



FISHERIES EXISTING CONDITIONS REPORT

ARGYLE STREET SOUTH BRIDGE

TOWN OF CALEDONIA
HALDIMAND COUNTY

G.W.P. 3805-01-00

JANUARY, 2004

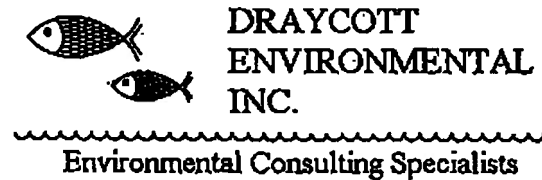


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1 hour

1.0 Introduction

This project encompasses the general rehabilitation and/or replacement of the Argyle Street South Bridge over the Grand River in the town of Caledonia. Current proposals call for the replacement of the current bridge, including piers with a 5 span, box girder bridge with decorative arches. Instream work is expected to be required to complete the project.

This study is classified as a Group B project under the Class Environmental Assessment for Provincial Transportation Facilities (2000). This Fisheries Technical Report was prepared to document fish habitat in the vicinity of the bridge, to determine appropriate mitigation measures to be implemented during construction and to assess impacts to the aquatic environment that may result from the proposed construction.

2.0 Background and Approach

The proposed project is limited to the existing bridge over the Grand River. Figure 1 shows the location of the bridge.

Field investigations encompassed the following aquatic habitat parameters:

- Morphology (including shoreline habitat);
- Fish species present in the vicinity of the study area;
- "critical" or important habitat areas including potential spawning areas, good nursery cover, as well as any potential pollutant point sources; and
- Potential habitat compensation or enhancement opportunities.

For the purpose of the fisheries investigations, the study area included the Grand River 100 m upstream and downstream of the bridge. Within this area, instream and bank habitat were photographed and assessed.

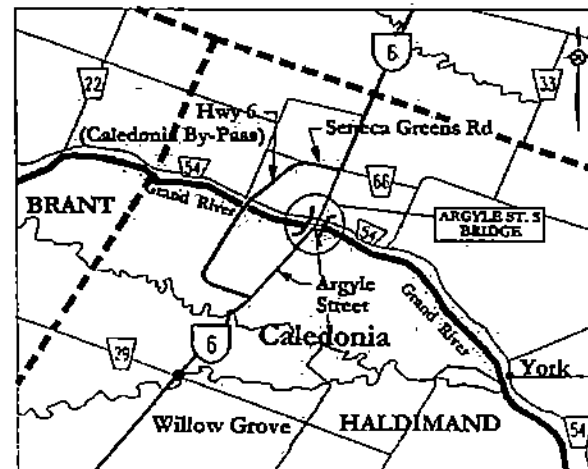


Figure 1: Key map showing bridge location.

3.0 Existing Fisheries and Aquatic Habitat

3.1 Fish Habitat

Fish habitat in the vicinity of the bridge was characterized by swift flowing runs underneath the bridge arches in the main channel with backwater areas behind each of the piers. Habitat along the banks consisted of very shallow, slow flowing riffles and runs with detritus and woody debris predominant. Typical habitat immediately downstream of the bridge is shown in Figure 2. Figure 3 shows the habitat farther downstream. Substrate in the faster areas consisted of large rubble, cobble and gravel and was free of fine materials. Substrate behind the piers was also composed of gravel, with some larger material closer to the main flow. Closer to the centre line of the pier, substrate was predominantly a sand-silt mixture.



Figure 2: View of the downstream side of the bridge. Typical habitat along the banks can be seen in the lower section of the picture.

Downstream of the bridge is a small, vegetated island. Substrate around the island is composed of the same gravel and cobble mixture found in the main channel. There is a backwater area behind the island where silt is being deposited. Upstream of the bridge is a shallow, predominantly gravel riffle that could be used as a spawning area for salmonids or sucker species that cannot migrate over the dam (Figure 4). Figure 3 shows the location of the major habitat types in the study area.

Riparian vegetation consists of Manitoba maple trees along the banks, with some shrubs (primarily willow) underneath the bridge and around the island. Banks within the study area are stable and well vegetated with grass.

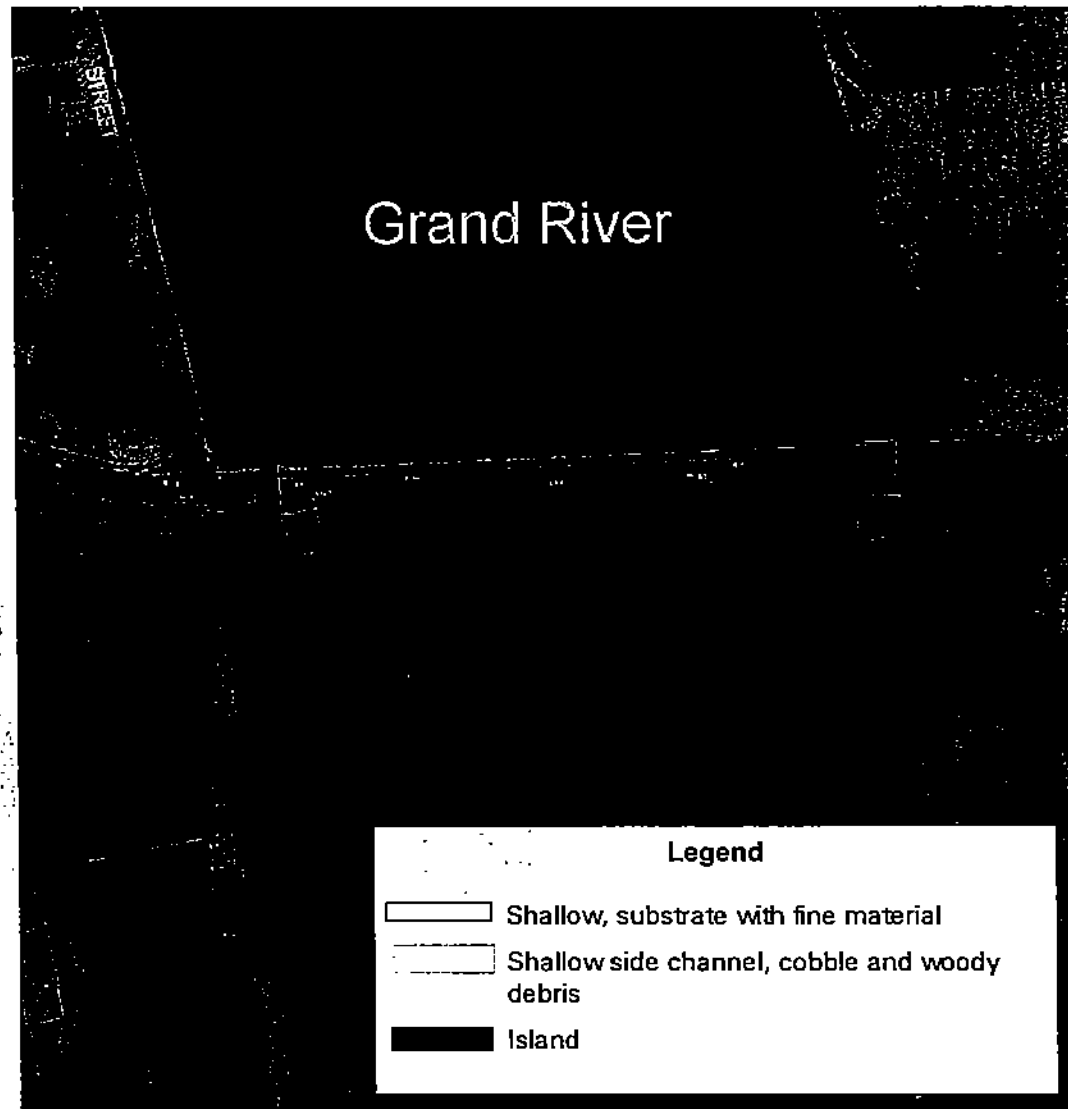


Figure 3: Location of specialized habitat in the study area.

Other than the upstream gravel bar already mentioned, the other specialized habitat within the study area is around the bridge. The fast water between the piers is potential feeding habitat for a variety of species, particularly rainbow trout, who could take refuge in the slower areas and capture food as it drifts by. The area of slack water behind the piers (Figure 6) could be used by minnow species for all life stages (spawning, rearing and adult). There are some areas of relatively clean gravel that could also be potential spawning habitat for trout or sucker species. The shallow side channels along the banks under the bridge are potential rearing habitat for many of the species that are present in the river.

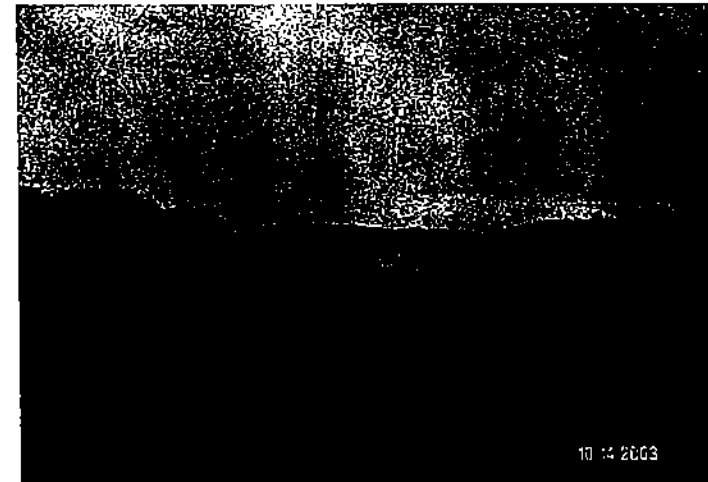


Figure 4: View of Grand River downstream of bridge.

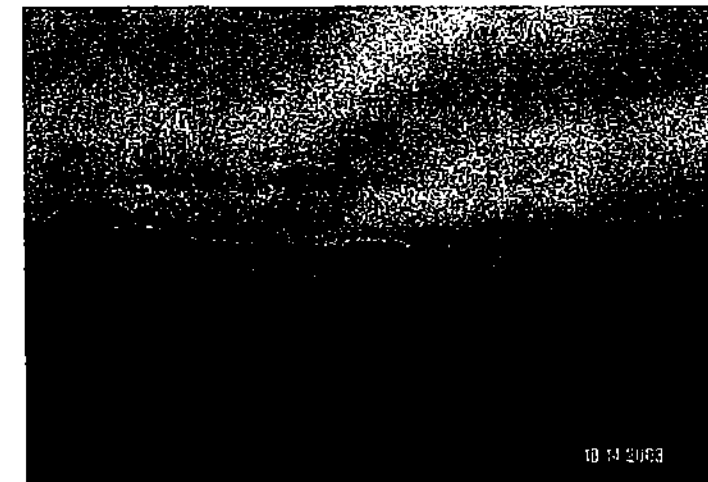


Figure 5: View of Grand River upstream of bridge.



Figure 6: View from south bank showing existing piers. Behind each pier is an area of quiet water (example outlined in red).

3.2 Fish Species

The Grand River supports a diverse array of fish species, particularly downstream of the Dunnville Dam, which is the first barrier upstream of lake Erie (Grand River Conservation Authority (GRCA), 2002). A review of previous investigations found reports information from 1971, 1974, 1981, 1988, 1998 and 2001. Additional information was also provided by Scott Reid (PhD candidate, Trent University) who sampled fish in the vicinity of the bridge in 2002-2003 and from the GRCA which conducted sampling on September 11, 2003 in areas downstream of the bridge. A list of the species found and the source of the information is presented in Table 1. Table 1 also lists the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status, based on the most recent list (COSEWIC, 2003).

Table 1: Fish species captured in the Grand River downstream of Caledonia Dam.

Common Name	Scientific Name	COSEWIC Status	Source of Information ^a
alewife	<i>Alosa pseudoharengus</i>		6
black crappie	<i>Pomoxis nigromaculatus</i>		1, 4, 5
black redhorse	<i>Moxostoma duquesnei</i>	Threatened	7
blackside darter	<i>Percina maculata</i>		5, 8
bluegill	<i>Lepomis macrochirus</i>		5
bluntnose minnow	<i>Pimephales notatus</i>		1, 2, 5, 6, 8
brook silverside	<i>Labidesthes sicculus</i>		1, 5
brown bullhead	<i>Ameiurus nebulosus</i>		1, 4, 5
channel catfish	<i>Ictalurus punctatus</i>		4, 6
common carp	<i>Cyprinus carpio</i>		1, 4, 5, 6, 8
common shiner	<i>Luxilus cornutus</i>		1, 2, 5, 6, 8
eastern sand darter	<i>Ammocrypta pellucida</i>	Threatened	5
emerald shiner	<i>Notropis atherinoides</i>		1, 5
fathead minnow	<i>Pimephales promelas</i>		5
freshwater drum	<i>Aplodinotus grunniens</i>		1, 6
gizzard shad	<i>Dorosoma cepedianum</i>		8
golden redhorse	<i>Moxostoma erythrurum</i>		4, 5, 6, 8
golden shiner	<i>Notemigonus crysoleucas</i>		1
greater redhorse	<i>Moxostoma valenciennesi</i>		5, 6
greenside darter	<i>Etheostoma bleimioides</i>	Special Concern	5
hornyhead chub	<i>Nocomis biguttatus</i>		1, 8
Johnny darter	<i>Etheostoma nigrum</i>		1, 5
largemouth bass	<i>Micropterus salmoides</i>		1, 2, 4, 5, 6
logperch	<i>Percina caprodes</i>		2, 5, 6, 8
longnose dace	<i>Rhinichthys cataractae</i>		5
longnose gar	<i>Lepisosteus osseus</i>		1, 5, 6
mimic shiner	<i>Notropis volucellus</i>		2, 5, 8
mooneye	<i>Hiodon tergisus</i>		6
northern hognose sucker	<i>Hypentelium nigricans</i>		5, 8
northern pike	<i>Esox lucius</i>		4, 8
pumpkinseed	<i>Lepomis gibbosus</i>		1, 4, 5
quillback	<i>Carpoides cyprinus</i>		5

Common Name	Scientific Name	COSEWIC Status	Source of Information ^a
rainbow darter	<i>Etheostoma caeruleum</i>		5
rainbow trout	<i>Oncorhynchus mykiss</i>		1
river chub	<i>Nocomis micropogon</i>		2, 5
river redhorse	<i>Moxostoma carinatum</i>	Special Concern	7
rock bass	<i>Ambloplites rupestris</i>		1, 2, 4, 5, 6, 8
rosyface shiner	<i>Notropis rubellus</i>		1, 2, 5
sea lamprey	<i>Petromyzon marinus</i>		3
shorthead redhorse	<i>Moxostoma macrolepidotum</i>		1, 4, 5, 8
silver redhorse	<i>Moxostoma anisurum</i>		4, 5, 6
smallmouth bass	<i>Micropterus dolomieu</i>		1, 2, 4, 5, 6, 8
spotfin shiner	<i>Cyprinella spiloptera</i>		1, 2, 5, 6
spottail shiner	<i>Notropis hudsonius</i>		5, 6
stonecat	<i>Noturus flavus</i>		2, 5, 8
striped shiner	<i>Luxilus chrysocephalus</i>		5
trout perch	<i>Percopsis omiscomaycus</i>		6
walleye	<i>Stizostedion vitreum vitreum</i>		1, 4, 5, 6
white crappie	<i>Pomoxis armularis</i>		1, 5
white sucker	<i>Catostomus commersoni</i>		1, 4, 5, 6, 8
yellow perch	<i>Perca flavescens</i>		4, 5

^a Information sources

- 1 - MNR records for below Caledonia Dam in 1971
- 3 - MNR records for below Caledonia Dam in 1981
- 5 - Tarandus (1998)
- 7 - Reid (personal communication)

- 2 - MNR records for below Caledonia Dam in 1974
- 4 - GRCA (1988)
- 6 - Anderson (2002)
- 8 - GRCA (personal communication)

The presence of resident rainbow trout has also been confirmed by Art Timmerman of the Ministry of Natural Resources. In addition to the resident species listed in Table 1, migratory runs of rainbow trout have also been observed (Paul General, personal communication). Migratory runs of walleye and suckers have also been noted at the site (Paul General, personal communication). The Caledonia Dam has fish ladders to assist non-jumping species, but the success of the ladders is in question. The Dam acts as a barrier to all but the strongest rainbow trout. There are also reports of a limited spawning run of Chinook and Coho salmon in the fall.

The presence of resident rainbow trout and pacific salmon means that this section of the river will be classified as a coldwater system and be subject to the instream timing restrictions associated with that designation. The specific timing restriction will be determined by MNR, but will likely involve a construction window (period of allowable instream work) from mid June until September. This is by no means a firm date, it will depend on discussion with the Ministry of Natural Resources and the Department of Fisheries and Oceans, once a project design is finalized.

3.3 Species designated by COSEWIC

Four species found in the study area have been given designations by COSEWIC. The eastern sand darter and black redhorse are considered Threatened. A Threatened species is defined as a species likely to become endangered if limiting factors are not reversed. Limiting factors can be habitat loss, pollution or exploitation. The other two species of note are the greenside darter and the river redhorse, which have been listed as a species of Special Concern. A species of Special Concern is defined by COSEWIC as a species that possesses characteristics

that make it particularly sensitive to human activities or natural events. These species are not under any particular pressure at the present, but need to be monitored to ensure stability of the population. The details of each of these four species are listed below. More information on each species can be found in Appendix A.

Eastern Sand Darter

A single eastern sand darter was collected along the shoreline upstream of the bridge in 1998 (Tarandus, 1998). The eastern sand darter frequents water with limestone bottoms, covered with a thin layer of fine sediment, riffles composed of rubble and gravel and slightly silted sand bottoms in rivers. They are known to partially bury themselves in the fine substrate of their preferred habitats (Scott and Crossman, 1973). The main preference seems to be sandy bottom areas with enough current to keep silt from depositing. Preferred spawning habitat is similar, a sand bottom, with enough current to keep it silt free. Habitat matching this description was found downstream of some of the bridge piers, along the shoreline underneath the bridge and around the island downstream of the bridge. Whether the darters could actually get out and utilize this habitat is not known. This area will potentially be impacted if the piers are removed.

The decline of the eastern sand darter is attributed to loss of habitat, primarily through siltation, which reduces oxygen and smothers the eggs of the species. Because of the decline of this species, it is considered Threatened by COSEWIC. The species is listed under Schedule 1 of the new *Species at Risk Act (SARA)*. Under the Act, there are new requirements for works that may damage or destroy the residence of a listed endangered or threatened (Schedule 1) species. In addition to the normal requirements for the protection of aquatic habitat under the *Fisheries Act*, additional information will be required to specifically demonstrate how impacts to the listed species will be avoided. This could include additional pre-construction monitoring, enhanced sediment and erosion control mitigation measures and post-construction monitoring to determine if there was any impact on the habitat of the species.

Black Redhorse

The black redhorse is also listed as a threatened species, however it is on Schedule 2 of *SARA*, since its status has not been updated since the new requirements came into effect in 1999. This fish prefers fast moving riffle areas with a sand, gravel and bedrock substrate, similar to the habitat found around the bridge piers. According to Scott Reid (personal communication), black redhorse in spawning condition were found in riffle areas between the dam and the bridge. It is not unlikely that this species could also utilize the habitat around the piers and the area around the island. Since this fish is a strong swimmer, it is able to utilize the entire river and could be found in the vicinity of the bridge.

The primary threat to the black redhorse has been the alteration of its natural spawning habitat through the construction of dams. There is currently work ongoing as part of a recovery strategy for the entire Grand River. As part of *SARA* requirements, any potential impacts resulting from construction will have to account for the recovery strategies that are in place.

River Redhorse

The river redhorse is listed as a species of special concern and has been placed on Schedule 3 of the *SARA* species listing. Placement on Schedule 3 means that a report on its status must be prepared using the revised criteria before it can be listed under Schedule 1. Otherwise there are no special requirements, outside of what would normally be required as part of the Fisheries

Act application. The preferred habitat of the river redhorse is fast water, with a gravel to bedrock substrate and very little silt. Changes to habitat are listed as the primary reason for the concern regarding this species.

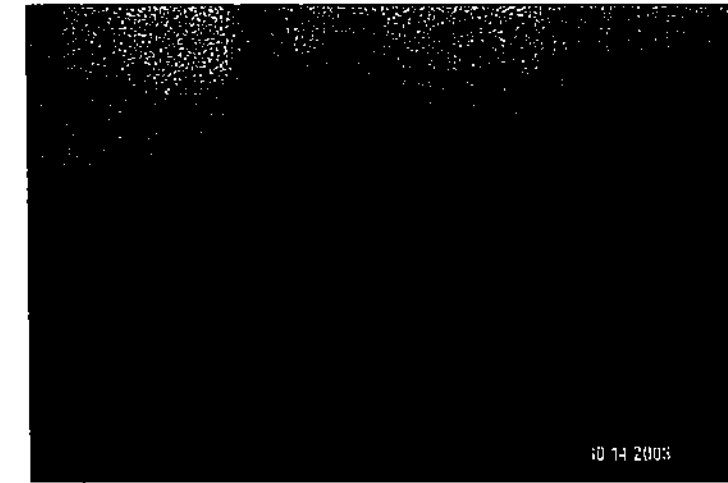


Figure 7: Algae covered boulders downstream of the bridge.

Greenside Darter

The greenside darter is listed as a species of special concern. Unlike the eastern sand darter, the greenside darter requires less specific habitat, preferring moderate to fast-flowing, clean water. Spawning takes place on filamentous algae covered boulders in fast flowing water. Some algae was observed coating the boulders downstream of the bridge (Figure 7), but it could not be determined if the algae was suitable for spawning greenside darters. This species is listed under Schedule 3 of *SARA*, which means that a report on its status must be prepared using the revised criteria before it can be listed under Schedule 1. Otherwise there are no special requirements, outside of what would normally be required as part of the Fisheries Act application.

4.0 Summary

The Grand River supports a diverse number of fish species in the vicinity of the bridge. In addition, the bridge piers have created conditions on their downstream side that could provide habitat for a number of species, including four species that have been listed by COSEWIC. The presence of these listed species will require more careful consideration and planning of any instream construction activities in order to avoid any negative impact on the fish and fish habitat of the Grand River.

5.0 References

- Anderson, P. 2002. Grand River 2001 Fish Community Assessment Study Report. Draft prepared for the Watershed Science Center and the Grand River Conservation Authority. 57 pp.
- COSEWIC 2003. Canadian Species at Risk, May 2003. Committee on the Status of Endangered Wildlife in Canada. 43 pp.
- Grand River Conservation Authority. 1988. Caledonia Class Environmental Assessment.
- Ministry of Natural Resources. 1971. Field Collection Returns for Caledonia Dam.
- Ministry of Natural Resources. 1974. Field Collection Returns for Caledonia Dam.
- Ministry of Natural Resources. 1981. Field Collection Returns for Caledonia Dam.
- Scott, W.B. and E. J. Crossman. 1973. Freshwater Fishes of Canada. Bulletin 184, Fisheries Research Board of Canada.
- Tarandus Associated Ltd. 1998. Grand River Fish Survey in the Vicinity of the Caledonia Dam, 1998. Prepared for the Grand River Conservation Authority and the Ontario Ministry of Natural Resources. 59 pp.

APPENDIX A – INFORMATION REGARDING THE FOUR LISTED COSEWIC SPECIES

(All information from COSEWIC website: <http://www.cosewic.gc.ca>)

Black Redhorse

Scientific name:	<i>Moxostoma duquesnei</i>
Taxonomic group:	Fishes (freshwater)
Range:	ON
Status under SARA*:	Threatened, on <u>Schedule 2</u>
Last COSEWIC** designation:	Threatened (April 1988)

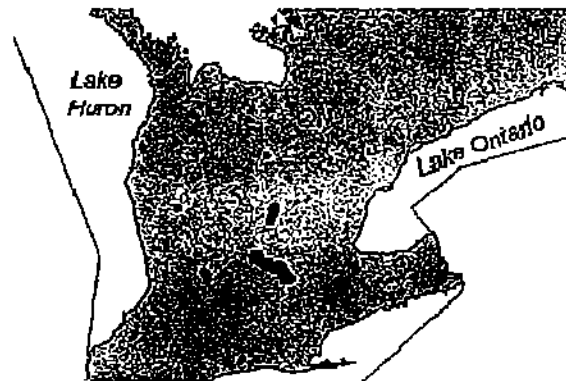
*SARA: The Species at Risk Act
**COSEWIC: The Committee on the Status of Endangered Wildlife in Canada

Photo: Natural Resources Canada



Description

The Black Redhorse is one of the smallest suckers. In Canada, it reaches a length of 250 to 330 mm and a weight of 900 to 1 000 g. Normally, the back of the Black Redhorse is grey or olive brown, the sides are bluish silver and the belly is silver or white. The fins are slate grey to orange, and sometimes have a red glint. During the spawning season, males have a lateral pink stripe, and their backs and sides are greenish black. The mouth of the Redhorse Sucker, like that of most suckers, is found in the lower part of the nose, which allows it to suck up aquatic invertebrates from the bottom of rivers.



Approximate range - not for legal use

Distribution and Population

There are no estimates on the size of the Canadian population of the Black Redhorse. In Canada, this fish is found in the Great Lakes basin; it has been seen in Catfish Creek and in the Grand, Thames and Maitland Rivers. Its distribution extends into the United States, in the Mississippi River system.

Habitat

The Black Redhorse is found in medium-size rivers, where the river bed is composed of sand or gravel and bedrock substrates, where siltation is minimal and where the current is fairly

strong. The Black Redhorse has typically been caught in waters that are oxygen rich and fertile which have a mean temperature of 20 °C in July.

Biology

The Black Redhorse spawns at the end of May or the beginning of June; the spawning period lasts 7 to 8 days and intensifies when the water temperature nears 15 °C. Each female lays between 4 126 and 11 551 eggs, placed on a pile of gravel. Both sexes reach sexual maturity at 4 years and can then spawn every year.

Threats

Dams built on the Grand and Thames Rivers have brought about changes in these rivers and have thus contributed to the disappearance of Black Redhorse spawning habitat. Few biologists can actually recognize the Black Redhorse; all suckers are grouped together during field observations, which has a negative effect on the information available for specific species.

Protection

Species that were designated at risk by COSEWIC prior to October 1999 must be reassessed against revised criteria before they can be considered for addition to Schedule 1 of the *Species at Risk Act* (SARA). To find out when re-assessment of this species is anticipated, please consult the [COSEWIC web site](#).

The fish habitat section of the Fisheries Act of Canada gives limited protection to the Black Redhorse. The Ontario Ministry of Natural Resources has given sections of the Nith River "sensitive environment" designations and has attempted to designate the Black Redhorse a peripheral species.

Recovery Initiatives

Recovery Plan Status: The steering committee for the Grand River Recovery Project is overseeing the development of a Recovery Plan for Fishes at Risk in the Grand River Watershed.

Plan Goal: facilitate the protection and recovery of the fishes at risk in the Grand River Watershed.

Long-term Objectives:

- secure existing populations of species at risk;
- re-establish the species in parts of their historic range where they are no longer found;
- produce a brochure publicizing the recovery plan featuring individual species and make these available at various locations in the watershed.

Summary of Research and Monitoring Activities:

- 1999: Mapped and assessed the habitat of the Eastern Sand Darter and monitored the specie in areas of suitable habitat.
- 2002: Sampled 16 sites from May to October to locate species. Along the Grand and Nith rivers 201 Black Redhorse were found, and along the lower Grand River 59 River Redhorse were found.
- 2002-2003: Investigating the impact of river fragmentation on the genetic structure of Black Redhorse and River Redhorse populations using microsatellite and mitochondrial DNA.
- 2003: Sampling along the Grand River to update information on the distribution of Black

Redhorse populations. Sampling for Eastern Sand Darters. Assessing habitat use by Redhorse species using radio-telemetry

Summary of Recovery Activities:

- 1997: a steering committee for the Grand River Recovery Project was formed.
- 2000: the Redside Dace Action Group was formed to address issues in the Irvine Creek Watershed.
- 2002: A new recovery team was established and a recovery strategy has been drafted.

Summary of Progress to Date:

Most of the recent work has involved habitat and population surveys for the fishes at risk in the watershed. The distribution data for species (fishes) at risk in the watershed have been updated by monitoring and sampling. Area residents have an improved understanding of species at risk and recovery activities in the watershed as a result of outreach activities.

THAMES RIVER ECOSYSTEM

The Black redhorse is one of several species being addressed under a recovery plan for the Thames River ecosystem.

Recovery Strategy Status: recovery strategy is in development

Strategy Goal: to improve the status of all aquatic species at risk in the Thames River through an ecosystem approach that sustains and enhances all native aquatic communities.

Long-term Objectives:

- develop partnerships with agencies, industries, and community groups;
- improve public consultation and awareness to foster responsible public and private action benefiting aquatic habitats;
- monitor and compile information on aquatic species at risk in the Thames River;
- ensure recovery actions identified for aquatic species regard the needs of terrestrial species at risk in the watershed.

Summary of Research/Monitoring Activities:

- 2001: initiated research to support stewardship activities.

Summary of Recovery Activities:

- 2001: adopted a Thames River Recovery logo; conducted habitat restoration and communication activities.

Recovery Team

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Upper Thames River Conservation Authority
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NSV 5B9
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fax: (519) 451-1188

References

- Parker, B. and E. Kott. 1988. Status Report on the BLACK REDHORSE, *Moxostoma duquesnei*, in Canada. Committee on the Status of Endangered Wildlife in Canada. 17 pp.

River Redhorse

Scientific name:	<i>Moxostoma carinatum</i>
Taxonomic group:	Fishes (freshwater)
Range:	ON QC
Status under SARA*:	Special Concern, on <u>Schedule 3</u>
Last COSEWIC** designation:	Special Concern (April 1987)

*SARA: The Species at Risk Act

**COSEWIC: The Committee on the Status of Endangered Wildlife in Canada

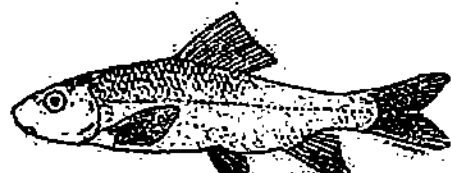
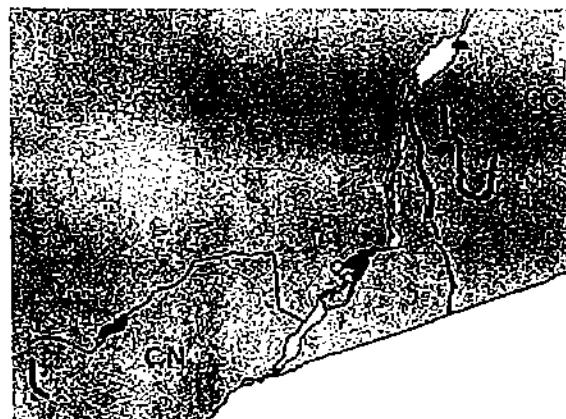


Photo: Natural Resources Canada

Description

The River Redhorse is a large sucker with a broad, flat head, a long snout and an inferior mouth. The dorsal fin has a square edge, the caudal fin is forked with pointed tips, the anal fin is long, the pelvic fins have pointed tips and the pectoral fins have square edges with pointed tips. The back of this fish is brown or olive-green, while its sides are paler and its underparts are golden to white. The dorsal, caudal and anal fins are light red, while the pelvic and pectoral fins are red or olive with white. River Redhorses measure 305 to 457 mm.



Approximate range - not for legal use

Distribution and Population

In Canada, River Redhorses are found only in southern Ontario and southwestern Quebec. Estimates of the size of Canadian populations of River Redhorses are not available, but these populations seem to be declining.

Habitat

River Redhorses inhabit moderate to large rivers where the current is fast, and the bottom is composed of stones, rubble and bedrock with very little siltation.

Biology

River Redhorses spawn in late May or early June, in areas of fast flowing shallow waters where the bottom is composed of rocks or cobble. River Redhorses can live up to 14 years.

Threats

The River Redhorse does not adapt to siltation or pollution, and changes in the habitat are thus important limiting factors.

Protection

Species that were designated at risk by COSEWIC prior to October 1999 must be reassessed against revised criteria before they can be considered for addition to Schedule 1 of the *Species at Risk Act* (SARA). To find out when re-assessment of this species is anticipated, please consult the [COSEWIC web site](#).

The Federal Fisheries Act prohibits destruction of fish habitat. In the United States, the River Redhorse is listed as endangered, threatened, rare or extirpated in several states.

References

- Parker, B. 1987. Updated Status Report on the RIVER REDHORSE, *Moxostoma carinatum*, in Canada. Committee on the Status of Endangered Wildlife in Canada. 17 pp.
- Parker, B. and P. McKee. 1983. Status Report on the RIVER REDHORSE, *Moxostoma carinatum*, in Canada. Committee on the Status of Endangered Wildlife in Canada. 10 pp.

Eastern Sand Darter

Scientific name: *Ammocrypta pellucida*
Taxonomic group: Fishes (freshwater)
Range: ON QC
Status under SARA*: Threatened, on Schedule 1
Last COSEWIC designation:** Threatened (November 2000)

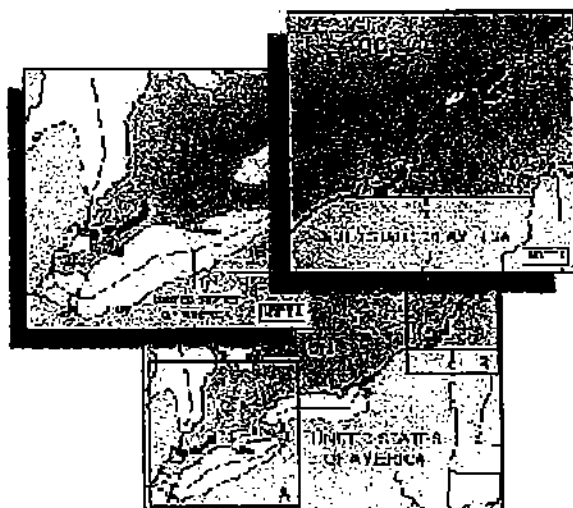
*SARA: The Species at Risk Act
**COSEWIC: The Committee on the Status of Endangered Wildlife in Canada



Photofmage: Smithsonian Institution NMNH Division of Fishes

Description

The Eastern Sand Darter is a small, slender fish. Its body is long, translucent and usually incompletely scaled. It is pale white, yellowish or silvery coloured, and bears 10 to 14 dark spots along each side. These spots are often rounded in front and oblong at back. Adults are 46-71 millimeters long.



Approximate range - not for legal use

Distribution and Population

The Eastern Sand Darter is a North American species. It has been found in the Ohio River basin in Ohio, Indiana, Illinois, Kentucky, West Virginia and Pennsylvania. Canadian populations have occurred in Lake Huron, Lake Erie, and Lake St. Clair drainages in Michigan, Ohio, New York and Ontario. The species has also occurred in the St. Lawrence River and Lac Champlain drainages of Quebec, Vermont and New York.

It was common and widespread in the early 1900s. It has since declined from many parts of its range, and has been extirpated from others. It continues to occur in lakes Erie and St. Clair and in several rivers in southwestern Ontario and Quebec. Its status in Quebec is not known due to lack of recent data. Recently, new sites have been found for the species, extending the known range of the Brantford population by 17 km.

Habitat

The fish favours sandy bottoms of streams and rivers and sandy shoals in lakes. It frequents water over limestone bottoms covered with a thin layer of mud, riffles over rubble and gravel, and silted sand bottoms. The water can be clear, tea-coloured or murky. Currents can range from still to swift.

Biology

Females are ready to spawn at about one year provided they have reached 36 millimeters in length. Spawning occurs from late June to late July. Water temperatures during spawning range from 14 °C to 24 °C. The male mounts the female, and 22 to 829 eggs are deposited as the pair vibrate and bury their tails in river or lake bottom. Individuals only migrate for food. The species feeds mostly on midge and black-fly larvae. It has a limited diet due to the species' small mouth size and restricted habitat.

Threats

Poor water quality may have caused decline or extirpation in urban areas like Montreal and Chateaugay, Quebec. Siltation, which reduces oxygen at the bottom of waterways, seems to be the main cause of habitat loss in Canada. Reduced oxygen deprives the eggs of a substance they need to survive. Silting of critical habitat, impoundments, chemical pollution and acid mine drainage are blamed for species' decline in Ohio, Illinois and Kentucky.

Protection

The Eastern Sand Darter is protected under the federal *Species at Risk Act* (SARA). More information about SARA, including how it protects individual species, is available in the [Species at Risk Act: A Guide](#).

The Federal Fisheries Act prohibits destruction of fish habitat. The Ontario Lakes and Streams Improvement Act forbids tampering that leads to build-up of silt in waterways. The Quebec habitat is somewhat protected by Environmental Quality Act.

Recovery Initiatives

Recovery Plan Status: The steering committee for the Grand River Recovery Project is overseeing the development of a Recovery Plan for Fishes at Risk in the Grand River Watershed.

Plan Goal: facilitate the protection and recovery of the fishes at risk in the Grand River Watershed.

Long-term Objectives:

- secure existing populations of species at risk;
- re-establish the species in parts of their historic range where they are no longer found;
- produce a brochure publicizing the recovery plan featuring individual species and make these available at various locations in the watershed.

Summary of Research and Monitoring Activities:

- 1999: Mapped and assessed the habitat of the Eastern Sand Darter and monitored the specie in areas of suitable habitat.
- 2002: Sampled 16 sites from May to October to locate species. Along the Grand and Nith rivers 201 Black Redhorse were found, and along the lower Grand River 59 River Redhorse were found.
- 2002-2003: Investigating the impact of river fragmentation on the genetic structure of Black Redhorse and River Redhorse populations using microsatellite and mitochondrial DNA.
- 2003: Sampling along the Grand River to update information on the distribution of Black Redhorse populations. Sampling for Eastern Sand Darters. Assessing habitat use by Redhorse species using radio-telemetry

Summary of Recovery Activities:

- 1997: a steering committee for the Grand River Recovery Project was formed.
- 2000: the Redside Dace Action Group was formed to address issues in the Irvine Creek Watershed.
- 2002: A new recovery team was established and a recovery strategy has been drafted.

Summary of Progress to Date:

Most of the recent work has involved habitat and population surveys for the fishes at risk in the watershed. The distribution data for species (fishes) at risk in the watershed have been updated by monitoring and sampling. Area residents have an improved understanding of species at risk and recovery activities in the watershed as a result of outreach activities.

SYDENHAM RIVER ECOSYSTEM

This species is one of several species being addressed under an ecosystem-based recovery plan for the Sydenham River.

Strategy Goals: to sustain and enhance the native aquatic communities of the Sydenham River through an ecosystem approach that focuses on species at risk; for the five mussel and eight fish species, to maintain existing populations and restore each species to areas of the river where they formerly occurred.

Long-term Objectives:

- maintain the current populations and geographical distributions of species at risk;
- Improve water quality by reducing sediment and nutrient loading and chemical inputs;
- establish a broad based monitoring program that assesses the physical, chemical and biological characteristics of the system;
- reduce the risk of exotic species introductions;
- enhance the understanding of key aspects of the ecosystem that will lead to further refinement and prioritization of essential recovery actions;
- promote improved land stewardship practices by encouraging a sense of public ownership and involvement among landowners, stakeholders, those working in the watershed and

other interested citizens;

- generate awareness regarding the Sydenham River and the significance of its natural heritage.

Summary of Research/Monitoring Activities:

- 1999 - 2000: completed four background reports on: water quality, stream channel analysis, land use, and species at risk; synthesized background reports into a summary report with recommendations for recovery actions.
- 1999 - 2001: conducted mussel surveys in the St. Clair delta.
- 2001: conducted fish and mussel surveys in the Sydenham River; re-instated a water quality monitoring program.
- ongoing: sampling lake and sea bottom invertebrates; conducting research on the identification of fish hosts for 3 endangered mussel species.

Summary of Recovery Activities:

- 2000: initiated the Sydenham River Stewardship Program through local stewardship councils, with support from the federal Habitat Stewardship Program.
- 2001: conducted a variety of stewardship activities throughout the watershed, including riparian plantings, livestock restrictions, and manure management; several public meetings were held to increase awareness and allow input on the development of the recovery strategy; area landowners completed stewardship projects on their lands to reduce sediment and nutrient delivery to watercourses; implemented a school outreach program to raise awareness of species at risk in the Sydenham River; developed a publicly-accessible Web site; distributed an informative poster throughout the watershed; initiated projects to improve the water quality in the northern portion of the watershed under the St. Clair Remedial Action Plan.

Summary of Progress to Date:

In 1998, a previously unknown population of northern riffleshell was discovered in the Ausable River of the lower Lake Huron drainage, and wavy-rayed lampmussels were found at a site on the Maitland River near Auburn. Researchers have collected significant data on the population size, demographics, habitat, and range of the rayed bean in the Sydenham River. They have also determined several fish hosts in Canada for the rayed bean.

Objectives for 2002 - 2003 are:

- determine the fish host(s) and life history for the northern riffleshell and snuffbox in Canada;
- confirm the fish host for the wavy-rayed lampmussel in Canada;
- conduct mudpuppy surveys (host for mudpuppy mussel larvae) will be conducted in the Sydenham River to determine the population size and status;
- initiate ten additional long-term index monitoring sites on the East Sydenham River that will be resurveyed every 3-5 years to monitor populations of endangered freshwater mussels (rayed bean, riffleshell);
- initiate a genetic study on the northern riffleshell and rayed bean, to determine if populations in the Sydenham River are genetically distinct from other U.S. populations, and to help determine the feasibility of restocking extirpated populations;
- conduct additional surveys of the Ausable River to better determine the status of the northern riffleshell and snuffbox in this river;
- conduct additional surveys of the Maitland River to better determine the status of the

wavy-rayed lampmussel in this river;

- conduct surveys of previously unsurveyed areas of the Sydenham River to better determine the status of endangered mussels in the river;
- initiate propagation of the rayed bean.

THAMES RIVER ECOSYSTEM

The Eastern sand darter is one of several species being addressed under a recovery plan for the Thames River ecosystem.

Recovery Strategy Status: recovery strategy is in development

Strategy Goal: to improve the status of all aquatic species at risk in the Thames River through an ecosystem approach that sustains and enhances all native aquatic communities.

Long-term Objectives:

- develop partnerships with agencies, industries, and community groups;
- improve public consultation and awareness to foster responsible public and private action benefiting aquatic habitats;
- monitor and compile information on aquatic species at risk in the Thames River;
- ensure recovery actions identified for aquatic species regard the needs of terrestrial species at risk in the watershed.

Summary of Research/Monitoring Activities:

- 2001: initiated research to support stewardship activities.

Summary of Recovery Activities:

- 2001: adopted a Thames River Recovery logo; conducted habitat restoration and communication activities.

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THAMES RIVER ECOSYSTEM

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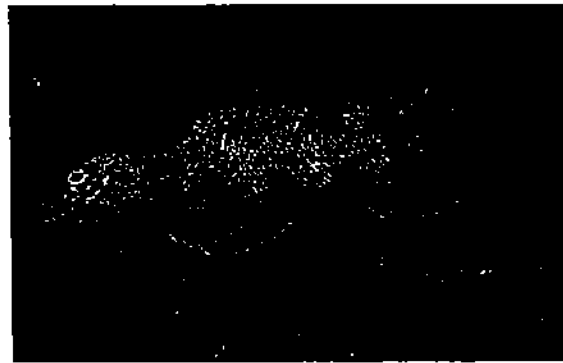
References

Holm, Erling and N. E. Mandrak. 1994. Status Report on the eastern sand darter, *Ammocrypta pellucida*, in Canada. Committee on the Status of Endangered Wildlife in Canada. 18 pp.

Greenside Darter

Scientific name: *Etheostoma blennioides*
Taxonomic group: Fishes (freshwater)
Range: ON
Status under SARA*: Special Concern, on Schedule 3
Last COSEWIC designation:** Special Concern (April 1990)

*SARA: The Species at Risk Act
**COSEWIC: The Committee on the Status of Endangered Wildlife in Canada



Photo/image: William Roston

Description

The Greenside Darter has a rounded snout which extends slightly beyond the mouth. The first dorsal fin, the anal fin, and the pelvic and pectoral fins are usually smaller on the females. The two dorsal fins are close together, the caudal fin is slightly forked, the pelvic fins are pointed on the young fish but rounded on the adults, and the pectoral fins are slightly pointed. The back and head of this fish are olive-green or olive-brown, while its sides, caudal, anal and pelvic fins are pale green, and the underparts are white. There are 5 to 7, V-shaped marks on the lower sides of the fish, and two dark lines extend downwards from the eyes. Greenside Darters measure about 76 mm.



Approximate range - not for legal use

Distribution and Population

In Canada, the Greenside Darter is found in a few river systems of southwestern Ontario. It has disappeared from several locations in Ontario, and its populations seem to be reduced.

Habitat

The Greenside Darter inhabits rivers and streams where the water is fairly clear and the flow is moderate to fast. The breeding areas of this fish are areas of fast moving water where the rocks are covered with green algae.

Biology

Greenside Darters reach sexual maturity at one year of age. The average life span of this fish is three years. Spawning occurs in pairs, but the fish will have several partners during the breeding season. The females need 10 to 12 spawning occasions during the spawning period to lay all their eggs. Once laid, the eggs are not protected by adult fish. Greenside Darters do not migrate.

Threats

Destruction of habitat is a threat to Greenside Darters. Chemical contaminants can endanger Greenside Darter populations either by directly killing the fish or by killing the insect larvae that they eat. An increase in turbidity can also limit Greenside Darter populations.

Protection

Species that were designated at risk by COSEWIC prior to October 1999 must be reassessed against revised criteria before they can be considered for addition to Schedule 1 of the *Species at Risk Act (SARA)*. To find out when re-assessment of this species is anticipated, please consult the [COSEWIC web site](#).

The Federal Fisheries Act prohibits destruction of fish habitat.

References

- Dalton, K. W. 1990. Status Report on the GREENSIDE DARTER, *Etheostoma blennioides*, in Canada. Committee on the Status of Endangered Wildlife in Canada. 32 pp.