Rationale for sampling is to inform fish presence/absence and species composition/density as part of habitat confirmations to prioritize fish passage restoration at barrier culverts as per the Fish Passage Technical Working Group Phase 2 protocol (<https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/land-based-investment/investment-categories/fish-passage>). Some of the background planning for this work is summarized in a 2016 report located at <http://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=50900>. Maps are at <https://hillcrestgeo.ca/outgoing/fishpassage/projects/elk/> . Project is part of an initiative for fish passage restoration activities to benefit westslope cutthrout trout in the Elk River watershed group currently led by the Canadian Wildlife Federation.

Presence/absence of fish, species composition/density and distribution limits can be useful for prioritizing which crossings are a best fit for fish passage restoration and help inform follow up monitoring. Sampling is proposed at a portion of the 10 or so sites we will be performing habitat confirmations at this fall. The current list of candidate streams is extensive and will be narrowed down to under in the next week through modeling, ongoing communications with First Nations, FLNR, Canadian Wildlife Federation and stakeholders.

It is unlikely that sampling will be conducted at more than 5 of the streams listed in the sampling location tables however until the sites are visited in the field it is difficult to determine if the sampling will be beneficial to inform the prioritization and monitoring. Sampling methodologies will be dependent on the site, fish species suspected, type of habitat encountered and ongoing communications with numerous stakeholders but may include minnowtrapping, electrofishing and dipnetting upstream and downstream of barrier culvert locations.

Please note that the sampling will be completed before October 30, 2020 however the period is listed as Dec 31, 2020 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 and submitted to the Province as per the permit conditions before 90 days has expired.

I have attached an excel file with a complete list of potential sites, details and potential fish species encountered. Myself (Allan Irvine, R.P.Bio.) and Kyle Prince, P.Biol will be conducted potentially most of the fieldwork however Nupqu Development Corp staff (Mark Fjeld, Dominique Nicholas and Natalie Morrison) may also be conducting assessments. Please don’t hesitate to contact me if you have any questions or concerns at [al@newgraphenvironment.com](mailto:al@newgraphenvironment.com) 2507771518.

Reading layer `irvine\_columbia\_2016' from data source `C:\Users\allan\OneDrive\New\_Graph\Current\2020-025\_cwf\_elk\scripts\Elk\_Fish\_Passage\_Planning\gis\elk\_planning\_2020.gpkg' using driver `GPKG'  
Simple feature collection with 16 features and 13 fields  
geometry type: POINT  
dimension: XY  
bbox: xmin: 633304 ymin: 5468176 xmax: 659211 ymax: 5506282  
projected CRS: NAD83 / UTM zone 11N

Table 1: Potential sampling site stream details.

| MoE\_region | pscis\_model\_combined\_id | pscis\_stream\_crossing\_id | stream\_name | watershed\_code\_50k | watershed\_code\_20k | road\_name | easting\_11n | northing\_11n | uphab\_gross\_sub15 | upstr\_species | map\_50k | notes |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Kootenay | 4772 | 50249 | Trib to Michel Ck | 349-248100-393001-820000-000000-000000-000000 | 300.625474.584724.412090.177768.149055 | Spruce | 657517.0 | 5505182 | 0.00000 |  | 082G118 | Michel51 (PSCIS 50273) is downstream at 1.2 km at Hwy 3 Roberts Ck non-fish in model due to steep gradients at mouth - could be hwy fill though |
| Kootenay | 5229 | 62521 | Lizard Ck Trib | 349-248100-212002-250000-000000-000000-000000 | 300.625474.584724.233916.242980 | Mt. Fernie | 638000.0 | 5483390 | 2208.22271 |  | 082G113 | Great potential for replacement. NA |
| Kootenay | 6295 | 50185 | Morrissey Ck | 349-248100-139000-570000-000000-000000-000000 | 300.625474.584724.166401.036885 | Lodgepole Rd (5466 02) | 645674.0 | 5469026 | 1794.42295 |  | 082G108 | High value habitat located upstream at Morrisey02 (Grainger 2012). This crossing from VAST 2012 (PSCIS 50185) NA |
| Kootenay | 4657 | 50153 | Trib to Lizard Ck | 349-248100-212004-350000-000000-000000-000000 | 300.625474.584724.233916.441528 | Mt Fernie Park Rd | 636121.0 | 5484097 | 608.15437 |  | 082G113 | NA NA |
| Kootenay | 4656 | 62516 | Lizard Ck Trib | 349-248100-212004-350000-000000-000000-000000 | 300.625474.584724.233916.441528 | Mt. Fernie | 636137.0 | 5484091 | 619.31451 |  | 082G113 | Might be unassessed crossing located 60 m downstream. NA |
| Kootenay | 4552 | 50158 | Lizard Ck Trib | 349-248100-212006-080000-000000-000000-000000 | 300.625474.584724.233916.614769 | Mt. Fernie | 634163.0 | 5484538 | 41.43644 |  | 082G113 | Unassessed crossing located 0.4 km upstream. NA |
| Kootenay | 4514 | 102994 | Trib to Michel Ck | 349-248100-393003-750000-000000-000000-000000 | 300.625474.584724.412090.361097 | Wheeler N Rd | 659211.0 | 5499658 | 0.00000 |  | 082G119 | Also Michel18 or PCSIS 50240 (Grainger 2012). HGI is to upstream crossing barriers Michel21/23 (Grainger 2012). NA |
| Kootenay | 5174 | 50194 | Trib to Morrisey Ck |  | 300.625474.584724.166401.582365 | Morrisey (R08366 1) | 651245.0 | 5475072 | 0.00000 |  | 082G113 | One unassessed crossing 0.5 km upstream. NA |
| Kootenay | 4770 | 50273 | Robert Ck | 349-248100-393001-820000-000000-000000-000000 | 300.625474.584724.412090.177768 | Crowsnest Highway | 657682.0 | 5506282 | 79.00851 |  | 082G118 | HGI to Michel27. Roberts Ck non-fish in model due to steep gradients at mouth - could be hwy fill though |
| Kootenay | 5230 | 50152 | Trib to Lizard Ck | 349-248100-212002-250000-000000-000000-000000 | 300.625474.584724.233916.242980 | Mt Fernie Park Rd | 637987.0 | 5483407 | 2196.26774 |  | 082G113 | EB, BT and WCT known in mainstem NA |
| Kootenay | 5854 | 50159 | Trib to Lizard Ck | 349-248100-212000-000000-000000-000000-000000 | 300.625474.584724.233916.640417 | Mt Fernie Park Rd | 633304.0 | 5484606 | 1620.94189 | CRS,CT,RB,WCT | 082G113 | Stream is not mapped NA |
| Kootenay | 6297 | 50181 | Trib to Morrisy Ck e | 349-248100-139000-570000-000000-000000-000000 | 300.625474.584724.166401.036885.469824 | Lodgepole (5466 01) | 648294.0 | 5468176 | 0.00000 |  | 082G108 | Also MORRO074 (Vast 2012). Looks like very good potential NA |
| Kootenay | 4110 | 50198 | Trib to Morrisey Ck | 349-248100-139007-070000-000000-000000-000000 | 300.625474.584724.166401.673669 | Morrisey | 651593.0 | 5476509 | 0.00000 |  | 082G113 | High value step-pool habitat. One unassessed crossing upstream (200 m). Fairly steep system. looks good Morrisey21 just up the road |
| Kootenay | 4939 | 50195 | Trib to Morrisey Creek | 349-248100-139006-510000-000000-000000-000000 | 300.625474.584724.166401.616689 | Morrisey (R08366 1) | 651669.0 | 5475526 | 0.00000 |  | 082G113 | Fairly steep system NA |
| Kootenay | 4464 | 50199 | unnamed tributary to Morrisey Creek | 349-248100-139007-210000-000000-000000-000000 | 300.625474.584724.166401.685320 | Morrisey | 651693.0 | 5476730 | 0.00000 |  | 082G113 | Potential barrier based on fish bearing status of Morrissey Creek NA |
| Kootenay | 4653 | 50200 | unnamed tributary to Morrisey Creek | 349-248100-139007-450000-000000-000000-000000 | 300.625474.584724.166401.711911 | Morrisey spur | 651913.0 | 5477123 | 0.00000 |  | 082G113 | Good candidate for replacement. Dependant on fish bearing status for Morrissey Creek NA |
| Kootenay | 6152 | 50254 | unnamed tributary to Michel Creek | 349-248100-393000-000000-000000-000000-000000 | 300.625474.584724.412090.672587 | Corbin Hwy | 664878.0 | 5489762 | 58516.46482 | CT,CT/RB,EB,LNC,LSU,MW,SP,WCT,WSU | 082G114 | 3 culverts (1.2m diameter for each) Beaver pond on inlet. Hwy culvert below. NA |
| Kootenay | 5739 | 50261 | unnamed tributary to Michel Creek | 349-248100-393009-460000-000000-000000-000000 | 300.625474.584724.412090.940325 | Flathead | 669027.0 | 5481115 | 2826.59417 |  | 082G114 | 3x900mm CMPs, unknown fish presence NA |
| Kootenay | 5330 | 62499 | Unknown | 349-248100-483000-330032-000000-000000-000000 | 300.625474.584724.501797.033182.311246.264457 | Tributary to Line Creek | 659617.0 | 5528837 | 360.24658 | WCT | 082G124 | Road not in use. Some rearing habitat available. NA |
| Kootenay | 4655 | 103042 | Unknown | 349-248100-139007-450000-000000-000000-000000 | 300.625474.584724.166401.711911 | Unknown | 651799.0 | 5477448 | 0.00000 |  | 082G113 | Good candidate. NA |
| Kootenay | 5089 | 112353 | Unknown | 349-248100-393002-480066-000000-000000-000000 | 300.625474.584724.412090.240087.667860 | Alexander Rd | 664632.0 | 5516384 | 23.43818 |  | 082G119 | Culvert needs re-alignment NA |
| Kootenay | 17554 | NA |  | 349-248100-726000-000000-000000-000000-000000 | 300.625474.584724.738542 |  | 644657.0 | 5564913 | 1811.15676 | EB,WCT | 082J108 | NA NA |
| Kootenay | 17567 | NA |  | 349-248100-323000-000000-000000-000000-000000 | 300.625474.584724.342196 |  | 648371.3 | 5499555 | 8322.22918 | WCT | 082G118 | NA NA |
| Kootenay | 34025 | NA |  | 349-248100-488000-000000-000000-000000-000000 | 300.625474.584724.507380 |  | 651627.2 | 5528886 | 20387.35085 | BT,DV,RB,WCT | 082G123 | NA NA |
| Kootenay | 40886 | NA |  | 349-248100-159000-000000-000000-000000-000000 | 300.625474.584724.180931 |  | 643730.8 | 5471867 | 3248.35790 |  | 082G108 | NA NA |
| Kootenay | 40894 | NA |  | 349-248100-266000-000000-000000-000000-000000 | 300.625474.584724.287942 |  | 643568.1 | 5490341 | 10801.93209 | DV,EB,WCT | 082G113 | NA NA |
| Kootenay | 40931 | NA |  | 349-248100-431000-000000-000000-000000-000000 | 300.625474.584724.451535.232924 |  | 652354.9 | 5520234 | 14066.89049 | EB | 082G123 | NA NA |
| Kootenay | 94439 | NA |  | 349-248100-460000-000000-000000-000000-000000 | 300.625474.584724.478727.698691 |  | 660483.9 | 5524256 | 1952.03571 | RB,WCT | 082G124 | NA NA |
| Kootenay | 127165 | NA |  |  | 300.625474.584724.218710 |  | 641013.0 | 5479285 | 7050.13936 |  | 082G113 | NA NA |
| Kootenay | 127535 | NA |  | 349-248100-658000-000000-000000-000000-000000 | 300.625474.584724.672966 |  | 646742.0 | 5554529 | 5102.94930 |  | 082J103 | NA NA |
| Kootenay | 127536 | NA |  | 349-248100-693000-000000-000000-000000-000000 | 300.625474.584724.711904.088567 |  | 643583.0 | 5560088 | 6069.74955 |  | 082J103 | NA NA |
| Kootenay | 234681 | NA |  | 349-248100-510000-000000-000000-000000-000000 | 300.625474.584724.529811 |  | 650152.0 | 5532051 | 15417.24544 |  | 082G123 | NA NA |
| Kootenay | 234688 | NA |  | 349-248100-132000-000000-000000-000000-000000 | 300.625474.584724.157128 |  | 644312.9 | 5467413 | 1014.85440 |  | 082G108 | NA NA |

Table 2: Fish species potentially encountered in Elk River watershed according to fisheries inventory summary records.

| Scientific Name | Species Name | Species Code |
| --- | --- | --- |
| Catostomus catostomus | Longnose Sucker | LSU |
| Catostomus commersoni | White Sucker | WSU |
| Catostomus macrocheilus | Largescale Sucker | CSU |
| Family: Salmonidae | Cutthroat Trout | CT |
| Oncorhynchus clarki clarki x Oncorhynchus mykiss | Cutthroat/Rainbow cross | CRS |
| Oncorhynchus clarki lewisi | Westslope (Yellowstone) Cutthroat Trout | WCT |
| Oncorhynchus mykiss | Rainbow Trout | RB |
| Oncorhynchus nerka | Kokanee | KO |
| Oncorhynchus sp | Fish are either RB or CT, but suspect they are CT | CT/RB |
| Prosopium williamsoni | Mountain Whitefish | MW |
| Ptychocheilus oregonensis | Northern Pikeminnow | NSC |
| Rhynichthys cataractae | Longnose Dace | LNC |
| Richardsonius balteatus | Redside Shiner | RSC |
| Salvelinus confluentus | Bull Trout | BT |
| Salvelinus fontinalis | Brook Trout | EB |
| Salvelinus malma | Dolly Varden | DV |
| - | No Mussels Found | NMF |