

IN TUNE

Re-establishing the Free Passage of Fish in the Richelieu River

A considerable challenge. The solution being considered: two fish passes at the St Ours dam.

The Copper Redhorse, a Threatened Species in Quebec

SLV 2000 partners are implementing an action plan to prevent the disappearance of this unique species in Quebec.

ZIPs

The Chaleur Bay ZIP describes some of its projects, in particular the Hortus garden, which made a big impression on the Cousteau Society during a recent visit.

The Copper Redhorse – To the Rescue of a Threatened Species in Quebec



Photo : Louis Bernatchez

Legend:

The copper redhorse weighs an average of 2 kg and is 50 cm long. Its small head, shaped like an equilateral triangle, is less than one-fifth of its total length. Like all members of the family Catostomidae, redhorses have ventral mouths surrounded by thick lips and no teeth in their jaws.

In Quebec, there are five different species of redhorse, so-called because they often have red fins. One of these species, the copper redhorse, is fighting for its survival. Since 1995, St Lawrence Vision 2000 partners have been carrying out a plan to prevent this unique species from disappearing in Quebec.

Interest in the copper redhorse is easy to explain. First, it is the only vertebrate species exclusive to Quebec. No other specimens have ever been found anywhere else in the world.

The population's status is also very precarious. In the past, the copper redhorse was found only along some stretches of a few rivers in the St Lawrence Plain: the Richelieu, Yamaska, Noire, Mille Îles and Maskinongé rivers and the St Lawrence River from the western tip of the island of Montreal to the eastern end of Lake St Pierre.

Today, the Richelieu River seems to be home to the only copper redhorse population that is able to reproduce. It can still be found in the Mille Îles, Yamaska and Noire rivers, and has become very rare in the St Lawrence. There are thought to be a few thousand copper redhorse remaining.

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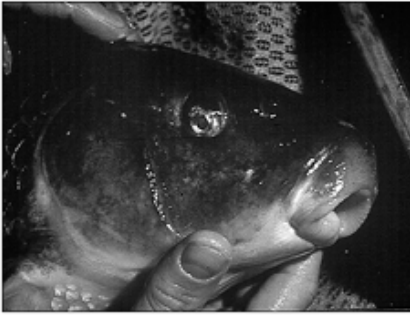


Photo : Alain Branchaud

Legend:

The copper redhorse feeds exclusively on mollusks, which it grinds with molar-like teeth located in its throat. The copper redhorse's teeth are the same size as those of an adult human.

Victim of a Combination of Factors

The species' decline can be explained by a combination of several factors: environmental degradation, habitat fragmentation and disturbance during spawning.

The copper redhorse lives in watercourses that crisscross the most populated region of Quebec. Deforestation, agriculture, urbanization and industrial activity have led to a deterioration in water quality, which in turn has had an adverse impact on the species' survival. In their work, biologists Alain Branchaud and Andrée Gendron suggest that contamination of the water by chemicals such as agricultural herbicides may interfere with copper redhorse spawning.

Dam construction has led to habitat fragmentation, increased sedimentation and reduced

opportunity for spawners to move to breeding grounds.

With regard to disturbance during breeding periods, we know that the copper redhorse spawns in late June or early July when the water temperature is above 20°C. It would appear that sharing rivers and streams with pleasure boaters is not always to the species' advantage.

Designation, Protection, Research, Development — and Tasting!

"On April 22, 1999, the copper redhorse became the first wildlife species officially designated as a threatened species under the Quebec Act respecting Threatened or Vulnerable Species," explained Michel Huot, the biologist in charge of threatened species for the Quebec government's Wildlife and Parks Sector. "This long-awaited designation will better protect the copper redhorse and its habitat."

Under St Lawrence Vision 2000, an action plan was proposed by the Comité d'intervention pour la survie du chevalier cuivré [action committee for the survival of the copper redhorse], chaired by Pierre Dumont, a biologist at the Montérégie regional directorate in the Wildlife and Parks Sector. Intended to maintain the species and prevent its disappearance, the plan has two objectives:

- to promote the species' survival in natural environments
- to ensure the species'

conservation by keeping specimens in captivity

A number of initiatives proposed by the Committee have already been or are in the process of being implemented. Some of the proposed solutions concern the species' habitat. A wildlife sanctuary could be created in the near future to protect spawning grounds near the Chambly Basin rapids, safe from all disturbances and changes.

Other activities in the action plan are aimed at developing methods to compensate for the species' low breeding rate in natural environments. Through the combined efforts of the University of Quebec at Montreal, the Quebec Department of the Environment and Wildlife and the Montreal Biodome, the techniques required for an artificial breeding program have been developed.

The planned fish pass on the Richelieu River at the St Ours Canal Historic Site should give the copper redhorse access to spawning grounds upstream in the Chambly Rapids.

Finally, beer lovers can also help the copper redhorse by looking for the Rescousse brand at SAQ outlets. Proceeds from the sale are being handled by the Quebec Wildlife Foundation and will go to support projects to protect and restore threatened species. Look for the label with the copper redhorse!



Illustration : Ghislain Caron

Legend:

Proceeds from the sale of Rescousse beer go to support projects to protect and restore threatened species. The project was the brainchild of biologists Andrée Gendron and Alain Branchaud.

For more information, consult the following site:

<http://www.gouv.qc.ca/minorg/indexa.htm>

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Sources:

Comité d'intervention. 1995. *Plan d'intervention pour la survie du suceur cuivré (Moxostoma hubbsi)*, Québec, ministère de l'Environnement et de la Faune, Direction de la faune et des habitats, 48 p.

Quebec Department of the Environment Internet site

A Challenge to Preserving Biodiversity – Re-establishing the Free Passage of Fish in the Richelieu river

In spring 1996, representatives of the Quebec Department of the Environment and Wildlife and Parks Canada met to discuss how to protect several species of fish and the St Ours dam on the Richelieu River. Various studies carried out under Phase II of the St Lawrence Vision 2000 action plan showed that the dam at the St Ours Canal Historic Site was blocking the passage of fish in the Richelieu River. Following the meeting, Parks Canada set up a committee to study various solutions to re-establish the free passage of fish. This article describes the committee's work.



Photo : Sylvain Paradis

The search for a solution to re-establish the free passage of fish in the Richelieu River poses a considerable technological challenge. Representatives of Parks Canada, the Quebec Department of the Environment and Wildlife, Fisheries and Oceans Canada, Transport Canada and Public Works and Government Services

Canada worked together to develop a solution that would meet the needs of various fish species in the Richelieu. The Committee also called on the expertise of specialists in hydraulic engineering, fish biology and fish ladder construction and management.

One of the options studied by the Committee to enable various fish species to reach their spawning grounds was the construction of a multi-species fish pass. The structure would allow several fish populations to increase their genetic diversity and chances of survival, thereby helping to preserve the diversity of fish in the Richelieu River.

The Committee also recommended that a second structure be built specifically for the American eel so the important commercial species could reach its feeding grounds.

Historical Background

Constructed in 1846 to open up navigation to New York State, the St Ours dam was built almost even with the water's surface and so had only a minimum impact on fish movement. Several years later, in 1911, a fish pass was added to the structure.

However, when the dam was rebuilt in 1969, the fish pass was not replaced. From that time on, the dam became a significant obstacle to the passage of several species of fish, in violation of the federal government's Fisheries Act, which stipulates that all dam owners must install fish ladders.

In 1972, the entire site and its structures were transferred to Parks Canada. By planning the construction of two fish passes at the St Ours dam, Parks Canada and the St Lawrence Vision 2000 partners are demonstrating a keen interest in solving the fish migration problem in this section of the Richelieu River.

Action in Favour of Several Species

Among the species that would benefit from these structures are several fish whose status is precarious, in particular the copper redhorse, river redhorse, lake sturgeon and American shad.

The Richelieu River is also home to the American eel, a commercially important species in the region. However, since the St Ours dam was rebuilt in 1969, commercial eel fishing has decreased considerably. Only small numbers of eels head up the river and very few individuals big enough to be fished remain. As a result, in 1998, the commercial eel fishery, which had been going on in the Richelieu for four generations, was closed.

Many Complex Technical Requirements

Although building fish passes for salmon is common, the design and construction of a multi-species structure presented a technical challenge as the characteristics and requirements of different fish species had to be taken into account. For example, the designers had to consider the ability of species to cross a vertical obstacle, the current speed in the pass's many pools, the size of the pools for large species, water flow, the dispersion of the current at the pass entrance and different spawning run periods.

In spring 1997, Parks Canada set up a technical committee of engineers and biologists from various departments to study the design of the multi-species fish pass. SNC Lavalin was then given a mandate to develop plans and specifications for the structure.

A Major Partnership

In keeping with the objectives set out under Phase III of St Lawrence Vision 2000, the fish pass project at the St Ours dam is a concrete effort to preserve biodiversity and maintain viable populations of precarious species. As such, the project would provide a significant environmental benefit for the Richelieu River, one of the largest tributaries of the St Lawrence in the heart of Quebec's most populous area.



Photo : Sylvain Paradis

The cost of building two fish passes at the St Ours dam has been estimated at \$1.6 million. Despite the efforts made to date, construction, which was to have started in August 1998, had to be postponed owing to major budget cuts. However, as the project's proponent, Parks Canada is counting on the financial and technical support of its SLV 2000 partners to finally get the project under way as quickly as possible.

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Sources:

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La Haye, Michel et Michel Huot. 1995. *Situation du Suceur cuivré (Moxostoma hubbsi) au Québec : espèce susceptible d'être menacée ou vulnérable*, Québec, Le Groupe de recherche SEEQ Itée pour le ministère de l'Environnement et de la Faune, Direction de la faune et des habitats, 50 p.

Chronicle

ZIP Committees in
the Heat of the Action

The Chaleur Bay ZIP Committee

Co-operation, Enhancement and Gardening in the Gulf of St Lawrence



Photo : Michel Chouinard

This article describes the work accomplished by ZIP (Area of Prime Concern) committees to protect and restore the uses and resources of the St Lawrence River. Under Phase III of the St Lawrence Vision 2000 action plan, the co-ordinating organizations are working to implement environmental remedial action plans (ERAPs) developed by each of the riverside communities. There are currently 12 ZIP committees and two more should be added soon.



Photo : Michel Chouinard

The Chaleur Bay ZIP Committee co-ordinates regional efforts to rehabilitate and conserve 350 kilometres of shoreline between Matapedia and Cape Gaspé. It is also trying to dovetail its initiatives with those of neighbouring New Brunswick, as the southern portion of the Chaleur Bay ecosystem lies in that province while the northern portion is in Quebec.



Photo : Michel Chouinard

A Willingness to Work Together

Over the past few years, sustainable development committees have been set up in New Brunswick. This has enabled the Chaleur Bay ZIP Committee to begin developing an effective forum for discussion that brings together people who share the same concerns.

The ZIP Committee would like to continue this close co-operation and is now working to create a formal co-ordinating structure that could be used to establish an integrated management approach for the Chaleur Bay ecosystem.

Protecting and Enhancing Pointe Verte

The Chaleur Bay ZIP Committee has already been recognized in the region for its expertise in carrying out concrete ecosystem protection and enhancement projects. For example, in 1996, the municipality of Maria asked the Committee to take action to protect a sand point in the Verte River estuary.

A number of activities incompatible with the site's fragility (all-terrain vehicle traffic, excavation, etc) were going on on the point, which is in the process of becoming a barachois. These activities were destroying the plant cover and accelerating erosion.

With the support of 13 organizations in Maria, the ZIP Committee obtained the funding needed to conduct a study aimed at protecting and enhancing the sand point and a salt marsh in the Verte River. The municipality implemented the recommendations contained in the Committee's report and then took action to prohibit activities that would hamper efforts to protect and enhance the site and to ensure the conservation of this fragile natural habitat in its planning program. An observation centre and interpretive panels were also installed so visitors could enjoy the area, which is frequented by seabirds.

"The ZIP study gave the municipality of Maria a mechanism to secure the funds needed to create a municipal park," commented Michel Chouinard, the ZIP Co-ordinator. "For example, public meetings held by the committee made citizens realize the ecological value of the marsh; in fact, a number of them wanted the report's recommendations to go even further to ensure the site was protected,"



Photo : Aviaphoto

added Mr Chouinard, pointing out that today the natural park is a great source of delight for the community.

The Cousteau Society Visits the Hortus Garden

Launched in Cascapedia Bay in 1995, the Hortus project was recently visited by the Cousteau Society at its first port of call during its voyage up the St Lawrence in conjunction with the activities of the Biosphere's Ecowatch Network.

Discharges of industrial and municipal waste over several years have disturbed the environment of Cascapedia Bay, considerably reducing its biological productivity. In developing this first marine garden, the ZIP Committee and its partners wanted to create new habitats that would encourage several species of algae, fish, mollusks and crustaceans to return to the area.

In 1998, a series of 42 artificial reefs of varying shapes and sizes were submerged in six areas of Cascapedia Bay. Dives in the first six months after the reefs were installed noted encouraging signs. Marine organisms seemed to be adapting to the new habitats and several species had moved right in to the reef areas.

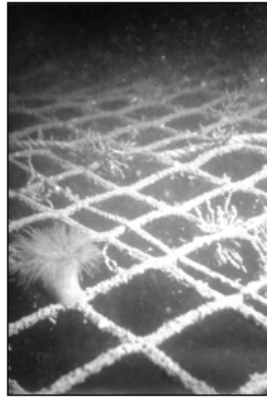


Photo : Jean-François Lussier

The Hortus project was received enthusiastically in Chaleur Bay. This past winter, more than 600 people viewed the first video images showing how life forms had moved to the reefs. The viewers included students from two schools in New Richmond who, after taking part in a shoreline clean-up activity in June 1998, had made the project's leaders promise that they would show them the results. The students were so excited with what they saw on the videos, they offered to help clean up the shoreline again this spring.

The Cousteau Society, like the local community, was also impressed with the Hortus garden's innovativeness and the observations gathered during dives in the reef areas while they were there. No doubt these visitors will help spread the news about the Hortus project around the world.

Reopening Shellfish Harvesting Areas

One of the projects that the ZIP Committee would like to undertake is an inventory of shellfish harvest

areas between Miguasha and Gaspé. Almost all of the 48 mussel and softshell clam harvest areas have been closed because of bacteriological pollution or the risk of contamination by toxic algae.

However, the public wants to get back to harvesting mussels and clams, a traditional activity that is very popular in the region. Accordingly, the ZIP Committee will conduct a study in the summer of 1999 to determine whether the sources of pollution that led to the areas' closure are still present. The data gathered will be used to classify the shellfish areas. The municipalities will then be able to start the process of reopening the areas that have the best shellfish harvesting potential.

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News *in* BRIEF



Photo : Environnement Canada

"The government partners in the St. Lawrence Action Plan Vision 2000 (SLV 2000) and Stratégies Saint-Laurent officially concluded, on June 7, a second cooperation agreement designed to ensure and continue the Zones d'intervention prioritaire (ZIP) (priority action areas) Program. The ZIP, first implemented in 1993, is extended for four more years".

LE FLEUVE

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