March, 2010

Aquatic Species at Risk
in the Sydenham River Watershed

The Sydenham River in southwestern Ontario is the only major watershed which lies completely in the Carolinian Life Zone and is relatively undisturbed by industrial development. This has made the river a biological treasure. The Sydenham River supports an incredible variety of aquatic life, or what we call biodiversity. At least 82 species of fish and 34 species of freshwater mussels have been found here, making it one of the most species-rich watersheds in all of Canada. Several species in the Sydenham River are found nowhere else in Canada, and some remain at only a few locations globally. Twenty-five species of fish, mussels and reptiles which live in and around the Sydenham River are nationally or provincially Species at Risk.

Mussels Can Recover

Freshwater mussels like clean water, so a good way to determine the health of a river is to count mussels. The good news is that work on the Grand River has shown that improvements in water quality have helped the mussels.

Scientists from Environment Canada and the University of Guelph studied the diversity and distribution of freshwater mussels and then compared the new information to data gathered on the Grand about 30 years previous. They found that the mussel population had rebounded significantly since the 1970s when the Grand River was more seriously affected by the effluent from sewage treatment plants. Sewage plant upgrades had led to a significant improvement in water quality, making the Grand a more hospitable place for mussels.

Surveys conducted in the late 1990s on the Sydenham River found 30 native species (J. L Metcalfe-Smith et al 2003). Four pollution-sensitive species had disappeared over the 1900s, some species had declined and several species which are pollution-tolerant had expanded their range.

After more than ten years of implementing water quality programs, we don't know if aquatic habitats and mussel populations have improved. We do know that improving the water quality will help the mussels and the humans in the watershed. Every landowner's actions can make a difference, and we can all benefit in the long run.

Landowners Making a Difference

Twenty-seven Best Management Practices were implemented in 2009 to improve the aquatic habitats of the Sydenham and its tributaries. Projects included streambank stabilization in Middlesex Centre; well decommissioning in Plympton-Wyoming; septic upgrades in Adelaide-Metcalfe and Chatham-Kent; eight wetland enhancement projects in Brooke-Alvinston, St. Clair, Dawn-Euphemia and Warwick and 15 riparian buffer projects in Dawn-Euphemia, Warwick, Chatham-Kent, St. Clair, Southwest Middlesex, Middlesex Centre, Enniskillen, Strathroy-Caradoc and Adelaide-Metcalfe. The grant from the Habitat Stewardship Program (HSP) of Environment Canada totalled $157,581. With landowner contributions and other grants, the total value of these projects was $596,176. This brings the cumulative HSP project tally to 275 projects, with HSP grants over $1.1 million from 2000 to 2009. The total value of these projects is over $5 million.

Riparian buffers are an excellent way to protect the streambank and to prevent sediment from entering the river.

Strathroy Reservoir Seeing Improvement

The St. Clair Conservation Authority has completed five years of water quality monitoring for the Strathroy Reservoir. One of the key concerns for the healthy recovery of the Sydenham River was identified in the Sydenham River Recovery Study as being the presence of dams. Therefore, discussions were started concerning the state of the Strathroy Reservoir and its impact on downstream water quality.

Four options for future use and management of the Strathroy Reservoir were recommended and the option chosen involved retaining the dam and developing enhancement and monitoring projects. This included identifying the fish species that live in the Strathroy Reservoir in the year 2004 and again in 2009 after the naturalization.

The method used during both surveys is called the backpack electro-fishing method. The backpack contains a battery that passes a current through the water stunning the fish so that they turn over showing their white belly making it easy to scoop them up with a long handled net. The fish are slipped into a bucket where they begin to swim around almost immediately, unharmed. After collecting a number of fish they are identified, returned to the reservoir and their numbers are recorded for our Strathroy Reservoir Monitoring Program.

Our preliminary findings seem to point to a significant improvement in fish numbers on the north side of the reservoir. This is an area that has been allowed to grow up along the reservoir's edge with the addition of native plantings to fill in open spaces along the shoreline. There was a significant increase in numbers of the following species: largemouth bass, white crappie, pumpkinseed sunfish, green sunfish, long ear sunfish and bluntnose minnows. However, groundwater contributions, due to Strathroy's switch from well water to Lake Huron drinking water in 2006, and the cool wet weather in 2009 should also be taken into consideration.

What are the Threats?

The Sydenham River supports one of the richest freshwater mussel communities in Canada with 30 native species still living in the river. The Sydenham River Recovery Strategy (A.J. Dextrase et al 2003) described threats to the mussels which include:

- Heavy sediment loads causing turbidity and siltation
- Nutrient loads including phosphorus and nitrogen compounds
- Toxic compounds including herbicides and insecticides
- Thermal effects from loss of riparian zones, presence of reservoirs and global climate change
- Exotic species including carp, zebra mussels and round gobies

How should we respond to these threats? Good stewardship by all landowners; responsible management by landowners, municipalities and agencies; broad community awareness and education, and more research and monitoring are all needed. There is still lots to be done, but more and more people are joining in to help make a difference.

Biologists look for fish in the Strathroy Reservoir. The method used to sample fish is called backpack electro-fishing. The backpack contains a battery that passes a current through the water, stunning the fish so that they float to the surface making it easy to scoop them up with a long handled net. The fish are slipped into a bucket, identified and released unharmed to the reservoir. Above, is a longear sunfish, one of the species identified during the survey.

Stewardship Rangers Chip in to Build a Home for Snakes

Since the arrival of European settlers, snake populations throughout much of North America have experienced varying levels of decline. The decline in snake populations can be attributed to a wide variety of human activities. An inherent fear, loathing and suspicion of snakes have been cultivated in the psyche of many westerners. It is being increasingly realized, however, that herptiles, including snakes, play an important role in the ecosystem.

Working with staff of the St. Clair Region Conservation Authority, the Chippewas of the Thames First Nation Stewardship Ranger crew undertook a project to construct a snake hibernaculum, which is a fancy word for a home for snakes. The project was undertaken on Conservation Authority owned property in St. Clair Township. While many types of snakes would find this a fine place to live, the purpose of the project was to create habitat for the eastern fox snake, a species that is considered endangered in Canada.

This snake hibernaculum was constructed by digging a trench down a slope and backfilling it with rock rubble and cement construction blocks. This provides excellent drainage and easy access for the snakes throughout the structure. Once completed the surface of the hibernaculum is covered with soil and natural vegetation allowed to grow.

The rock and cinder blocks provide excellent dry hiding places for snakes. This hibernaculum, or home for snakes, was constructed with the help of Stewardship Rangers from Chippewas of the Thames First Nation.

Aquatic Species at Risk in the Sydenham River

Mussels

northern riffleshell - Endangered
wavy-rayed lampmussel - Endangered
rayed bean - Endangered
snuffbox - Endangered
mudpuppy mussel - Endangered
kidneyshell - Endangered
round hickorynut - Endangered
round pigtoe - Endangered
rainbow mussel - Endangered
fawnsfoot - Endangered
eastern pondmussel - Endangered
mapleleaf mussel - Threatened

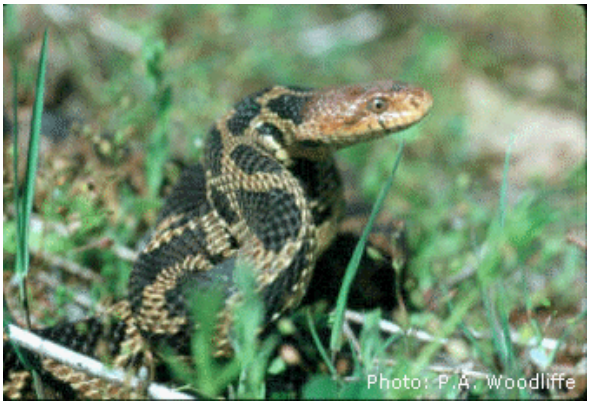
Fish

northern madtom - Endangered
eastern sand darter - Threatened
spotted gar - Threatened
blackstripe topminnow - Special Concern
pugnose minnow - Special Concern
grass pickerel - Special Concern
bigmouth buffalo - Special Concern
greenside darter - Special Concern

Reptiles

eastern fox snake - Endangered
eastern spiny softshell turtle - Threatened
Blanding's turtle - Threatened
snapping turtle - Special Concern
northern map turtle - Special Concern

Endangered: A species facing imminent extirpation or extinction.
Threatened: A species that is likely to become endangered if limiting factors are not reversed.
Special Concern: A species is of special concern because of characteristics that make it particularly sensitive to human activities or natural events.



Eastern Fox Snake – photo courtesy of P.A. Woodliffe

Mussels - at home in the Sydenham

Everyone is familiar with the image of the "Canary in the Coal Mine". The bird serves as an early warning system for the miners. Trouble with the bird means trouble coming for the humans as well. So it goes with freshwater mussels and the quality of our streams and rivers. 70% of our mussel species are at risk of disappearing. They are the most endangered group of animals in Canada. Like the canary in the coal mine, it's a signal that we cannot ignore.

Mussels are a vital link in the food chain as food items for many animals including muskrats, raccoons, and otters. Mussels are filter feeders and therefore improve water quality by straining out suspended particles and pollutants from the water. Mussels typically remain in one place for most of their life and require good water quality, sediment types, and physical habitat. Biologists often use mussels as "biological monitors" to indicate past and present water and sediment quality in lakes and streams. Gradual mussel die-offs or sudden mussel kills are signs of water pollution problems and other environmental health concerns. Stable, diverse mussel populations mean clean water and a healthy aquatic system.

The Sydenham River has recorded over 34 different types of mussels, more mussel species than any other body of water in Canada. The mussels of the Sydenham River come in many different sizes, shapes, textures and colours. They can be as small as your thumbnail or as big as your hand. Their shell can have bumps that look like warts and pimples or they can have smooth ridges. Their colour can range from dandelion yellow to lime green.

The Sydenham is a treasure. Our actions can make a difference.

Rayed bean – the smallest mussel in the Sydenham River. Photo courtesy of Shawn Staton.

For more information
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Under Construction: Turtle Nesting Site

A threatened species of native turtle, the Eastern Spiny Softshell, is getting a new nesting site in the St. Clair Region Conservation Authority watershed. "This is great news for this quirky species," said Muriel Andreae, Senior Biologist with the Conservation Authority. The SCRCA received funding from Ontario's Species at Risk Stewardship Fund and Environment Canada's Habitat Stewardship Fund for Species at Risk to build and maintain two gravel beds along the Sydenham River. "This has given us the chance, once again, to work with private landowners to find good locations for more nesting sites," Andreae said.

Like most turtles, the Spiny Softshell needs to bask so the eggs will develop in the female. This is when the turtles are easiest to observe. Once the eggs are ready, the female turtle must find a dry sunny location to bury her eggs, so "solar heating" can incubate the eggs until fall. Since 1994, Authority staff and watershed volunteers have conducted annual surveys of the Sydenham to document the population of this rare turtle.

Suitable nesting sites are rare in the Sydenham. A nesting site with deep gravel exposed to full sunlight can provide ideal egg laying habitat. "We're building the best sites we can," said Andreae. "But in the end, only the mother Eastern Spiny Softshell Turtle can decide where she'll lay her eggs."

Partners in Conservation

Environment Canada's Habitat Stewardship Program for Species at Risk
Fisheries and Oceans Canada
St. Clair Region Conservation Authority
St. Clair Region Conservation Foundation
TD Friends of the Environment Foundation
Ontario Ministry of Natural Resources
Middlesex Stewardship Committee
Rural Lambton Stewardship Network
Stewardship Kent
University of Guelph

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