Progress Towards the Implementation of the Recovery Strategy for the

Bull Trout (Saskatchewan-Nelson Rivers populations)

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For copies of the recovery documents, or for additional information on species at risk, including Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status reports, and other related documents, please visit the Species at Risk Public Registry.

Cover photo: Photo by Jeremy Stewart

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Preface

The *Species at Risk Act* (S.C. 2002, c.29) (SARA) requires the competent minister(s) to monitor and report on the implementation of recovery documents (that is, recovery strategies, action plans, and management plans) for species at risk. These reports must describe the progress made towards the species' recovery or conservation[1].

The Minister of Fisheries is the competent minister for aquatic species at risk. The minister responsible for the Parks Canada Agency is the competent minister for aquatic species at risk that are found in their jurisdiction. Fisheries and Oceans Canada (DFO) and Parks Canada (PC) have jointly prepared this progress report.

Reporting on the progress toward implementing the recovery strategy includes the collective efforts of the competent ministers, provincial and territorial governments, and all other parties involved in carrying out actions that contribute to the species' recovery.

As stated in the preamble to SARA, success in the recovery of species at risk depends on the commitment and cooperation of many contributors, and will not be achieved by DFO and PC, or any other jurisdiction, alone. All Canadians are invited to join in supporting and implementing the recovery strategy, for the benefit of the species and Canadian society as a whole.

Acknowledgements

The progress report was prepared by regional recovery planners within DFO. The progress toward species recovery described in this report would not have been achieved without the partnerships and contributions of many individuals and organizations.

Executive summary

This report summarizes the progress made by DFO, PC and their partners towards implementing the recovery strategy plan for the Bull Trout (*Salvelinus confluentus*), Saskatchewan-Nelson Rivers populations, between 2020 and 2025.

For more information on the contents of this document, please contact the Species at Risk Program (dfo.ncrsara-leprcn@dfo-mpo.gc.ca).

[1]"Recovery" applies to species listed under SARA as threatened, endangered or extirpated, which require a recovery strategy and one or more action plan(s). "Conservation" applies to species listed under SARA as special concern, which require a management plan.

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1. Bull Trout (*Salvelinus confluentus*) Saskatchewan-Nelson Rivers Populations

THREATENED

Credit: Jeremy Stewart

Fisheries and Oceans Canada (DFO), Parks Canada (PC) and their partners have made progress towards the implementation of the research and management activities identified in the Recovery Strategy for the Bull Trout (*Salvelinus confluentus*), Saskatchewan-Nelson Rivers populations, in Canada, through the actions undertaken between September 2020 and March 2025, to support the recovery of the Bull Trout, Saskatchewan-Nelson Rivers populations. The recovery strategy provides detailed information on the species, its threats, its needs, the recovery goal, the identification of critical habitat, broad strategies, and research and management activities.

This progress report is part of a series of documents for this species that should be taken into consideration together, including the recovery strategy. Refer to the Bull Trout, Saskatchewan-Nelson Rivers populations species profile on the Species at Risk Public Registry for more information and related documents.

1.1 Progress towards meeting the recovery goal for the Bull Trout, Saskatchewan-Nelson Rivers populations

Population and distribution objectives (recovery goal) establishes, to the extent possible, the number of individuals and/or populations, and their geographic areas of distribution, that are necessary for the recovery of the species. The long-term recovery goal for the Bull Trout, Saskatchewan-Nelson Rivers populations is to:

- protect, maintain and recover Bull Trout to self-sustaining populations where recovery is likely, within the recovery area

Four broad strategies were identified in the recovery strategy to meet the recovery goal for the Bull Trout, Saskatchewan-Nelson Rivers populations. During the reporting period, recovery actions were undertaken by DFO, PC and their partners under each broad strategy. Some key achievements are described below.

Broad strategy 1: research

- To study the Bull Trout genetics, researchers initially used a specialized panel based on single nucleotide polymorphisms (SNPs). In 2022, development began on a more advanced “restriction site-associated DNA” (RAD) capture panel in collaboration with the University of Montana
- Genetic testing shows that Bull Trout populations in several eastern slope watersheds have occasionally hybridized with the Brook Trout (*Salvelinus fontinalis*) but remain

mostly genetically distinct. While instances of mixing were detected, they appear to be rare, highlighting the importance of local conservation efforts (Franks 2024)
- A new technique tested in Kananaskis, Alberta placed fertilized Bull Trout eggs in protective capsules within streams. Over 70% survived to early life stages, although freezing temperatures posed a major challenge (Lepine 2024)
- A recent study showed that Bull Trout sperm and eggs (both field- and lab-fertilized) can be transported over long distances, more than 1,300 km, with high survival and fertilization rates, supporting more flexible and remote restoration strategies (Kissinger et al. 2025)
- Surveys found the Bull Trout scarce in the Upper Little Red Deer River and in poor condition in Pinto Lake, where non-native fish remain a concern
- Lab studies show the Bull Trout are highly sensitive to warm water. Larvae struggle to survive above 12°C, and juveniles face stress and increased mortality at 15°C, now considered their upper thermal limit. Their ideal temperature range is between 9°C and 12°C (Maldonado 2025; Best et al. 2025; Lazaro-Cote et al. in prep)
- In 2023, fish surveys at 79 sites across 4 Alberta watersheds found Bull Trout in the Elk and Nordegg areas, with the highest numbers in Nordegg. Genetic testing showed no signs of mixing with Brook Trout. These results will inform fish sustainability metrics, management actions and planning for Bull Trout recovery actions
- A decision-support framework was developed to guide conservation translocations by evaluating ecological risks and benefits (DFO 2023)

Broad strategy 2: monitoring and habitat assessment

- A variety of tools and techniques are being used to monitor the Bull Trout and assess habitat. These include electrofishing, redd surveys, and tagging fish with passive integrated transponder devices to follow their movements. Environmental DNA (eDNA) sampling has been used to detect fish presence from water samples. To understand overall ecosystem health, researchers collect aquatic insects using the Canadian Aquatic Biomonitoring Network (CABIN) protocol and analyze water chemistry for pollutants. Remote trail cameras and drones are used to observe human activity, fish passage, and how well restoration efforts are working. Finally, habitat assessments, including surveys of streambanks, erosion, vegetation, and land use, help guide future restoration work and ensure long-term success. Projects have been carried out through partnerships among government, Indigenous Nations and communities, non-government organizations (NGOs), and landowners
- Ongoing monitoring is being conducted across several watersheds, with a focus on sites where reclamation or recovery actions have been implemented. Some populations have shown limited or uncertain recovery, whereas surveys in Pinto Lake found a decline in the number of young Bull Trout in the outlet stream. Efforts are underway to reduce non-native fish in the area, which compete with the Bull Trout for food and may prey on their young
- In Rocky Creek, 31 stream crossings were stabilized using bioengineered sediment control structures, off-highway vehicle (OHV) trails were decommissioned to restrict access, and native vegetation was planted to reduce erosion. Following these actions, predicted system capacity rose to 52%, likely moving from a very high risk fish sustainability index (FSI) to high risk FSI. Field monitoring showed that mature Bull Trout

catch rates nearly tripled, while immature catch rates more than quadrupled (MacPherson et al. 2024)
- In Fall Creek 54 stream crossings were reclaimed, motorized access was restricted, and habitat was restored along 11 km of trail. From 2018 to 2022, monitoring showed encouraging increases in Bull Trout catch rates, suggesting positive impacts from the reclamation, though longer-term monitoring and additional upstream restoration may be needed to fully support population recovery (Government of Alberta 2024)
- In Radiant Creek fencing, planting, and log structures were installed to improve habitat. Monitoring highlighted both successes and challenges like drought and low fish densities
- An assessment was completed for the Ram River watershed, which tracked the Bull Trout spawning trends and habitat changes over 3 years. Data informed land-use planning and recovery actions
- In 2022 and 2023 data was collected in the Upper McLeod River watershed to examine the influence of the riparian zone on water temperature. Streams with more intact riparian cover (such as Anderson Creek) consistently maintained cooler summer temperatures, making them more suitable as thermal refugia for the Bull Trout. In contrast, streams with less riparian cover or more exposure (like McPherson and Watson Creeks) were more likely to exceed critical temperature thresholds (Caskenette et al. 2025). Monitoring of riparian zones can be used to inform a model for refined classification of critical habitat
- Stream temperature sensors have been installed and monitored, and advanced stream temperature modeling is being used to identify areas with suitable thermal conditions for the Bull Trout and to guide restoration

Broad strategy 3: management and regulatory actions

- A strategic compliance plan is being developed to ensure compliance with SARA by clarifying roles, improving inter-agency coordination, and promoting proactive prevention and consistent enforcement to address threats to native trout species
- Cumulative effects models identified 4 major threats, stream fragmentation, sedimentation, angling mortality, and hybridization with non-native trout, affecting Bull Trout populations
- A novel modelling framework applied in Rocky Creek showed that reducing sediment and angling pressures significantly improved Bull Trout capacity and catch rates, supporting data-driven recovery planning
- A state of fish and fish habitat report was developed for Alberta's east slopes, including metrics, classification schemes, and science advice to address knowledge gaps that can be used to inform recovery planning for Bull Trout
- A stream temperature model for the Upper Oldman River is being developed to simulate temperature patterns across sub-basins, identify thermal refugia for Bull Trout, and assess risks from landcover and climate disturbances
- Multi-stakeholder initiatives like the Alberta Native Trout Collaborative (NTC) coordinated recovery actions, land use planning, and public education for Bull Trout
- Programs like the Watercourse Crossing Program (WCP) and high-resolution stream mapping support regulatory compliance and strategic restoration planning for Bull Trout habitat

Broad strategy 4: outreach and education

- Numerous campaigns, workshops, fairs, and online content (social media, blogs, videos) were used to raise awareness about Bull Trout, their threats, and conservation actions. This included signage, identification tags, factsheets, and interactive events like angling fairs and stewardship days
- A coordinated communications plan for at-risk native trout, was developed for the NTC to unify messaging across organizations, targeting diverse audiences (anglers, OHV users, landowners) through tailored materials and engagement strategies
- Digital and print media for at-risk native trout, including Bull Trout, was shared via social media, websites, newsletters, and guidebooks, including a widely anticipated Watercourse Crossing Guidebook and educational videos on fish-friendly infrastructure
- Native trout workshops, CABIN training, and restoration events for Bull Trout habitat provided hands-on learning and volunteer opportunities, with strong participation from conservation groups, professionals, and the public
- Programs like the edible bioengineering model program and pop-up education stations engaged youth and local communities in understanding and protecting Bull Trout habitats

Achievement of the recovery goal is evaluated using performance indicators. Table 1 provides an overview of the status of performance indicators as of the end of the reporting period. Performance indicators that were partially met or not met are discussed in the “Knowledge gaps and future priorities” section below.

Table 1: Status of performance indicators for Bull Trout, Saskatchewan-Nelson Rivers populations for the period 2020 to 2025.

Performance indicator	Status[2]
An increase in the number of Bull Trout in Designatable Unit (DU) 4[3], especially in core and potential core populations.	Not met
No decrease in the range or number of populations.	Partially met, underway
Continued identification, refinement, and description of critical habitat (until it is believed that all has been identified), making protection of the habitat more effective for the species.	Partially met, underway
Assessment of biological characteristics indicating good overall health of Bull Trout (for example, body growth, reproductive health, lack of disease).	Partially met, underway

[2] **Met**: the performance indicator has been met and no further action is required
Met, ongoing: the performance indicator has been met, but efforts will continue until such time the population is considered to be recovered.
Not met: the performance indicator has not been met, and little to no progress has been made
Partially met, underway: the performance indicator has not been met, but there has been moderate to significant progress made
[3] Bull Trout in the Saskatchewan-Nelson Rivers populations is also referred as DU 4.

Performance indicator	Status[2]
Identification and monitoring of all existing, new or emerging human threats, and natural limiting factors, their overall effects on the population determined and, where possible, mitigated due to best practices or legislation to lessen their effect on Bull Trout in DU 4.	Partially met, underway

1.2 Actions supporting the identification of critical habitat

Critical habitat for the Bull Trout, Saskatchewan-Nelson Rivers populations was identified in the recovery strategy to the extent possible, using the best available information. Critical habitat provides the features and attributes necessary to support the species' life-cycle functions and achievement of the species' population and distribution objectives. Legal protection of critical habitat for the Bull Trout, Saskatchewan-Nelson Rivers populations was achieved on March 31, 2021 through the making of a Critical Habitat Order. In addition, a Critical Habitat Description for the Bull Trout, Saskatchewan-Nelson Rivers populations was published on December 5, 2020 identifying the critical habitat protected under one of the Acts described in SARA section 58(2).

The recovery strategy includes a schedule of studies outlining 7 studies required to identify new critical habitat. Table 2 provides an overview of the current status of these studies.

Table 2: Status of the implementation of the schedule of studies for Bull Trout, Saskatchewan-Nelson Rivers populations for the period 2020 to 2025.

Study	Timeline	Status
Studies to identify lake and reservoir critical habitat.	2030	Not started
Studies to determine the width of riparian zone necessary to be protected as critical habitat.	Ongoing to 2030	In progress
Studies to better understand the thresholds of tolerance to disturbance and destruction from human activities.	Ongoing to 2030	In progress
Studies to develop an improved water temperature model using the most current knowledge and techniques.	Ongoing to 2030	In progress
Studies to develop Bull Trout water temperature thresholds that are appropriate to use with the best available water temperature models.	Ongoing to 2030	In progress
Studies to understand the distribution and habitat use of Bull Trout within a watershed, particularly in watersheds that are data deficient.	Ongoing to 2030	In progress
Studies to identify life history use (migration corridors, overwintering and rearing) of Bull Trout, including, but not limited to, zones outside of the modelled thermally suitable zone.	Ongoing to 2030	In progress

1.3 Key gaps and future priorities for the Bull Trout, Saskatchewan-Nelson populations

To support the recovery of Bull Trout (Saskatchewan-Nelson Rivers populations), continued use of tools like cumulative effects models, habitat vulnerability assessments, and expanded genetic studies is essential. A translocation framework tailored to Bull Trout is needed to guide site selection, and stream temperature monitoring should be expanded in high-value areas to improve model accuracy under climate change. Key data gaps remain, including ongoing population monitoring, spawning areas, sediment sources, and fish passage barriers. Angling pressure and the impact of non-native trout are poorly understood, complicating management. Recovery efforts should prioritize increasing Bull Trout numbers in core and potential core areas, maintaining population monitoring to detect declines, identifying and mitigating emerging threats, and advancing studies to identify critical habitat.

2. Concluding statement

During the reporting period, progress was made toward implementing the management activities identified in the recovery strategy for the Bull Trout, Saskatchewan-Nelson Rivers populations.

DFO remains committed to the recovery of all aquatic species at risk. The work that has been initiated and completed to date has built a strong foundation for the continued management of the Bull Trout, Saskatchewan-Nelson Rivers populations. DFO, PC and its partners will continue to work towards the achievement of the recovery goal for Bull Trout, Saskatchewan-Nelson Rivers populations, and welcome the participation of additional partners.

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