



Important Amphibian and Reptile Areas Nomination Form

Part 1: IMPARA Criteria:

The Important Amphibian and Reptile Areas Program (IMPARA) Site Criteria are intended to be guidelines for identifying the importance of a site, and are somewhat flexible, depending on the specifics of the site. These criteria are intended to be the first step in a dialogue between the nominator and CHS.

Sites may be nominated based on one or more of the following criteria:

1. Sites containing species of conservation concern
2. Sites containing a high diversity of species
3. Sites that fulfill important life history function for congregations of species

1. Species of Conservation Concern

A site that is nominated under this criterion must contain a significant number of individuals of a species that is of conservation concern at one or more of the following levels:

- Globally designated as Critically Endangered, Endangered or Vulnerable by the International Union for the Conservation of Nature ([IUCN](#)).
- Nationally designated as at-risk (Endangered, Threatened, and Species of Special Concern) by the Committee on the Status of Endangered Wildlife in Canada ([COSEWIC](#))
- Provincially/territorially designated as at-risk by: COSEWIC, a provincial government or other designated group that assesses the status of species within a province, or a provincial/regional Conservation Data Centre.

Defining what is meant by a "significant" number of individuals of any species is difficult given the diversity of life histories, geographic distributions and abundances of amphibians and reptiles. Here are two methods to define a significant number of individuals:

- The site holds greater than or equal to 1% of a species' Canadian population.
- The site is one of 50 or fewer sites, or is one of the 50 most important sites supporting the Canadian population of a species.

These three methods require different qualities and quantities of information. They reflect the reality that a great deal is known about some species of amphibians and reptiles, and relatively little about the majority. Therefore, we encourage nominators to include as much information as they can in their nomination. For example, when it is possible to estimate the number of individuals at a site as well as in all of Canada, then method 1 should apply. Otherwise, if the total number of sites at which the species occurs is known, method 2 should apply. Sites from which a species has been extirpated may also be nominated if habitat restoration and/or re-introductions are underway or planned.

CHS uses the broad definition of a species used by COSEWIC, which defines species as, "Any indigenous species, subspecies, variety or geographically defined population of wild fauna and flora."

2. High Diversity of Species

A site that is nominated under this criterion regularly holds a large proportion of the amphibian and/or reptile species known to be present within the nation, province/territory, region, or another spatial scale. The goal of this criterion is to identify sites that contain higher than average numbers of species. Species diversity varies significantly from region to region across Canada, and lower latitudes generally have more species than higher latitudes. This means that a significant proportion of the herpetofauna in one region may be relatively insignificant in another region, and vice versa. Therefore, it is up to the nominator to define the geographic scale (i.e. national, provincial/territorial, regional, or other) under consideration, and to demonstrate how the site's diversity is relatively high.

Nominators may also choose to make their case based on various taxonomic levels. For example, the site may hold a large proportion of the province's snake species.

3. Important Life History Requirements

A site that is nominated under this criterion is used by exceptionally large numbers of amphibians and/or reptiles that congregate for the purpose of completing some life history activity such as reproduction, hibernation, or thermoregulation (e.g. communal hibernation sites, vernal breeding ponds). The nominator should define the geographic scale at which this site should be considered important. Nominators should also provide evidence supporting their claim that the congregation of a species at the site is exceptionally large.

Other Considerations

Important Amphibian and Reptile Areas must have clear boundaries (geographical or political), and must be large enough to potentially support self-sustaining populations. However, they should also be small enough that they form units amenable to locally-oriented conservation and restoration. While areas that already protect amphibian and reptiles (i.e., parks and conservation areas) are obvious candidates for IMPARA designation, it is also important to nominate areas that are not currently protected.

Part 2: Nomination Form

Personal Information

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Organization/Affiliation: Ministry of Natural Resources and Forestry (Ontario)
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Province/Territory: ON
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Fax:
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Location

Site names: Beausoleil Island (in Georgian Bay Islands National Park)
Province/Territory: Ontario
County/Region/District(s): Muskoka County
Closest City/Town: Honey Harbour
UTM/Geographical Coordinates: 44.87643 °N, -79.865996 °W
Directions to Site: Island in southeastern Georgian Bay, near Honey Harbour, Ontario.
Maps (please attach): see Figures 1 and 2.
Other:

Physical Description

Area (please specify units): Just under 11 km²

Please describe the site, providing information of habitat type, vegetation type, presence and type of water bodies:

Beausoleil Island is located in southeastern Georgian Bay and is part of the world's largest fresh water archipelago, which is made up of over 30,000 islands. It is also the largest island in Georgian Bay Islands National Park (32 islands). The island is located along a transition zone between the open rock barrens and windswept pines of the Canadian Shield and the hardwood forests and deeper soils characteristic of Great-Lakes-St. Lawrence Lowlands. This transition zone combined with the shoreline ecosystems that border the island give rise to an incredible diversity of habitats.

There is abundant rock barren habitat throughout the north end of the island which supports unique communities of lichen and drought-tolerant plants. Many of these rocky areas are dominated by a mix of shrubs and ground cover such as juniper, serviceberry and blueberry, which provide ideal snake thermoregulation habitat within the surrounding matrix of forest and wetland. White Pine, Hemlock, juniper and scrub Red Oak are the dominant trees in and around these rock barren communities. The central and southern parts of the island are primarily maple and beech-dominated deciduous and mixed forests with deeper, often very sandy soils. The island has a high diversity and abundance of wetland habitats, including coastal wetlands, beaver ponds, bogs, fens, marshes and swamps. The north end of the island in particular has an expansive interior wetland complex that covers over 25 ha and numerous bays and inlets that are bordered by extensive coastal wetlands. Shoreline habitats also include sand beaches and bedrock. There is also an interior lake, Fairy Lake, on the north end of the island.

It is not just the vast diversity of different habitats that makes this island so unique, but the close proximity of all of these habitats to each other, which results in incredible diversity of plants and animals. For example, 17 reptile and 12 amphibian species have been documented on the island, which represents over half of Ontario's herpetofauna diversity.

Beausoleil Island can only be accessed by watercraft. Private watercraft can dock in numerous locations and a Parks Canada shuttle vessel provides day trip visitor access to several locations on a frequent schedule. Overnight campers can access the island via water taxi service businesses.

More detail about the natural heritage of Beausoleil Island, including the ecosystems and species they support, is available on the Parks Canada website: [http://www.pc.gc.ca/eng/pn-
np/on/georg/natcul/natcul1.aspx](http://www.pc.gc.ca/eng/pn-
np/on/georg/natcul/natcul1.aspx)

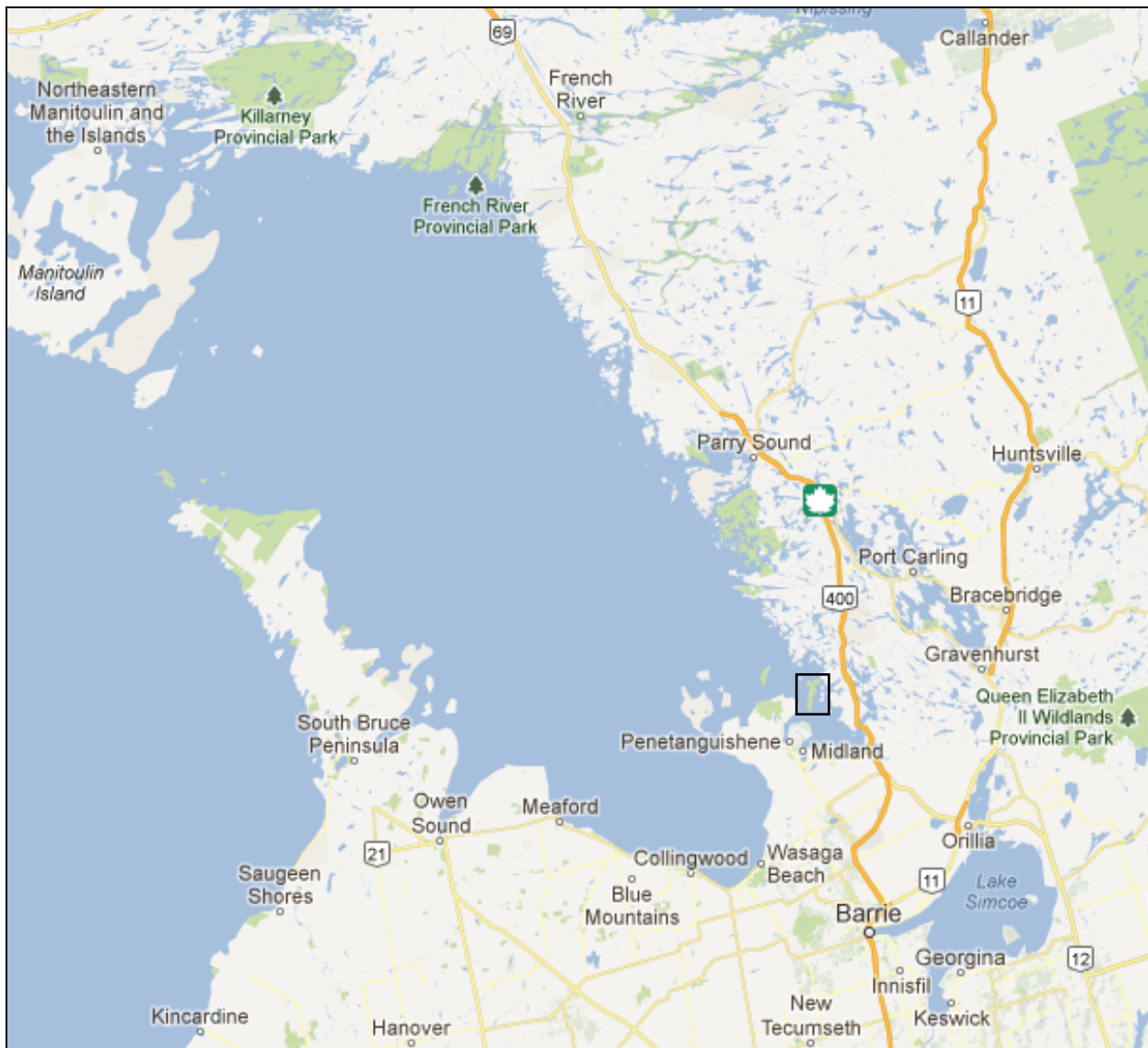


Figure 1. Location of Beausoleil Island in Ontario, as indicated by the square outline.



Figure 2. Map of Beausoleil Island depicting location names and human infrastructure.



Figure 3. Examples of several habitat types on Beausoleil: Lake Huron shoreline (top left), deciduous forest (top right), rock outcrop with low-lying shrubs (bottom left) and beaver pond (bottom right).

Land Ownership

If there are five or fewer owners, please list them. Otherwise, an appropriate government representative, such as municipal council or regional district, is sufficient.

Name: Andrew Promaine
Organization/Affiliation: Parks Canada
Address: 901 Wye Valley Road
City/Town: Midland
Province/Territory: Ontario
Postal Code: L4R 4K6
Telephone: 705.527.7211
E-mail: Andrew.Promaine@pc.gc.ca

Are the land owners/managers aware of the importance of the site to amphibian and reptile conservation? Yes

Are they aware of this site nomination, and if so did they participate in the process? Parks Canada is aware of the site nomination and the local staff are very excited about the potential for Beausoleil Island to be listed as an IMPARA. However, I did not request their assistance with the application. I am confident they would be willing to provide additional detail if it is requested.

Amphibian and Reptile Species

In the table provided, please list all species of amphibians and reptiles recorded at the site, estimated numbers of individuals of each species (if known), and any citations from which information was obtained (include the name of an observer if information is not published). Provide a Literature Cited section at the end of the nomination.

Beausoleil Island is large and I am not aware of any quantitative estimates of reptile and amphibian populations on the island. However, repeated surveys over the last eight years provide some evidence that populations of many reptile and amphibian species, including several threatened and endangered species, occur in high densities on this island. Please see “Site Criteria” for more information about reptile and amphibian occurrence and population density on Beausoleil Island. In the table below, ORAA stands for Ontario Reptile and Amphibian Atlas and NHIC stands for Natural Heritage Information Centre. In addition to these species lists being available in the ORAA and NHIC database, I have also observed all of these species on the island, with the exception of the Spotted Turtle and Five-lined Skink. Following is a description of the relative abundance categories used in the following table:



- **Rare:** Restricted to specialized habitats that are very limited (occur in less than 25% of the site) and / or occurs at very low density and is usually not encountered during surveys
- **Uncommon:** Encountered as often as not during surveys but is likely to be seen over several days of surveys
- **Common:** Usually encountered during surveys, multiple individuals often encountered during surveys of high quality habitat; typically widespread and occurs in a variety of habitats throughout the site
- **Abundant:** Many individuals encountered regularly during surveys, typically “tripping” over this species in high quality habitat (e.g. concentrations of leopard frogs along a shoreline); widespread and occurs in a variety of habitats throughout the site

Species	Status (SARA)	No. of Individuals	References
Snakes and Lizards			
Dekay's Brownsnake	Not assessed	Common	ORAA
Eastern Foxsnake	Threatened	Uncommon	Ontario NHIC
Eastern Gartersnake	Not assessed	Common	ORAA
Eastern Hog-nosed Snake	Threatened	Uncommon	Ontario NHIC
Eastern Milksnake	Special Concern	Uncommon	Ontario NHIC
Five-lined Skink	Special Concern	Rare	Georgian Bay Islands National Park Management Plan
Massasauga	Threatened	Common	Ontario NHIC
Northern Ribbonsnake	Special Concern	Rare	Ontario NHIC

Northern Ring-necked Snake	Not assessed	Uncommon	ORAA
Northern Watersnake	Not at Risk	Common	Ontario NHIC
Red-bellied Snake	Not assessed	Rare	
Turtles			
Blanding's Turtle	Threatened	Uncommon	Ontario NHIC
Eastern Musk Turtle	Threatened	Common	Ontario NHIC
Midland Painted Turtle	Not assessed	Common	ORAA
Northern Map Turtle	Special Concern	Common	Ontario NHIC
Snapping Turtle	Special Concern	Uncommon	Ontario NHIC
Spotted Turtle	Endangered	Rare	Ontario NHIC
Frogs and Toads			
American Bullfrog	Not assessed	Abundant	ORAA
American Toad	Not assessed	Common	ORAA
Gray Treefrog	Not assessed	Common	ORAA
Green Frog	Not assessed	Abundant	ORAA
Northern Leopard Frog	Not assessed	Abundant	ORAA
Spring Peeper	Not assessed	Common	ORAA
Wood Frog	Not assessed	Common	ORAA
Salamanders			
Blue-spotted Salamander	Not assessed	Uncommon	ORAA
Eastern Newt	Not assessed	Abundant	ORAA
Eastern Red-backed Salamander	Not assessed	Abundant	ORAA
Four-toed Salamander	Not at Risk	Uncommon	ORAA
Spotted Salamander	Not assessed	Uncommon	ORAA

Other Species

Please list other significant non-amphibian and non-reptile species (e.g. rare or endemic) that are present at the site and describe the importance of the site to these species.

Species	Status	Importance of Site	References
Eastern Whip-poor-will	Threatened	Supports local populations of this threatened species	Personal observations
Prairie Warbler	Not at Risk	Rare in Canada but very abundant on the island	Personal observations; Georgian Bay Islands National Park Management Plan



Figure 4. Reptiles and amphibians encountered on Beausoleil Island: Eastern Hog-nosed Snake (top left), Red-spotted Newt (top right), Eastern Musk Turtle (bottom left) and Gray Treefrog (bottom right)

Site Criteria

Under each category, please provide a description of how this site fulfills the Important Amphibian and Reptile Areas criteria (see Part 1). If a category does not apply to this site then simply leave it blank (e.g. if there are no threatened species present then leave the Threatened Species category blank).

1. Species of Conservation Concern:

Of the 109 documented Element Occurrences (EOs) of Spotted Turtle in Canada, only 25 are known to be extant while the rest are based on historical occurrences and may be extirpated or of questionable viability. Therefore, it is likely that Beausoleil Island supports one of fewer than 50 extant populations of Spotted Turtles in Canada, and it is certainly one of the 50 most important sites supporting the Canadian Spotted Turtle population.

Although the island supports many species of conservation concern, it likely does not constitute 1% of the Canadian range of the other species. Populations of these other species of conservation concern are none-the-less significant and of high conservation importance for the following reasons:

- 1) Several species of conservation concern occur at unusually high abundance on the island. Herpetofauna surveys have been conducted on Beausoleil Island once to twice each spring for the past eight years. Encounter rates from these surveys suggest that

populations of several reptile and amphibian species of conservation concern occur at higher abundance on the island than what is typical throughout the range of these species. For example, between two and six Eastern Hog-nosed Snakes are typically detected during each 2.5 day survey; whereas many weeks of targeted surveys are often required in other parts of this species' range before a single individual is located. It is likely that the Beausoleil Island population of Eastern Hog-nosed Snakes is one of the highest density populations in Ontario. Similarly, Massasaugas tend to be encountered at higher density during surveys on Beausoleil Island than in many other parts of the species range (Crowley unpublished data).

- 2) The island is almost completely unaffected by the threats that have caused declines and local extirpation events elsewhere in Ontario, specifically road mortality and habitat loss. Although designated protected areas, such as provincial or national parks, afford some protection to species at risk reptiles and amphibians, threats are still present to varying degrees and some populations continue to experience local decline or even extirpation. For example, many protected areas in southern Ontario have high road density (Crowley 2006), and high rates of road mortality have been documented in several protected areas in Ontario (e.g. Farmer 2007). The maintenance of large, roadless areas where reptile and amphibian populations occur is the one of the best conservation solutions for addressing the threat of road mortality, which is one of the main drivers of reptile and amphibian decline in Canada. It is rare to find areas in southern Canada that support high diversity and abundance of reptiles and amphibians and that are largely unaffected by road mortality, habitat loss and other threats. Beausoleil Island is one such site, and, consequently, it has high value to act as a benchmark for regional comparisons thus helping in the long-term conservation of these species in Canada.

Given the large populations of Massasauga and Eastern Hog-nosed snake that occur on Beausoleil Island and the lack of threats affecting these populations, Beausoleil Island can easily be considered one of the 50 most important sites supporting Canadian populations of Massasauga and Eastern Hog-nosed Snake, and likely several other reptile species of conservation concern as well.

2. High Species Diversity:

Beausoleil Island has an incredible diversity of herpetofauna, with seventeen reptile species and twelve amphibian species confirmed to occur on the island. Several additional species are suspected to occur on the island but have yet to be verified. This site is home to over half of Ontario's herpetofaunal species and represents just over one quarter of Canada's herpetofaunal diversity.

Beausoleil Island supports a surprisingly high number of species of conservation concern; 11 of the island's 17 reptile species are listed provincially and federally as species at risk, and this list includes one Endangered and several Threatened species (see preceding list).

Human Impacts

Please describe how human activities are impacting the site and the immediately surrounding areas in the following ways:

- Current site usage (if any), e.g. industrial, residential, farming, logging, camping, recreation, etc. (please indicate relative importance):

Parks Canada owns and operates one small campground with campsites and a small number of cabins, eight back-country campsites dispersed across the island and one additional area with a few small cabins. There are two boat-access YMCA camps on the island. There is a relatively extensive network of low-impact hiking (and some biking) trails throughout the island, as well as picnic areas and lookouts. The only roads on the island are located around the main national park campground, and they are not open to the public. The only other motorized vehicles use on the island is occasional use of ATVs at the two YMCA camps.

- Pollution (air, water, light, noise):

Negligible

- Threats to habitat (e.g. development, habitat loss or degradation, succession, fire)

The island is entirely owned by Parks Canada, which has outlined a clear mandate to protect and enhance the ecological integrity of the island in the park management plan (Parks Canada, 2010). Although the development of new campsites or hiking trails may occur, future management by the park is unlikely to result in any substantial habitat loss. The YMCA camps are rustic and have a very small footprint (e.g. the paths connecting buildings are just small trails through the forest).

- Past or current habitat conservation or restoration efforts:

Beausoleil Island is being managed by Parks Canada to preserve the natural landscape and ecological integrity (Parks Canada 2010). Key strategies to accomplish this include

- A restoration project to re-locate most park infrastructure to the mainland, further reducing the footprint on the island
- Planned zoning change of the majority of the island to “Wilderness” to provide enhanced protection
- Initiation of an ecological monitoring program
- Public education programs to help reduce visitor impacts (e.g. snake education)
- Strategies to prevent the introduction and mitigate the effects of invasive species
- Support for stewardship and conservation work in the greater park ecosystem (surrounding areas)

Recommended conservation actions for this area

Please describe any conservation actions that are needed/recommended for this area:

The Parks Canada Management Plan for Georgian Bay Islands National Park provides an extensive list of the conservation actions that should be completed on the island, and these are summarized in the above section. Expansion of the public education program for snakes would be especially beneficial since negative human-snake interactions, including persecution, is one of the largest threats to these species on the island. For example, the addition of kiosks with information about Massasaugas and other snake species at major camping or boat docking sites would have a lot of benefit.

Other Concerned Organizations

Please provide contact information for organizations or individuals that are involved in protection/conservation of this site, *i.e.* World Wildlife Fund Canada, Nature Conservancy Canada, Ducks Unlimited, Federation of Nova Scotia Naturalists.

As mentioned previously, Parks Canada is the primary organization concerned with the conservation of this site.

Previous Work

Please list studies/documents/papers that have been derived from this site. If possible, include the documents with the submission or provide enough information so that the sources can be retrieved by CHS

Christensen, R. J. 2013. The movement patterns and home ranges of Blanding's Turtles (*Emydoidea blandingii*) in two protected areas in Ontario, Canada. M.Sc. Thesis, McMaster University. 94 pp.

Chiucchi, J. E., and H.L. Gibbs, H. L. 2010. Similarity of contemporary and historical gene flow among highly fragmented populations of an endangered rattlesnake. *Molecular Ecology* 19: 5345-5358.

Davy, C.M. and R.W. Murphy. 2014. Conservation genetics of the endangered Spotted Turtle (*Clemmys guttata*) illustrate the risks of "bottleneck tests". *Canadian Journal of Zoology* 92: 149–162.

URL: <http://www.nrcresearchpress.com/doi/abs/10.1139/cjz-2013-0188>

Hager, H. A. (1998). Area-sensitivity of reptiles and amphibians: Are there indicator species for habitat fragmentation?. *Ecoscience* 139-147.

Hecnar, S.J., Casper, G.S., Russell, R.W., Hecnar, D.R. and Robinson, J.N., 2002. Nested species assemblages of amphibians and reptiles on islands in the Laurentian Great Lakes. *Journal of Biogeography*, 29(4): 475-489.

Markle, C. and P. Chow-Fraser. 2014. Habitat Selection by the Blanding's Turtle (*Emydoidea blandingii*) on a Protected Island in Georgian Bay, Lake Huron. *Chelonian Conservation and Biology* 13(2): 216–226.

DOI: <http://dx.doi.org/10.2744/CCB-1075.1>

URL: <http://www.bioone.org/doi/full/10.2744/CCB-1075.1>

Parks Canada. 2010. Georgian Bay Islands National Park of Canada Management Plan. <http://www.pc.gc.ca/eng/pn-np/on/georg/plan.aspx>

Parks Canada has been very supportive of annual spring reptile and amphibian surveys that have been occurring since 2008. There is no publication associated with this, but all species occurrence data has been submitted to Parks Canada, the Natural Heritage Information Centre (Ontario's Conservation Data Centre) and the Ontario Reptile and Amphibian Atlas.

A reptile and amphibian training course has been held on the island since 2013. This course is organized by Ontario Nature, Nature Conservancy of Canada, OMNRF and Blazingstar Environmental, with support from Parks Canada

Literature Cited

Please list any references cited in this nomination.

Crowley, J. F. 2006. Are Ontario reptiles on the road to extinction? Anthropogenic disturbance and reptile distributions within Ontario. Master's thesis. University of Guelph, Guelph, Ontario.

Farmer, R.G. 2007. Factors associated with vertebrate roadkill in southern Ontario parks. Thesis submitted to the Department of Zoology, University of Guelph, Ontario.

Parks Canada. 2010. Georgian Bay Islands National Park of Canada Management Plan. <http://www.pc.gc.ca/eng/pn-np/on/georg/plan.aspx>