

Environment and Climate Change Canada
Canada Nature Fund: Community-Nominated Places for Species-At-Risk

Kootenay Connect: Bonanza Biodiversity Corridor

YR 3 Annual Progress Report

April 2021 – Mar 2022

Kootenay Connect is a project facilitated by Kootenay Conservation Program

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1 Bonanza Projects Summary

1.1 Project Milestones

Bonanza projects covers the expansion of our existing biodiversity knowledge to further develop and identify conservation values in the BBC, along with a series of wetland restorations¹ in the Bonanza Biodiversity Corridor (BBC). This expanded biodiversity and landscape level assessment included SARS, Beaver Habitat and Old Growth field studies, identifying and mapping the key ecological processes and values in the corridor in Year 3. Based upon this elevated knowledge base and with the completion of the three wetland restorations, a draft BBC Conservation Management framework and plan has been developed to guide future requirements for ongoing conservation management in the BBC.

Wetland Restorations: Wetland restorations works were completed for the Upper Bonanza and Summit Lake Marsh in the fall of 2021. We were able conduct Year 1 of post-implementation monitoring for Hunter Siding². Permitting delays for in-stream work impacted construction schedules, materials and machinery availability. Despite these challenges, all in-stream construction work was completed within the S.11 WSA timeline of October 31, 2021. Site specific monitoring programs were developed for both of these sites. Complete details of these Year 3 construction works and the environmental monitoring steps are provided in the Post-Construction Reports for Summit and Upper Bonanza Marsh.

There are two minor items that remain outstanding due to the onset of winter conditions and the inability to complete these tasks in the fall of 2021. These outstanding items are: final inspection of pedestrian walkways and planting of 10 saplings at the Upper Bonanza access route. SLSS will ensure that these outstanding tasks are completed in Year 4.

Biodiversity, Beavers and Species-at-Risk: Datasets from previous field work, environmental assessments and confirmed species inventories have been updated with the data collected throughout this 3-year project (2019 to 2021). This expansion of our baseline biodiversity knowledge for the BBC includes upslope field work to capture an improved understanding of the biodiversity thru the various watershed layers of the BBC landscape. Efforts in Year 3 were focussed on correlating and evaluating this data and information and compiled to deliver the appropriate GIS mapping layers and identification of critical conservation values. The resultant Terrestrial Ecosystem Maps (TEM) is a major milestone towards the conservation and protection, while providing the much-needed knowledge baseline for landscape-level planning. Maps provide a visual perspective of confirmed knowledge needed for strategic decision making for preserving the BBC's biodiversity, its ecological processes and its ability to adapt to climate change.

Ecosystem mapping layers delivered for the BBC are as follows:

- Species-at-Risk / Sensitive Habitats
- Beaver Habitats
- Old Growth / Mature Stands

Climate Change Impacts: The proposed work plan for Year 3 did initially include a high-level climate vulnerability assessment for the BBC. However, due to resource scheduling challenges we encountered in the fall 2021, we have deferred this analysis to Year 4. In the interim, the DRAFT BBC Conservation Management Plan includes a synopsis of the expected climate changes and trajectory for the BBC based on accepted climate forecasting models.

¹ Sites are in the riparian zones of Bonanza Creek are Hunter Siding, Summit Lake and Upper Bonanza marshes.

² Complete detail of the monitoring program and results are provided in the Monitoring and Adaptive Management report.

BBC Conservation Management Plan (BBC CMP): As a key drainage and wildlife corridor within the Slocan Watershed, the BBC warrants an appropriate level of conservation management to retain that landscape connectivity, its ecosystem and biodiversity values, particularly in the face of climate change. Current and past BBC conservation work has provided us with an opportunity to draft a BBC watershed management framework. This framework has been developed and crafted to collectively bringing together key aspects that need to be addressed in the long run and the protection of the conservation values that have been identified for the BBC (re: BBC Conservation Value Assessment report). The BBC CMP framework will be fully developed for implementation in Year 4 that includes collaboration and ratification with all land stewards, regulatory stakeholders and various conservation entities that have a vested interest in retaining and protecting the BBC’s biodiversity.

1.2 Project Reporting

Deliverables for Year 3 represent summary reporting for all three project years (2019-2022). A BBC 6-minute project video has been created to capture all project results, providing a visual view of the on-the-ground restoration works and showcasing the unique biodiversity of the BBC. Results, conclusions and landscape mapping of this work permitted the project team to develop a DRAFT BBC Conservation Management Plan as a separate management report. Project reports delivered for Year 3 are:

Biodiversity/SARs, Habitats & Old Growth (Reports and Maps)

- BBC Conservation Value Assessment
- Beaver Habitat Assessment
- Primary BBC Ecosystem Maps:
 - BBC Conservation Values
 - Beaver Habitat
 - Old Growth
 - Sensitive ecosystems

Wetland Restorations (Reports):

- Restoration Monitoring & Adaptive Management (Post-Project Site-Specific Plans)
- Summit Lake Marsh – Post-Construction Report
- Upper Bonanza Marsh - Post-Construction Report
- Pre-Construction Checklist (Summit and Upper Bonanza)

BBC Conservation Management (Report):

- DRAFT BBC Conservation Management Plan

2 Accomplishments by Project

2.1 Hunter Siding Monitoring

The Hunter Siding restoration site implementation was completed in October 2020 and the first year of post-implementation monitoring was completed. The majority of the 1,600 saplings planted in 2020, successfully survived the winter season, the average survivability rate between all three planting sites was 83%. This high success in survivability (despite having unprecedented heat and drought) was partially due to high moisture content in the soil at the site. Given the success rate, an additional 150 cottonwoods were planted in 2021, demonstrating how the monitoring works in conjunction with adaptive management at the site. Complete Hunter Siding results are provided in the *Monitoring and Adaptive Management* report.

2.2 Summit Lake Marsh Restoration

The Summit Lake Marsh restoration focussed on enhancing surface flow and related hydro scenarios for a small stretch of deteriorated rail bed that was impacting Western Toad migrations and potential fish passage. Permit approval from FLNRORD was considerably delayed in 2021 and not issued until October 8, 2021. Despite a deluge of rain throughout the construction period, all in-stream work was completed before the permit closure date of October 31, 2021. Complete details of the restoration works are provided in the *Summit Lake Marsh Post-Construction Report*, including a visual presentation of construction and restoration results. Given the close proximity of some of the beaver dams to the project site, precautions will be taken to minimize any impact on beaver activity and dams. Sedimentation mitigation and species protection during the construction period were taken. Upon completion of the restoration works, site specific plans were developed (see further details *Monitoring and Adaptive Management*). As managers of the newly-designated non-motorized recreational trail that runs through the Summit Lake Marsh, the Rosebery-Bonanza-Summit Trail Alliance has assumed accountability approach completion and ongoing maintenance of the pedestrian walkway.

2.3 Upper Bonanza Restoration

The Upper Bonanza wetland complex has been found to be rich with water, life and biodiversity, including extensive beaver habitat (lodges, dams and larders). This Upper Bonanza restoration focussed on enhancing the quality of rearing Rainbow Trout habitat through placement of woody debris features in several mainstem sections, re-aligning water flows through the construction of swales and some reconnection of valley bottom areas that have been hydraulically isolated from the creek. Complete details of the restoration works are provided in the *Upper Bonanza Post-Construction Report*, including a Before and after visuals of Bonanza Creek mainstem sections. Mitigation strategies and protection of sensitive habitats/species were deployed during the construction period. Upon completion of the restoration works, site specific monitoring plans were ratified for ongoing effectiveness evaluation of this site (see further details *Monitoring and Adaptive Management*).

2.4 Beaver Habitats

The final *Beaver Habitat Assessment* report is the result of 3 years of field work, research and digital monitoring of beaver activity and habitat structures in the BBC valley bottom. There is no question there is significant beaver activity, providing natural channelling and throughout the corridor. The active beaver population in the corridor is estimated to be 45 beavers from 9 individual colonies. Beaver habitat maps were produced for the corridor identifying lodges, dams, larders and historical beaver habitats. Details, maps and further beaver observations are provided in the *Beaver Habitat Assessment* report.

2.5 Biodiversity and Species-at-Risk

The BBC is known as a biodiversity hot spot and an active wildlife corridor, with a diverse and ever-expanding list of species confirmed and many more species in the corridor still to be confirmed. Updated tables as a result of In Year 3 of the Biodiversity/SAR surveys are presented below, adding several species and taxa from Year 2 observations. Complete details, maps, species and SAR listings are provided in the BBC Conservation Values report.

Species Identified³ for the Bonanza Biodiversity Corridor

Lifeform	No. of Taxa
Amphibian	4
Annelid	1
Benthic Invertebrate	102
Bird	160
Fish	16
Fungus	258
Lichen	81
Mammal	45
Mollusc	22
Myxomycete	64
Plant	567
Reptile	4
Terrestrial Arthropod	100
Total	1,425

Conservation Ranking of Confirmed Species in the BBC

BC List	No. of taxa	COSEWIC	No. of taxa	SARA	No. of taxa
Red	5	Endangered	5	Endangered	4
Blue	55	Threatened	8	Threatened	7
Yellow	11	Special Concern	21	Special Concern	15
		Not at Risk	3		

³ Includes higher-level classifications for observations that have not been identified to species and some species identification may not have been verified.

3 Monitoring Program(s)

As the restoration projects build in biodiversity knowledge and site-specific restoration works are implemented, a monitoring program have been developed for each restoration site. This multi-site monitoring program includes specific measures and tests to be conducted and evaluated have been established for post-implementation monitoring in Year 4 and subsequent years. The complete set of monitoring plans and results for the Hunter Siding restoration site are provided in the Bonanza Wetlands Enhancement Project *Monitoring and Adaptive Management* report.