

# **Ontario Species at Risk Evaluation Report**

**for**

## **Spotted Turtle (*Clemmys guttata*)**

Committee on the Status of Species at Risk in Ontario  
(COSSARO)

Assessed by COSSARO as ENDANGERED

May, 2015

Final

## Tortue ponctuée (*Clemmys guttata*)

La tortue ponctuée (*Clemmys guttata*) est une petite tortue (carapace de 9 à 13 cm de longueur) d'eau douce qui se caractérise par une coquille noire parsemée de taches jaunes distinctives. Elle vit dans différents types de terres humides, dont des marais, des tourbières et des fourrés marécageux. Elle est répartie dans le sud de l'Ontario à l'extrémité nord de la baie Géorgienne, mais on la trouve souvent dans des populations isolées dispersées à grande échelle. La tortue ponctuée est une tortue longévive qui atteint sa maturité sexuelle entre l'âge de 11 ans et 15 ans. La femelle pond quatre ou cinq œufs en moyenne, et celles qui vivent dans la partie nord de l'aire de répartition ne s'accouplent généralement qu'à tous les deux ans. Les tortues sont particulièrement actives au début du printemps et plusieurs individus sont en dormance pendant la majeure partie de l'été.

Les tortues ponctuées ont été déclarées abondantes dans le sud-ouest de l'Ontario au début des années 1990, mais elles sont beaucoup moins nombreuses aujourd'hui. Elles diminuent continuellement dans la plupart des sites et aucune tortue n'a été signalée depuis au moins 20 ans dans environ 75 p. 100 des emplacements connus. La tortue ponctuée a disparu dans au moins quatre emplacements. Les principales causes de son déclin sont la mortalité routière, la perte d'habitat causée par les aménagements, la dégradation de l'habitat par des espèces végétales envahissantes (en particulier par le roseau commun) et la capture de spécimens sauvages pour le commerce des animaux de compagnie ou le commerce de la médecine traditionnelle. Elle a donc été évaluée comme une espèce en voie de disparition par le CDSEPO.

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## Executive summary

The Spotted Turtle (*Clemmys guttata*) is a small (carapace length 9-13 cm) freshwater turtle, characterized by a black shell with a smattering of distinctive yellow spots. It lives in a variety of wetland types including marshes, bogs and thicket swamps. It is distributed across southern Ontario north to the north end of Georgian Bay but occurs in often isolated widely scattered populations. Spotted Turtle is a long-lived turtle, reaching sexual maturity at age 11-15. Females lay an average of 4-5 eggs and those in the northern part of the range typically only breed every second year. The turtles are most active in early spring and many individuals are dormant through much of the summer.

Spotted Turtle was reported to be abundant in southwestern Ontario in the early 1900s but is now significantly reduced. It has shown a continual decline at most sites and no turtles have been reported in at least 20 years at about 75% of known locations. It has been extirpated from at least four locations. The main causes for the decline are road mortality, habitat loss from development, habitat degradation by invasive plant species (in particular from Common Reed) and collection of wild specimens for the pet trade or traditional medicine trade. Thus, it has been assessed as Endangered by COSSARO.

# 1. Background information

## 1.1. Current designations

- GRANK: G5 (NatureServe 2015)
- NRANK Canada: N3
- COSEWIC: Endangered (November 2014)
- SARA: Endangered (Schedule 1)
- ESA 2007: Endangered (2004)
- SRANK: S3

## 1.2. Distribution in Ontario

The Spotted Turtle occurs from extreme southwestern to southeastern Ontario and north to Georgian Bay. It generally occurs discontinuously at scattered locations throughout this area but is most prevalent north of Lake Erie and around Georgian Bay. Subpopulations are generally not contiguous. The Natural Heritage Information Centre (NHIC) has identified 109 Element Occurrences (EOs) but 81 are considered historical with no records for over 20 years and at least four are believed to be extirpated. Spotted Turtles are possibly still present at most of these EOs which may reflect lack of survey effort. Nevertheless populations have continued to decline at most EOs where monitoring has taken place (COSEWIC 2014).

The species was much more abundant in Ontario in the 1800s and early 1900s and has declined steadily since then. Spotted Turtles have been extirpated from some protected areas including Point Pelee National Park and MacGregor Point Provincial Park. Even some remote populations that are minimally impacted from human uses are showing population declines. The population in the province is estimated to be 2000 to 3000 adult turtles (COSEWIC 2014).

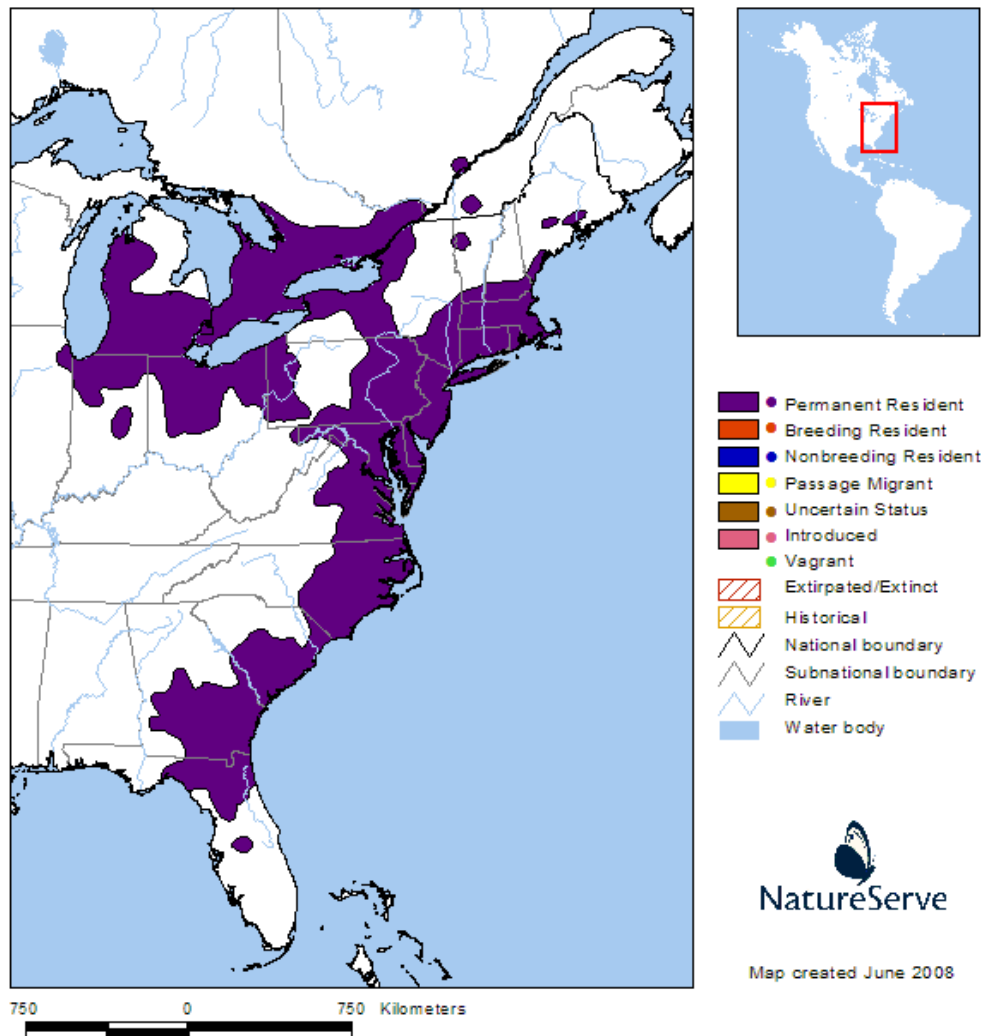
## 1.3. Distribution and status outside Ontario

The Spotted Turtle ranges from northeastern Illinois, Michigan, southern Ontario and southern Maine, south along the Atlantic Coastal Plain to central Florida. There are very few records from Quebec and it may be extirpated there (COSEWIC 2014). This turtle is designated as S1, S2 or S3 in all states and provinces bordering Ontario.

## 1.4. Ontario conservation responsibility

Approximately 17% of the global range of the Spotted Turtle occurs in Ontario based on the range map in NatureServe (2015).

Figure 1. Global distribution of the Spotted Turtle.



## 1.5. Direct threats

The main threats to the species are: 1) road mortality when individuals move between wetlands or are searching for places to lay their eggs, 2) collection for pet trade or for traditional medicine, 3) habitat loss and 4) habitat degradation from invasive species.

Spotted Turtle populations that occur adjacent to roads are susceptible to high rates of mortality, particularly of females that are moving to nesting sites. As the road network continues to expand, more subpopulations are at risk of increased road mortality.

This small attractive turtle is highly prized in the pet trade. At least 23 of the 109 subpopulations are considered to have a high risk of poaching due to ease of site access (COSEWIC 2014). Because Spotted Turtles concentrate at breeding sites in the early spring, a large portion of a given subpopulation could be removed by a single poaching event.

The rate of wetland loss in southwestern Ontario has been extreme, and therefore most

of the species' original habitat has been eliminated. The rate of wetland loss has been much slower there in recent decades (because there is not much more that can be removed) but the species has persisted in the reduced wetland area. The amount of remaining wetland may not be sufficient to sustain some Spotted Turtle subpopulations in the long term.

A more recent habitat related problem is that many of the remaining wetlands are being invaded and then dominated by invasive plant species which can change the structure. In particular, Common Reed (*Phragmites australis*) has or is in the process of transforming many wetlands, making them unsuitable for Spotted Turtle. Common Reed grows very tall, outcompeting all lower vegetation that provides cover and food, and the tough dense stalks are difficult for the turtles to move through. Even natural succession of some wetlands such as transformation of thicket swamps into closed swamps is making some sites unsuitable for Spotted Turtles (COSEWIC 2014).

A threats calculation was conducted by COSEWIC (2014) which determined that the risk from road mortality and road effects is high, as is the risk from pet trade. Habitat loss due to invasive plants, specifically monospecific stands of the non-native *Phragmites australis* subsp. *australis*, is high to medium. The threat from residential and commercial development is medium. The calculated overall impact of these threats was a projected continued decline of 22-70% over the next three generations (COSEWIC, 2014).

## 1.6. Specialized life history or habitat use characteristics

Spotted Turtle is a long-lived species that needs to attain 11-15 years of age before it is sexually mature and then only lays an average of 4-5 eggs per year, which is very low for a turtle. In the northern part of its range, females lay eggs every second year. Consequently it has a low rate of reproductive capability. Maximum longevity in a Georgian Bay subpopulation was estimated to be 110 years for females calculated from 24 years of mark-recapture data (Litzgus 2006). It also has a low rate of dispersal and individuals generally do not move between nearby subpopulations: the distances over which individuals travel do not normally exceed 2km in areas of unsuitable habitat and 3km in areas of suitable habitat (NatureServe, accessed May 21, 2015).

## 2. Eligibility for Ontario status assessment

### 2.1. Eligibility conditions

#### 2.1.1. Taxonomic distinctness

Yes. The Spotted Turtle was first described by Schneider (1798) and is confined to eastern North America. No subspecies are recognized. The genus *Clemmys* formerly included two other North American turtle species but now Spotted Turtle is considered a monotypic genus.

### 2.1.2. Designatable units

No. Subpopulations are often biogeographically isolated, however, there is no evidence of local adaptation or significant differences among subpopulations and designating them as separate units is not justified (Davy and Murphy 2014).

### 2.1.3. Native status

Yes. Spotted Turtle has been known to occur in Ontario since at least the 1800s. Ontario lies well within the main range of the species and it is clearly a native species.

### 2.1.4. Occurrence

Yes. Spotted Turtle currently occurs in Ontario

## 2.2. Eligibility results

Spotted Turtle (*Clemmys guttata*) is eligible for status assessment in Ontario.

## 3. Ontario status assessment

### 3.1. Application of endangered/threatened status in Ontario

#### 3.1.1. Criterion A – Decline in Total Number of Mature Individuals

Meets Threatened A3(b)+(c) since there is an estimated reduction of greater than 40% (midpoint of 22-70% based on threats calculation in COSEWIC 2014) in three generations (generation time determined to be 41.5 years by COSEWIC 2014) due to the threat of invasive species, road mortality and poaching of wild individuals.

COSEWIC (2014) predicts an overall population decline of >40% in 123 years based on a projected 10% annual adult mortality in southwestern Ontario subpopulations and 5% annual adult mortality in Georgian Bay subpopulations.

#### 3.1.2. Criterion B – Small Distribution Range and Decline or Fluctuation

Does not apply. Spotted Turtle is too widespread in southern Ontario to qualify.

#### 3.1.3. Criterion C – Small and Declining Number of Mature Individuals

Meets Endangered C1 since the total number of mature individuals may be less than 2500 individuals according to COSEWIC (2014) (total number of individuals in Canada estimated as 2000-3000; COSEWIC, 2014), and there is a continuing decline in the total number of mature individuals of at least 20% within 2 generations.

The rate of wetland habitat loss has slowed considerably since any evaluated wetland containing this species will be designated as a Provincially Significant Wetland that is

protected from development. However, the rapid spread and domination of many wetlands by the robust invasive Common Reed is reducing the habitat suitability of these wetlands. Furthermore the aggregating habits of this desired species during breeding makes them highly susceptible to collectors who know locations to find them.

#### 3.1.4. Criterion D – Very Small or Restricted Total Population

Does not apply since there are more than 1000 mature individuals, and number of locations exceeds the threshold of 5.

#### 3.1.5. Criterion E – Quantitative Analysis

Does not apply since Population Viability Analyses (PVA) has not been conducted on the provincial population.

A PVA has been conducted using road mortality estimates which resulted in an adult survivorship estimate of 0.89 for a southwestern Ontario subpopulation (i.e. 10% of adults die annually; Enneson and Litzgus 2009).

### 3.2. Application of Special Concern in Ontario

Does not apply since some criteria above apply for Threatened or Endangered.

### 3.3. Status category modifiers

#### 3.3.1. Ontario's conservation responsibility

Approximately 17% of the global range of the Spotted Turtle occurs within Ontario.

#### 3.3.2. Rescue effect

Due to the highly developed landscape and remnant fragmented habitats in border areas in combination with the limited dispersal capability of the Spotted Turtle, it is highly unlikely that a rescue effect would help the species in Ontario.

### 3.4. Other status categories

#### 3.4.1. Data deficient

No. Many subpopulations have not been sampled recently but others have been carefully monitored and trends are clear.

#### 3.4.2. Extinct or extirpated

Not applicable.



### 3.4.3. Not at risk

Not applicable.

## 4. Summary of Ontario status

The Spotted Turtle (*Clemmys guttata*) is classified as Endangered in Ontario. It meets criterion A3bc for Threatened and criterion C1 for Endangered. It was also classified as Endangered by COSEWIC in 2014.

## 5. Information sources

COSEWIC. 2014. COSEWIC assessment and status report on the Spotted Turtle *Clemmys guttata* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 74 pp.

Davy, C.M., and R.W. Murphy. 2014. Conservation genetics of the endangered spotted turtle illustrates the risks of 'bottleneck tests'. *Canadian Journal of Zoology* 92: 149–162.

Enneson, J.J. and J.D. Litzgus. 2009. Stochastic and spatially explicit population viability analyses for an endangered freshwater turtle, *Clemmys guttata*. *Canadian Journal of Zoology* 87: 1241-1254.

Litzgus, J.D. 2006. Sex differences in longevity in the Spotted Turtle (*Clemmys guttata*). *Copeia* 2006: 281-288.

Logier, E.B.S. 1939. The Reptiles of Ontario. Royal Ontario Museum Handbook No. 4. 63 pp.

Nash, C.W. 1906. Batrachians and reptiles of Ontario. Checklist of the vertebrates and catalogue of specimens in the biological section of the Provincial Museum. Department of Education, Toronto, Ontario. 32 pp.

NatureServe, 2015. *Clemmys guttata* – Spotted Turtle. NatureServe Explorer. [accessed May 21, 2015].

Seburn, D. and C. Seburn. 2000. Conservation Priorities for the Amphibians and Reptiles of Canada. World Wildlife Fund Canada and Canadian Amphibian and Reptile Conservation Network.

# Appendix 1: Technical summary for Ontario

Species: Spotted Turtle

## Demographic information

Demographic attribute	Value
Generation time. Based on average age of breeding adult: age at first breeding = 11-15 years; average life span = up to 110 years.	11-15 years to reach sexual maturity and first breeding, However generation time is 41 years (COSEWIC 2014)
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Yes
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations (82 years).	>30% decline
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations (123 years).	Unknown
Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations (123 years).	>40%
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over any 10 years, or 3 generations, over a time period including both the past and the future.	>40%
Are the causes of the decline a. clearly reversible and b. understood and c. ceased?	a. No b. Yes c. No
Are there extreme fluctuations in number of mature individuals?	No

## Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence. Including only recent records = 153,200 km <sup>2</sup> Recent and historical (pre-1994) = 161,873 km <sup>2</sup>	Between 153,000 km <sup>2</sup> and 162,000 km <sup>2</sup> .
Index of area of occupancy (IAO).	Between 460 km <sup>2</sup> and 2000 km <sup>2</sup> .

Is the total population severely fragmented? (i.e. is >50% of its total area of occupancy is in habitat patches that are (a) smaller than would be required to support a viable population, and (b) separated from other habitat patches by a distance larger than the species can be expected to disperse?)	a. Likely b. Yes
Number of locations ( <i>as defined by COSEWIC</i> ).	20-30 according to COSEWIC (2014), however they list 23 recent + 10 First Nation reserves. Also 82 historic sites, many which have not been monitored recently.
Number of NHIC Element Occurrences ( <i>Request data from MNRF</i> )	109
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	Yes
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	Yes inferred based on greater number of historic locations than in previous assessment
Is there an observed, inferred, or projected continuing decline in number of populations?	Yes
Is there an observed, inferred, or projected continuing decline in number of locations?	Yes
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	Yes
Are there extreme fluctuations in number of populations?	No
Are there extreme fluctuations in number of locations?	No
Are there extreme fluctuations in extent of occurrence?	No
Are there extreme fluctuations in index of area of occupancy?	No

Number of mature individuals in each sub-population or total population (if known)

<b>Sub-population</b>	<b>N of mature individuals</b>
Georgian Bay/Bruce/Greater Area (8 areas)	>456
Southeastern Ontario (6 areas)	>218
Southwestern Ontario (7 areas)	>1170
Total	1843 (1700-2110)

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild: Probability of 6 or more of 9 known subpopulations in Ontario becoming extinct in 100 years is 26%. Probability of GB1 subpopulation (studied since 1977) becoming extirpated in 100 years is 60%, despite a relatively pristine environment (Enneson and Litzgus 2009).

## Rescue effect

<b>Rescue effect attribute</b>	<b>Likelihood</b>
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	No
Would immigrants be adapted to survive in Ontario?	Probably
Is there sufficient suitable habitat for immigrants in Ontario?	Probably in the Georgian Bay / Central Ontario region;
Is the species of conservation concern in bordering jurisdictions?	Yes/ ranked as S1-S3 in all bordering jurisdictions
Is rescue from outside populations reliant upon continued intensive recovery efforts?	Yes would only be possible with trans-location of individuals.

## Appendix 2: Adjoining jurisdiction status rank and decline

### Information regarding status rank and decline of Spotted Turtle

<b>Jurisdiction</b>	<b>Subnational rank</b>	<b>Population trend</b>	<b>Sources</b>
Ontario	S3	Declining	NatureServe 2015
Quebec	S1	Probably extirpated	NatureServe 2015, Seburn and Seburn 2000
Manitoba	Not present	n/a	NatureServe 2015
Michigan	S2	n/a	NatureServe 2015
Minnesota	Not present	n/a	NatureServe 2015
Nunavut	Not present	n/a	NatureServe 2015
New York	S3	n/a	NatureServe 2015
Ohio	S3	n/a	NatureServe 2015
Pennsylvania	S3	n/a	NatureServe 2015
Wisconsin	Not present	n/a	NatureServe 2015

#### Acronyms:

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

COSSARO: Committee on the Status of Species at Risk in Ontario

ESA: Endangered Species Act

GRANK: global conservation status assessments

IAO: index of area of occupancy

MNRF: Ministry of Natural Resources and Forestry

NHIC: Natural Heritage Information Centre

NNR: Unranked

NRANK: National conservation status assessment

PVA: Population viability analysis

SARA: Species at Risk Act

SRANK: subnational conservation status assessment

S1: Critically imperiled

S3: Vulnerable

CDSEPO: Le Comité de détermination du statut des espèces en péril en Ontario