

Ontario Species at Risk Evaluation Report for
Bald Eagle
Pygargue à tête blanche
(*Haliaeetus leucocephalus*)

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

Assessed by COSSARO as Not at Risk

March 2022

Executive summary

The Bald Eagle is a well-known bird of prey with a bright white head, neck and tail, and a dark brown body. Its massive beak is bright yellow, as are its powerful legs. Adults have piercing very pale eyes. Young eagles are mostly brown, variably speckled with white. Bald Eagles have a wingspan of just over two metres. They soar on flattened wings and in silhouette show as much head and neck in front of the wing as there is tail projecting behind.

Bald Eagles nest in a variety of habitats and forest types, almost always near a major lake or river where they do most of their hunting. While fish are their main source of food, Bald Eagles can easily catch prey up to the size of ducks, and frequently feed on dead animals, including White-tailed Deer. They usually nest in large trees such as pine and poplar. During the winter, Bald Eagles sometimes congregate near open water such as the St. Lawrence River, or in places with a high deer population where carcasses might be found.

Bald Eagles are widely distributed throughout North America. In Ontario, they nest throughout the north, with the highest density in the northwest near Lake of the Woods. Historically they were also relatively common in southern Ontario, especially along the shore of Lake Erie, but this population was all but wiped out 50 years ago. After an intensive re-introduction program and environmental clean-up efforts, the species has rebounded and can once again be seen in much of its former southern Ontario range.

Bald Eagle is classified as Not at Risk in Ontario. This species does not meet criteria to be considered Endangered, Threatened or Special Concern.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

The Bald Eagle (*Haliaeetus leucocephalus*) is a large diurnal bird of prey and is the only representative of the sea eagle group (genus *Haliaeetus*) in North America. Two subspecies are recognized. *Haliaeetus leucocephalus washingtoniensis* occurs in the northern United States and Canada, while *Haliaeetus leucocephalus leucocephalus* occurs in the southern United States, from California and Arizona east to Virginia and Florida, south to northwest Mexico (Buehler 2020).

1.1.2. Designatable units

Bald Eagle is known to occur in Ontario within a single designatable unit. Although the 2003 Bald Eagle Status Report (Grier et al. 2003) recognized two subpopulations in Ontario based upon geography (north and south of the French-Mattawa river systems), there was no apparent biological basis for this distinction and these do not represent separate DUs.

1.1.3. Native status

Bald Eagle is native to Ontario.

1.1.4. Occurrence

Bald Eagles occur in every province and territory in Canada, as well as every state in the United States (Buehler 2020). Bald Eagles are widely distributed across Ontario (Cadman et al. 2007; Armstrong 2014, Buehler 2020).

1.2. Eligibility results

Bald Eagle (*Haliaeetus leucocephalus*) is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G5 (NatureServe 2022)
- IUCN: LC (October 2016)
- NRANK Canada: N5B,N5N,N5M
- COSEWIC: Not at Risk (April 1984)
- SARA: No Schedule, No Status
- ESA 2007: Special Concern (2008)

- SRANK: S4 (ranked in 2020)

2.2. Distribution in Ontario

Confirmed breeding locations for the Bald Eagle are currently widely distributed across Ontario and breeding season distribution is essentially continuous across the province at the macro scale (Armstrong 2014). The highest numbers of nesting Bald Eagles occur along the Great Lakes shoreline and in association with the large lake and river systems of northwestern Ontario (Cadman et al. 2007; Armstrong 2014).

Nest sites in southern Ontario are primarily distributed along Lake Erie and Lake Huron, with scattered inland sites across eastern and southern Ontario (Cadman et al. 2007; Armstrong 2014).

2.3. Distribution, status and the broader biologically relevant geographic range outside Ontario

Bald Eagle is widely distributed in North America, occurring in all provinces and territories in Canada, as well as all states in the United States (Buehler 2020). Although designated as Threatened in New York State, Bald Eagle populations appear to be stable or increasing in all adjacent states. The most recent Bald Eagle census from the Ohio Department of Natural Resources Division of Wildlife estimates 806 nests in Ohio in 2021, an estimated increase of 14% from the 707 Bald Eagle nests documented in Ohio in 2020 (ODNR 2022). The United States Fish and Wildlife Service removed the Bald Eagle from the federal endangered species list in 2007.

For the purposes of this assessment, the broader biologically relevant geographic range (BBRGR) for Bald Eagle is considered to include Manitoba and Quebec, as well as Michigan, Ohio, Indiana, Illinois, Missouri, Wisconsin, New York and Pennsylvania. These jurisdictions represent the probable over-wintering range occupied by individuals from Ontario, and also represents potential source populations associated with rescue effect.

Table 1. Condition of the Species in Adjacent Jurisdictions and Broader Biologically Relevant Geographic Range.

| Adjacent Jurisdictions | Biologically Relevant to Ontario (n/a, yes, no) | Condition | Notes & Sources |
|-------------------------------|--|--------------------------|--|
| Quebec | Yes | S4 | NatureServe 2022 |
| Manitoba | Yes | S5B,S3N | NatureServe 2022 |
| Michigan | Yes | S4 | NatureServe 2022 |
| Minnesota | Yes | S3B,S3N Increasing | NatureServe 2022 (MDNR 2022) |
| Nunavut | Yes | SNR | NatureServe 2022 |
| New York | Yes | S2S3B, S2N Threatened | NatureServe 2022 New York State Department of |

| Adjacent Jurisdictions | Biologically Relevant to Ontario (n/a, yes, no) | Condition | Notes & Sources |
|-------------------------------|--|------------------|--|
| | | Increasing | Environmental Conservation (Caster 2021) |
| Ohio | Yes | S3 increasing | NatureServe 2022 (ODNR 2022). |
| Pennsylvania | Yes | S4B, S5N, S4M | NatureServe 2022 |
| Wisconsin | Yes | S4B, S4N | NatureServe 2022 |
| Illinois | Yes | S4S5 | NatureServe 2022 |
| Indiana | Yes | S3 | NatureServe 2022 |

2.4. Ontario conservation responsibility

Although Ontario has a greater proportion of the global breeding distribution than any other North American jurisdiction, Ontario's conservation responsibility does not meet the established threshold for this criterion.

2.5. Direct threats

A threats calculation was not conducted as part of this assessment, however current threats facing the Bald Eagle in Ontario include pollution, incidental mortality related to the operation of wind farms, disease (West Nile Virus and potentially Avian Vacuolar Myelinopathy), human population growth and habitat disturbance, lead poisoning, localized habitat loss and changes to prey abundance and distribution related to climate change (Armstrong 2014).

The widespread use of organochlorine insecticides such as DDT during the mid-20th century was a primary factor in the decline of Bald Eagles. Thinning of eggshells and embryo death leading to reproductive failure and population collapse was one result of DDT contamination (Armstrong 2014). Although levels have improved in recent decades, long-term environmental contamination persists and remains a concern for the Bald Eagle, particularly for those nesting near the Great Lakes (Armstrong 2014). New and emerging chemical contaminants are also a potential concern, such as the fire retardant polybrominated diphenyl ethers (PBDEs) and perfluorinated compounds (PFCs) (Armstrong 2014).

In addition to the above, Slabe et al. (2022) reported unexpectedly high frequencies of lead poisoning of eagles, both chronic (46 to 47% of Bald and Golden Eagles, as measured in bone) and acute (27 to 33% of bald eagles), as measured in liver, blood, and feathers. Continent-wide demographic modeling suggests that lead poisoning at reported levels suppresses population growth rates for Bald Eagles by 3.8% (Slabe et al. 2022). Scott and Bollinger (2015) reported that 8.8% of Bald Eagles collected in Saskatchewan between 1992 to 2012 died of lead poisoning. No Ontario-specific information regarding lead poisoning is available, but the threat is likely to be similar in Ontario to that elsewhere in its North America range.

2.6. Specialized life history or habitat use characteristics

The Bald Eagle is the second largest North American bird of prey, with adult birds displaying a distinctive white head and white tail contrasted against dark brown body and wings in adult birds. Size varies widely across the range of this species, with total length ranging from 71–96 cm, wingspread from 168–244 cm and body mass ranges from 3.0 to 6.3 kg (Buehler 2020); females are larger than males. Bald Eagles are long-lived, capable of surviving for more than 38 years in the wild (USGS 2022). The generation time for Bald Eagle is reported to be 17.2 years (BirdLife International 2016).

In Ontario, typical Bald Eagle nesting habitat is described as mature forest, with scattered super-canopy trees and adjacent large productive waterbodies (Szuba and Naylor 1998). Bald Eagles typically nest within 2 km of water with suitable foraging opportunities and often adjacent to large waterbodies (Buehler 2020). Nest distance from water's edge is variable geographically (Buehler 2020), with nests in northwestern Ontario ranging from 6 to 200 m from shorelines (Armstrong 2014). Bald Eagle nests in Ontario are more often near lakes than large rivers, and are also often located on peninsulas or islands (Armstrong 2014).

Buehler (2020) reported that in some cases, distance to water is not as critical as the quality of the foraging area that is present. Quality of foraging areas is defined by diversity, abundance, and vulnerability of the prey base (Livingston et al. 1990), structure of aquatic habitat, such as the presence of shallow water (Macdonald and Austin-Smith 1989) and absence of human development and disturbance (McGarigal 1991).

Adult Bald Eagles migrate in the fall when sufficient food is no longer available within the breeding territory (Buehler 2020). Bald Eagles from the Great Lakes region generally migrate south along major river drainage systems such as the Missouri and Mississippi rivers from August-January (Buehler 2020). Several Bald Eagles overwintering in Missouri originated from breeding areas in northwestern Ontario, or at least migrated through Ontario (Armstrong 2014). Some adults in Ontario do not migrate, instead making more localized movements to winter food sources. A substantial number of Bald Eagles now overwinter within Ontario, near areas with available food supply (Sandilands 2005; Armstrong 2022).

The availability of food is the primary determinant of Bald Eagle wintering habitat, with birds commonly congregating where food is available (Armstrong 2014). Open water areas are important components of overwintering habitat in northern areas, as these areas allow access to fish and waterbirds (Buehler 2020). Typical overwintering areas in southern Ontario are open water below dams or falls where injured fish, dead fish and waterfowl are available (Armstrong 2014). Landfills are also a significant source of food for overwintering Bald Eagles in parts of northern Ontario (Armstrong 2022).

2.7. Existing Conservation and Recovery Actions

Ontario has prohibited shooting or trapping of Bald Eagles since 1936, and passed an Endangered Species Act, listing the Bald Eagle as Endangered in 1980 (Gerrald & Ingram, 1985).

A Bald Eagle Status Report for Ontario was completed in 2003 (Grier et al. 2003). A Management Plan for Bald Eagle in Ontario was drafted in 2014 (Armstrong 2014) and a Government Response Statement produced (OMECP 2021). To help protect and recover the Bald Eagle, OMECP (2021) indicates that the Ontario government will lead the following management actions:

- Encourage the submission of Bald Eagle data to the Ministry's central repository at the Natural Heritage Information Centre.
- Continue to monitor active and inactive Bald Eagle nests and provide the data on an annual basis to a provincial repository.
- Work with First Nations to conduct an assessment of existing indigenous knowledge of the natural history, ecology and conservation status of the Bald Eagle in Ontario.
- Continue to apply existing nest management guidance (e.g. forest management guidance, municipal planning guidance, wind power guidance) to ensure that active and alternative Bald Eagle nest sites are maintained, productivity remains high and a healthy population state is maintained.
- Support conservation, agency, municipal, industry partners and Aboriginal communities to undertake activities to protect and manage the Bald Eagle. Support will be provided where appropriate through funding, agreements, permits (including conditions) and advisory services.
- Complete the development of ecoregional criteria schedules for Significant Wildlife Habitat, with consideration of the population status of Bald Eagles in each ecoregion. Identify Bald Eagle overwintering habitat as a criterion (e.g. seasonal concentration area) in the Significant Wildlife Habitat criterion schedule for southern Ontario ecoregions, and develop provincial guidance or best management practices for their identification, management and protection near or within urban centres.
- Continue the protection afforded to the Bald Eagle under the Fish and Wildlife Conservation Act (FWCA), and continue to enforce this protection to achieve no direct human killing of Bald Eagles.
- Maintain monitoring by wind energy facilities for incidental mortality of Bald Eagles.
- Initiate a monitoring program to examine the effectiveness of the revised forest management planning guidance and wind energy guidance for the protection of Bald Eagle nests and the mitigation of disturbance effects on nesting Bald Eagles.
- Educate other agencies and authorities involved in planning and environmental assessment processes on the threats to Bald Eagle.
- Undertake communications and outreach to increase public awareness of species of special of concern in Ontario.

In addition to the above, OMECP (2021) indicates that the Government of Ontario will focus its support on priority actions:

- Initiate a volunteer-based monitoring program with partner organizations to monitor Bald Eagle numbers and trends across the province (High Priority).
- Monitor disease and contaminant levels in Bald Eagle populations by developing and maintaining a collaborative tissue contaminant monitoring program and database with partners (High Priority).
- Identify and document historical nesting habitat that has not yet been recolonized, particularly in southern Ontario adjacent to the lower Great Lakes (Erie, Ontario), and undertake measures to protect and manage these habitats through stewardship programs to maintain their suitability and accessibility for future occupancy (Medium Priority).
- Continue to identify and manage Bald Eagle nesting, overwintering and stopover habitat as Significant Wildlife Habitat for management, protection and mitigation during land use and resource management planning (Medium Priority).
- Maintain a long-term nest monitoring data set to monitor trends and impacts of climate change on nesting phenology and other aspects of reproduction (Medium Priority).

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

Not applicable. Number of mature individuals in Ontario is unknown, but the number of adults is clearly increasing based on Breeding Bird Atlas data and number of confirmed nest locations (Armstrong 2014).

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

Not applicable. EOO estimated at 1,188,250 km² and IAO estimated at 5,992 km².

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

Not applicable. Insufficient information available on population size. Number of adults in Ontario is clearly increasing based on Breeding Bird Atlas data and number of confirmed nest locations. Extreme fluctuations in number of mature individuals not observed.

3.1.4. Criterion D – Very small or restricted total population

Not applicable. Population well above thresholds and increasing.

3.1.5. Criterion E – Quantitative analysis

Not applicable. Analysis not completed.

3.2. Application of Special Concern in Ontario

Does not apply. Species does not meet the criteria for Special Concern.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Does not apply. The species is designated G5 and ranked as Least Concern by IUCN. Ontario has a larger proportion of the global breeding distribution than any other North American Jurisdiction, however Ontario's conservation responsibility remains low due to the widespread distribution of Bald Eagle in North America.

3.3.2. Status modification based on level of risk in broader biologically relevant geographic range

The broader biologically relevant geographic range of this species is considered to include Manitoba and Quebec, as well as Michigan, Ohio, Indiana, Illinois, Missouri, Wisconsin, New York and Pennsylvania. Bald Eagle is listed as Threatened in New York and is ranked from S3 to S5 in other adjacent jurisdictions, however Bald Eagle populations appear to be stable or increasing in these jurisdictions. Because of these population trends, no status modifiers related to the BBRGR have been applied.

3.3.3. Rescue Effect

The potential for rescue effect from adjacent jurisdictions is possible. Bald Eagles are highly mobile and dispersal from jurisdictions outside of Ontario is possible and demonstrated.

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

The designation of Not at Risk is appropriate for this species based on population trends across the province. This species does not meet criteria to be considered Endangered, Threatened or Special Concern.

4. Summary of Ontario status

Bald Eagle (*Haliaeetus leucocephalus*) is classified as Not at Risk in Ontario. This species does not meet criteria to be considered Endangered, Threatened or Special Concern.

The change in status of this species from the 2007 assessment is considered a genuine change based on available data which indicates a general increase in the number of mature individuals.

5. Information sources

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Appendix 1: Technical summary for Ontario

Species: Bald Eagle (*Haliaeetus leucocephalus*)

Demographic information

| Demographic attribute | Value |
|---|---|
| Generation time. Based on average age of breeding adult: age at first breeding = X year; average life span = Y years. | 17.2 years. |
| Is there an observed, inferred, or projected continuing decline in number of mature individuals? | No. Available data indicates a general increase in the number of mature individuals. |
| Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations. | Unknown – not declining |
| Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations. | Unknown. Likely increasing |
| Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations. | Unknown |
| 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. | Unknown |
| Are the causes of the decline (a) clearly reversible, and (b) understood, and (c) ceased? | a. Yes b. Yes c. Unknown. Persistent contaminants still present in Great Lakes, lead poisoning an ongoing threat. |
| Are there extreme fluctuations in number of mature individuals? | Unknown, but no evidence to suggest |

Extent and occupancy information in Ontario

| Extent and occupancy attributes | Value |
|---|---------------------------|
| Estimated extent of occurrence (EOO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i> | 1,188,250 km ² |
| Index of area of occupancy (IAO). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i> | 5,992 km ² |
| Is the total population severely fragmented? | a. No |

| Extent and occupancy attributes | Value |
|---|--|
| 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? | b. No |
| Number of locations. <i>See Definitions and Abbreviations on COSEWIC and IUCN websites for more information on the term "location". Use plausible range to reflect uncertainty if appropriate.</i> | Ontario considered a single location. |
| Number of NHIC Element Occurrences <i>Request data from MNR.</i> | 2615. Element Occurrences limited to confirmed nest locations. |
| 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? | No |
| Is there an observed, inferred, or projected continuing decline in number of sub-populations or EOs? | No |
| Is there an observed, inferred, or projected continuing decline in number of locations? | No |
| Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat? | No |
| 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 |
|---|-------------------------------------|
| | Unknown |

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

Threats

A threats calculation was not conducted for this species, however an assessment was completed using COSEWIC Guidelines. Current threats facing the Bald Eagle in Ontario include:

- i. Renewable energy (wind turbines) (IUCN3.3) – low threat
- ii. Agricultural & forestry effluents (IUCN 9.3) – locally persistent – low threat
- iii. Housing and urban areas (IUCN 1.1) – Negligible threat
- iv. Commercial and industrial areas (IUCN 1.2) - Negligible threat
- v. Viral pathogen (West Nile Virus) (IUCN 8.5.2) – Unknown threat
- vi. Diseases of unknown cause (Avian Vacuolar Myelinopathy) (IUCN 8.6) – Unknown threat
- vii. Pollution (lead poisoning) (IUCN 9.0) – Unknown threat
- viii. Industrial & military effluents (new and emerging chemical contaminants) (IUCN 9.2) – Unknown threat
- ix. Droughts (IUCN 11.2) – Unknown threat

Rescue effect

| Rescue effect attribute | Value |
|--|--|
| Does the broader biologically relevant geographic range for this species extend beyond Ontario? | Yes |
| Status of outside population(s) most likely to provide immigrants to Ontario | Species listed as Threatened in New York state and ranked S3-S5 in other adjacent jurisdictions. |
| Is immigration of individuals and/or propagules between Ontario and outside populations known or possible? | Yes |
| Would immigrants be adapted to survive in Ontario? | Yes |
| Is there sufficient suitable habitat for immigrants in Ontario? | Yes |
| Are conditions deteriorating in Ontario? | No |
| Is the species of conservation concern in bordering jurisdictions? | Yes. Threatened in New York state. |
| Is the Ontario population considered to be a sink? | No |
| Is rescue from outside populations likely? | Yes |

Sensitive species

This is not a data sensitive species.

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
EO: Element occurrence (as defined by NHIC)
EOO: extent of occurrence
GRANK: global conservation status assessments
IAO: index of area of occupancy
IUCN: International Union for Conservation of Nature and Natural Resources
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
S2: Imperiled
S3: Vulnerable
S4: Apparently Secure
S5: Secure
IUCN: International Union for Conservation of Nature and Natural Resources
CDSEPO: Le Comité de détermination du statut des espèces en péril en Ontario