Ministry of the Environment, Conservation and Parks
2024

Black Redhorse and Silver Shiner

Ontario Government Response Statement

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Protecting and Recovering Species at Risk in Ontario

Species at risk recovery is a key part of protecting Ontario's biodiversity. The *Endangered Species Act, 2007* (ESA) is the Ontario government's legislative commitment to protecting and recovering species at risk and their habitats.

Under the ESA, the government must ensure that a recovery strategy is prepared for each species that is listed as endangered or threatened. A recovery strategy provides science-based advice to government on what is required to achieve recovery of a species.

Generally, within nine months after a recovery strategy is prepared, the ESA requires the government to publish a statement summarizing the government's intended actions and priorities in response to the recovery strategy. The response statement is the government's policy response to the scientific advice provided in the recovery strategy. In addition to the strategy, the government response statement considers (where available) input from Indigenous communities and organizations, stakeholders, other jurisdictions, and members of the public. It reflects the best available local and scientific knowledge, including Indigenous Knowledge where it has been shared by communities and Knowledge Holders, as appropriate, and may be adapted if new information becomes available. In implementing the actions in the response statement, the ESA allows the government to determine what is feasible, taking into account social, cultural and economic factors.

The Recovery Strategy for Black Redhorse (*Moxostoma duquesnei*) in Ontario and the Recovery Strategy for Silver Shiner (*Notropis photogenis*) in Ontario were completed on July 12, 2023. Given their common threats and similar distributions the recovery efforts for these two species are being addressed collectively in a single government response statement.

Black Redhorse is a medium-sized fish that averages 40 cm in length. It is olive, gold, or brassy on the back and sides, and silver or white underneath. It has a downward-facing sucker mouth, and lower fins which are often pale red or orange.

Silver Shiner is a relatively large minnow that can grow to about 14 cm long. It is silvery overall with a dark stripe down the center of the back, and has a long snout with two black crescents between the nostrils.

Protecting and Recovering Black Redhorse and Silver Shiner

Black Redhorse and Silver Shiner are listed as threatened species under the ESA, which protects both the animals and their habitats. The ESA prohibits harm or harassment of the species and damage or destruction of its habitat without authorization or complying with the requirements of a regulatory exemption.

Black Redhorse occurs only in eastern North America. Its range extends from southwestern Ontario and New York south to northern Alabama in the east, and from southeastern Minnesota south to eastern Oklahoma in the west. Its distribution is particularly disjunct (geographically separated) in the western portion of its range. In Canada, Black Redhorse is restricted to southwestern Ontario, which represents the northern-most limit of its global distribution. It is found in tributaries of Lake Huron (Sauble, Saugeen, Maitland, Bayfield, and Ausable rivers), Lake St. Clair (Thames River and numerous tributaries), and Lake Erie (Grand River and some tributaries). Black Redhorse has not been recorded in the Lower Thames River since 2003, which could indicate a range reduction, but may also be due to a lack of recent sampling. In 2010, Black Redhorse was collected from two sites in the Grand River watershed where the species had not previously been detected (Big Creek and Four Wells Lake). Single individuals collected from Lake Simcoe and Spencer Creek (Lake Ontario tributary) are thought to be the result of accidental introductions, and a single individual from Gully Creek is thought to be a transient from a larger Lake Huron tributary population. Black Redhorse is believed to be extirpated from Catfish Creek (Lake Erie tributary).

Silver Shiner has a similar global distribution, ranging from southwestern New York south to North Carolina in the east, and from southeastern Michigan and southwestern Ontario south to northern Georgia and Alabama in the west. The Canadian range is limited to southern Ontario, in the tributaries of Lake Huron (Saugeen and North Saugeen rivers), Lake St. Clair (Thames River and its tributaries), Lake Erie (Grand River and some tributaries) and Lake Ontario (Bronte and Sixteen Mile creeks). Silver Shiner was only recently detected at single sites in the Saugeen and North Saugeen rivers. Additional surveys are required to determine its status and extent within these watercourses. Some locations – including Fanshawe Lake (Thames River tributary), Laurel, Schneider, Silver, and Whitemans creeks and the Speed River (Grand River tributaries) – may be considered historical as Silver Shiner has not been observed in those areas in more than 30 years.

Black Redhorse is found in medium-sized rivers with clear, warm water and moderate to fast flows. It is most often associated with clean, coarse bed material (gravel and cobble) in wider stretches of river with stable channels and well-developed pools. Black Redhorse is less tolerant of turbidity (cloudiness) and siltation than other Redhorse species found in Ontario. In spring, adult Black Redhorse migrate upstream to spawn. Spawning occurs most often in shallow riffles over substrates ranging from fine gravel to cobble. During spawning, Black Redhorse tend to avoid higher flow rates and have been observed to abandon previously used spawning shoals during extreme increases in stream flows (e.g. storm events). The species may be naturally limited by its restrictive spawning habitat preferences. Upon hatching, larval Black Redhorse possess a yolk-sac which provides them with nutrition until they are able to begin feeding on their own. They remain at spawning sites until the yolk-sac is absorbed, then disperse to nursery habitat which consists of shallow near shore areas with vegetation and mud, silt and sand

substrates, or shallow pools and areas with slower currents. Both larval and juvenile Black Redhorse demonstrate a preference for pools and backwater areas, though they have sometimes been observed in areas of faster current. Aggregations of juvenile Black Redhorse in areas of groundwater influx in the Grand River suggests the importance of such areas as refuge from poor water quality and temperature conditions.

Silver Shiner is found in medium to large streams and rivers with moderate to fast flows. It is associated with alternating riffles and pools or turbulent areas below dams, and demonstrates a preference for sand and gravel substrates. The species appears to avoid shallow areas with a steep channel slope, demonstrating a preference for higher average water depths. Silver Shiner has been found in both clear and turbid (murky) waters, suggesting it may have some tolerance for higher levels of suspended solids. Its thermal preferences are unknown. Spawning habitat for Silver Shiner is poorly understood, though there is some evidence that spawning occurs in relatively deep riffles in habitat similar to that used by other shiners (*Luxilus* species) and chubs (*Nocomis* species). Spawning in Ontario is thought to occur from early May to early June. There is little information available on habitat needs of larval and young-of-year Silver Shiner, but they have been reported in areas with slower currents and warmer waters than those preferred by adults. Similar to Black Redhorse, Silver Shiner has been observed in areas influenced by groundwater seepage. Additionally, terrestrial insect species have been reported as a prey source for Silver Shiner, suggesting riparian (streamside) vegetation may be an important habitat feature.

The primary threat to Black Redhorse and Silver Shiner is poor water quality from pollution and siltation. Lands surrounding the species' habitat are primarily agricultural and urban areas where practices such as removal of riparian areas, unrestricted livestock access to rivers, improper use of fertilizers and pesticides, and substandard septic and sewage treatment systems can contribute to sedimentation and nutrient loading. These contaminants may impact reproduction, behaviour, resistance to pathogens and embryo development. However, species-specific tolerances for Black Redhorse and Silver Shiner are not well understood and require further study.

Modifications to natural systems represent a threat to Black Redhorse and Silver Shiner as they impact flow regimes, water temperature, material cycling and other important habitat characteristics. Dams, as well as improperly designed and installed culverts, may also create barriers to movement that limit access to habitat and restrict connectivity of populations, though further research is required to better understand impacts to the two species. Similarly, threats from non-native and invasive species (e.g. invasive carps, Sea Lamprey, Round Goby, dreissenid mussels) are presumed but require further investigation.

Incidental capture during baitfish harvesting is a potential threat and misidentification of this species leading to unintentional harvest is possible. However, studies have shown that bycatch of species at risk in Ontario's bait industry is extremely low, and harvesters are required by law to release any fish species at risk that they catch. Ontario also recently removed three species (Shorthead Redhorse [*Moxostoma macrolepidotum*], Silver Redhorse [*M. anisurum*] and Northern Hog Sucker [*Hypentelium nigricans*]) that may have been confused with Black Redhorse from the list of permitted baitfish species. This change may help to minimize risk of incidental harvest due to misidentification of this species.

Significant knowledge gaps remain for Black Redhorse and Silver Shiner related to habitat needs, life history, population dynamics and threats. Population demographics of both species are poorly characterized in Ontario, preventing the identification of quantifiable population and distribution objectives. Consistent, targeted sampling and improvements in species identification are required to fill this knowledge gap. Research to identify habitat needs – particularly for Silver Shiner – as well as threats and thresholds of tolerance for both species, are necessary to prioritize recovery efforts and refine objectives.

Government's Recovery Goal

The government's goal for the recovery of Black Redhorse and Silver Shiner is to stabilize or increase existing populations, and to maintain or increase the species' distributions within their natural ranges in Ontario.

Actions

Protecting and recovering species at risk is a shared responsibility. No single agency or organization has the knowledge, authority or financial resources to protect and recover all of Ontario's species at risk. Successful recovery requires inter-governmental co-operation and the involvement of many individuals, organizations and communities. In developing the government response statement, the government considered what actions are feasible for the government to lead directly and what actions are feasible for the government to support its conservation partners to undertake.

Government-led Actions

To help protect and recover Black Redhorse and Silver Shiner, the government will directly undertake the following actions:

- Continue to protect Black Redhorse and Silver Shiner and their habitat through the ESA.
- Undertake communications and outreach to increase public awareness of species at risk in Ontario (e.g. through the Ontario Parks Discovery Program, where appropriate).
- Continue to monitor Silver Shiner populations and mitigate threats to the species and its habitat (e.g. remove barriers and implement bank stabilization measures) in provincially protected areas, where feasible and appropriate.
- Educate other agencies and authorities involved in planning and environmental assessment processes on the protection requirements under the ESA.
- Encourage the submission of Black Redhorse and Silver Shiner data to Ontario's central repository through the NHIC (Rare species of Ontario) project in iNaturalist or directly through the Natural Heritage Information Centre.
- Continue to support conservation, agency, municipal and industry partners, and Indigenous communities and organizations to undertake activities to protect and recover Black Redhorse and Silver Shiner. Support will be provided where appropriate through funding, agreements, permits and/or advisory services.
- Continue to implement Ontario's *Invasive Species Act, 2015* to:
  - prevent the introduction and spread of invasive species (e.g. invasive Carp) that threaten Black Redhorse by applying the prohibitions set out in the Act and as prescribed through the associated Regulations.

- prevent the introduction and spread of invasive species (e.g. dreissenid mussels) that threaten Black Redhorse and its habitat by requiring boaters to take mandatory precautions to remove aquatic organisms and drain water from watercraft and watercraft equipment prior to transporting overland or launching into any waterbody in Ontario.

- Continue to implement the Aquatic Invasive Species Regulations made under the federal *Fisheries Act, 1985* to control the spread of invasive species that threaten Black Redhorse and Silver Shiner and their habitats by prohibiting the transportation, possession, and release of live Round Goby in Ontario.
- Continue to implement the Ontario Invasive Species Strategic Plan (2012) to address the invasive species (e.g. dreissenid mussels, Sea Lamprey, Round Goby) that threaten Black Redhorse and Silver Shiner and their habitats.
- Continue to implement Ontario's Sustainable Bait Management Strategy, 2020 to address potential risks to species at risk and the spread of invasive species.
- Conduct a review of progress toward the protection and recovery of Black Redhorse and Silver Shiner within five years of the publication of this document.

Government-supported Actions

The government endorses the following actions as being necessary for the protection and recovery of Black Redhorse and Silver Shiner. Actions identified as "high" may be given priority consideration for funding under the Species at Risk Stewardship Program. Where reasonable, the government will also consider the priority assigned to these actions when reviewing and issuing authorizations under the ESA. Other organizations are encouraged to consider these priorities when developing projects or mitigation plans related to species at risk.

Focus Area: **Management and Threat Mitigation**

Objective: Maintain or improve the quality of Black Redhorse and Silver Shiner habitat through mitigation of threats.

Black Redhorse and Silver Shiner occur in highly developed landscapes in southern Ontario and face threats from pollution, alterations in flow, and barriers to movement, which restrict availability and quality of habitat. As priorities are established based on threat evaluations for each species, collaborative implementation of actions to mitigate these threats on a watershed basis will ensure a cohesive approach to protection and recovery of the species and their habitats in Ontario. Collaborators may include local landowners, land managers, ecosystem recovery teams, Indigenous communities and organizations, municipalities, aquatic professionals, and stewardship organizations. The implementation of management and threat mitigation actions for Black Redhorse and Silver Shiner is likely to have a positive impact on other aquatic species at risk within the same watersheds. However, the potential impacts of these actions – including on other species at risk, flood control or the spread of invasive species – should be carefully considered prior to implementation.

Actions:

1. Minimize threats in and around the species' habitats by undertaking activities and completing effectiveness monitoring for these activities, including:
   i. **(High)** establishing or restoring riparian buffers

ii. **(High)** developing and implementing Environmental Farm Plans and Nutrient Management Plans
iii. **(High)** implementing best management practices (BMPs) to prevent or reduce siltation, altered flow regimes and contaminants
iv. where feasible and appropriate, removing or modifying barriers to movement (e.g. installing fish ladders) within portions of watersheds that are occupied by Black Redhorse and Silver Shiner and where suitable upstream habitat exists or could be restored

Focus Area: **Research and Monitoring**
Objective: Fill knowledge gaps related to Black Redhorse and Silver Shiner habitat, population trends and threats.

Regular, standardized surveys are required to refine habitat needs, determine population dynamics and formulate quantitative population and distribution objectives for Black Redhorse and Silver Shiner. In order to focus efforts where they will best support the protection and recovery of the two species, a threat evaluation is necessary to determine priorities based on likelihood and level of impact. Filling these knowledge gaps will provide a better picture of the status of Black Redhorse and Silver Shiner and ensure resources are appropriately allocated to their recovery. Where possible, these actions should be undertaken in collaboration with Indigenous communities and organizations, and other conservation partners to promote inclusion of local knowledge and resources.

Actions:

2. **(High)** Develop and implement a standardized protocol to inventory and monitor Black Redhorse and Silver Shiner, and, where possible, coordinate efforts for other species at risk fishes and invasive species which occur in the same watersheds. Actions may include:
   i. surveying for the species' presence/absence within current and historical distributions and other targeted areas where suitable habitat exists and there is reason to believe each species may be present to confirm status and extent of populations
   ii. monitoring changes in distribution, abundance, demographics and habitat conditions where the species are known to occur
3. Evaluate threats to Black Redhorse and Silver Shiner at all life stages to inform priorities for populations at the watershed scale. Actions may include:
   i. **(High)** identifying pollution sources and their cumulative impacts on the species
   ii. conducting flow-needs assessments to inform water level management
   iii. investigating the potential impacts of climate change and severe weather on the species and their habitats
   iv. investigating the impacts of invasive and non-native species on Black Redhorse and Silver Shiner
   v. evaluating the likelihood and impacts of human disturbance (e.g. incidental harvest, recreational activities)
4. Determine the life history (e.g. fecundity, spawning periodicity, survival in early life) of Black Redhorse and Silver Shiner to inform population models and recovery efforts.

5. Investigate the necessity and feasibility of augmenting existing populations of the species.

Focus Area: **Awareness and Outreach**

Objective: Increase the level of awareness and engagement in protecting and recovering Black Redhorse and Silver Shiner.

Black Redhorse and Silver Shiner habitat is bordered by public, private and commercial lands including agricultural fields, livestock farms, residential properties and Indigenous lands. Due to the nature of aquatic systems, the species are also impacted by activities occurring upstream of occupied habitat. Increasing public awareness of Black Redhorse and Silver Shiner, their threats and mitigation options will encourage engagement in activities to protect and recover the species.

Actions:

6. **(High)** Collaborate with Indigenous communities and organizations, landowners, land managers and conservation partners to promote awareness of Black Redhorse and Silver Shiner and their threats among people engaged in agriculture, stewardship, fishing and shoreline modification activities within the species' ranges by sharing information on:
   i. how to identify the species
   ii. the species' habitat requirements
   iii. protection afforded to the species and their habitats under the ESA
   iv. actions that can be taken to avoid or minimize the impacts to the species and their habitats
   v. actions that can be taken to promote the species' protection and recovery
7. Educate bait harvesters on the identification and biology of Black Redhorse and Silver Shiner. Encourage the use of harvest techniques and timing that minimizes potential impacts on the species and their habitats, and the reporting of individuals if incidentally caught.
8. Encourage participation by fisheries biologists, technicians and other resource managers in fish identification courses to improve reporting on species' occurrences.

Implementing Actions

Financial support for the implementation of actions may be available through the Species at Risk Stewardship Program. Conservation partners are encouraged to discuss project proposals related to the actions in this response statement with Ministry of the Environment, Conservation and Parks staff. The Ontario government can also provide guidance about the requirements of the ESA, whether an authorization or regulatory exemption may be required for the project and, if so, the authorization types and/or conditional exemptions for which the activity may be eligible. Implementation of the actions may be subject to changing priorities across the multitude of species at risk, available resources and the capacity of partners to undertake recovery activities. Where appropriate, the implementation of actions for multiple species will be co-ordinated across government response statements.

Performance Measures

Progress towards achieving the government's goal for the recovery of Black Redhorse will be measured against the following performance measures:

- Continued presence of Black Redhorse within its current distribution by 2028.
- Status of populations in recently discovered locations (e.g. Big Creek, Four Wells Lake [and connecting Forwell Creek]) determined by 2028.
- Surveys to detect Black Redhorse in new locations with suitable habitat completed by 2031.
- Population trajectories at current locations determined to be stable or increasing by 2031.

Progress towards achieving the government's goal for the recovery of Silver Shiner will be measured against the following performance measures:

- Status and distribution of Silver Shiner in the Saugeen and North Saugeen rivers determined by 2028.
- Continued presence of Silver Shiner within its current distribution by 2028.
- Surveys to detect Silver Shiner in new locations with suitable habitat completed by 2031.
- Population trajectories at current locations determined to be stable or increasing by 2031.

Reviewing Progress

The ESA requires the Ontario government to conduct a review of progress towards protecting and recovering a species no later than the time specified in the species' government response statement, which has been identified as 5 years. The review will help identify if adjustments are needed to achieve the protection and recovery of Black Redhorse and Silver Shiner.

Acknowledgement

We would like to thank all those who participated in the development of the Recovery Strategies and Government Response Statement for the Black Redhorse (*Moxostoma duquesni*) and Silver Shiner (*Notropis photogenis*) in Ontario for their dedication to protecting and recovering species at risk.

For Additional Information:
Visit the species at risk website at ontario.ca/speciesatrisk
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