

**Ontario Species at Risk Evaluation Report for
Blanding's Turtle (*Emydoidea blandingii*)**

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

Assessed by COSSARO as Threatened

May 2017

Tortue mouchetée (*Emydoidea blandingii*)

La tortue mouchetée est une tortue de taille moyenne facilement reconnaissable à sa carapace haute et bombée et à sa gorge jaune vif. Elle a la capacité de refermer la moitié antérieure de son plastron. Ayant une espérance de vie élevée, elle atteint sa maturité à un âge plus avancé que d'autres tortues, soit autour de 20 ans. Elle occupe divers types de milieux humides, et son aire de répartition s'étend du Sud de l'Ontario (on la trouve dans la majeure partie de cette région de la province) jusqu'à Sudbury et Sault Ste. Marie, au nord. Plus mobile que certains autres de ses congénères, elle se déplace souvent d'un milieu humide à un autre durant la saison active. Les femelles font leur nid en terre haute, à des centaines de mètres de leur milieu humide.

De nombreuses menaces ont contribué au déclin des tortues mouchetées : 1) la perte d'habitat, 2) la mortalité sur les routes et les voies ferrées, 3) la dégradation de l'habitat en raison d'espèces de plantes invasives, 4) le ramassage pour le commerce d'animaux domestiques ou de produits médicinaux, et 5) la prédation sur les nids par des populations élevées de prédateurs attribuables à l'activité humaine.

La conversion des milieux humides a été importante dans la moitié Sud de l'aire de répartition de l'espèce en Ontario, avec une perte enregistrée de 60 %. Dans le Sud-Ouest de l'Ontario, la population de tortue mouchetée aurait chuté dans la même mesure. Ce récent déclin dans cette région a probablement été exacerbé par l'invasion du roseau commun d'Europe. En revanche, le recul de l'habitat et, par conséquent, de la population en général, a été beaucoup moindre dans la moitié Nord de l'aire de répartition de l'espèce, dans le Bouclier canadien.

Le CDSEPO considère la tortue mouchetée comme une espèce menacée vu la chute démographique estimée qui a cours depuis trois générations. À l'échelle nationale, le COSEPAC l'a récemment reclassifiée comme espèce en voie de disparition, en raison du déclin présumé de 60 % de la population et des milieux humides. Cependant, vu le faible taux de perte des milieux humides et le peu de menaces dans la portion Nord de l'aire de répartition, le taux général de perte des milieux humides pour la province tourne probablement plus autour de 30 à 50 %. Les populations de tortue mouchetée dans les autres provinces (Québec, Nouvelle-Écosse) sont beaucoup plus petites, et beaucoup plus à risque d'extinction qu'en Ontario.

Cette publication hautement spécialisée «COSSARO Candidate Species at Risk Evaluation for Blanding's Turtle» n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la Loi sur les services en français. Pour obtenir des renseignements en français, veuillez communiquer avec le CDSEPO au COSSAROSecretariat@ontario.ca.

Executive summary

Blanding's Turtle is a medium sized turtle that is easily recognized by its high domed shell and bright yellow throat. It has the ability to close the front half of the plastron. Blanding's Turtle is a long-lived species with a late age of maturity compared to other turtles, of about 20 years. It occurs in a wide variety of wetland types and ranges across most of southern Ontario north to Sudbury and Sault Ste. Marie. Blanding's Turtles are more mobile than other turtles, often moving between several wetlands over the course of the active season. Females nest in open upland areas but wander many hundreds of metres from their resident wetlands.

The Blanding's Turtle is subjected to a number of threats which have contributed to its decline including: 1) habitat loss, 2) road and railway mortality, 3) degradation of habitat by invasive plant species, 4) collection of animals for pet or medicine trade, and 5) nest predation by elevated populations of predators due to human activities.

Wetland conversion has been substantial in the southern half of the species range in Ontario with a documented loss of 60%. In southwestern Ontario, it is inferred that the Blanding's Turtle population has declined by a similar degree. Recent population declines have been documented in southwestern Ontario, likely exacerbated by the continued spread of the invasive European Common Reed. Habitat loss has been considerably lower in the northern portion of the species range on the Canadian Shield and the overall population decline has been lower there.

Blanding's Turtle was assessed as Threatened by COSSARO due to the inferred rate of population decline over three generations. Federally, COSEWIC recently reclassified the Blanding's Turtle as Endangered, based on the inferred population decline of 60% in line with the wetland loss. However due to the lower rates of wetland loss and threats in the northern portion of its range, the amount of overall wetland loss in the province is more likely in the range of 30 to 50%. Blanding's Turtle populations in other provinces (Quebec, Nova Scotia) are much smaller and at a higher risk of extinction than in Ontario.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

Blanding's Turtle is a distinct species that was first described in 1838 by Holbrook. It is the only species in the genus *Emydoidea* (although quite closely related to the European genus *Emys*) (Feldman and Parham 2002) and is clearly distinct from any other North American turtle. There are no recognized subspecies.

1.1.2. Designatable units

Blanding's Turtle's range in Ontario is continuous and therefore only one designatable unit is applicable. COSEWIC (2016) recognizes two designatable units in Canada: the Great Lakes / St. Lawrence DU which includes all of Ontario; and a Nova Scotia DU that is widely separated from its main contiguous range.

1.1.3. Native status

Blanding's Turtle is clearly native as Ontario forms a significant portion of the contiguous range of the species in eastern North America. The species is well known across much of southern Ontario.

1.1.4. Occurrence

Blanding's Turtle (*Emydoidea blandingii*) has been a regularly occurring species in Ontario for over 100 years with numerous observations reported from many areas in recent years.

1.2. Eligibility results

Blanding's Turtle (*Emydoidea blandingii*) is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G4 (NatureServe 2017)
- NRANK Canada: N3
- COSEWIC: Endangered (November 2016)
- SARA: Threatened (Schedule 1)
- ESA 2007: Threatened (June 2008)
- SRANK: S3 (2015)

2.2. Distribution in Ontario

The Blanding's Turtle is quite widespread across southern Ontario. It occurs from extreme southwestern Ontario, east to Ottawa, north to North Bay and Sudbury, and northwest to Sault-St. Marie. It is apparently absent from the Bruce Peninsula and areas immediately to the south, as well as the far eastern part of the province. A few scattered records occur as far north as Timmins. It is unknown if these represent genuine populations or they may have been released individuals.

The Ontario Reptile and Amphibian Atlas (Ontario Nature 2017) shows that Blanding's Turtle has been found in 715 10 x 10 km squares within the range described above. NHIC has not yet determined the total number of Element Occurrences (EOs) in the province but it is likely to be hundreds (Colin Jones pers. comm.). The total Ontario population is estimated to be < 50,000 mature individuals, based on data from the Ontario Reptile and Amphibian Atlas. This is an increase from the estimate used in the previous assessment (10,000), reflecting increased survey efforts, rather than a genuine increase in population size. There has also been an increase in reporting from forestry companies and private individuals, both through the NHIC system, the Ontario Reptile and Amphibian Atlas (Ontario Nature 2017) and through submissions made directly to COSSARO.

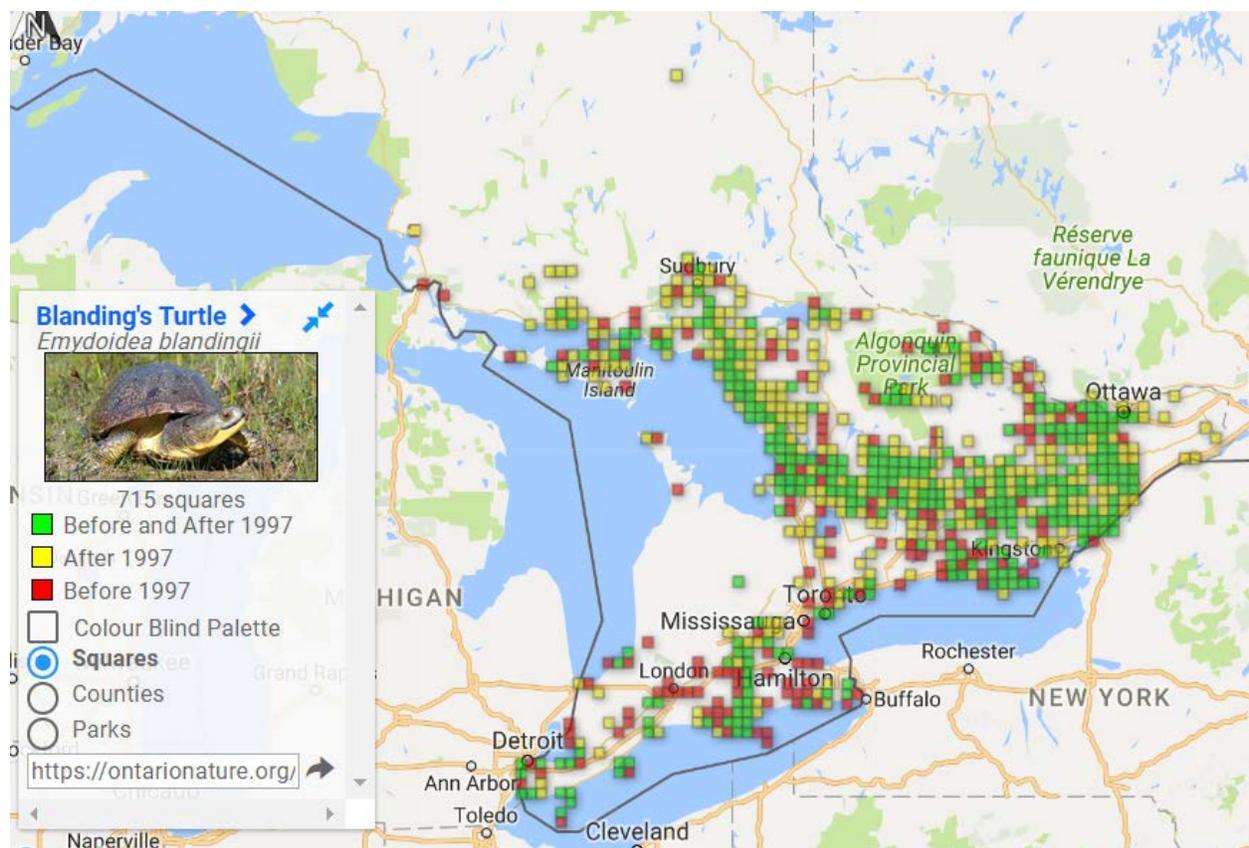


Figure 1. Range of Blanding's Turtle in Ontario (Ontario Nature 2017).

2.3. Distribution and status outside Ontario

Blanding's Turtle is confined to northeastern North America and does not range very far

south compared to other turtle species. The main continuous range of the Blanding's Turtle extends from extreme southwestern Quebec west to Nebraska, and from the south shore of Lake Superior south to northwestern Pennsylvania and central Illinois. There are also disjunct populations in southeastern New York, New England and Nova Scotia. The Nova Scotia population is very small (estimated at <500 adults) and very isolated.

2.4. Ontario conservation responsibility

Approximately 20% of the Blanding's Turtles global range lies in Ontario (COSEWIC 2016). Therefore the province has a fairly high conservation responsibility for this species but it is less than the 25% threshold.

2.5. Direct threats

The Blanding's Turtle is subjected to a number of threats which include: 1) habitat loss, 2) road and railway mortality, 3) degradation of habitat by invasive plant species, 4) collection of animals for pet or medicine trade, and 5) nest predation by elevated populations of human-subsidized predators (e.g. Raccoons) (COSEWIC 2016).

Habitat loss has been substantial in the southern half of the Blanding's Turtle's Ontario range. Most counties south of the Canadian Shield have experienced wetland losses of 45 - 85% since European colonization mostly for agriculture and other uses (Ducks Unlimited 2010). While most of this occurred in the late 1800s and early 1900s, average wetland loss from 1982 to 2002 continued at 0.17% annually (Ducks Unlimited 2010). It could be inferred that the Blanding's Turtle population has declined by a similar rate over this time period but this has not been proven, and it assumes that the species was present in all wetlands. On the Canadian Shield, wetland loss has been minor by comparison, yet cottage development, expanding roads and mining result in some habitat loss in this area.

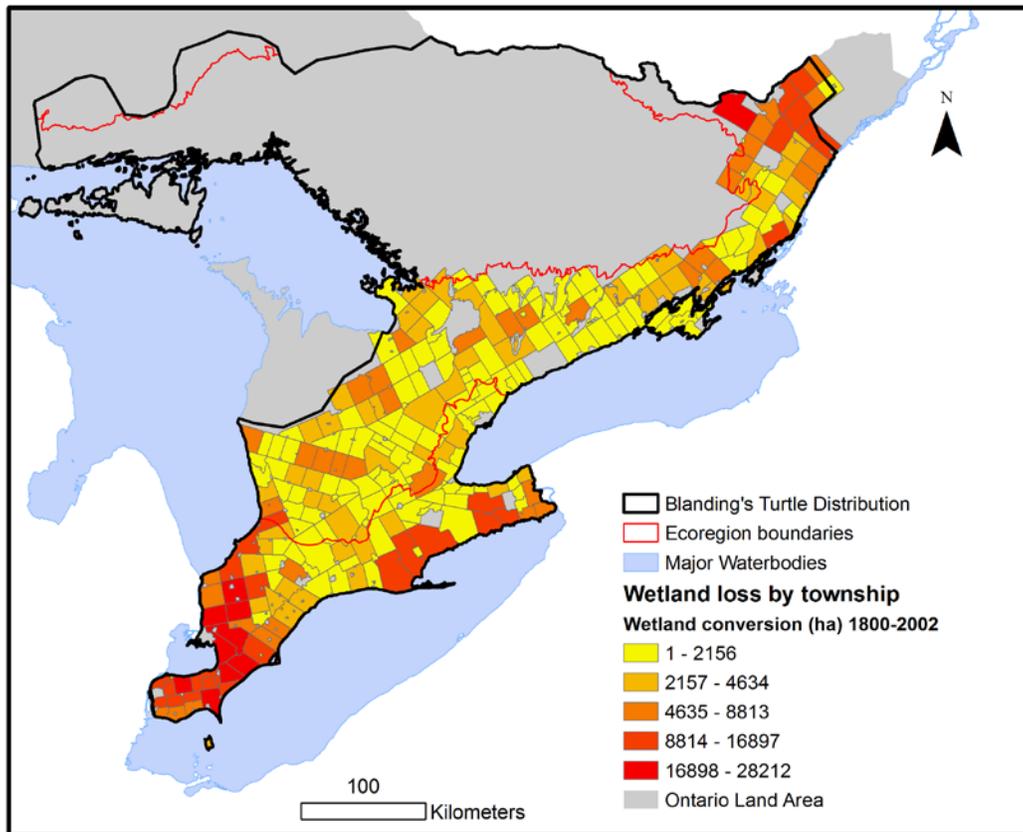


Figure 2. Wetland loss by township within the range of Blanding's Turtles in Ontario south of the Canadian Shield from pre-settlement (~1800) to 2002 (Ducks Unlimited Canada 2010).

Blanding's Turtles travel further overland than any other species of Ontario turtles to nest or disperse, making them particularly susceptible to being killed when crossing roads and railways. Turtles are intentionally targeted by some thoughtless drivers (Ashley *et al.* 2007). Extrapolating on Blanding's Turtle road mortality study along four highways in south-central Ontario, Seburn and Gunson (2016) estimated that between 265 and 400 Blanding's Turtles are killed by vehicles in the province each year. This is approximately 1% of the estimated adult population. Models by Hawkins (2016) predicted that road mortality of two adult females every ten years resulted in population extirpation within 200 years relative to a stable population not experiencing road mortality, based on a population of 25 adults. The amount of paved roads in Ontario has increased fivefold between 1935 and 1995 to 35,000 km (Fenech *et al.* 2001) and has increased considerably in the 20 years since then.

The highly invasive European Common Reed (*Phragmites a. australis*) is altering the function and structure of many wetlands inhabited by Blanding's Turtles. Since the 1990s, European Common Reed has become extremely abundant at many sites within southwestern Ontario where observations of Blanding's Turtle turtles have declined

substantially (COSEWIC 2016). Thus far Common Reed has not had a major effect on wetlands on the Canadian Shield as yet but it is predicted to spread throughout southern Canada by 2030 (Catling and Mitrov 2011), which would encompass the entire Blanding's Turtle Canadian range. COSEWIC (2016) predicts that suitable Blanding's Turtle habitat could decline by 11% - 70%, due to European Common Reed over the next 120 years (three generations).

Capturing of Blanding's Turtles for pet, food and traditional medicine trades, and smuggling them out of Ontario has been documented on several occasions in 2007 and 2013 (COSEWIC 2016). The extent that this is occurring is unknown but the impact could be significant at some locations, including protected areas.

With elevated populations of human-subsidized predators (i.e., those that occur in higher abundances resulting from increased food resources from human sources; Garrott *et al.* 1993) such as skunks, raccoons and cats, the rate of turtle nest and juvenile predation is higher than historically and can be so intense in some populations that there is little recruitment. Studies in southwestern Ontario have reported up to 100% predation rates of nests that were not protected with caging (Gillingwater and Brooks 2001).

There are other causes of mortality that occur less frequently but can stochastically affect some subpopulations. These include accidental mortality from human activities (e.g. boat and ATV collisions), pollution of wetlands, and climate change.

A Threats Calculator was completed by COSEWIC (2016) which identified roads and railroads as the highest threat (high); followed by transportation/service corridors, and invasive plant species (high-medium); then residential development, collecting animals and nest predation by subsidized predators (medium). Dams and water management were ranked as medium-low. Other threats were ranked as low, negligible or unknown.

2.6. Specialized life history or habitat use characteristics

The Blanding's Turtle is a long-lived, late maturing species that is highly mobile for a turtle. It typically nests many hundreds of metres from its summer range wetlands making it susceptible to mortality by roads as well as predators. Being a highly mobile species with late maturation (20-25 years), threats have a relatively high probability of affecting an individual before it even has a chance to reproduce.

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 A2ce, population reduction inferred over the last three generations where the causes of reduction have not ceased. The reduction is inferred mainly from the documented loss of 60% of wetland habitat in southern Ontario (subcriterion c).

COSEWIC (2016) interpreted this as a decline in Blanding's Turtle population of 60%, which meets the threshold for Endangered. However, this likely over-estimates the extent of decline. This is primarily due to the fact that the documented habitat loss did not occur at the same magnitude over the full range of this species in Ontario. Wetland loss in the Georgian Bay region (accounting for 48% of the range and 20% of the original wetlands within the range of Blanding's Turtle) has experienced only minor wetland loss. Additionally, some of the wetland loss occurred more than three generations ago and not all of that wetland area necessarily supported Blanding's Turtles. Consequently, a more probable estimate of the population decline of Blanding's Turtle is in the range of 30-50%, which satisfies the criteria for Threatened.

Subcriterion e also applies, as Blanding's Turtle faces ongoing pressure from invasive species, particularly the European Common Reed which is so robust that it is making wetland habitat unusable for the turtle in some wetlands, and it is restricting its ability to move through the habitat.

3.1.2. Criterion B – Small distribution range and decline or fluctuation

Does not meet criteria since both EOO (400,000 km²) and IAO (9,900 km²) are above criteria and there are at least 100 locations.

3.1.3. Criterion C – Small and declining number of mature individuals

Does not meet criteria since the population is estimated at 25,000 to 45,000 individuals which is well above the threshold.

3.1.4. Criterion D – Very small or restricted total population

Does not meet criteria since the population is estimated at 25,000 to 45,000 individuals which is well above the threshold.

3.1.5. Criterion E – Quantitative analysis

A Population Viability Analysis for the Ontario population of Blanding's Turtle has not been completed and therefore this criteria does not apply. A PVA was conducted for one small subpopulation which predicted extirpation within 200 years if two adult females are killed by vehicles in each 10 year period (Hawkins 2016) in a population of 25 adults. Otherwise a PVA for the whole Ontario population has not been completed and therefore this criteria cannot be used.

3.2. Application of Special Concern in Ontario

Does not apply.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Ontario comprises approximately 20% of the Blanding's Turtle's global range, which is a substantial conservation responsibility but it falls short of the threshold of 25%.

3.3.2. Rescue effect

While there is some possibility of rescue effect from adjacent populations in Michigan or New York, it is unlikely given the limited mobility of Blanding's Turtles and the network of roads that they would have to cross. Furthermore the species is listed as S3 and S2/3 in those states respectively so it is also declining in those jurisdictions. There is suitable habitat in southeastern Ontario and individuals would likely be able to survive if it were possible for them to get there.

3.4. Other status categories

3.4.1. Data deficient

Not applicable.

3.4.2. Extinct or extirpated

Not applicable.

3.4.3. Not at risk

Not applicable.

4. Summary of Ontario status

Blanding's Turtle (*Emydoidea blandingii*) is classified as **Threatened** in Ontario based on meeting criterion A2ce. COSEWIC designated the Blanding's Turtle as Endangered in Canada based on an inferred population decline as a result of the amount of wetland loss that occurred since European settlement. COSSARO applied the status of Threatened in Ontario since some of this wetland loss occurred more than three generations ago and wetland loss has not been high in the 48% of the species' range on the Canadian Shield. The decline of Blanding's Turtles was likely in the range of 30 to 50% (see section 3.1.1 above).

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Appendix 1: Technical summary for Ontario

Species: Blanding's Turtle (*Emydoidea blandingii*)

Demographic information

Demographic attribute	Value
<p>Generation time. Based on average age of breeding adult: age at first breeding = X year; average life span = Y years.</p>	<p>Mean Generation Time = 40 years (range 37-42)</p>
<p>Is there an observed, inferred, or projected continuing decline in number of mature individuals?</p>	<p>Yes, observed, inferred and projected declines for some monitored sub-populations of 50-95% in previous 10-30 years (< 1 generation) and high annual adult road mortality rates of 6-23%</p>
<p>Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.</p>	<p>> 40% projected decline in 2 generations (~80 years) based on observed and inferred declines for monitored subpopulations of 50-95% over the last 10-30 years (< 1 generation) and high annual adult road mortality rates of 6-23%.</p>
<p>Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.</p>	<p>> 60% loss of wetlands in south portion may indicate a similar population decline over the last 3 gen. (~120 years), and high annual adult road mortality rates of 6-23%.</p>
<p>Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.</p>	<p>COSEWIC (2016) projects > 50% decline over the next 3 generations (~120 years) based on observed declines for monitored subpopulations in SW Ontario of 50-95% over last 10-30 years (< 1 generation) and high annual adult road mortality rates of 6-23%.</p>

Demographic attribute	Value
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.	Estimated > 60% decline over the 3 generation period between the mid-1800s to mid-1900s when >70% of pre-settlement wetlands were drained
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 (EOO).	~222,000 km ² for nearly entire population, > 400,000 km ² if isolated sightings are included
Index of area of occupancy (IAO).	> 9900 km ² (based on 2475 grids)
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. No b. No
Number of locations.	Likely 50 to 100 according to COSEWIC (2016). However probably should be more given the number of sites in NHIC database
Number of NHIC Element Occurrences	NHIC has not identified number of EOs but have listed 1700 different sites in database.
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	No
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	Yes, inferred according to COSEWIC (2016) since few observed recently at some EOs

Extent and occupancy attributes	Value
Is there an observed, inferred, or projected continuing decline in number of populations?	Yes, projected. At some sites observations have declined by 50-95% in <1 generation
Is there an observed, inferred, or projected continuing decline in number of locations?	Yes, inferred and projected decline due to high habitat loss and development south of Canadian Shield.
Is there an observed, inferred, or projected continuing decline in area, extent or quality of habitat?	Yes. Several road, residential, wind energy and mining developments are occurring or proposed within Blanding's Turtle habitat resulting in further net loss of habitat. Invasive Common Reed is projected to cause a 11-70% decline in Blanding's Turtle habitat over the next three generations. Climate change is expected to reduce the amount of suitable habitat for Blanding's Turtles in southwestern Ontario by 2080.
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)

Sub-population (or total population)	Number of mature individuals
Total Ontario Population	<i>Estimated at 25,000 to 45,000</i>

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

Threats

Calculated overall threats impact Very High (high range) and High (low range).

- i. Road and rail mortality and associated road effects;
- ii. Habitat loss and degradation from invasive European Common Reed (*Phragmites a. australis*), development (including residential, cottage, road, commercial, mining and energy production) and wetland modifications (including beaver dam removals and waterfowl habitat creation);
- iii. Collection for the pet, food and traditional medicine trades;
- iv. Increased predation of nests and juveniles by higher numbers of "subsidized predators";
- v. Mortality of individuals from human activities and intrusions (including agricultural, forestry, energy production and mining activities; boat and ATV collisions);
- vi. Pollution of wetlands (from agriculture, mining and forestry); and
- vii. Predicted habitat loss due to climate change.

Threats Calculator completed by status report authors: Teresa Piraino, Jeffie McNeil; MMFP QC: Yohann Dubois, Daniel Toussaint; OMNR: Graham Cameron, Joe Crowley (also AR SSC), Colin Jones; CWS QR: Gabrielle Fortin; COSEWIC Amphibians and Reptiles SSC: Jim Bogart (co-chair), Ron Brooks, Jackie Litzgus, Dennis Murray; Other experts: Scott Gillingwater, Christina Davy; Facilitator: Dave Fraser (COSEWIC).

Rescue effect

Rescue effect attribute	Value
Status of outside population(s) most likely to provide immigrants to Ontario	S1-S3 in all adjacent U.S.A. states and provinces
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Immigration is not known but may be very limited; potential for some to occur
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Minimal in southwest Ontario but more habitat available in southeast and southcentral Ontario
Are conditions deteriorating in Ontario?	Yes
Is the species of conservation concern in bordering jurisdictions?	Yes
Is the Ontario population considered to be a sink?	No
Is rescue from outside populations likely?	Unlikely

Sensitive species

Blanding's Turtle is considered Data Sensitive by COSEWIC.

Appendix 2: Adjoining jurisdiction status rank and decline

Information regarding rank and decline for Blanding's Turtle (*Emydoidea blandingii*)

Jurisdiction	Subnational rank	Population trend	Sources
Ontario	S3	Declining	NatureServe 2017, COSEWIC 2016
Quebec	S1	Declining	NatureServe 2017, COSEWIC 2016
Manitoba	NA	Not applicable	NatureServe 2017
Michigan	S3	Unknown	NatureServe 2017
Minnesota	S2	Unknown	NatureServe 2017
Nunavut	NA	Not applicable	NatureServe 2017
New York	S2S3	Unknown	NatureServe 2017
Ohio	S2	Unknown	NatureServe 2017
Pennsylvania	S1	Unknown	NatureServe 2017
Wisconsin	S3S4	Unknown	NatureServe 2017

Acronyms

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

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

EO: Element Occurrence

EOO: Extent of Occurrence

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

SARA: Species at Risk Act

SNR: unranked

SRANK: subnational conservation status assessment

S1: Critically imperiled

S3: Vulnerable

S5: Secure

IUCN: International Union for Conservation of Nature and Natural Resources