

Progress Towards the Implementation of the
Recovery Strategy for the
Rainbow Trout (*Oncorhynchus mykiss*)
Athabasca River Populations
for the Period 2020 to 2025



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

Cover photo: Photo by Eddie Noton, Fisheries and Oceans Canada.

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Preface

The *Species at Risk Act* (S.C. 2002, c.29) (SARA) requires the competent ministers 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 conservation¹.

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

Reporting on the progress toward implementing recovery documents includes reporting on 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 or conservation.

As stated in the preamble to SARA, success in the recovery and conservation 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 documents, for the benefit of the species and Canadian society as a whole.

Acknowledgements

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

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.

Executive summary

This report summarizes the progress made by Fisheries and Oceans Canada and its partners towards implementing the recovery strategy for the Rainbow Trout, Athabasca River populations, during the period 2020 to 2025. For more information on the contents of this document, please contact the Species at Risk Program (dfo.ncrsara-leprcn@dfo-mpo.gc.ca).

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1 Rainbow Trout (*Oncorhynchus mykiss*), Athabasca River populations

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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 Rainbow Trout \(*Oncorhynchus mykiss*\) in Canada \(Athabasca River populations\)](#)”, through the actions undertaken between September 2020 and May 2025, to support the recovery of the Rainbow Trout, Athabasca River populations. The recovery strategy provides detailed information on the species, its threats, its needs, population and distribution objectives, the identification of critical habitat, broad strategies to be taken toward recovery, and research and management activities.



Credit: Clayton James, Fisheries and Oceans Canada

This progress report on the implementation of the recovery strategy is part of a series of documents for this species that should be taken into consideration together, including the recovery strategy. Refer to the [Rainbow Trout, Athabasca River populations](#) species profile on the [Species at Risk Public Registry](#) for more information and related documents.

1.1 Progress towards meeting the population and distribution objective for the Rainbow Trout, Athabasca River populations

The population and distribution objectives establish, to the extent possible, the number of individuals and/or populations, and their geographic distribution, that is necessary for the recovery of the species. The population and distribution objective for the Rainbow Trout, Athabasca River populations (hereafter, Athabasca Rainbow Trout) is to:

“Protect, maintain and enhance self-sustaining, native populations of Athabasca Rainbow Trout within the Athabasca River drainage, which will allow for sustainable use.”

To assist with the long-term recovery goal, specific objectives were developed for a 5 year timeframe. The first 5 years’ objectives are to:

“Increase the number of Athabasca Rainbow Trout populations to self-sustaining levels, and increase the number of pure strain (that is, core) populations. This will be achieved, while maintaining or increasing population size, by improving habitat quality, connectivity, and reducing impacts of competition and genetic introgression from non-native fish species in current Athabasca Rainbow Trout range.”

Four broad strategies were identified in the recovery strategy to meet the population and distribution objectives for the Athabasca Rainbow Trout. 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: stewardship and education

- Signage, guidebooks, digital media, interactive story maps, school programs, and stakeholder workshops have been implemented to raise awareness of Athabasca Rainbow Trout conservation, promote riparian health, and support regulatory compliance and invasive species prevention

Broad strategy 2: population assessment, monitoring and research

- Surveys and monitoring by Alberta Conservation Association from 2021 to 2023 confirmed widespread presence of Athabasca Rainbow Trout in the Upper McLeod River and the Wildhay River watersheds ([Spence et al. 2023](#); [Lebedynski 2024](#))
- Surveys were conducted in tributaries of the Athabasca River watershed in the Hinton area by Freshwater Conservation Canada in 2023 and in the Tri-Creeks watershed by the Government of Alberta in 2020 and 2024 to assess Athabasca Rainbow Trout distribution and genetic status
- DFO conducted research to compare Athabasca Rainbow Trout movement between disturbed versus undisturbed waterbodies to develop a species distribution model. Movement was compared among: Athabasca Rainbow Trout and Brook Trout; different Athabasca Rainbow Trout life history forms; upstream and downstream movement in response to temperature; and ice-off and spawning periods
- The upper thermal tolerance of Athabasca Rainbow Trout was studied ([Hnytka et al. 2025](#)). Athabasca Rainbow Trout show physiological flexibility in tolerating warmer water but limited behavioral adaptability, indicating a potentially lower resilience to sublethal effects associated with increasing stream temperature due to climate change
- Studies were conducted to assess the impact of environmental pressure on Athabasca Rainbow Trout, such as interactions with Brook Trout, barriers to movement, cumulative effects, angling pressure, and thermal tolerance to fill information gaps for management and recovery

Broad strategy 3: habitat assessment and monitoring

- DFO assessed multiple habitat parameters to help identify suitable habitat for both juvenile and adult Athabasca Rainbow Trout, as well as migrant versus resident life history types
- In the Upper Athabasca drainage, passive integrated transponder tagging is being used to evaluate whether long culverts act as movement barriers
- Sampling and advanced stream temperature modelling guided habitat restoration and potential refinement of critical habitat for Athabasca Rainbow Trout. These activities included habitat surveys in the Wildhay River and the Upper McLeod River watersheds to monitor stream temperature during summer months ([Spence et al. 2023](#); [Lebedynski 2024](#); [Caskenette et al. 2025](#))
- A collaborative stream temperature monitoring network is being led by fRI Research and supported by various partners. The network collected existing and new water temperature data from various locations across Alberta's East Slopes to support the development of spatial statistical stream network models that predict stream temperatures in areas with limited data

Broad strategy 4: management and regulatory actions

- Between 2020 and 2025, efforts to support regulatory compliance and strategic restoration planning included the development of a strategic compliance plan, a tactical plan, a state of fish and fish habitat report (Dey et al. 2023), coordination with multi-stakeholder initiatives such as the Alberta Native Trout Collaborative (NTC), implementation of programs such as the Watercourse Crossing Program, and high-resolution light detection and ranging (LiDAR) stream mapping such as that conducted by fRI Research
- A study assessed the impacts of contaminants from coal mine operations on Athabasca Rainbow Trout. The study observed dietary shifts, likely to compensate for the loss of nutritionally valuable food sources, in response to a coal mine spill in Apetowun Creek. The study recommended updating industrial monitoring programs to include both baseline and ongoing aquatic food web data collection to understand future catastrophic disturbance events ([Medinski et al. 2022](#))
- Watercraft inspection stations, campaigns (such as “Clean, Drain, Dry your gear”, “Don’t Let It Loose”), and infographics were developed by federal and provincial governments to prevent aquatic invasive species from entering Alberta’s waterbodies ([Government of Alberta 2025](#)).
- Data collected through SARA permits were archived by DFO and shared with the Government of Alberta to support recovery
- Complementary efforts included science workshops on trout recovery and threats, and engagement with First Nations and Métis communities/organizations, and stakeholders to identify fish habitat restoration priorities, which inform a decision-support mapping tool for conservation and recovery planning

Achievement of the population and distribution objective 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 “Key gaps and future priorities” section below.

Table 1: Status of performance indicators for Rainbow Trout, Athabasca River populations (Athabasca Rainbow Trout) for the period 2020 to 2025.

Performance indicator	Status ²	Description of progress
An overall increase in the number of Athabasca Rainbow Trout populations that are genetically determined to be core populations	Partially met, underway	The sampling conducted during the reporting period showed Rainbow Trout were the most abundant salmonid species captured and the most widely distributed fish species in the Upper McLeod River watershed between 2021 to 2022 and in the Wildhay River watersheds between 2022 to 2023 (Spence et al. 2023 ; Lebedynski 2024). Genetic analysis to determine core populations of sampled streams is underway (see below).
An increase in the number of Athabasca Rainbow Trout populations that are free of competition from invasive or non-native species such as Brook Trout	Partially met, underway	Studies on the effects of introduced Brook Trout on Athabasca Rainbow Trout are completed or underway; the resulting effects on Athabasca Rainbow Trout populations are not yet determined.
A decline in all existing human threats and their effects on populations of Athabasca Rainbow Trout whether through mitigation or overall reduction due to best practices or legislation	Partially met, underway	Cumulative effect considerations were integrated into fish habitat decision-making through new guidance documents, risk assessments, and mapping tools (Hodgson et al. 2022 ; Fisheries and Oceans Canada [DFO] 2022). The Government of Alberta's cumulative effects model identified 4 major threats affecting Athabasca Rainbow Trout populations: sedimentation, stream fragmentation, hybridization with non-native trout, and angling mortality. The Alberta Native Trout Collaborative (NTC) and partners advanced native trout recovery through cumulative effects analysis, genetic analysis, watershed assessments, the development of a tactical plan for the Athabasca River basin, and habitat restoration (NTC 2024).

² **Partially met, underway:** the performance indicator has not been met, but there has been moderate to significant progress made

Not met: the performance indicator has not been met, and little to no progress has been made

Performance indicator	Status ²	Description of progress
An increase in the identification and refinement of the description of critical habitat that will make protection of the habitat more effective and meaningful to the species	Partially met, underway	Thermal tolerances of Athabasca Rainbow Trout were studied, and coupled with stream temperature monitoring, provided data on temperature-suitable streams that supported potential refinement of critical habitat for Athabasca Rainbow Trout.
An increase in the distribution and the number of Athabasca Rainbow Trout populations whether through introductions into new areas, re-introduction into formerly populated areas, or discovery of new populations	Not met	Not met, as the genetic analysis study on genetically pure Athabasca Rainbow Trout is ongoing. As a result, no actions have been taken to introduce or re-introduce populations of Athabasca Rainbow Trout into new or formerly populated areas, respectively.

1.2 Actions supporting the identification of critical habitat

Critical habitat for the Athabasca Rainbow Trout 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 Athabasca Rainbow Trout was achieved on March 31, 2021 through the making of a Critical Habitat Order. In addition, a Critical Habitat Description for the Athabasca Rainbow Trout was published on March 5, 2021 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 3 studies that could inform refinement of existing critical habitat and identification of 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 Rainbow Trout, Athabasca River populations (Athabasca Rainbow Trout) for the period 2020 to 2025.

Study	Timeline	Status ³	Description of progress
Studies to identify and describe life history, movement and habitat use by life-stage (including quality of habitats), including improvement of understanding and delineation of critical habitat	2020 to 2025	In progress	Fisheries and Oceans Canada (DFO) developed a species distribution model for Athabasca Rainbow Trout to characterize movement in adults and juveniles, thereby providing an evaluation of the habitat requirements of populations with differing life histories. Habitat suitability was assessed based on both information from the model and movement data at study sites with a range of habitat parameters and high susceptibility to warming to help identify suitable habitat for both juvenile and adult trout.
Determine if the life history parameters for river migrant fish are different than stream resident life history parameters (for example, survival rates, growth)	2020 to 2025	In progress	The species distribution model and habitat assessment study by DFO collected information on stream residents and river migrants, thereby improving knowledge of differences in life history parameters.

³ In progress: the planned study is underway and has not concluded

Study	Timeline	Status ³	Description of progress
Studies to identify suitable habitats and determine feasibility for recovering genetically pure Athabasca Rainbow Trout (outside current areas occupied by pure-strain populations)	Ongoing	In progress	Water temperature data has been collected to identify potential cold-water habitat suitable for the Alberta at-risk native trout species. DFO developed a decision support framework to guide the conservation translocation decisions for the <i>Species at Risk</i> Act (SARA)-listed freshwater fishes and mussels as a recovery tool. This framework will inform the recovery potential of genetically pure Athabasca Rainbow Trout and future decisions on applying translocation as a recovery tool for Athabasca Rainbow Trout (DFO 2023).

1.3 Key gaps and future priorities for the Rainbow Trout, Athabasca River populations

Through the development of this report, key areas were identified where continued efforts will support the recovery of Athabasca Rainbow Trout, including:

- continue surveys to determine or confirm genetic status
- study population status, life history (including differences between stream resident and river migrant fish), spawning areas, and overwintering habitat
- identify and reduce key threats by watershed
- identify and assess areas suitable for restoration and reintroduction, and identify source populations
- reduce hybridization and control non-native fish populations
- study riparian habitat and tolerance thresholds to human disturbance
- strengthen Indigenous, public, and stakeholder engagement for stewardship and awareness

2 Concluding statement

During the reporting period, progress was made toward implementing the research and management activities identified in the recovery strategy for the Rainbow Trout, Athabasca River populations. Overall, moderate progress has been made toward meeting the population and distribution objective, with some performance indicators showing progress, though none have yet been fully met. DFO remains committed to the recovery of all aquatic species at risk. The work that has been initiated and completed to date represents an important step in that direction. DFO, PC, and their partners will continue to work towards the achievement of the population and distribution objectives for aquatic species at risk, and welcome the participation of additional partners.

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