

Amphibian and Reptile Conservation in Ontario: Guidelines for Parks and Protected Areas at Long Point, Rondeau and Point Pelee*

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Abstract

Amphibians and reptiles are among the multitude of species increasingly threatened by human-induced and natural factors, globally and in Canada. Southern Ontario, Canada's most biologically diverse region, comprises a unique assemblage of herpetofauna, including many threatened and endangered species not found anywhere else in the country. Three areas in particular, Long Point, Rondeau and Point Pelee, situated along the north shore of Lake Erie, have long been considered exceptional areas because of their rich natural and cultural histories. Parks and other protected areas at these three peninsulas and on Pelee Island in western Lake Erie represent strongholds for extremely rare Canadian herpetofauna species such as the threatened eastern spiny softshell turtle and the endangered blue racer. However, habitat fragmentation and a host of other impacts, such as persecution of snakes and inadvertent road kills, have resulted in population declines and local extirpations. Such causes are believed to be responsible for the loss of Blanchard's cricket frog – now extinct in Canada – and nine additional amphibian and reptile species from Point Pelee National Park.

The purpose of this paper is to assess in terms of the population status and limiting factors of herpetofauna, the need for regional and site-based conservation within southern Ontario. Recent advancements in conservation biology and landscape ecology are employed in developing a strategy for integrated conservation action. This is achieved by focusing on the evolving role of key parks and protected areas at Long Point, Rondeau, and Point Pelee, and by identifying the need to strengthen and enforce existing monitoring and assessment programs, species recovery programs, land use policy, and legislation. Recommendations for successful conservation include a combination of habitat protection, species recovery and monitoring, research, and public education, all of which have implications for land use planning and management within this and other regions facing similar environmental challenges.

Introduction

The ecological status of amphibians and reptiles in Canada and around the world has become a topic of concern for many. An evolutionarily successful group of animals, existing for over 300 million years, herpetofauna - amphibians and reptiles - are increasingly undergoing population declines and range reductions,

* This paper arises from a poster paper at the 1998 Annual Meeting of the Parks Research Forum of Ontario.

sometimes disappearing altogether, for many reasons but more commonly as a result of habitat loss caused by humans.

Herpetofauna are an important component of many ecosystems. They are effective predators of unwanted pest species such as rodents, and pose no threat to humans. Their value is also related to the fact that they are good indicators of ecosystem health or integrity and are appreciated by the scientific community and nature enthusiasts alike.

Considering the relatively small size of amphibians and reptiles and their unique set of ecological requirements (see Conant and Collins, 1991), this obscure and often maligned group of animals requires special planning considerations. The role of parks and protected areas is a key component in biological conservation. However, this role remains largely undefined.

Purpose

The purpose of this paper is to highlight the findings of recent research on the state of amphibian and reptile conservation in southwestern Ontario. The objectives are:

1. to demonstrate the importance of parks and protected areas at Long Point, Rondeau and Point Pelee; and,
2. to provide a set of guidelines for effective conservation of amphibians and reptiles within parks and protected areas in these three areas and elsewhere in the province.

Study Focus and Approach

This paper focuses on parks and protected areas at Long Point, Rondeau, and Point Pelee – three areas long considered important for herpetofauna in Canada (Figure 1). A literature review was conducted to assess research and conservation needs in these three areas in terms of existing information about the status of rare species, particularly those considered vulnerable, threatened, and endangered in Canada. Existing data and other information were obtained from a variety of sources, including the Ontario Herpetofaunal Atlas Data Base, the Committee on the Status of Endangered Wildlife In Canada (COSEWIC), and the Recovery of Nationally Endangered Wildlife (RENEW) Committee. Additional information was obtained from published and unpublished sources cited throughout this paper.

Highlights of Research Findings

- The significance of Long Point, Rondeau, and Point Pelee for herpetofauna can be expressed in terms of species richness (number of species), abundance of records (expressed for each species as a percentage of all Ontario records), and the presence of rare species (Figure 1; Table 1). The percentage of records may not reflect actual species abundance but may be more related to ongoing species inventories within parks and protected areas.
- A total of four COSEWIC species can be found at these three peninsulas (see Tables 2 and 3), though only two species – spotted turtles and eastern

spiny softshells – can be found at all three sites. Although many species are considered rare in Ontario and Canada, they are common or even abundant at Long Point, Rondeau and Point Pelee. An additional three COSEWIC species – smallmouth salamander, blue racer and Lake Erie water snake – are found on Pelee Island in Lake Erie.

- Table 4 indicates habitat preferences for species found at Long Point, Rondeau and Point Pelee. Sandy beach and dune areas are important for nesting turtles, whereas sloughs, ponds, tidal pools and other wetlands are important for breeding amphibians and foraging turtles. Several species occur in a variety of natural and human areas. At Point Pelee National Park, old fields are an important habitat component.
- Considerable baseline information is available for herpetofauna at Long Point and Point Pelee. In contrast, however, there is a lack of comparable information for populations at Rondeau (Table 5).
- Site specific threats include: road mortality along the Long Point Causeway; residential development in other areas adjacent to the Big Creek National Wildlife Area; and human activities at Rondeau and Point Pelee. At Point Pelee, five amphibians and five reptiles (all snakes) have disappeared (Table 1) because of possible contamination, human persecution and loss of habitat.
- Although amphibians and reptiles are threatened by several factors, both natural and human-induced, habitat loss is the most common threat for all herpetofauna species in Ontario.
- Species assessment programs (COSEWIC) and recovery planning (RENEW) represent a single species approach to conservation. Considerable effort is being allocated to study and protect threatened and endangered species (Table 6). However, there are several additional provincially and regionally rare species (Table 1), for which there is comparatively little information. Until their status is officially determined by COSEWIC, conservation action will not be considered under the RENEW program
- Parks and protected area mandates and several additional land use policies, guidelines and provincial and federal legislation include provisions that are relevant to the conservation of herpetofauna and their habitat (Tables 7 and 8).

	Long Point National Wildlife Area	Big Creek National Wildlife Area	Rondeau Provincial Park	Point Pelee National Park
Mudpuppy (S4)	+	+	+	+(RE)
Red-Spotted Newt (S5)	+		+	(RE)
Blue-Spotted Salamander (S4)	+(RHN)			(RE)
Spotted Salamander (S4)	+			(RE)
Tiger Salamander (SX)				E
Red-Backed Salamander (S5)	+	+	+	(RE)
Fowler's Toad (S2)	+	+	+	E(E)
Gray Treefrog (S5)	+		+	E(RE)
Blanchard's Cricket Frog (SX)	Extinct in Canada			E
Wood Frog (S5)		+	+	(RE)
Pickereel Frog (S3)	+(RHN)			
Bullfrog (S4)	+	+	+	E
Common Musk Turtle (S5)	+(RHN)		+	+(RE)
Spotted Turtle (S3)	+	+	+	+(RE)
Eastern Spiny Softshell (S4)	+(RHN)		+	+(RE)
Five-Lined Skink (S3)			+	+(RE)
Queen Snake (S2)	+(RHN)			
Eastern Hognose Snake (S3)	+	+	+	E(RE)
Black Rat Snake (S3)	+(RHN)	+	+	E
Eastern Fox Snake (S3)	+	+	+	+
Eastern Milk Snake (S5)	+		+	+(RE)
Blue Racer (S1)				E(RE)
Eastern Massasauga (S3)				E(RE)
Timber Rattlesnake (SX)	Extinct in Canada			E
*Provincial Status:				
S1 Extremely rare: usually five or fewer occurrences in Ontario or very few remaining individuals; often especially vulnerable to extirpation from Ontario.				
S2 Very rare: usually between five and 20 occurrences in Ontario or with many individuals from fewer occurrences; often susceptible to extirpation from Ontario.				
S3 Rare to uncommon: usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.				
S4 Common: usually more than 100 occurrences; usually not susceptible to immediate threats.				
Sfive Very common: demonstrably secure in Ontario under present conditions.				
SX: Apparently extirpated from Ontario, with little likelihood of rediscovery. Typically not seen in Ontario for many decades, despite searches at known historic sites.				
*Regional Status:				
RHN = Rare in the Regional Municipality of Haldimand-Norfolk (Known from five or fewer locations <i>vide</i> Gartshore 1987)				
RE = Rare in Essex County (Known from five or fewer locations <i>vide</i> Oldham, 1984)				

Table 1. Status* of Rare Amphibians and Reptiles at Long Point, Rondeau and Point Pelee (After Zammit, 1996)

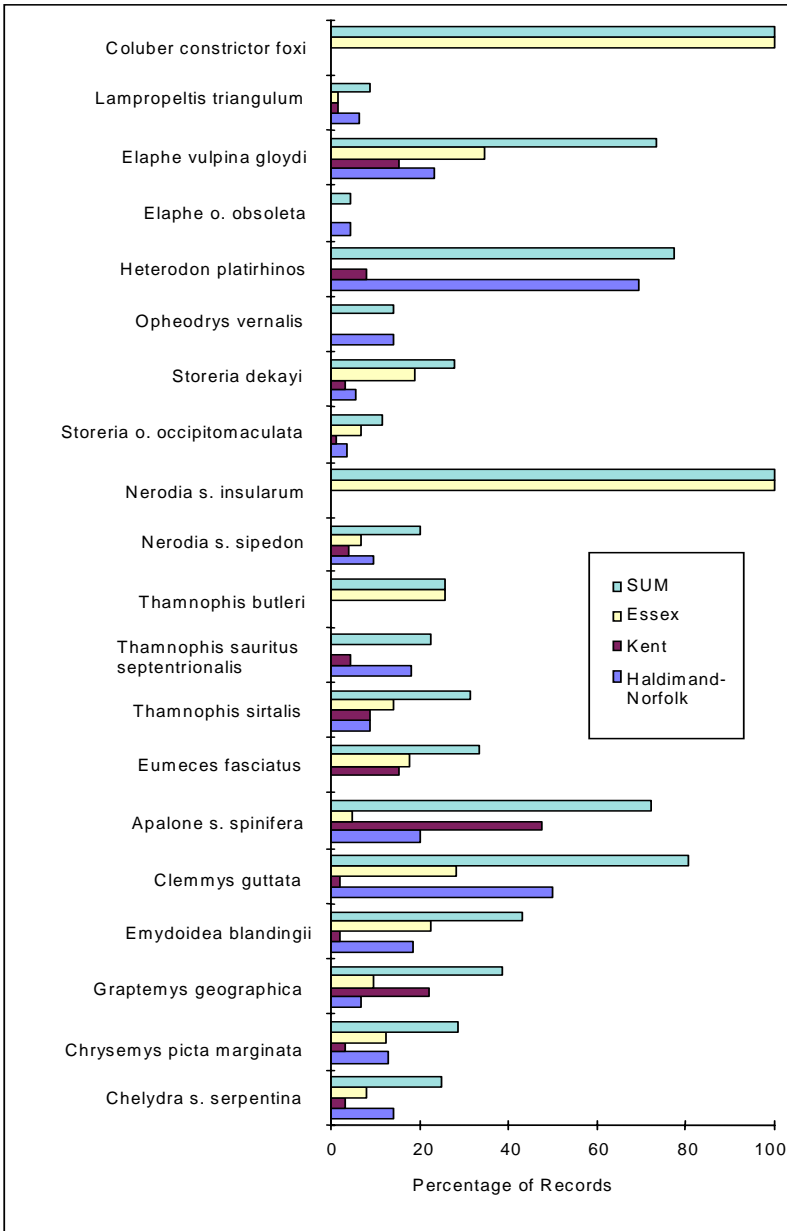


Figure 1a: Percentage* of reptile records obtained in the Long Point (Haldimand-Norfolk), Rondeau (Kent) and Point Pelee (Essex) Regions (Weller and Oldham, 1988) (*Calculated, for each region and all regions combined, as a percentage of total number of records for Ontario)

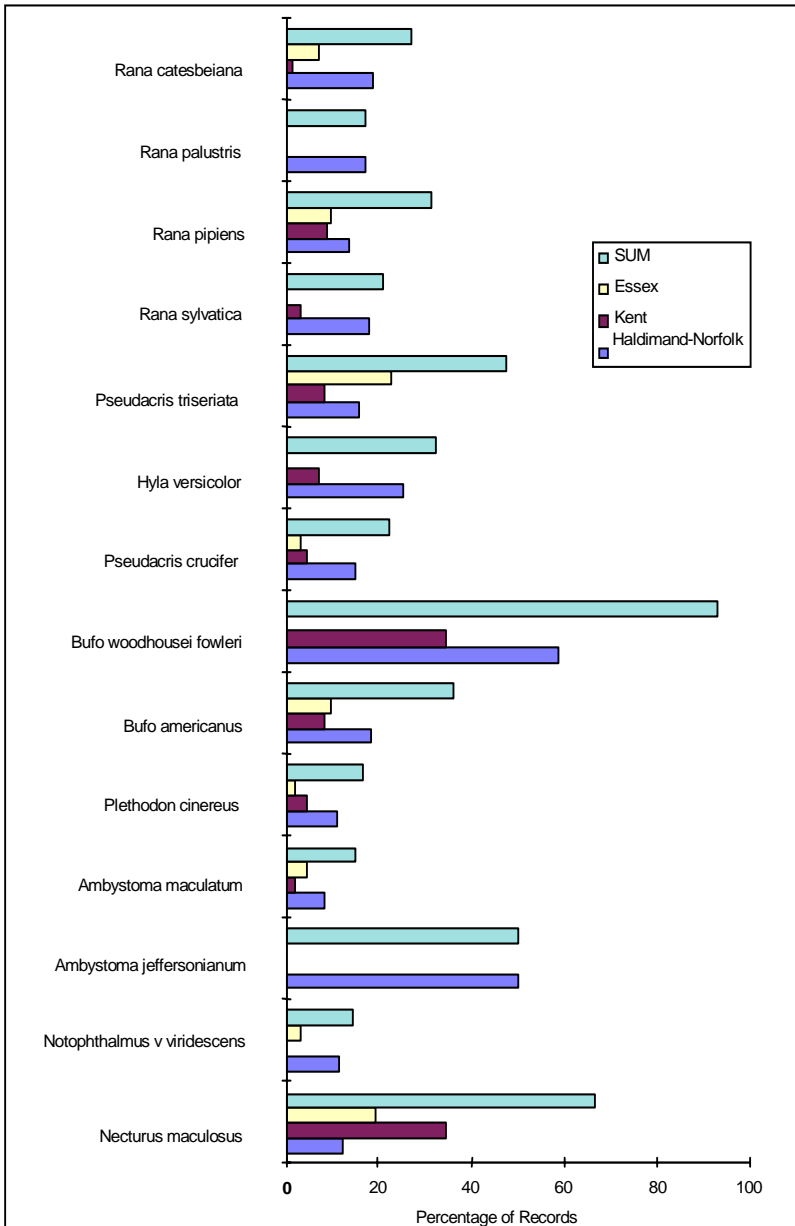


Figure 1b: Percentage* of amphibian records obtained in the Long Point (Haldimand-Norfolk), Rondeau (Kent) and Point Pelee (Essex) Regions (Weller and Oldham, 1988) (*Calculated, for each region and all regions combined, as a percentage of total number of records for Ontario)

Extirpated: pygmy short-horned lizard (<i>Phrynosoma douglassii douglassii</i>) and timber rattlesnake (<i>Crotalus horridus</i>)
Endangered: blue racer snake (<i>Coluber constrictor foxi</i>) , Lake Erie water snake (<i>Nerodia sipedon insularum</i>) , leatherback turtle (<i>Dermodochelys coriacea</i>) and Blanchard's cricket frog (<i>Acris crepitans blanchardi</i>)
Threatened: eastern massassauga rattlesnake (<i>Sistrurus catenatus catenatus</i>) , Blanding's turtle (<i>Emydoidea blandingi</i>) (Nova scotia population), eastern spiny softshell turtle (<i>Apalone spinifera spinifera</i>) .
Vulnerable: eastern short-horned lizard (<i>Phrynosoma douglassii brevirostre</i>), northern prairie skink (<i>Eumeces septentrionalis</i>), eastern yellow-bellied racer (<i>Coluber constrictor flaviventris</i>), wood turtle (<i>Clemmys insculpta</i>) , spotted turtle (<i>Clemmys guttata</i>) , pacific giant salamander (<i>Dicamptop tenebrosus</i>), smallmouth salamander (<i>Ambystoma texanum</i>) , Fowler's toad (<i>Bufo woodhousei fowleri</i>) .

Table 2a. Status of Amphibians and Reptiles Designated by the Committee on the Status of Endangered Wildlife in Canada. Species native to Ontario appear in bold type.

Fowler's Toad Geographic range in Canada is restricted to sandy beach and marsh areas along the north shore of Lake Erie in Ontario (Green, 1985 and 1989).
Blanchard's Cricket Frog Last observed within a single locality on Pelee Island, Ontario (Oldham and Campbell, 1989; Oldham, 1992).
Eastern Spiny Softshell Turtle Scattered and apparently not common throughout its Canadian range; affected by pollution, natural predators and other human impacts in Ontario (Campbell et al., 1991).
Eastern Massassauga Rattlesnake Reduction of former range and abundance in Ontario due to direct persecution by humans and extensive wetland destruction (Weller and Parsons, 1991).
Blue Racer Original range reduced in southwestern Ontario to verified populations occurring now only on Pelee Island, Ontario following habitat fragmentation and killing of snakes by humans (Campbell and Perrin, 1991).
Spotted Turtle Scattered populations in Ontario remain following an increase in wetland destruction, poaching and natural predators (Oldham, 1991).
Lake Erie Water Snake Population declines evident on Pelee Island due to human persecution and habitat (shoreline) destruction; also susceptible to genetic swamping by northern water snakes, <i>N. s. sipedon</i> , a mainland subspecies (Campbell and King, 1991).
Smallmouth Salamander Very restricted range in Canada, though currently abundant within some secure habitats on Pelee Island, Ontario, the only locality for this species in Canada (Bogart and Licht, 1991).
Blanding's Turtle (Nova Scotia population) Occurs at the northeastern limit of the species range in a restricted area geographically isolated from other populations; the population is small and apparently declining because the age distribution is considered "top-heavy" as result of low recruitment rates and artificially increased predator pressure imposed mainly by raccoons (Herman et al., 1994).

Table 2b. Justification for Status of Ontario Species

<u>LONG POINT</u>
Land Ownership: Canadian Wildlife Service (federal), Ontario Ministry of Natural Resources (provincial), Long Point Regional Conservation Authority (regional) and other private areas.
Site Description: Sand spit containing a variety of habitats including alternating dunes and savanna; dominated by freshwater marshes.
International Designations: RAMSAR (1982); UNESCO/MAB (1986)
COSEWIC Species: Fowler's toad, spotted turtle, eastern spiny softshell, and Blanding's turtle
Management Issues: road mortality along the Long Point Causeway, habitat alteration, natural predators, flooding and erosion
<u>RONDEAU PROVINCIAL PARK</u> Category: Natural Environment Class Park
Land Ownership: Ontario Ministry of Natural Resources (provincial)
COSEWIC species: Fowler's toad, spotted turtle, eastern spiny softshell and Blanding's turtle
Management Issues: No recent inventories apart from Ontario Herpetofauna Summary.
<u>POINT PELEE NATIONAL PARK</u>
Land Ownership: Parks Canada (federal)
International Designation: RAMSAR Wetland of International Importance (1987)
Site Description: Sand spit containing dunes, sand plains, upland forests and freshwater marsh.
COSEWIC Species: spotted turtle, eastern spiny softshell, Blanding's turtle
Extirpated Species: Fowler's toad, bullfrog, gray tree frog, wood frog, Blanchard's cricket frog, eastern hognose snake, black rat snake, blue racer, eastern Massasauga rattlesnake and timber rattlesnake
Management Issues: Species monitoring, specifically anurans, eastern fox snakes and five-lined skinks; repatriation of extirpated species; monitoring the status of spotted turtles and effects of natural predators on reproduction.

Table 3. Description and Analysis of Long Point, Rondeau, and Point Pelee

	Marsh			Upland Forest			Sloughs			Beach and Dunes			Cedar Savanna			Old Fields			Human Areas		
	L	R	P	L	R	P	L	R	P	L	R	P	L	R	P	L	R	P	L	R	P
Amphibians	L	R	P	L	R	P	L	R	P	L	R	P	L	R	P	L	R	P	L	R	P
Red-Spotted Newt	+			+			+	+		+											
Blue-Spotted Salamander				+			B														
Yellow-Spotted Salamander				+			B														
Redback Salamander				+			+			+										+	
American Toad	B	B	B	+	+	+	B	B	B	+	+					+			+	+	+
Fowler's Toad	B	B					B	+		+	+								+	+	
Gray Treefrog	B	B		+	+		+	+												+	
Midland Chorus Frog	+	+	+		+		+	+	+												
Northern Spring Peeper	B	B	B	+	+	+	+	+	+												
Wood Frog				+	+		B	B													
Northern Leopard Frog	B	B	B	+	+	+	+	+	+							+			+	+	
Green Frog	+	+					+			+											
Bullfrog	B	B					+			+											
Reptiles																					
Common Snapping Turtle	+	+	+	+			+	+		N	N	N								+	
Common Musk Turtle	+	+	+				+			N	N	N									
Midland Painted Turtle	+	+	+				+	+		N	N	N				N			+	+	
Common Map Turtle	+	+	+							N	N	N								+	
Blanding's Turtle	+	+	+				+	+		N	N	N				N			+		
Spotted Turtle	+	+	+				+			N	N	N									
Five-Lined Skink		+		+	+		+				+		+								
Eastern Garter Snake	+	+	+	+	+	+	+	+	+	+	+	+	+			+			+	+	+
Northern Ribbon Snake				+			+													+	
Northern Water Snake	+	+	+				+	+	+	+											
Queen Snake	+																				
Brown Snake		+		+	+		+	+								+				+	
Northern Ringneck Snake										+										+	
Eastern Hognose Snake				+	+		+			+	+									+	+
Black Rat Snake				+	+		+	+												+	
Eastern Fox Snake	+	+	+	+	+	+				+			+			+			+	+	+
Eastern Milk Snake				+	+	+	+	+					+			+				+	

+ - primary habitat; B - breeding habitat; N - nesting habitat

Table 4: Current Distribution of Native Herpetofauna among Major Habitats at Long Point (L), Rondeau (R) and Point Pelee (P) (Natural Heritage Information Center, unpublished data)

<p>LONG POINT</p> <p><i>Population Studies:</i> Published and unpublished reports to the Ontario Ministry of Natural Resources Published and unpublished reports to the Canadian Wildlife Service Melanism in eastern garter snakes Population and genetic studies of Fowler's toads Reproductive strategies of Blanding's turtle</p> <p><i>Community/Regional-Scale Monitoring:</i> Natural Areas Inventory of Herpetofauna in Haldimand-Norfolk (all species) Turtle study in Big Creek National Wildlife Area Ontario Herpetofaunal Summary (all species), IUCN/SSC Amphibian Population Monitoring Program (frogs and toads) Large Snake Survey, 1992-1993 (eastern fox snake, eastern hognose snake, black rat snake) Canadian Wildlife Service roadkill survey</p>
<p>RONDEAU PROVINCIAL PARK</p> <p><i>Population Studies:</i> eastern spiny softshell nest survey (unpublished)</p> <p><i>Community/Regional-Scale Monitoring:</i> Species checklists and inventories (outdated) Ontario Herpetofaunal Summary (all species)</p>
<p>POINT PELEE NATIONAL PARK</p> <p><i>Population Studies:</i> Published and unpublished research on eastern fox snakes and Five-lined skinks</p> <p><i>Community/Regional-Scale Monitoring:</i> Published and unpublished research on amphibians Ontario Herpetofaunal Summary (all species)</p>

Table 5: Review of Research on Herpetofauna (Zammit, 1996)

Species	Areas of Importance	Recovery Team - Participating Institutions	Recovery Report
Blanding's Turtle (Vulnerable in Nova Scotia)	Kejimikujik National Park, N.S.	Acadia Univ.*, Nova Scotia Museum, Nova Scotia Dept. of Natural Resources, Kejimikujik National Park, Acadia Center for Wildlife and Conservation Biology	in review
Softshell Turtle (Threatened)	Long Point, Rondeau, Point Pelee, and Sydenham and Thames Rivers	OMNR*, Upper Thames Region Conservation Authority, CWS, Univ. of Guelph, McGill Univ., Metro Toronto Zoo, private consultants	in draft
Massassauga (Threatened)	Georgian Bay Islands and Bruce Peninsula National Parks, Ojibway Nature Reserve, Windsor	Parks Canada*, OMNR, Metro Toronto Zoo, Brock Univ., Ojibway Nature Center, Ontario Field Herpetologists	in review
Blue Racer (Endangered)	Pelee Island, private and publicly owned areas	OMNR*, Pinery Prov. Park, Royal Ontario Museum, Univ. of Windsor, Metro Toronto Zoo, Univ. of Guelph, Gartner Lee Ltd., Herpetological Associates	in review
Lake Erie water snake (Endangered)	Pelee Island, private and publicly owned areas	OMNR*, Northern Illinois Univ., Ohio Univ.	in draft
Blanchard's cricket frog (Endangered in Canada)	Proposed reintroductions on Pelee Island and at Pinery Provincial Park	OMNR*, CWS, Univ. of Guelph, private consultants	approved in 1997

*Lead Agency; OMNR and the Canadian Wildlife Service (CWS)

Table 6: Summary of Critical Areas and Institutions Responsible for the Recovery of Threatened and Endangered Herpetofauna in Ontario (RENEW)

Agency	Legislation or Program
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Federal	
Environment Canada: Canadian Wildlife Service	National Parks Act Canada Wildlife Act (National Wildlife Areas) Biodiversity Conservation Strategy Declining Amphibian Population Task Force in Canada (DAPCAN)
Provincial	
Ontario Ontario Ministry of Natural Resources	Provincial Parks Act Endangered Species Act Game & Fish Act ¹ Public Lands Act ² Lakes & Rivers Improvement Act ³ Ecological Reserves Act (Proposed) Guidelines for Wetlands Management in Ontario Endangered Spaces Action Plan Biodiversity Conservation Strategy
Ontario Ministry of the Environment	Environmental Assessment Act
Regional	
Long Point Regional Conservation Authority Cattfish Creek Conservation Authority Kettle Creek Conservation Authority Lower Thames Conservation Authority (Rondeau) Essex Region Conservation Authority (Point Pelee)	Conservation Authorities Act ⁴ LPRCA Watershed Plan LPRCA and ERCA Lakeshore Management Plan LTRCA Lakeshore Management Plan (In Progress)
Regional Municipality of Haldimand-Norfolk	Planning Act
<p>Amendments imposed by Bill 26 (Environmental Commissioner of Ontario - Annual Report, 1994-1995):</p> <p>¹ All fees collected under this Act are to be held in a Consolidated Revenue Fund for purposes of fish/wildlife/ecosystem management, or related human activities.</p> <p>² Amendment to statute not indicated.</p> <p>³ Government given power to make regulations prescribing circumstances in which approval is required to construct or improve a dam.</p> <p>⁴ Municipalities given power to dissolve Conservation Authorities.</p>	

Table 7. Examples of Additional Institutional Frameworks Relevant to Species Conservation in the Long Point, Rondeau, and Point Pelee Areas (After Zammit, 1996)

Ontario Game and Fish Act	
REPTILES	
common snapping turtle	<i>Chelydra serpentina serpentina</i>
spotted turtle	<i>Clemmys guttata</i>
wood turtle	<i>Clemmys insculpta</i>
western painted turtle	<i>Chrysemys picta bellii</i>
Midland painted turtle	<i>Chrysemys picta marginata</i>
Blanding's turtle	<i>Clemmys guttata</i>
common map turtle	<i>Graptemys geographica</i>
common musk turtle	<i>Sternotherus odoratus</i>
eastern spiny softshell turtle	<i>Apalone spinifera spinifera</i>
queen snake	<i>Regina septemvittata</i>
eastern hognose snake	<i>Heterodon platirhinos</i>
black rat snake	<i>Elaphe obsoleta</i>
eastern fox snake	<i>Elaphe vulpina gloydi</i>
blue racer	<i>Coluber constrictor foxi</i>
Lake Erie water snake	<i>Nerodia sipedon insularum</i>
northern water snake	<i>Nerodia sipedon sipedon</i>
timber rattle snake	<i>Crotalus horridus</i>
Butler's garter snake	<i>Thamnophis butleri</i>
eastern Massasauga	<i>Sistrurus catenatus catenatus</i>
AMPHIBIANS	
bullfrog	<i>Rana catesbeiana</i>
Fowler's toad	<i>Bufo woodhousei fowleri</i>
Blanchard's cricket frog	<i>Acris crepitans blanchardi</i>
northern dusky salamander	<i>Desmognathus fuscus fuscus</i>
Ontario Endangered Species Act	
REPTILES	
blue racer	<i>Coluber constrictor foxi</i>
Lake Erie water snake	<i>Nerodia sipedon insularum</i>
timber rattlesnake	<i>Crotalus horridus</i>
AMPHIBIANS	
Blanchard's cricket frog	<i>Acris crepitans blanchardi</i>

Table 8: Provincial Legislation Covering Amphibians and Reptiles

Conclusions

Long Point, Rondeau and Point Pelee represent three of the most important areas for herpetofauna in Canada. Parks and other protected areas at these three peninsulas and on nearby Pelee Island are significant because they provide habitat for a diversity and abundance of amphibians and reptiles, many of which are rare in Ontario and Canada. They provide excellent opportunities for the conservation of herpetofauna and biological diversity in general.

An assessment of information relevant to these areas indicates the need for both site-based and regionally integrated conservation for herpetofauna along the north shore of Lake Erie. This can best be achieved by integrating existing species/habitat assessment and recovery programs, focusing these programs on parks and protected areas, and strengthening and enforcing public policy and legislation relevant to biodiversity conservation in Ontario and Canada.

Conservation Guidelines and Recommendations

Research and Monitoring - the basis for conservation action

- Conduct research on species biology, population abundance, distribution, demography, genetic variation – among and within populations as well as on social behaviour and habitat preferences.
- The effects of ultraviolet radiation, acid rain and other contaminants should be monitored in parks and protected areas, which are often subject to such environmental impacts.
- Collect, organize and maintain standardized data and other information necessary to fulfill existing species monitoring, assessment and recovery programs. Such data are necessary to improve knowledge of herpetofauna at Rondeau in particular. Existing data for populations at Long Point and Point Pelee provide a good ecological foundation for species conservation elsewhere in Ontario.
- Set conservation priorities, goals and objectives in accordance with global and sub-national (provincial) status rankings now available for habitats as well as for species through Ontario's Natural Heritage Information Centre – a partnership consisting of The Nature Conservancy in Canada, Natural Heritage League and Ontario Ministry of Natural Resources.
- Stronger partnerships are needed to facilitate data and information exchanges among public, private and academic researchers. Representing both government and non-government environmental organizations, COSEWIC and RENEW have thus far taken a single species approach – assessing the status of very few species and planning for the recovery of even fewer. The Working Group on Amphibian and Reptile Conservation in Canada has the potential to broaden the scope of species conservation. The Canadian Task Force on Declining Amphibian Populations (DAPCAN), a subsidiary of the World Conservation Union's Species Survival Commission Task Force (IUCN/SSC/DAPTF), has already implemented three volunteer-based projects across Ontario involving Road Kill Counts, Backyard Surveys and a Marsh Monitoring Program. In Ontario, the Canadian Wildlife Service of Environment Canada administers monitoring programs. The Long Point Bird Observatory oversees monitoring activities in the Long Point area.

Reintroductions

- As more information about species biology and habitat availability becomes known, it may be feasible to take specific actions. Reintroducing blue racers and Blanchard's cricket frog at Pinery Provincial Park and on Pelee Island, respectively, are actions being considered by recovery teams. One way of repatriating the blue racer back into its natural habitat on the Ontario mainland is to translocate individuals from Pelee Island. However, removal of individuals from this remnant population may jeopardize the species

entirely in Canada. To prevent this, it may be necessary to relocate racers from source populations in the United States for use in a captive breeding program at the Toronto Zoo or another suitable facility in Ontario. Since Blanchard's cricket frog is extinct in Canada, translocation from the U.S. is the only option for this species.

- Reintroducing other species such as bullfrogs and Fowler's toads at Point Pelee could be achieved more readily by translocating individuals from areas that support healthy populations such as Long Point and Rondeau.

Reserves and Sanctuaries

- Small areas within or adjacent to parks and other protected areas should be designated as reserves or sanctuaries to protect breeding habitat. Buffer zones would be useful in areas adjacent to protected areas such as the Big Creek National Wildlife Area at Long Point, where the incidence of road mortality and habitat loss due to cottage and marina development is high. Existing preservation zones could be designated or created at Rondeau Provincial Park and Point Pelee National Park, where cottages have been or are soon to be eliminated and where habitat is gradually being restored. For example, such areas could be designed to protect nesting turtles and their eggs against natural predators and human disturbance.

Education

- Provide educational opportunities and other interpretive programs within parks and protected areas. The Backus Heritage Conservation Area could better represent the herpetofauna of the Long Point area by establishing a museum – or zoo-like display. Steps could be taken to improve the interpretive facilities at Rondeau Provincial Park and Point Pelee National Park. Educational programs at all three peninsulas should be augmented to include hands-on workshops related to herpetofauna conservation. For example, Bruce Peninsula and Georgian Bay Islands National Parks have used education to improve human attitudes toward rattlesnakes and other large snakes.
- Promote awareness of the international importance of Long Point and Point Pelee. Consider bioregional (ecosystem) approaches to conservation at Rondeau and Point Pelee, following the example of UNESCO's Man and the Biosphere program, which has established World Biosphere Reserves at Long Point and on the Niagara Escarpment for a total of six in Canada.

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