

AN APPROACH TO AQUATIC ECOSYSTEM RECOVERY IN THE THAMES RIVER WATERSHED

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Abstract

The Thames River, a Canadian Heritage River located in southwestern Ontario, has been identified by federal and provincial governments as a priority site for protection and recovery of aquatic species at risk. Over the past century, urban and agricultural land-use changes in the Thames Valley watershed have negatively impacted the quality and quantity of the aquatic habitat. This degradation of aquatic habitat has resulted in the decline of many aquatic wildlife species. Faced with the challenge of balancing the needs of all watershed residents, the two conservation authorities on the Thames River have embarked on a process of aquatic habitat conservation.

Introduction

The Thames River watershed hosts 15% of the species at risk in Canada and contains one of the country's most diverse communities of aquatic species (fish spp., mussel spp. and reptile spp.), due to the river's many habitats, nutrient-rich waters, and connection with the Great Lakes. The Thames is the only major river in Canada where the majority of its watershed (over 90%) lies within the Carolinian Zone, a geographically small region characterized by broad-leaved deciduous trees, unparalleled species diversity (e.g., 2,200 species of vascular plants), and a relatively long growing season. The Upper Thames River Conservation Authority (UTRCA) is a watershed-based resource management agency that manages the upper watershed of the Thames River, an area of 3,432 square km in southwestern Ontario that is home to 422,300 people (Figure 1). In 2000, the entire Thames River was designated a Canadian Heritage River. The two conservation authorities on the river are working with many stewardship groups to conserve and revitalize the river's many natural, cultural and recreational values in an area of Canada with intense urbanization and agricultural development.

Location

The Thames River is the most southerly major river in Canada. It is nestled in the agricultural heartland of southwestern Ontario, in close proximity to Lakes Huron, St. Clair, and Erie. The Thames River rises at three distinct points creating three different branches: the North, Middle and South branches. The Thames drains approximately 5,825 km² and is the second largest river in southwestern Ontario. The river is approximately 273 km in length when measured from the headwaters of the South Branch (considered the start of

the Thames) to the mouth at Lake St. Clair.

Figure 1. The Upper Thames River Conservation Authority boundary (UTRCA, 2003).



Aquatic Species at Risk

Since 1994, the Upper Thames River Conservation Authority (UTRCA) has been partnering with dozens of groups, agencies and funders to study a species that is locally common but nationally threatened: the Eastern Spiny Softshell Turtle. The goals of this study include protecting the remaining local population, through education, landowner stewardship, and protecting or enhancing habitat and nest sites. An intensive public awareness program has included encouraging reports of turtle sightings, presentations and publications. Schools and community groups have also been involved in hands-on nest site creation and protection projects. The softshell turtle project has recently expanded to include three other locally found reptiles at risk.

With the experience gained and connections made through the softshell study, the UTRCA has received federal funding for a habitat stewardship program for aquatic species at risk. The program focuses on habitat implementation, monitoring, and a communication strategy for specific fish, mussel and turtle species in the Upper Thames watershed.

Within Canada, species at risk protection falls under both federal and provincial mandates. The federal government is in the process of initiating species at risk legislation, while the province of Ontario already has legislation in place. Canada's national recovery program to rescue wildlife species at risk of extinction is called RENEW (Recovery of Nationally Endangered Wildlife) (Environment Canada, 2003a). RENEW brings all relevant Canadian agencies, groups and individuals together in a concerted effort to rehabilitate endangered and threatened species once their status has been established. The recovery process includes formation of national recovery teams, development of recovery strategies and action plans, cooperative recovery actions, and program evaluation. The UTRCA has been encouraged by federal and provincial governments to take a lead role in initiating an *Ecosystem Recovery Plan for Aquatic Species at Risk in the Thames River* (UTRCA, 2004) watershed. The process involves two parts: a *Recovery Strategy* to be developed by a recovery team that identifies recovery goals, objectives and approaches; and an *Action Plan* that specifies actions to achieve objectives and implement approaches. Within the watershed, activities would include raising awareness about the diversity of species, involving community in species recovery, and monitoring for changes in species populations.

Fish

The Thames River sustains one of the most diverse fish communities in Canada. The river's complex system of interconnected springs, swales, ravines, streams and rivers provides a broad range of habitats for 88 fish species from 19 families. Ten hybrids have been recorded as well. This is a large representation of the approximately 150 fish species reported in Ontario.

It is difficult to determine the exact number of fish species in a water body at any given time due to the dynamic nature of the fish community: fish migrate seasonally, extinctions or extirpations can happen within a short lifetime [e.g., the gravel chub (*Erimystax x-punctatus*) is now gone] and exotic and introduced species can establish themselves quickly (e.g., the round goby is expanding its range). The Royal Ontario Museum Fish Distribution Database lists 91 species including hybrids, while the files from the Ontario Ministry of Natural Resources show 98 species and hybrids for the Thames River system. The diversity of the fish community in the Thames and its tributaries is not surprising when one considers the following facts:

- the Thames is a "gateway" watershed; it is located in the southernmost part of Canada, directly linked to the Great Lakes and thus the Atlantic Ocean. It was previously connected to the headwaters of the Mississippi River during the recession of the Wisconsin glacier;
- there is a long growing season in the 'deep south' of Canada. Thus, there is a

- good 'crop' of aquatic foods such as algae, phytoplankton, zooplankton, and insect larvae that are the basis of the fish food chain;
- the dynamic physical nature of the Thames (e.g., fluctuating water levels, erosional and depositional features, high nutrient levels in the water) creates a variety of habitat opportunities for fish in space and time. In addition, the Thames watershed includes both warm water and cold water streams; and,
 - cultural influences such as human introductions (deliberate and inadvertent) also add to the list of fish species in the river.

Reptiles and Amphibians

There are 30 species of reptiles and amphibians found in the Thames River and its watershed. This consists of five species of salamanders, eight species of frogs and toads, six turtles, one skink and 10 snakes (UTRCA, 2004). Another seven species have been recorded in the past and may still exist in the area, but there are no recent records. These are difficult animals to inventory due to their secretive and often nocturnal nature. The 30 to 37 herpetiles found here represent 61 to 75% of the 49 species that occur in the province. Ontario has more amphibians and reptiles than any other province (91 species in Canada). Many of the herpetofaunal species found in the Thames region are widespread and can be found across Ontario. However, several are found mostly in the extreme southern part of Ontario. These representatives of the Carolinian Life Zone include the eastern foxsnake (*Elaphe gloydi*), eastern hog-nosed snake (*Heterodon platirhinos*), queen snake (*Regina septemvittata*), eastern ratsnake (*Elaphe obsoleta*), eastern spiny softshell turtle (*Apalone spinifera*) and spotted turtle (*Clemmys guttata*).

Most herpetiles (e.g., frogs, toads, turtles) require water for part or all of their life cycle, but are not necessarily dependent on flowing water such as in the Thames and its tributaries. Ponds, wetlands (especially swamps), and moist woods are critical habitat for most amphibians and reptiles. Salamanders, for example, prefer moist woodlands or swamps like Skunk's Misery, a large swamp complex just north of the Thames River near Newbury. Frogs, toads and snakes are generalists and can utilize disturbed, grassy, or wooded habitats. The Thames River corridor has representatives of all of these habitat types, and so most species that can be found in the watershed are also likely to be found close to the river. Many may be reliant on the Thames for over-wintering habitat as they require deep or flowing rivers.

Recovery Planning for Aquatic Species at Risk

There are several key partners developing the *Recovery Plan* for Aquatic Species at Risk in the Thames River including the Upper Thames River Conservation Authority, Lower Thames Valley Conservation Authority, Ontario Ministry of Natural Resources, Fisheries and Oceans Canada, Environment Canada, and First Nations. There are also other scientific experts from the University of Western Ontario, University of Guelph and other institutions such as the Canadian Centre for Inland Water and the Royal Ontario Museum. These partners have formed a recovery team and are involved in the development of a

recovery plan—an undertaking of a few years.

Within the watershed, activities have included raising awareness about the diversity of species, involving community in species recovery, and monitoring for changes in species populations. By undertaking such an initiative, the Thames recovery team has become one of the major leaders in ecosystem-based recovery planning for species at risk. Having a *Recovery Plan* for aquatic species at risk in the Thames River in place opens the door to funding opportunities. For example, in preparation for its proposed new legislation, the federal government has implemented a *Habitat Stewardship Program for Species at Risk* (Environment Canada, 2003b). The goal of this program is to contribute to the recovery and protection of habitat for priority listed species at risk at the regional/ecosystem level. Future emphasis for funding under this program will be based on actions already identified in approved recovery plans where possible.

Recovery Plan Goal

To prepare a recovery plan that improves the status of all aquatic species at risk in the Thames River through an ecosystem approach that sustains and enhances all native aquatic communities.

Recovery Plan Objectives

- To integrate recovery planning with scientific knowledge and other watershed planning and management strategies;
- To develop effective recovery strategies that address the principle threats to aquatic species at risk in the watershed using the best available scientific information;
- To develop partnerships with agencies, industries, and community groups interested in species at risk recovery in the Thames River;
- To improve public consultation and awareness in order foster responsible public and private actions that benefit aquatic habitats;
- To support the compilation of background resource information pertinent to aquatic species at risk of the Thames River;
- To coordinate monitoring of aquatic species at risk in the Thames River watershed;
- To identify mechanisms for the timely implementation of recovery actions; and,
- To ensure recovery actions identified for aquatic species regard the needs of terrestrial species at risk where overlap of habitat occurs.

Conclusion

The development of a recovery plan for aquatic species in the Thames River watershed is one approach to improve aquatic habitat. It is a process that is based on scientific fact, is rigorous in its planning approach and encompasses a broad spectrum of stakeholders.

References

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