tape measure eslon	pilon x 2
Measuring board	Scale	Permits	Backroads Mapbook
Locational maps	Fish ID book	Background Documents	radio handheld
Satelite communicator	Field Safety Plan	first aid kit level 1	First Aid binder stocked
Site Cards / Field Guide	Minnow Traps	Catfood	Flagging
Laptop w/basecamp	GPS cable	Lazer level	Assessment cards fish passage
UAV radio	UAV	UAV landing pad	UAV GC tape
UAV safety plan (when required)	UAV registration	UAV license	UAV radio license
UAV backpack	Flow meter	ATV	Throw bags
polaski	shovel	fire extinguisher backpack	fire extinguisher pressurized
bucket rigid x 2	bucket foldable	clove oil kit w/ instructions	gloves leather
hard hat	steel toed boots	sharpies	ATV gas
ATV lock	UAV battery charger	wader disinfectant kit	GPS batteries
ATV helmets	Battery booster	Compressor 12V	Rubber boots (no-slip soles)
Small BT Speaker (for bears)	large backpack	–	–

Table 4: eDNA Equipment Checklist - SEE NOTE ABOVE FOR MINIMUM REQUIREMENTS

eDNA Equipment Checklist	•	•	•
field vest (surveyors)	note book	GPS	eDNA sampler
Car adaptor for charging eDNA batteries	Aluminium filter membrane housings x10	Filters	Extra hose
Nalgene bottles	Bleach Decontamination Bottle	Rinse bottle	Forceps/tweezers
95% ethanol	Colman cooler	Ice	Silica beads
Coin envelopes	Ziploc snack bags -medium	Ziploc snack bags -large	Nitrile gloves
3 jars/bowl/cups	–	–	–

Table 5: CABIN Equipment Checklist - SEE NOTE ABOVE FOR MINIMUM REQUIREMENTS

CABIN Equipment Checklist	•	•	•
clinometer	field vest (surveyors)	note book	GPS
phone/camera	Waders	Wading Boots (Rubber-soled only)	Turbidity Meter LaMotte 2020e
bucket rigid x 2	sharpies	wader disinfectant kit	GPS batteries
Colman cooler	Ice	Ziploc snack bags -medium	CABIN field sheets
clipboard	Gloves (rubber, neoprene)	Inside bottle waterproof label - use waterproof paper	Duct tape and tool kit
Densiometer	Velocity metre OR Meter stick	Measuring Tape	15 or 30cm ruler
Hand Level	Calculator	Tent pegs	CABIN Benthic Kick Net
Sieve	White tray	Squeeze Bottles	Spoon/tweezers
Bucket	Cabin sample jars	Formalin	–

Table 6: Truck Equipment Checklist - SEE NOTE ABOVE FOR MINIMUM REQUIREMENTS

Equipment	•	•	•
Hand saw	radio truck	Satelite communicator	first aid kit level 1
polaski	shovel	fire extinguisher backpack	truck tow rope
truck/car jack	Battery booster	Compressor 12V	pilon x 2
Tow strap	cloth or paper towel	–	–

Nearest Hospitals

Figure 1: Houston Health Centre - 3202 14 St, Houston, BC V0J 1Z0 - 250-845-2294

Figure 2: (Smithers) Bulkley Valley District Hospital - 3950 8 Ave, Smithers, BC V0J 2N0 - 250-847-2611

Figure 3: Wrinch Memorial Hospital - Hazelton - 2510 Hwy 62, Hazelton, BC V0J 1Y0 - 250-842-5211

Emergency Response Plan

New Graph Environment's detailed emergency response procedures can be found here. These procedures should be reviewed and an emergency response plan should be completed for each job site. Our Emergency Responce Plan template can be downloaded here.

Driving

We will be driving on forest service roads where it is essential to exercise caution and adhere strictly to all radio use protocols to ensure our safety. Proper communication on these roads helps

prevent accidents by keeping everyone informed about vehicle movements and road conditions. Please review the resource road safety and radio use sections of our Health and Safety plan so that everyone stays safe.

Field Plan

Fieldwork will focus on fish passage (Phase 1) assessments, habitat confirmation (Phase 2) assessments, and baseline monitoring in the Bulkley, Morice, Kispiox, and Zymoetz River watershed groups. Activities will include electrofishing at permitted sites and the collection of environmental DNA (eDNA) samples. Crews from the Office of the Wet'suwet'en and Gitsxan Environmental Services will support the fieldwork.

Fieldwork methods will result in products feeding reporting formats such as our 2024 and 2023 reports. We generally follow procedures in:

- fish passage assessments (Ministry of Environment 2011)
- habitat confirmations (Fish Passage Technical Working Group 2011).

Information on fish presence/absence, species composition, density, and distribution limits is useful for prioritizing crossings for fish passage restoration and informing follow-up monitoring. To support this, electrofishing, minnow trapping, and eDNA sampling may be conducted where appropriate. Standard Fish and Fish Habitat Inventory Field Forms (site cards) are used to collect habitat data. The field guide for completing these forms is available here.

Passive Integrated Transponder (PIT) tagging equipment is available and may be used to mark fish captured at electrofishing sites. Tagging can support long-term monitoring by providing data on population size and fish movement upstream and downstream of crossings. An overview of the tagging process is available here. To anesthetize fish prior to PIT tagging, we use a clove oil solution at 0.1mL/L (1:10,000), which provides effective sedation with minimal residual effects (Fernandes et al. 2017). The solution is prepared by dissolving clove oil in ethyl alcohol at a 1:9 ratio before mixing into water (Fernandes et al. 2017).

Digital field forms are used to collected data, utilizing Mergin Maps, which syncs with QGIS and supports offline use. Instructions for setting up Mergin Maps and using the digital field forms can be

found in the Fish Passage Guidebook. Users should send their Mergin usernames to enable project sharing and form access.

A field guide to freshwater fish identification, such as *Field Key to the Freshwater Fishes of British Columbia* by McPhail and Carveth (1993), can be useful during fieldwork. It is available for download here.

Check In Procedures

Call, text, or InReach Tara Stark (2505059854) each morning to share the plan for the day (i.e. name of roads and sites). Check in time is before 7pm each evening although we regularly check in throughout the day (ex. at arrival to site, 1pm and 4pm) on the InReach or by text and report position/provide updates.

Procedures for Failed Check-In - for Check in person

Procedures are summarized in Figure 4. If phone call or InReach check-in is not received by 7pm send text to InReach units, call or text cell phones of field crew members. If no response please call accommodations then personal emergency contacts to see if they have heard anything. Wait 1 hour and text InReach, text or call cell phones and personal emergency contacts and accommodations again. Repeat after 2 hours (9 pm) - if no response then notify the RCMP of a missing persons in field.

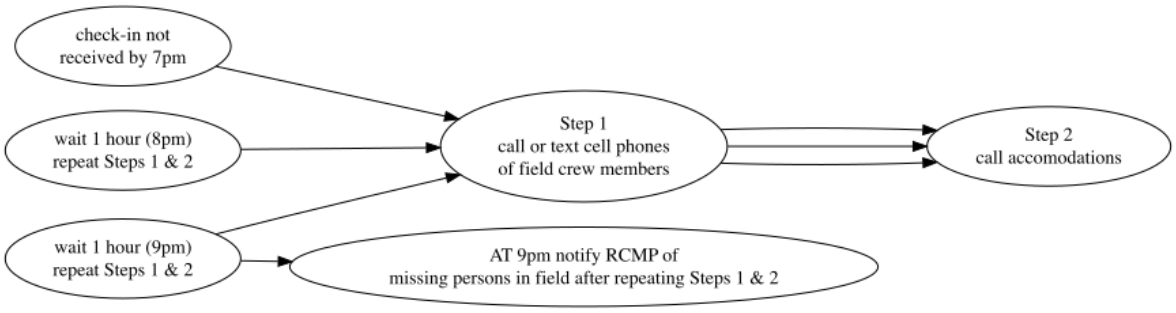

Figure 4: Procedures for failed check-in

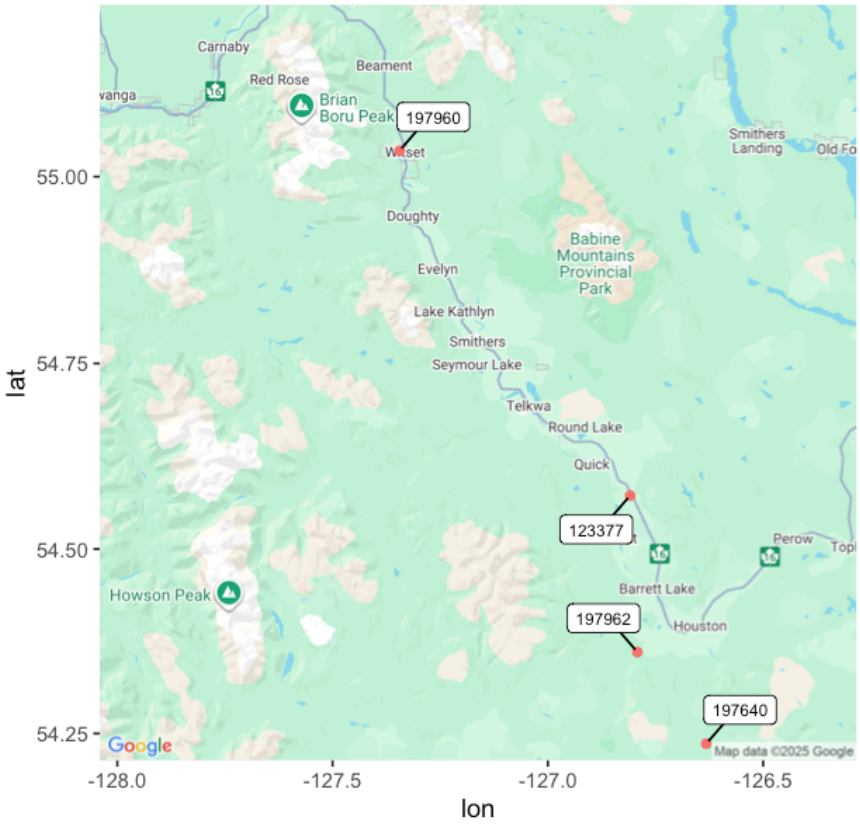

Figure 5: Map of potential sampling areas.

Table 7: Potential Phase 1 assessment, Phase 2 assessment, and Electrofishing Locations

id	stream_name	utm_zone	utm_easting	utm_northing	watershed_group_code	pscis_assessment_comment
123377	Thompson Creek	9	641633	6049398	BULK	Debris is partially blocking one of the two pipes. Historic washouts on road at this site. Landowner reports stream diverted downstream >50 years ago and crosses farmers field in ditched channel. 15:12
197640	Tributary To Buck Creek	9	654312	6012383	BULK	Large tributary on section of tributary connected to salmon bearing Buck Creek. Fish rising in outlet pool (estimated 130mm). Some cattle access points downstream.
197960	Corya Creek	9	605786	6099884	BULK	Outlet is cracked and drops. Inlet embedded to 2/3 way. 10:33
197962	Peacock Creek	9	643460	6025890	MORR	Partial inlet drop of varying height due to large woody debris and boulders. Side channel dry, must be seasonal use only. 17:47
198064	Tributary To Lamprey Creek	9	623369	6000283	MORR	Habitat confirmation conducted. Fish observed (150mm). 9:25

id	stream_name	utm_zone	utm_easting	utm_northing	watershed_group_code	pscis_assessment_comment
198217	Sik-E-Dakh	9	582874	6130541	KISP	The culvert was replaced with a bridge, featuring excellent construction with a wide channel beneath the structure. Riprap has been covered with soil to promote vegetation growth, and significant riparian restoration is underway with trees and shrubs being planted. Overall, this is a well-executed replacement project. Monitoring work was conducted and is included in the 2024 report.

References

Fernandes, I. M., Y. F. Bastos, D. S. Barreto, L. S. Lourenço, and J. M. Penha. 2017. “The Efficacy of Clove Oil as an Anaesthetic and in Euthanasia Procedure for Small-Sized Tropical Fishes.”*Brazilian Journal of Biology = Revista Brasleira De Biologia* 77 (3): 444–50. https://doi.org/10.1590/1519-6984.15015.

Fish Passage Technical Working Group. 2011. “A Checklist for Fish Habitat Confirmation Prior to the Rehabilitation Fo a Stream Crossing.”https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/land-based-investment/forests-for-tomorrow/checklist-for-fish-habitat-confirmation-201112.pdf.

McPhail, J. D., and R Carveth. 1993. “Field Key to the Freshwater Fishes of British Columbia.”https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nr-laws-policy/risc/field_key_to_freshwater_fishes_of_bc_field_size_water_resistant_version.pdf.

Ministry of Environment. 2011. “Field Assessment for Determining Fish Passage Status of Closed Bottom Structures.” BC Ministry of Environment (MoE). https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/land-based-investment/forests-for-tomorrow/field-assessment-for-determining-fish-passage-status-of-cbs.pdf.