Report on the Progress Towards the Implementation of the Action Plan for the:

# Carmine Shiner (*Notropis percobromus*)

for the Period 2019 to 2024



2026

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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 reports, and other related documents, please visit the Species at Risk Public Registry.

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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. Fisheries and Oceans Canada (DFO) has prepared this document.

Reporting on the progress toward implementing recovery documents includes reporting on the collective efforts of the competent minister(s), 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, 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

This document was prepared by DFO recovery planners. The progress toward species recovery 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 (DFO) and its partners towards implementing the action plan for the Carmine Shiner during the period 2019 to 2024. During the reporting period, DFO made progress towards several of the recovery measures identified in the action plan for the species, with 4 recovery measures being completed and 11 ongoing.

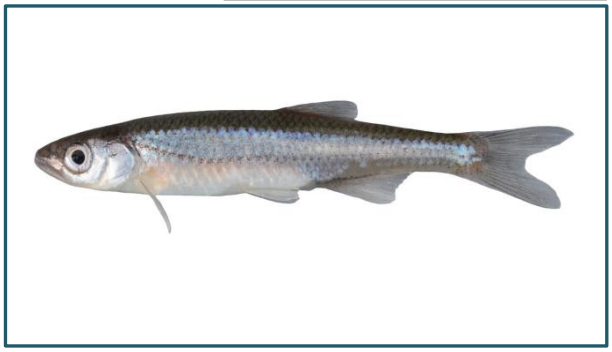
For more information on the contents of this document, please contact the Species at Risk Program (dfo.ncrsara-leprcn.mpo@dfo-mpo.gc.ca).

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# 1 Introduction

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Credit: D. Watkinson, Fisheries and Oceans Canada, Winnipeg

Fisheries and Oceans Canada (DFO) and its partners have made progress towards the implementation of the recovery measures identified in the "Action Plan for the Carmine Shiner (*Notropis percobromus*) in Canada", through the actions undertaken between January 2019 and December 2024, to support the recovery of the Carmine Shiner. The action plan outlines recovery measures to address the threats to the species and achieve its population and distribution objectives. It also evaluates the costs and benefits of implementing those measures. When the action plan was published in 2018, the Carmine Shiner was listed as threatened under Schedule 1 of SARA. In 2020, the status of the species was changed to endangered.

This progress report on implementation of the action plan is part of a series of documents for this species that should be taken into consideration together, including the action plan. Refer to the Carmine Shiner species profile on the Species at Risk Public Registry for more information and related documents.

# 2 Progress towards implementing recovery measures for the Carmine Shiner

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. For the Carmine Shiner, these objectives are to:

- maintain Carmine Shiner populations at their current abundance and within their present distribution within the Whitemouth, Birch, and Winnipeg River systems
- identify and protect the critical habitat of the Carmine Shiner

Three broad strategies were identified in the recovery strategy to address the threats to the species. The action plan for Carmine Shiner then established 17 recovery measures to implement these broad strategies and help meet the population and distribution objectives for the species. Progress made towards the completion of these measures by DFO and its partners during the reporting period is described below. Recovery measures that require further action are further discussed in the 'Key gaps and future priorities' section below.

**Table 1: Status of recovery measures under broad strategy 1: Research and monitoring for Carmine Shiner for the period 2019 to 2024.**

| Table (T) # - Recovery measure (RM) #[2] | Recovery measure | Status[3] | Description of progress |
|---|---|---|---|
| T1 – RM1 | Collect samples of Carmine Shiner and describe life history characteristics such as longevity, fecundity, size at age, age at maturity, diet, etc., and describe the associated habitat for each life history stage (juvenile, adult, etc.). | Ongoing | In July 2021, DFO sampled Carmine Shiner that exhibited a bimodal size distribution during summer, with young-of-the-year having fork lengths ≤30 mm and age 1+ individuals having fork lengths >30 mm (Watkinson et al. 2026).<br><br>In July 2021, mature individuals were observed releasing gametes throughout the sampling period, indicating that spawning occurred during mid-summer (Watkinson et al. 2026).<br><br>Stomach content analysis of Carmine Shiner from the Birch River revealed a diverse array of terrestrial and aquatic invertebrates, but there were no substantial differences between year classes and no clear temporal trends in diet composition (Enders et al. 2020). |
| T1 – RM2 | Survey areas adjacent to the known distribution in the Birch River to | Ongoing | In 2021, DFO sampled for Carmine Shiner within its known range as well as at 3 sites outside of its known range. Carmine Shiners were not captured at any sites adjacent to |

[2] Recovery measures are numbered based on the numbering system used in the action plan. As a result, recovery measures may appear out of order in tables due to the separation by broad strategy. "T" indicates which table of the action plan the recovery measure is from (T1: Measures to be undertaken by Fisheries and Oceans Canada; T2: Measures to be undertaken collaboratively between Fisheries and Oceans Canada and its partners; T3: Measures that represent opportunities for other jurisdictions, organizations or individuals to lead).

[3] **Completed**: the recovery measure has been completed, and no further action is required
**In progress**: the recovery measure has a specified end date, and progress has been made, but it has not been completed
**Ongoing**: the recovery measure has no specified end date or metric for completion; efforts will continue until such time the population is considered to be recovered (for example, population monitoring) or it is no longer feasible to continue
**Not started**: no progress has been made on the recovery measure
**Cancelled**: The recovery measure is no longer moving forward as it is no longer necessary for the species' recovery, or due to other limitations

| Table (T) # - Recovery measure (RM) #[2] | Recovery measure | Status[3] | Description of progress |
|---|---|---|---|
| | determine species presence and identify critical habitat. | | its known range in the Boggy River or Peterson Creek, but 3 Carmine Shiners were captured at a new location at McArthur Falls in the Winnipeg River. The individuals captured at McArthur Falls likely do not indicate an expansion of the range of the species, but a previously unsampled population (Watkinson et al. 2026). |
| T2 - RM1 | Survey the Peterson Creek area and Upper Pinawa Channel to determine if Carmine Shiner is present. Work done under the umbrella of the Canada – Manitoba Fisheries Advisory Committee agreement to engage in cooperative science. | | An environmental DNA (eDNA) sampling protocol developed to complement traditional sampling showed broadly consistent results with historical capture records in the Whitemouth River and Birch River (2019 and 2020), while no Carmine Shiner eDNA was detected at Peterson Creek, Bird River, and Lee River during the same period, despite previous captures at those sites (Khan et al. 2025). |
| T2 - RM2 | Develop laboratory techniques for environmental DNA analyses for Carmine Shiner and test for presence of Carmine Shiner in areas adjacent to the known species distribution. | | eDNA surveys conducted in 2023 and 2024 to assess the presence of Carmine Shiner in Rice Creek, an area adjacent to its known distribution, did not detect any Carmine Shiner eDNA (Docker, unpublished data). |
| T1 - RM3 | Perform laboratory experiments to determine the thermal preference of Carmine Shiner and relate | Completed | Study on thermal preferences of Carmine Shiner completed in 2013, before the reporting period. |

| Table (T) # - Recovery measure (RM) #[2] | Recovery measure | Status[3] | Description of progress |
|---|---|---|---|
| | it to oxygen concentration in the water. | | |
| T1 - RM4 | Develop a general computer model to predict habitat requirements for Carmine Shiner under conditions of climate change. | Completed | Study published in 2017, before the reporting period. |
| T1 - RM5 | Perform laboratory experiments to analyze the standard and activity metabolic rate of the Carmine Shiner over a range of water temperatures and dissolved oxygen concentrations. Acquired information will be applied in a bioenergetics habitat model to predict how Carmine Shiner populations will react to natural and anthropogenic flow and climate changes, and help identify potential habitat. | Completed | The standard metabolic rate for Carmine Shiner was measured under natural thermal conditions and significantly increased with both body mass and water temperature, indicating that the fitness of individuals may be compromised by increased water temperatures (Macnaughton et al. 2019). |
| T1 - RM6 | Collect samples of Carmine Shiner and | Ongoing | In 2021, DFO collected and measured 2,786 Carmine Shiner individuals within its known distribution and at one |

| Table (T) # - Recovery measure (RM) #[2] | Recovery measure | Status[3] | Description of progress |
|---|---|---|---|
| | describe population biological characteristics such as age and length distribution, relative abundance, etc. | | site in the Winnipeg River that had not been previously sampled.<br><br>Catch per unit effort (CPUE) at Birch River sites in July 2021 was significantly higher than in 2011; however, factors such as lower water levels and reduced depth in 2021 likely increased catchability. Despite the difference in sampling conditions, the substantially higher CPUE (an order of magnitude higher than in 2011) suggests that Carmine Shiner abundance may have been higher in 2021 compared to 2011 (Watkinson et al. 2026).<br><br>Fork lengths of captured fish ranged from 15 to 68 mm (mean = 41.7 mm). The size of Carmine Shiner captured in 2021 suggested that most fish were age 1+; however, the appearance of young-of-the-year individuals later in the sampling suggested that sampling later in the fall may have led to increased numbers of the young-of-the-year being captured as they became large enough to be captured in the sampling gear (Watkinson et al. 2026). |
| T1 - RM7 | Survey areas inhabited by Carmine Shiner and describe habitat characteristics such as water temperature, water oxygen concentration, velocity, depth, conductivity, substrate, etc. | Ongoing | During sampling in 2021, DFO recorded habitat use information for Carmine Shiner, including water temperature, velocity, depth, conductivity, and substrate (Watkinson et al. 2026). |

| Table (T) # - Recovery measure (RM) #[2] | Recovery measure | Status[3] | Description of progress |
|---|---|---|---|
| T2 - RM3 | Development of a predictive model of Carmine Shiner occurrence based on the integration of macro-level landscape analysis with species specific biological information.<br><br>Work done under the umbrella of the Canada – Manitoba Fisheries Advisory Committee agreement to engage in cooperative science. | Completed | Model developed in 2015, before the reporting period. |

**Table 2: Status of recovery measures under broad strategy 2: Management and regulatory actions for Carmine Shiner for the period 2019 to 2024.**

| Table (T) #- Recovery measure (RM) #[4] | Recovery measure | Status[5] | Description of progress |
|---|---|---|---|
| T2 - RM4 | Preserve and archive samples and scientific data on Carmine Shiner. | Ongoing | During field sampling in 2021, DFO retained 1 representative voucher specimen of Carmine Shiner from each access point; these specimens were preserved to confirm their identification in the laboratory and were stored at the Freshwater Institute (Watkinson et al. 2026).<br><br>DFO stores and publishes Carmine Shiner population and distribution records on the Canadian Aquatic Species at Risk web map. |
| T2 - RM5 | Conduct instream flow and environmental assessment programs. This includes the review of large water withdrawal requests in particular, but also other regulated development projects (for | Ongoing | Monitoring will continue when applicable. No large-scale industrial water withdrawals occurred within Carmine Shiner's known distribution during the reporting period (McLeod pers. comm. 2025a).<br><br>Enforcement activities by DFO's Conservation and Protection officers related to Carmine Shiner habitat occurred during the |

[4] Recovery measures are numbered based on the numbering system used in the action plan. As a result, recovery measures may appear out of order in tables due to the separation by broad strategy. "T" indicates which table of the action plan the recovery measures is from (T1: Measures to be undertaken by Fisheries and Oceans Canada; T2: Measures to be undertaken collaboratively between Fisheries and Oceans Canada and its partners; T3: Measures that represent opportunities for other jurisdictions, organizations or individuals to lead).

[5] **Completed:** the recovery measure has been completed, and no further action is required
**In progress**: the recovery measure has a specified end date, and progress has been made, but it has not been completed
**Ongoing**: the recovery measure has no specified end date or metric for completion; efforts will continue until such time the population is considered to be recovered (for example, population monitoring) or it is no longer feasible to continue
**Not started**: no progress has been made on the recovery measure
**Cancelled**: The recovery measure is no longer moving forward as it is no longer necessary for the species' recovery, or due to other limitations

| Table (T) #- Recovery measure (RM) #[4] | Recovery measure | Status[5] | Description of progress |
|---|---|---|---|
| | example, shoreline development). | | reporting period, including patrols and the use of SARA and *Fisheries Act* enforcement tools. |
| T3 – RM1 | Develop conservation easement agreements. | Ongoing | No new easement agreements were developed in Carmine Shiner's critical habitat and distribution areas from 2018 to 2024. A few were developed in previous years outside of this progress report timeline (Murray pers. comm. 2025). |
| T3 – RM2 | Integrate protection of riparian habitat within the provincial forest management plan. | Ongoing | No formal forest management plan exists for the specific forest management unit that encompasses Carmine Shiner distribution. Species at risk (including Carmine Shiner) are considered in broader forest management strategies led by the Government of Manitoba. These strategies incorporate input from regional teams, timber sale plans, and provincial guidelines, with mitigation measures informed by conservation and wildlife experts. The Government of Manitoba is open to enhancing riparian protection management and has requested Carmine Shiner's critical habitat spatial data to support this recovery measure (Matthewson pers. comm. 2025). |
| T3 - RM3 | Periodic monitoring of bait harvests. Implement a policy of no new bait blocks sanctioned in areas where Carmine Shiner is known to exist or might reasonably be expected to exist. | Ongoing | The Manitoba Fisheries Branch confirmed that baitfish harvesting did not occur within the known range of the Carmine Shiner between 2019 and 2024 (McLeod pers. comm. 2025b). |
| T3 - RM4 | Revision of the current provincial Fisheries Branch stocking strategy. | Ongoing | The Manitoba Fisheries Branch is currently drafting the stocking strategy document. Currently, no stocking is occurring with Carmine Shiner distribution. The Fisheries Branch |

| Table (T) #- Recovery measure (RM) #[4] | Recovery measure | Status[5] | Description of progress |
|---|---|---|---|
| | Will include a section regarding consideration for SARA species during the stocking program. | | Stocking Program discusses fish stocking deemed to be a risky introduction with DFO, and the province is open to discussion about potential wording for SARA species in the stocking strategy document (Schoen pers. comm. 2025). |

**Table 3: Status of recovery measures under broad strategy 3: Education and outreach for Carmine Shiner for the period 2019 to 2024.**

| Table (T) # - Recovery measure (RM) #[6] | Recovery measure | Status[7] | Description of progress |
|---|---|---|---|
| T3 - RM5 | Manitoba has tabled new Aquatic Invasive Species legislation. This legislation is designed to limit the movement of foreign biota as well as the conveyors of these biota (for example, water, mud, etc.). Within its annual work plan, the Aquatic Invasive Species (AIS) portfolio will continue to undertake: 1) public education about AIS; and 2) its monitoring and boat inspection activities. Specific emphasis will focus on reducing the potential for AIS to travel into Manitoba | Ongoing | In 2023, Nature Conservancy Canada, funded by the Canada Nature Fund for Aquatic Species at Risk (CNFASAR), conducted riparian health assessments at 30 sites along the Whitemouth and Birch rivers, monitoring for invasive species such as Rusty Crayfish (*Faxonius rusticus*), Emerald Ash Borer (*Agrilus planipennis*), and Phragmites (*Phragmites australis subsp. australis*). Most sites were rated healthy; however, Rusty Crayfish were detected in the Birch River downstream of Highway 1.<br><br>In 2020, the Invasive Species Centre conducted a survey funded through the CNFASAR to assess Manitobans' awareness of aquatic invasive species (AIS); the results revealed knowledge gaps, as only 44% of respondents believed reporting AIS was legally required and only 47% believed decontamination of watercraft or water-related equipment between waterbodies was mandatory. |

[6] Recovery measures are numbered based on the numbering system used in the action plan. As a result, recovery measures may appear out of order in tables due to the separation by broad strategy. "T" indicates which table of the action plan the recovery measures is from (T1: Measures to be undertaken by Fisheries and Oceans Canada; T2: Measures to be undertaken collaboratively between Fisheries and Oceans Canada and its partners; T3: Measures that represent opportunities for other jurisdictions, organizations or individuals to lead).

[7] Completed: the recovery measure has been completed, and no further action is required
**In progress**: the recovery measure has a specified end date, and progress has been made, but it has not been completed
**Ongoing**: the recovery measure has no specified end date or metric for completion; efforts will continue until such time the population is considered to be recovered (for example, population monitoring) or it is no longer feasible to continue
**Not started**: no progress has been made on the recovery measure
**Cancelled**: The recovery measure is no longer moving forward as it is no longer necessary for the species' recovery, or due to other limitations

| Table (T) # - Recovery measure (RM) #[6] | Recovery measure | Status[7] | Description of progress |
|---|---|---|---|
| | via the watercraft traffic that is moved along the TransCanada highway, and on limiting the spread of rusty crayfish, which are known to inhabit the Birch River. | | In 2021, the Manitoba Métis Federation conducted a virtual outreach to Métis citizens on tools for monitoring and recording species at risk and invasive species, funded through the Aboriginal Fund for Species at Risk.<br>The general regulations of the Manitoba Anglers' Guide provided information to anglers on best practices for preventing the spread of AIS and existing fines for AIS-related offences (Government of Manitoba 2021, 2022, 2023, and 2024a).<br><br>In 2024, the Government of Manitoba operated mandatory watercraft inspection stations, including 7 fixed and 5 roving stations strategically located along highways and at high-volume boat launches; the province conducted 18,500 inspections and achieved a decontamination rate of 13% (Government of Manitoba 2024b).<br><br>DFO's AIS Program and Conservation & Protection Fishery Officers have completed a number of inspections at both international and provincial borders (decontamination/warning rate 12.21% in 2023, 12.62% in 2024 and 3.35% in 2025) to circumvent the introduction of AIS species that could pose a risk to Carmine Shiner, as well as other aquatic species/ecosystems, and to promote education and outreach. They have also participated in outreach activities to promote education on species at risk and their habitats. |

# 3 Socio-economic costs and benefits

The socio-economic costs and benefits of implementing the action plan for Carmine Shiner reflect the costs and benefits of carrying out the recovery measures outlined in the action plan. The costs of implementing measures for Carmine Shiner are considered low.[8]

A large part of the economic costs borne by the federal government for Carmine Shiner recovery are provided via funding programs, including the Habitat Stewardship Program for Species at Risk, Aboriginal Fund for Species at Risk, and the Canada Nature Fund for Aquatic Species at Risk. During the reporting period, 4 projects targeting Carmine Shiner (and/or multi-species projects that included Carmine Shiner) received funding through these programs. Projects funded by these programs would have had dollar and in-kind costs fully or partially matched by recipients, where applicable. Additional costs of implementing recovery measures were incurred from SARA program funds for contracts with partners for activities such as genetic analysis or support for field programs.

The benefits that have come from the implementation of the action plan include contributing to meeting the population and distribution objectives for the Carmine Shiner. They also include positive impacts on biodiversity, the livelihoods of Canadians via the maintenance of healthy ecosystems, and the value individuals place on preserving biodiversity. The conservation of species at risk is vital to the Government of Canada's commitment to conserving biodiversity and is important to Canada's economic and natural wealth.

# 4 Key gaps and future priorities for the Carmine Shiner

During the reporting period (2019 to 2024), some of the recovery measures identified in the action plan were completed, with a few measures completed before the reporting period. Many of the recovery measures are ongoing, including those that involve monitoring Carmine Shiner and its habitat and working with the Province of Manitoba to ensure species at risk are considered during the development of provincial strategies and regulations. Continued standardized sampling for the species is also necessary to determine relative abundance and distribution over time. Priority next steps for the recovery of the Carmine Shiner include, but are not limited to:

- continue sampling and eDNA genetic surveys in areas adjacent to the known distribution of the species to determine potential new distribution areas
- continue monitoring habitat characteristics and quality to identify and reduce habitat threats to Carmine Shiner
- continue standardized sampling to monitor population trends over time

[8] As per the Treasury Board Secretariat Policy on Cost Benefit Analysis, 'low cost' is considered less than $1 million nationally in average annual costs, while 'high cost' is considered $1 million or more nationally in average annual costs.

- strengthen the partnership with the Province of Manitoba on Carmine Shiner recovery, including working with the province to include considerations of species at risk in provincial forestry plans, stocking strategies, bait-fishing, and development of conservation easements
- increase public outreach, education, awareness, and stakeholder engagement for stewardship

# 5 Concluding statement

During the reporting period, progress was made toward implementing the recovery measures identified in the action plan for Carmine Shiner, with 4 recovery measures being completed, and 11 ongoing. Physical and eDNA sampling was conducted and provided information on the distribution of the species. Field sampling programs provided insight into the abundance, reproduction, and diet of the Carmine Shiner. DFO and the Province of Manitoba continue to work together to monitor and protect the habitat of the species.

DFO remains committed to the recovery and conservation of all aquatic species at risk, and the work that has been initiated and completed to date represents an important step in that direction. DFO and its partners will continue to work towards the achievement of the population and distribution objectives for Carmine Shiner and welcome the participation of additional partners.

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