

Report on the Progress of Recovery Strategy Implementation for Western Silvery Minnow (*Hybognathus argyritis*) in Canada for the Period 2013 to 2019

Western Silvery Minnow



2022

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Preface

The federal, provincial, and territorial government signatories under the [Accord for the Protection of Species at Risk \(1996\)](#) agreed to establish complementary legislation and programs that provide for the protection of species at risk throughout Canada. Under section 46 of the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the competent ministers are responsible for reporting on the implementation of the recovery strategy for a species at risk, and on the progress towards meeting its objectives within five years of the date when the final recovery strategy was placed on the Species at Risk Public Registry and in every subsequent five-year period, until the recovery strategy is no longer required under SARA or the species' recovery is no longer feasible.

Reporting on the progress of recovery strategy implementation requires reporting on the collective efforts of the competent minister(s), provincial and territorial governments and all other parties involved in conducting activities that contribute to the species' recovery. Recovery strategies identify broad strategies and approaches that will provide the best chance of recovering species at risk. Some of the identified strategies and approaches are sequential to the progress or completion of others and not all may be undertaken or show significant progress during the timeframe of a report on the progress of recovery strategy implementation (progress report).

The Minister of Fisheries and Oceans is the competent minister under SARA for the Western Silvery Minnow and has prepared this progress report.

As stated in the preamble to SARA, success in the recovery of species at risk depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in the recovery strategy and will not be achieved by Fisheries and Oceans Canada, or any other jurisdiction alone. The cost of conserving species at risk is shared amongst different constituencies. All Canadians are invited to join in supporting and implementing the recovery strategy for the Western Silvery Minnow for the benefit of the species and Canadian society as a whole.

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Executive summary

The Western Silvery Minnow (*Hybognathus argyritus*) was assessed by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as threatened in 2001, and in 2003 it was listed on Schedule 1 of the *Species at Risk Act* (SARA) as threatened. In 2008, COSEWIC re-assessed the species as endangered, but the species status remained unchanged under SARA. [The Recovery Strategy for Western Silvery Minnow \(*Hybognathus argyritus*\) in Canada](#) (DFO 2008) was posted on the Species at Risk Public Registry in 2008. In 2017, COSEWIC again assessed Western Silvery Minnow as threatened. In 2017, an amendment was made to the recovery strategy and it was re-published as the "[Amended Recovery Strategy for Western Silvery Minnow \(*Hybognathus argyritus*\) in Canada](#)" (DFO 2017) (henceforth called the amended recovery strategy), which includes the identification of critical habitat for Western Silvery Minnow.

This document reports on the progress made on recovery strategy implementation between 2013 and 2019. Since two recovery documents were in place during that timeframe (that is, the recovery strategy until 2017, and the amended recovery strategy in the latter half of 2017), this document reports on all activities related to recovery strategy implementation within the six year time frame, but refers specifically to the 2017 amended recovery strategy since it replaced the 2008 recovery strategy. In 2016, a progress report covering the period of 2008 to 2013 was published that fulfilled Fisheries and Oceans Canada's (DFO) commitment to report every five years on the progress of recovery strategy implementation. This progress report furthers DFO's commitment and reports on the progress made towards the implementation of the amended recovery strategy and covers the period from 2013 to 2019.

The main threats identified for the Western Silvery Minnow include:

- species introductions
- habitat loss/degradation
- pollution
- natural processes

The most significant threats to habitat for the Western Silvery Minnow may be those that substantially alter the existing flow regime of the river, causing habitat loss or impairment. Such threats may include surface water removal (that is, for irrigation and domestic use), dam construction, and canal maintenance. Other threats include groundwater extraction, livestock use of the flood plain, point and non-point source pollution, anoxia, species introductions, scientific sampling, and natural processes (that is, drought and climate change).

The recovery goal for Western Silvery Minnow is "to protect and maintain a self-sustaining population of Western Silvery Minnow within its current range in the Milk River". The key objectives in the amended recovery strategy (DFO 2017) are to: 1) quantify and maintain current population levels; 2) refine knowledge on the essential functions, features and attributes of critical habitat for various life stages of the Western Silvery Minnow; and 3) identify potential threats from human activities and ecological processes and develop plans to avoid, eliminate, or mitigate these threats.

The following is a list of some of the activities that have been completed since the publication of the previous progress report and that describe important progress of implementation:

- in 2017, an amended recovery strategy (DFO 2017) was posted to the Species at Risk Public Registry which included identification of critical habitat
- a study that assessed how flow augmentation impacts the availability of suitable habitat for Western Silvery Minnow in the Milk River was published in 2018
- an action plan for the Milk River and St. Mary's drainage basin was published in 2018
- a standardized sampling method for monitoring the occurrence and relative abundance of Western Silvery Minnow was developed and published in 2019

Table of contents

Preface	i
Acknowledgements	i
Executive summary	ii
Table of contents	iv
1. Introduction	1
2. Background.....	1
2.1. COSEWIC assessment summary and threats to the species and its critical habitat.....	1
2.2. Recovery	3
3. Progress towards recovery.....	3
3.1. Activities supporting recovery	4
3.2. Activities supporting the identification of critical habitat.....	8
3.3. Summary of progress towards recovery	9
3.3.1 Completion of action plan	9
3.3.2 Critical habitat identification and protection.....	9
3.3.3 Recovery feasibility.....	9
4. Concluding statement	9
5. References	11

1. Introduction

This progress report outlines the progress made towards meeting the objectives listed in the [Amended Recovery Strategy for Western Silvery Minnow \(*Hybognathus argyritis*\) in Canada](#) (DFO 2017), from 2013 to 2019 and is the second subsequent progress report as required under section 46 of the *Species at Risk Act* (S.C. 2002, c.29) (SARA). This document is one in a series of documents that are linked and should be taken into consideration together, including the Committee on the Status of Endangered Species in Canada (COSEWIC) status reports ([COSEWIC 2001](#), [2008](#), and [2017](#)), the [Recovery Potential Assessment \(RPA\)](#) (DFO 2013), the [previous five-year progress report](#) (DFO 2016), the amended recovery strategy (DFO 2017), and the [Action Plan for the Milk River and St. Mary River Drainage Basins in Canada](#) (DFO 2018).

Section 2 of the progress report provides references to or reproduces key information on the threats to the species, recovery goal and objectives for achieving its recovery, and approaches to meeting the objectives to measure the progress of recovery. For more details, readers should refer back to the amended recovery strategy (DFO 2017). Section 3 reports the progress of activities identified in the amended recovery strategy to support achieving the recovery goal and objectives. Section 4 summarizes the progress toward achieving the objectives.

2. Background

2.1. COSEWIC assessment summary and threats to the species and its critical habitat

The listing of the Western Silvery Minnow under SARA in 2003 led to the development and publication of the Recovery Strategy for the Western Silvery Minnow (*Hybognathus argyritis*) in Canada in 2008, and the Amended Recovery Strategy for the Western Silvery Minnow (*Hybognathus argyritis*) in Canada in 2017 (DFO 2017). The amended recovery strategy is consistent with the information provided in the COSEWIC status report (COSEWIC 2008) and the COSEWIC summary information is included in section 1 of the recovery strategy. The listing and development of the recovery strategy were further informed by the RPA of Western Silvery Minnow (*Hybognathus argyritis*) in Canada.

In 2008, COSEWIC re-examined and changed the status of the Western Silvery Minnow from threatened to endangered in the COSEWIC status report (COSEWIC 2008). In 2017, COSEWIC re-examined and changed the status of the Western Silvery Minnow from endangered to threatened in the COSEWIC Status Report (COSEWIC 2017).

2017 COSEWIC Assessment Summary

Assessment Summary – November 2017

Common name: Western Silvery Minnow

Scientific name: *Hybognathus argyritis*

Status: Threatened

Reason for designation: This is a small-bodied minnow species that is restricted in Canada to the Milk River of southern Alberta. It is a habitat specialist found in shallow zones of turbid prairie waters with high seasonal flow variability and unstable fine sediments. It is threatened by flow management resulting from water diversions in the United States and a warming and drying climate with negative impacts on habitat quantity and quality. Despite meeting criteria for being designated as endangered, the severity of the threats is uncertain and there is no evidence of a decline in abundance since the previous assessment.

Occurrence: Alberta

Status history: Designated special concern in April 1997. Status re-examined and designated threatened in November 2001. Status re-examined and designated endangered in April 2008. Status re-examined and designated threatened in November 2017.

The amended recovery strategy identifies the threats to survival and recovery of the Western Silvery Minnow and threats to its critical habitat.

Section 4 of the amended recovery strategy (DFO 2017) provides information on the threats to the species' survival and recovery. These threats include:

- species introductions
- habitat loss/degradation
- pollution
- natural processes

Critical habitat for the Western Silvery Minnow has been identified, to the extent possible, in section 7 of the amended recovery strategy (DFO 2017). The amended recovery strategy (DFO 2017) also provides examples of activities that are likely to result in destruction to critical habitat (that is, threats to critical habitat). The list of activities provided in table 6 of the amended recovery strategy is neither exhaustive nor exclusive, and their inclusion has been guided by the relevant threats to habitat described in the recovery strategy. Below is a summary of the activities likely to result in the destruction of critical habitat for the Western Silvery Minnow. For more details on the activities likely to result in the destruction of critical habitat, consult the amended recovery strategy (DFO 2017).

Changes in flow regulation: Increase in flow, especially during high spring and summer flows, may increase larval drift downstream into unsuitable habitats (that is, reservoirs downstream) or increase erosion of stream banks and impact spawning, larval development and feeding activities. Conversely, low flow can result in stranding and spawning failure.

Canal maintenance: Temporary or premature closure of the St. Mary's diversion canal for maintenance activities, especially during low flow periods, can severely reduce the flow of the river or result in isolated pools and habitat fragmentation.

Dam construction (water impoundment or reservoir creation) and operation (flow modification): Impoundments can alter the habitat type, flow regime, sediment load, microbiota, and water temperature, and increase the risk of introduced species successfully inhabiting the altered habitat.

Surface water extraction (non-irrigation): Temporary Diversion Licenses issued during low flow periods could reduce Western Silvery Minnow habitat.

Release of harmful substances: Storm water and sewage releases, accidental spills and gas leaks at river and tributary crossings, river crossing at bridges or pipelines, and contamination of water from seismic or drilling activities could affect habitat.

2.2. Recovery

This section summarizes the information, found in the amended recovery strategy (DFO 2017), which provides a way to measure the recovery goals and recovery objectives that are necessary for the recovery of Western Silvery Minnow.

The recovery goal for Western Silvery Minnow is:

- to protect and maintain a self-sustaining population of Western Silvery Minnow within its current range within the Milk River in Canada.

Based on this overall objective, the following specific objectives were proposed to meet recovery goals and objectives, and to address threats to the survival of the species:

1. quantify and maintain current population levels
2. refine knowledge on the essential functions, features and attributes of critical habitat for various life stages of the Western Silvery Minnow
3. identify potential threats from human activities and ecological processes and develop plans to avoid, eliminate or mitigate threats

The amended recovery strategy (DFO 2017) did not include performance indicators. The progress towards achieving the recovery goal and objectives will be informed by the progression made under the approaches and studies in section 3.1 and 3.2 below.

3. Progress towards recovery

The amended recovery strategy (DFO 2017) for the Western Silvery Minnow (DFO 2017) divides the recovery effort into four broad strategies: 1) research, 2) monitoring, 3) management and regulatory actions, and 4) education and outreach. Progress in carrying out these broad strategies is reported in section 3.1. Section 3.2 reports on the activities identified in the schedule of studies to identify critical habitat. Section 3.3 reports on the progress under the broad strategies and other commitments (for example, action plan and critical habitat order) identified in the amended recovery strategy (DFO 2017) and information obtained through implementing the amended recovery strategy (DFO 2017). The following tables provide information on the implementation of activities undertaken to address the approaches and broad strategies identified in the recovery planning table of the amended recovery strategy (DFO 2017).

3.1. Activities supporting recovery

Table 1 provides information on the implementation of activities undertaken to address the approaches and broad strategies identified in the recovery planning table of the amended recovery strategy (DFO 2017).

Table 1. Details of activities supporting the recovery of the Western Silvery Minnow from 2013 to 2019.

Activity	Broad strategy and approach	Descriptions and results	Recovery objectives ¹	Participants ²
Identification of limiting factors	Research; monitoring	Research was completed to examine the seasonal habitat selection and movement of Western Silvery Minnow in the Milk River. Habitat availability under various flow conditions and movement potential for the species was used to develop a habitat suitability model across various life stages of the species (Neufeld et al. 2018).	3	University of Alberta (U of A) , Alberta Environment and Parks (AEP), Fisheries and Oceans Canada (DFO)
Habitat monitoring	Research; monitoring	Routine and opportunistic monitoring of environmental parameters including flow conditions, turbidity, water temperature, and dissolved oxygen has been completed. These environmental parameters should continue to be monitored to track water quality.	3	DFO, AEP, U of A
Population monitoring	Research; monitoring	A standardized sampling method for monitoring the occurrence and relative abundance of Western Silvery Minnow was completed and published and will be used going forward (Macnaughton et al. 2019).	2	DFO
Water management and conservation	Management and regulatory actions	In Alberta, a license must be obtained under the province's <i>Water Act</i> , before ground or surface water can be diverted. Temporary diversion licenses are approved by AEP. DFO will provide advice for Temporary Diversion Licences when impacts to species at risk may occur.	2	AEP, DFO

Activity	Broad strategy and approach	Descriptions and results	Recovery objectives ¹	Participants ²
		Recommended sources of temporary water diversion are surface run-off dugouts, sloughs and non-fish-bearing lakes and creeks; fish-bearing lakes and creeks are least recommended. This activity is ongoing and should continue to occur.		
Development impact mitigation	Management and regulatory actions	Impact mitigation for development projects is reviewed on a case-by-case basis and is ongoing. DFO has arrangements with federal agencies and provincial governments that conduct an initial review of projects, under their respective jurisdictions, to determine if they require permits under the <i>Species at Risk Act</i> (SARA) or DFO review under the fisheries protection provisions of the <i>Fisheries Act</i> . The focus, for any development project, is the elimination or mitigation of any potential adverse impacts on Western Silvery Minnow or its habitat. This activity is ongoing and should continue.	2	DFO, AEP
Stocking program rationalization	Management and regulatory actions	The intention of this activity is to reduce the potential for species introductions and stocking-related impacts to Western Silvery Minnow. In Alberta, stocking programs are provincially managed. Lakes, reservoirs, and ponds are stocked throughout the province with Brook Trout (<i>Salvelinus fontinalis</i>), Rainbow Trout (<i>Oncorhynchus mykiss</i>), Brown Trout (<i>Salmo trutta</i>) or Cutthroat Trout (<i>Oncorhynchus clarkii</i>); however, Western Silvery Minnow are not typically found in these lacustrine (lake) environments, as these areas do not provide suitable habitat for the species. Additionally, AEP would consult with DFO	2	AEP, DFO

Report on the Progress of Recovery Strategy Implementation for Western Silvery Minnow 2022

Activity	Broad strategy and approach	Descriptions and results	Recovery objectives ¹	Participants ²
		prior to stocking in waters where species at risk are found.		
International cooperation	Management and regulatory actions	The Milk River watershed is shared between Canada and the United States (U.S.) and as such, it is subject to provisions in the Boundary Waters Treaty of 1909 between Canada and the U.S. The treaty is administered by a binational organization called the International Joint Commission (IJC), which has appointed members from both Canada (including DFO) and the U.S. governments. The treaty provides the principles and mechanisms to resolve disputes concerning shared water. AEP has been working with U.S. agencies to avoid unscheduled flow interruptions in the Milk River during flow augmentation. This is an ongoing activity that should continue.	2	DFO, AEP, U.S. agencies
Data conservation; Facilitate information exchange	Management and regulatory actions; education and outreach	All samples and information (current and future) are appropriately preserved and archived. Information collected is shared between DFO and AEP, and archived. This activity is ongoing and should continue.	2	AEP, DFO, universities
Improve awareness of the species	Education and outreach	Various groups and organizations, including AEP, have been involved in events and/or developed informational material related to improving awareness of Western Silvery Minnow. This activity is ongoing and should continue to occur.	2	DFO, AEP
Encourage stakeholder participation	Education and outreach	Interpretative signage has been developed in cooperation with the Milk River Fish Species at Risk Recovery Team and local municipalities and will be installed along the Milk River. Signage	2	DFO, County of Warner No. 5, Milk River Fish Species at Risk Recovery

Report on the Progress of Recovery Strategy Implementation for Western Silvery Minnow 2022

Activity	Broad strategy and approach	Descriptions and results	Recovery objectives ¹	Participants ²
		includes information related to Western Silvery Minnow and the SARA.		Team, Town of Milk River, Cardston County
Discourage species introductions	Education and outreach	Provincial regulations prevent species introductions and, therefore, may reduce the potential for damage to Western Silvery Minnow populations from introduced predators and competitors. Under the Alberta General Sportfishing Regulations, it is unlawful to: <ul style="list-style-type: none"> • release live fish or live fish eggs into any waters except back to the waters from which they were caught • possess live bait fish and use live fish for bait 	2	AEP

¹Refers to recovery objectives from section 2.2 of this document and section 5 of the amended recovery strategy (DFO 2017).

²Lead participant(s) is/are listed on top and in bold; other participants are listed alphabetically. Not all activities have specific participants identified.

3.2. Activities supporting the identification of critical habitat

Table 2 provides information on the implementation of the studies outlined in the schedule of studies to identify critical habitat found in the amended recovery strategy. Each activity has been assigned one of two statuses:

- 1) completed: the planned activity has been carried out and concluded
- 2) in progress: the planned activity is ongoing and has not concluded or has no end date

Table 2. Activities that have been completed or are in progress since the completion of the amended recovery strategy and that are associated with the schedule of studies to identify critical habitat.

Study	Timeline	Status	Descriptions and results	Participants ¹
Studies to identify and characterize habitat use by life stages of Western Silvery Minnow	2017 to 2022	In progress	Critical habitat for Western Silvery Minnow in the Milk River was identified to the extent possible in section 7 of the amended recovery strategy (DFO 2017). A critical habitat order was published in 2018. Additional areas of critical habitat may yet be identified. Critical habitat data will be used to develop habitat suitability models across various life stages of the species.	DFO , AEP, U of A
Movement studies	2017 to 2022	In progress	Tagging studies have been completed which show that visible implant tags, specifically visible implant elastomer tags, are most suitable for Western Silvery Minnow due to relatively high retention and low stress, and therefore can be used for movement or mark-recapture studies (Neufeld et al. 2015). With tagging methodology determined, studies to document movements and estimate population size can begin.	U of A
Identify availability and location of habitat	2017 to 2022	Completed	Essential functions, features and attributes critical for each life stage were identified. This information was used to inform the identification of critical habitat in the amended recovery strategy.	DFO , Milk River Fish Species at Risk Recovery Team

¹Lead participant(s) is/are listed on top and in bold; other participants are listed alphabetically. Not all activities have specific participants identified.

3.3. Summary of progress towards recovery

3.3.1 Completion of action plan

The Action Plan for the Milk River and St. Mary River Drainage Basins in Canada was published in 2018 (DFO 2018). It addresses the Western Silvery Minnow and the Rocky Mountain Sculpin (Eastslope populations) found in the Milk River and St. Mary River drainage basins, Alberta, and follows a multi-species approach to protect and maintain self-sustaining populations of both species. The action plan addresses all the objectives in the recovery strategies for the Rocky Mountain Sculpin (Eastslope populations) and the Western Silvery Minnow.

3.3.2 Critical habitat identification and protection

Critical habitat for the Western Silvery Minnow has been identified, to the extent possible, in section 7 of the amended recovery strategy (DFO 2017). Further research should be carried out to better refine critical habitat to fully achieve the recovery objectives. Studies are needed that identify and characterize habitat use by different life stages, availability and location of habitat, and movement patterns of Western Silvery Minnow. Recovery activities have allowed for evaluation of some threats, such as flow manipulation, and have shown the detrimental effects that can occur with regards to habitat disruption.

The Critical Habitat Order for the Western Silvery Minnow, protecting the identified critical habitat in the amended recovery strategy (DFO 2017), was registered on December 19, 2018.

3.3.3 Recovery feasibility

The best available information supports the current recovery feasibility of the Western Silvery Minnow. Recovery of the Western Silvery Minnow is considered feasible because it meets the four criteria of technical and biological feasibility as described in the Recovery Feasibility Summary of the amended recovery strategy (DFO 2017).

4. Concluding statement

From the period of 2013 to 2019, through the implementation of the activities identified in the amended recovery strategy for the Western Silvery Minnow in Canada, substantial progress has been made in recovering the Western Silvery Minnow. Progress towards achieving the recovery goals and objectives defined in section 5 of the amended recovery strategy (DFO 2017) continues and the recovery approach remains effective.

There are no known instances of population or habitat decline in the Milk River and there is no information to suggest that the population has declined since the amended recovery strategy (DFO 2017) was published, all of which suggests that the Western Silvery Minnow in the Milk River is being maintained. Progress has been made through research and monitoring activities, management activities, and education and awareness activities, but further work related to research and monitoring activities, including gaining a better understanding of current population levels, and ensuring regular monitoring of Western Silvery Minnow should be explored. Investigation into gear types and sampling techniques for detection of this species has resulted in development of a standardized, species-specific sampling protocol, which will lead to a better assessment of population distribution and abundance over time. It is important to maintain existing partnerships, to establish new partnerships, and to conduct scientific studies to address uncertainties.

Taken together, the ongoing and completed activities indicate that a substantial degree of progress has been made towards the goal of maintaining Western Silvery Minnow in the Milk River in Canada. There are still data gaps that need to be addressed with additional monitoring and assessment surveys conducted to refine the extent of the species' distribution and to determine its prevalence within its current distribution. An increase in stewardship and outreach activities is also needed to help fill in knowledge gaps that surround this species in Canada.

DFO remains committed to recovering the Western Silvery Minnow. The work started and completed to date has built a strong foundation for continued research and management of this species over the next reporting period. Progress made to date would not have been achieved without the contribution from our partners. DFO is looking forward to continuing this successful collaboration and welcomes the participation of additional partners.

5. References

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