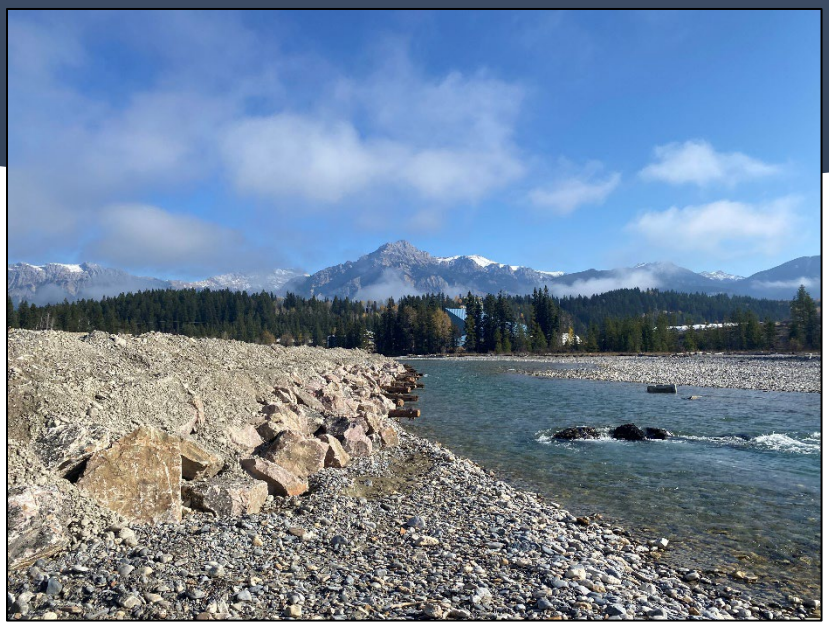
2021

North Columbia Bull Trout Population Monitoring– 2021 Final Report



PROJECT COL-F22-F-3544

PREPARED FOR: FISH AND WILDLIFE COMPENSATION PROGRAM

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Executive Summary

The North Columbia Bull Trout Population Monitoring project development was focused on creating a collaborative, community-based project focused on the Bluewater, Waitabit and Blaeberry Rivers. Through reviewing methods for bull trout population monitoring in similar systems in the region and engaging regional land managers, First Nations and community groups, Trout Unlimited – Golden, worked towards FWCP priority action COLRRA.SOI.SB.21.01 Focal and Inventory species projects for species at risk-P2. Work that occurred under this project funding identified suitable methodology for bull trout population monitoring, developed a proposal for the next phases of project funding and developed a working group to foster the shared goal of bull trout amongst regional interest groups. Future work will refine project methodology, explore avenues for on the ground community engagement in the project and continue to secure funding for the next phase of the project.

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Introduction

The seed funding provided by the FWCP for the development of the North Columbia Bull Trout Population Monitoring Project was intended to: identify suitable methods for population monitoring and develop a collaborative atmosphere with First Nations, government and non-government organisations for the future of our regions bull trout *(Salvelinus confluentus).* This project was spearheaded by the Trout Unlimited (TU) Golden Chapter with the intention of working towards FWCP Priority action COLRRA.SOI.SB.21.01 Focal and Inventory species projects for species at risk-P2.

Bull trout are not only a culturally important species, they are an indicator of stream health and are provincially blue listed. Baseline population data for bull trout is lacking in much of the North Columbia system. With the increases in anthropogenic activities in the region, pressures of global climate change increasing and the popularity of bull trout fishing increasing locally (Dave Burns Pers. Comm) getting a baseline of bull trout populations in these systems close to the town of Golden is becoming more and more pertinent.

TU's efforts have been successful in working towards the goals of project development and collaboration among interested stakeholders. Project proposals were submitted to FWCP and to the Habitat Conservation Trust Fund for survey work in the 2022 field season using research and consulting with professionals under the COL-F22-F-3544 funding. A North Columbia Bull Trout Working Group was established in 2021 with various stakeholders with the intention of building a collaborative atmosphere, sharing project plans and exploring areas of asset or funding sharing. This working group has been slow to develop given Covid-19 restrictions but a spring 2022 meeting is planned to discuss plans for the upcoming field season and funding needs.

The proposals submitted by TU for future survey funding and details on the Upper Columbia Bull trout Working Group are discussed further in this document.

Goals and Objectives

The goal of this project development was to develop a collaborative bull trout population monitoring program in the North Columbia. The objective to support this goal were to:

- Determine suitable methodology for bull trout population monitoring and create a proposal for future phases of the project; and
- Develop a collaborative community around bull trout conservation.

The long-term objectives of this project are multi faceted. This project plans on:

- Bringing community together to raise awareness of bull trout to the forefront;
- Gathering baseline data to determine the stability of local bull trout populations; and
- Identifying areas for potential habitat improvements or enhancement.

These long-term objectives will assist in creating a more community-based desire for bull trout conservation through engagement in data collection and education. Collecting a baseline of bull trout population data will help understand the stability of population in these streams as anthropogenic in fluences, be it development or bull trout harvest, increase with the times. Knowing populations trends will help managers know if and when management decisions are needed. Also, in the long-term, having

a baseline of these population will help understand larger impacts to the systems such as climate change. The on the ground involvement in this project will help to identify areas that have been impacted by anthropogenic activities or areas that could use some improvements to better support activities such as bull trout spawning. In all, this project is aimed to raise the profile of the North Columbia bull trout to ensure that this species has a place in our streams into the future.

Study Area

This project focused on known bull trout streams in the North Columbia, the Bluewater, Waitabit and Blaeberry Rivers. These streams are located in the traditional territories of the Ktunaxa and Secwépmec peoples. The streams of interest for this project are located north of Golden BC on the Rocky Mountain (East) side of the Rocky Mountain Trench. Figure 1 shows the location of the streams of interest in relation to Golden and Donald. All of the streams of interest are glacier influenced systems with headwaters deep in glaciated valleys with varying levels of anthropogenic influence.

The selection of these tributaries for this project involves numerous factors including, anthropogenic influences, popularity for anglers and proximity to the Town of Golden.

These streams have differing levels of anthropogenic influence allowing for a contrast when comparing population trends across the systems. The Bluewater (furthest north) has been heavily logged in the past, with a deactivated road the reaches nearly to the start of the system. The Waitabit (middle river) is the least influenced stream in the group with no access roads or logging in the valley. The Blaeberry is the most impacted system with an abundance of residential development in the lower reaches and an active forest service road that reaches into its headwaters. All of these systems are similar in their nature as glacial influenced streams.

Sport and sustenance fishing has been on the increase in the Golden area, as has been observed by the TU Board. This increase is concerning as the bull trout is a blue listed species and harvest is still permitted in the region. These streams have a range of fishing activity as a result of their access, the Bluewater is accessible mainly in the lower reaches, the Waitibit is accessible at its confluence with the Columbia and the Blaeberry is accessible from confluence nearly to its origin. The comparison and contrast of these streams will help in identifying pressures to the over all bull trout population be it fluvial or adfluvial.

The proximity of these systems to the Town of Golden makes them attractive for monitoring compared to other major tributaries to the North Columbia such as the Bush, Sullivan or Kinbasket Rivers. These closer streams are much more financially feasible for inventory, likely experience much higher angler pressure and are generally more convenient for creating a scenario of general community involvement in project activities.

Figure 1: Overview map of project area emphasising the streams of interest for bull trout population monitoring.

Bluewater

The Bluewater joins the Columbia River just north of Donald BC and flows from the northwest being initiated in the Campbell Icefields of the Rocky Mountains (Figure 2). A road has been constructed well into the Bluewater valley for timber extraction but has recently been reclaimed eliminating ground access options to the upper valley. Access to the lower 6km, prior to the confluence with the Columbia River, is relatively easy with a number of different road segments. There is a canyon section of the river above 6km with some falls that could be a potential barrier to fish passage, however; provincial map layers indicate that kokanee have been observed above these falls so passage by bull trout is likely. The target survey length is approximately 39km with an estimation of the length to what is likely to be suitable spawning habitat.

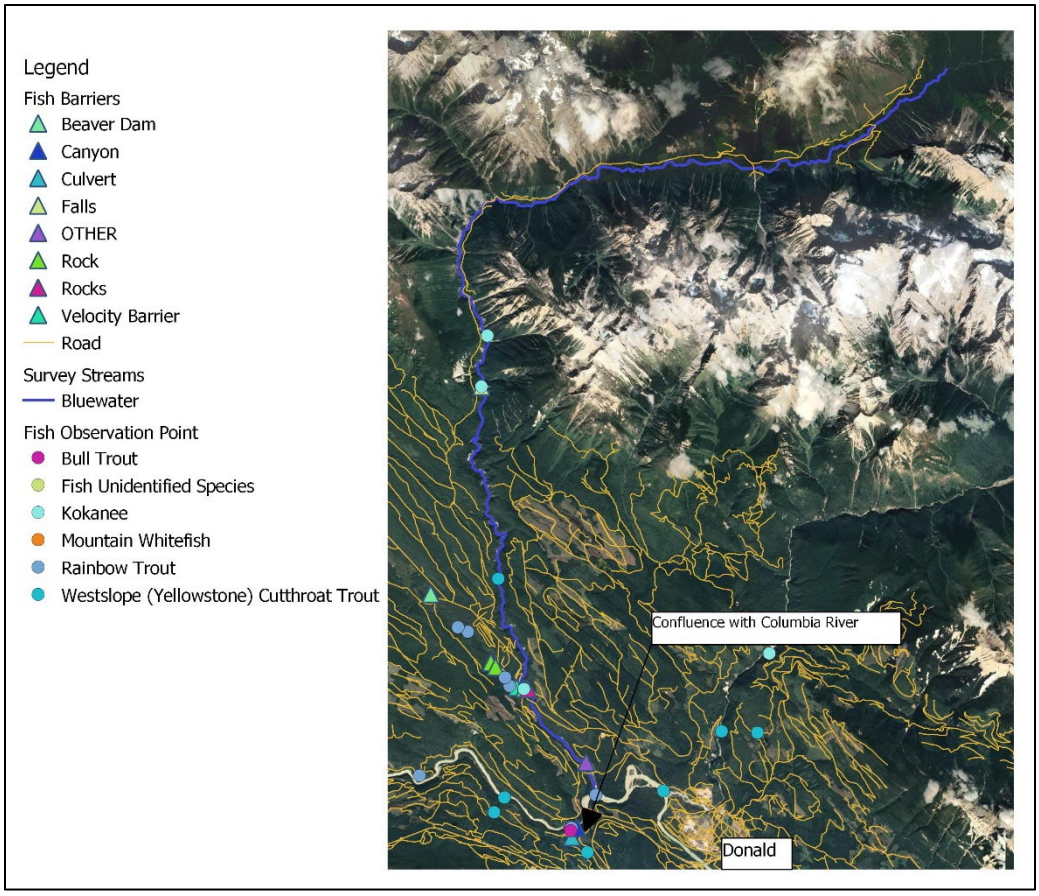

Figure 2: Map showing Bluewater River, fish observations, fish barriers and roads.

Waitabit

This 28km long stream is fed by the Freshfield Icefield, in the Rocky Mountains, to the northwest of its confluence with the Columbia River (Figure 3). This system is largely untouched by resource extraction activities, recreational users and is generally quite wild. The Waitabit joins the Columbia River just north of Donald and south of the Bluewater. Road access to this river is limited to the lower reaches up to 4.5 km upstream of the Columbia confluence and is surrounded canyons and dense forest for the majority of its flow. The Waitabit provides a good control to detect changes in the greater landscape (Northern Columbia) verses changes in individual systems, particularly in relation to intensive land uses that contribute to habitat degradation, as the Waitibit has had much less anthropogenic influence than the other streams targeted in this project.

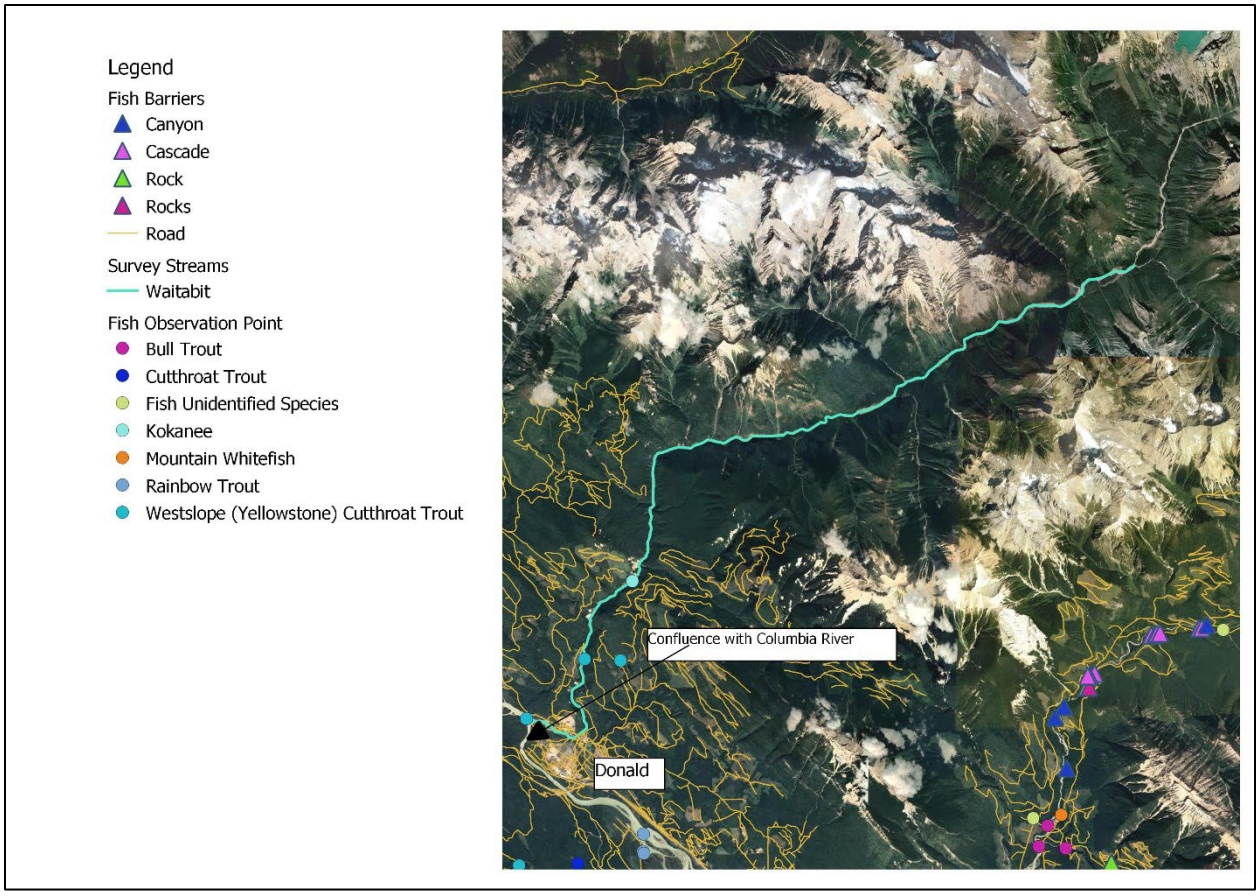

Figure 3: Waitabit Creek, fish observations and roads in relation to Donald and the Columbia River confluence.

Blaeberry

The targeted 57 km long section of the Blaeberry River starts its flow in Howse Pass at the border of Banff National Park and Alberta. Flow is built in this system by multiple glacier fed streams including Mummary Creek, Collie Creek and Wildcat Creek. The upper catchment basin of the Blaeberry is highly developed with resource roads and has a long history of forest and mineral extraction. The popularity of recreational use is also increasing with popular destinations such as Thompson Falls and the Mummary Glacier. The lower reaches are surrounded by rapidly expanding subdivisions that are transitioning large rural acreages into smaller properties. A large waterfall (Thompson Falls) separates the lower reaches of the Blaeberry (20km) (Figure 4) and the upper reaches (37km) (Figure 5). Provincial mapping layers and local knowledge support the occurrence of a population of bull trout on the upstream side of this fish barrier. Surveys will be split by the lower and upper reaches of the Blaeberry and with the assumption that this fluvial population in the upper reaches is unique and disconnected from the larger system. The Blaeberry catchment area is the most anthropogenically impacted system in the proposed project area.

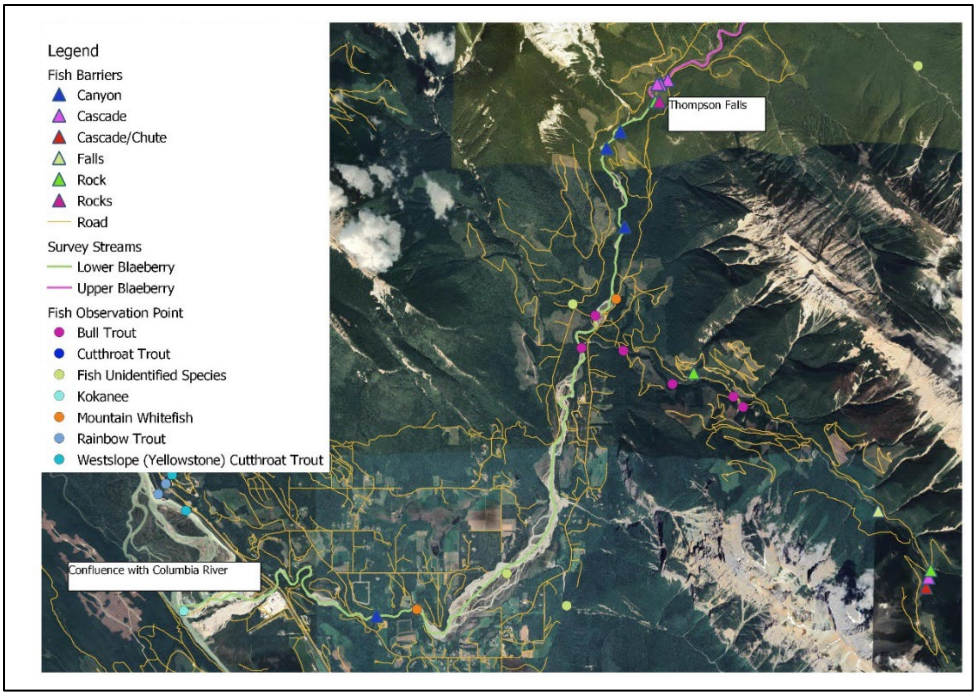

Figure 4: Lower Blaeberry, road locations, fish observation points and potential fish barriers in relation to the confluence with the Columbia River and Thompson Falls.

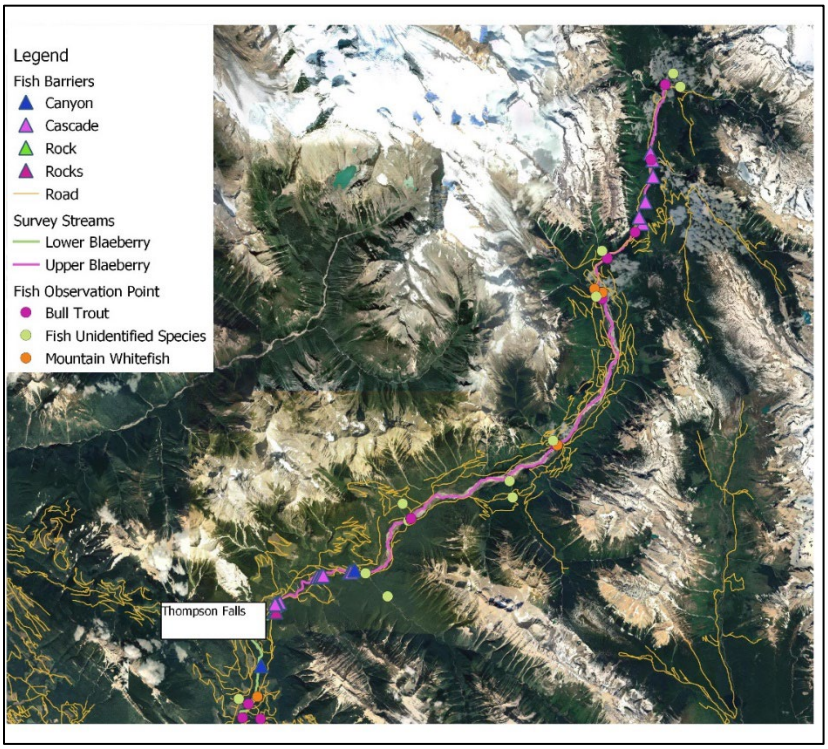

Figure 5: Upper Blaeberry River, fish observation points, access roads and potential fish barriers in relation to Thompson Falls.

Methods

A review was completed of bull trout population surveys conducted in the region looking for commonly used methods in comparable river systems. In addition to reviewing previous works in the region, provincial biologists were contacted to discuss needs and benefits of bull trout population monitoring in the North Columbia. Methods for surveying for population monitoring were also discussed with provincial staff. In the process of contacting representatives from the regional First Nations, Provincial biologists and NGO representatives the idea of forming a working group to focus on bull trout conservation was hatched.

Methods for surveying bull trout populations were reviewed with the surveying for redds being the most commonly used method for similar systems. Surveying for redds requires clear water to view the stream substrate where bull trout construct their redds, which can be a challenge in glacial fed systems like the Bluewater, Waitabit and Blaeberry Rivers. Redd survey programs were reviewed from works conducted on the Kaslo River and Keen Creek (Andrusak, 2007), tributaries to Kootenay Lake (Baxter & Street, 2020), Slocan Lake tributaries (Baxter & Irvine, 2017), Arrow Lake tributaries (Decker & Hagen, 2008) and Williston Lake tributaries (Putt et al., 2018).

Decker & Hagen (2008) and Baxter & Street (2020) surveyed glacial fed tributaries in their programs (Illecillewaet and Incomappleaux Rivers – Arrow Lakes - and Hammil Creek – Kootenay Lake). With Decker and Hagen (2008) suggesting that "*glacial fed systems could readily be surveyed*" given surveys were timed following the subsiding of glacial influence on the stream near the end of spawning season. An additional consideration for conducting redd surveys on glacial fed systems is ensuring that high water events that can redistribute bedload and deposit sediment do not obscure recent redds (Baxter & Street, 2020; Decker & Hagen, 2008). Given the remote nature and canyon character of the Bluewater and Waitabit rivers, large portions of these streams will require helicopter-based surveys methods, where large portions of the Blaeberry are readily accessed and could be surveyed on foot. A consideration in moving forward with redd surveys should be that the window that survey conditions are ideal (low water with minimal turbidity) may be limited, multiple crews and helicopters may be the best option to quickly cover survey areas while favorable conditions exist.

Standard methods for conducting redd surveys, as outlined in all of the reviewed work, is completed by two observers walking parallel to the stream commencing at a migration barrier proceeding to the confluence of the stream with the major system. In the case of these streams, the lower boundary would be the Columbia River. Locations are likely present, especially in the Blaeberry River below Thompson Falls, where river depth may make observation of redds impossible. Areas with deep constricted flows like this will likely require the use of snorkel and mask to accurately count redds. An initial survey of these streams will assist in identifying areas where specialized redd count methods such as these are needed.

Bull trout are a highly temperature sensitive species and thus are highly impacted by increases in stream temperature that can be a result of anthropogenic activities (Dunham, Rieman, & Chandler, 2003) or possibly even climate change. The glacial influence of these streams will likely keep the temperature favorable for bull trout use but as glaciers recede and global temperatures increase, a baseline of temperature trends could be useful for determining or predicting irreparable changes in these systems.

TU has sought out input from regional professionals, provincial biologists, regional First Nations and NGO's. While developing this project, it became apparent that having separate conversations with all parties was inefficient when it came to building a collaborative atmosphere for regional bull trout conversation. Following conversation with Jon Bissett (Shuswap Indian Band/Columbia Wetlands Stewardship Partners) the idea of the North Columbia Bull Trout Working Group was developed to help fulfill this project objective of community project collaboration.

Results and Outcomes

The work undertook by TU on this project brought the goal of conducting a collaborative bull trout population monitoring program closer to reality. Methodology suitable of estimating bull trout use in the streams has been identified with proposals being submitted to progress into a first year of data collection. Table 1 summarizes the streams and stream lengths identified for redd surveys. The development of the North Columbia Bull Trout Working Group (NCBTWG) is the pinnacle for this project. Having a collaborative atmosphere where land managers, First Nations and NGOs can work towards the common goal of bull trout conservation will be very productive in ensuring projects occur in the region with meaningful community involvement.

Table 1: Summary of streams targeted for bull trout redd surveys.

Gazetted name	Reach	Watershed Code	Length	Fish Barriers
Bluewater Creek	Whole River	300-894200	39 km	Falls noted as an obstruction, KO noted above falls.
Waitabit Creek	Whole River	300-895300	28 km	No known barriers
Blaeberry River	Lower – Confluence with Columbia River to Thompson Falls	300-902100	20 km	Thompson Falls – Upstream Barrier
Blaeberry River	Upper – Thompson Falls to Wildcat Creek	300-902100	37 km	No noted barriers, know occurrences of bull trout above Thompson falls.

Invitations for involvement in the NCBTWG have been forwarded to the Columbia Wetlands Stewardship Partners, Shuswap Indian Band, Ktunaxa Nation Council, Provincial Ministry of Forests Lands Natural Resource Operations and Rural Development, the Lake Windermere Rod and Gun Club, and the Golden District Rod and Gun Club. The goal of this project is to discuss project ideas and explore avenues of collaboration and shared interest for the benefit of regional bull trout populations. Currently, this working group has planned to meet on a quarterly basis but as projects develop, involvement and meetings will likely increase in frequency.

The long-term goals of this project are essentially for generating a community of bull trout conservation through raising awareness of issues that make bull trout a blue listed species and generally raising the profile of the species locally. Involving the collective communities, be it NGO, FN or the

general angling public, through project involvement and public education is expected to lead to more public awareness and appreciation for bull trout. This public involvement portion of the project has hopes to generate interest and develop local champions that will carry on a legacy of bull trout conservation work into the future. Having this project develop and getting more inventory and data collection on the ground will aid in identifying areas that could be enhanced to increase access to smaller tributaries or enhanced to improve spawning or rearing conditions. The on the ground work will in the inventory stage will help identify issues that could be the focus of future habitat enhancement work for the long-term conservation of the bull trout in the North Columbia system.

Recommendations

TU will continue to work with the members of the NCBTWG to further develop this bull trout population monitoring project. Avenues that require further development include the breakdown of stream reaches requiring specialized survey methods, like snorkel surveys, areas that can be adequately surveyed on foot and areas requiring helicopter access. Further quantifying these areas will help develop a more accurate budget for future survey years. Among the NCBTWG, TU can continue to look for areas of First Nation involvement with on the ground survey activities as the project evolves.

TU will continue working to secure funding for the development and continuation of this project.

The installation of water temperature and turbidity monitoring devices could be helpful in establishing a baseline temperature for these streams and predicting when water conditions are ideal for redd surveys in these glacial systems.

Acknowledgements

Advise, support and direction has been given for this project from Dave Burns of Trout Unlimited Golden. Will Warnock and Jeff Burrows from MFLONROD provided insight into population monitoring needs and gaps for the region. Jon Bissett supported with a wealth of knowledge of the area and fisheries work in general. David Hubbard of the Lake Windermere Rod and Gun Club, Chad Parent of the Golden District Rod and Gun Club supported through commitments to the NCBTWG. The cover photo is of recent streambank restoration work completed on the Blaeberry River (B.Gustafson).

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