

**Ontario Species at Risk Evaluation Report for
Red Knot (rufa Subspecies)
Bécasseau maubéche de la sous-espèce rufa
(*Calidris canutus rufa*)**

Southeastern USA / Gulf of Mexico / Caribbean wintering population

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

(Southeastern USA / Gulf of Mexico / Caribbean wintering
population)
Assessed by COSSARO as Endangered

April 2021

Bécasseau maubèche – Population hivernante du sud-est des États-Unis, du golfe du Mexique et des Caraïbes (*Calidris canutus rufa*)

Le bécasseau maubèche de la sous-espèce *rufa*, population hivernante du sud-est des États-Unis, du golfe du Mexique et des Caraïbes, est classé dans la catégorie des espèces en voie de disparition par le CDSEPO, en raison d'un déclin de la population qui traverse l'Ontario pendant sa migration, dont on estime qu'il se situe entre 33 % et 84 %, d'après les dénombrements des effectifs de la population hivernale et les déclins observés de l'habitat, dont on prévoit la poursuite à l'avenir. Ce statut est conforme au statut attribué actuellement à l'espèce par le COSEPAC.

Cette publication hautement spécialisée 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 ministère l'Environnement, de la Protection de la nature et des Parcs au cossarosecretariat@ontario.ca.

Executive summary

The Red Knot has six recognized subspecies, of which one occurs in Ontario: *Calidris canutus rufa*. The Ontario population consists of birds from three separate designatable units, primarily distinguished by their differing overwintering grounds, along with variations in their morphology and genetics. Red Knots are present in Ontario solely as migrants, travelling between their arctic breeding grounds and overwintering grounds in the southern USA or South America. As migrants, they are widely recorded in Ontario, while James Bay is considered a significant stopover location, used by as much as 25% of the subspecies.

Red Knot *rufa* subspecies *rufa* subspecies, Southeast USA / Gulf of Mexico / Caribbean wintering population, is classified as Endangered by COSSARO due to an estimated 33–84% decline in the population migrating through Ontario, based on winter population surveys and observed declines in habitat, which are projected to continue in future. This status is consistent with the current COSEWIC status.

1. Eligibility for Ontario status assessment

1.1. Eligibility conditions

1.1.1. Taxonomic distinctness

The Red Knot has six recognized subspecies of which one, *C. c. rufa*, occurs in Ontario (COSEWIC, *In Press*, 2020).

1.1.2. Designatable units

The rufa subspecies of Red Knot has three distinct and widely separated wintering populations, considered to be separate designatable units by COSEWIC (*In Press*, 2020). These designatable units are: the Tierra del Fuego / Patagonia wintering population, the Northeastern South American wintering population and the Southeastern USA / Gulf / Caribbean wintering population.

1.1.3. Native status

Red Knot rufa subspecies is a native species in Ontario.

1.1.4. Occurrence

Red Knot rufa subspecies Southeast USA / Gulf of Mexico / Caribbean wintering population occurs in Ontario as a seasonal migrant, moving between its breeding grounds in the Arctic, and wintering grounds in South America and southern North America (COSEWIC, *In Press*, 2020).

1.2. Eligibility results

Red Knot rufa subspecies (*Calidris canutus rufa*) rufa subspecies, Southeast USA / Gulf of Mexico / Caribbean wintering population, is eligible for status assessment in Ontario.

2. Background information

2.1. Current designations

- GRANK: G4T2 (NatureServe 2021)
- IUCN: Near Threatened (August 2018)
- NRANK Canada: N1B,N3N4N,N3M
- COSEWIC: Endangered (February 2020)
- SARA: Not listed
- ESA 2007: Status (2009)
- SRANK: S1M (ranked in year)

*The Endangered status of Red Knot rufa subspecies under the Ontario Endangered Species Act predates recent taxonomic changes and the resulting split to three designatable units.

2.2. Distribution in Ontario

The Southeast USA / Gulf of Mexico / Caribbean wintering population of Red Knot rufa subspecies is present in Ontario only as a migratory species. Accordingly, more precise distribution data on the population in Ontario is very limited and of relatively limited value. Accordingly, EOO and AIO were not calculated. NHIC observations of Red Knot rufa subspecies in Ontario are shown in Figure 1.

Ongoing research suggests that approximately 25% of rufa subspecies stopover in Ontario in southern James Bay (M. Burrell pers. comm. 2021). Stopover habitat plays an important role in the species life cycle. Red Knot migration concentrations contributed significantly to the designation of several Important Bird Areas in Ontario, such as Pei lay sheesh kow IBA.

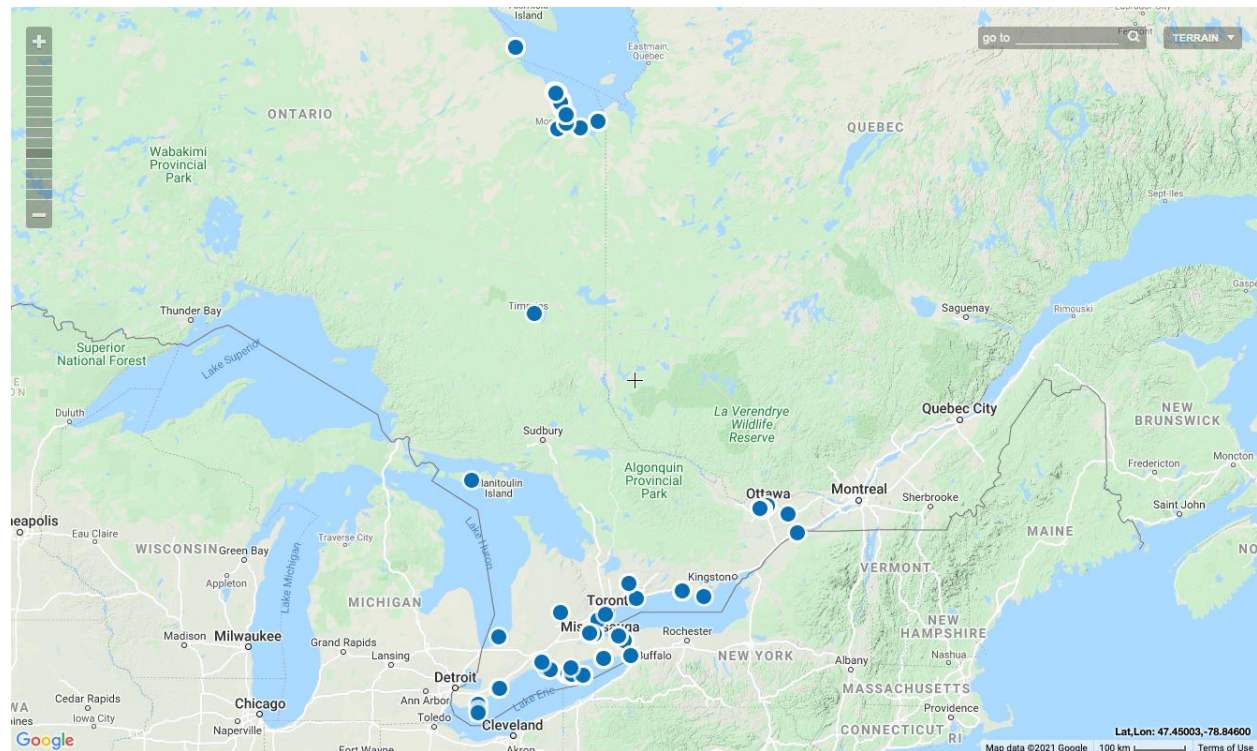


Figure 1: NHIC records of Red Knot rufa subspecies in Ontario, note these data represent combined observations for individuals from all designatable units because it is not possible to distinguish them during migration.

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

Birds from all three Red Knot rufa subspecies designatable units that occur in Ontario breed within the central and southern parts of the Canadian Arctic archipelago. Specific locations include: Coats and Mansel islands in northern Hudson Bay, Southampton Island, the east coast of Foxe Basin (Godfrey 1986; Gaston 2019), island in Foxe Basin (COSEWIC, *In Press*, 2020), and the west coast of Baffin Island (Niles *et al.* 2005, 2008, 2010). This distribution of birds from the three designatable units appears to overlap on their breeding grounds, however genetic differentiations suggest that some genetic isolation is occurring (Baker *et al.* 2021a, b).

The Southeast USA / Gulf of Mexico / Caribbean designatable unit of Red Knot rufa subspecies overwinters in coastal areas of Florida, Louisiana, the Texas/Mexico border region, and islands in the Caribbean Sea (COSEWIC, *In Press*, 2020).

As a migratory species, the Red Knot rufa species has a large global range, and spends time in a large number of countries and jurisdictions. In several of these, specifically its breeding grounds and countries it migrates through, the population appears to overlap with birds from other designatable units. On this basis, there is no reason to define the broader biological relevant geographic range of the designatable unit at any scale smaller than the unit itself. Globally, the Tierra del Fuego / Patagonia overwintering

population of the Red Knot rufa subspecies has seen large declines. Most North American jurisdictions with a ranking reported in Nature Serve (as of March 2021) list this species as a variation of S1, Critically Imperiled, with a minority listing it as S2, Imperiled.

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	SM1	(Natureserve 2021)
Manitoba	Yes	S1S2M	(Natureserve 2021)
Michigan	Yes	SNRN	(Natureserve 2021)
Minnesota	Yes	SNRN	(Natureserve 2021)
Nunavut	Yes	SNRB	(Natureserve 2021)
New York	Yes	SNRN	(Natureserve 2021)
Ohio	Yes	S1	(Natureserve 2021)
Pennsylvania	Yes	S2M	(Natureserve 2021)
Wisconsin	Yes	S1N	(Natureserve 2021)
<i>Other Relevant Jurisdiction</i>			

2.4. Ontario conservation responsibility

The Southeast USA / Gulf of Mexico / Caribbean wintering population of Red Knot rufa subspecies only occurs in Ontario as a migratory species and does not account for any breeding or overwintering habitat. Specific population data for Ontario are not available, but the province may represent a significant migratory corridor for this population. Ongoing research suggest that approximately 25% of rufa subspecies stopover in Ontario in southern James Bay (M. Burrell pers. comm. 2021).

2.5. Direct threats

The Southeast USA / Gulf of Mexico / Caribbean wintering population of Red Knot rufa subspecies had an overall threat impact of Medium–High according to an assessment conducted by COSEWIC (*In Press*. 2020). Threats included ongoing issues with Horseshoe Crab abundance in Delaware Bay, increased predation and disturbance from increasing falcon populations, and possible impacts of climate change such as shifting weather patterns and rising sea levels (COSEWIC, *In Press*. 2020).

2.6. Specialized life history or habitat use characteristics

Red Knots are long-distance migrants, reproducing in the north before travelling thousands of kilometers south to overwinter. Birds experience extensive physiological

change during migration to increase flight efficiency and allow them to rapidly store resources.

Birds in the Southeast USA / Gulf of Mexico / Caribbean wintering population of Red Knot rufa subspecies appear to be genetically distinct from other designatable units (Baker *et al.* 2012a). They also follow a different migration route from other populations that overwinter nearby (Newstead *et al.* 2013).

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

Endangered A2bc+4bc. The global population, a proportion of which migrates through Ontario, is estimated to have declined 33–84% over the past three generations, and habitat quality is declining.

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

Does not apply. Insufficient data are available to calculate EOO and AOO for this species in Ontario, and this are complicated by the species being present solely as a migrant.

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

Threatened C2a(ii). The global population, at proportion of which migrates through Ontario, is estimated to contain 9,300 mature individuals and is lower than the threshold for threatened. All individuals occur in the same subpopulation, which is experiencing an ongoing decline.

3.1.4. Criterion D – Very small or restricted total population

Does not apply. Insufficient data are available to estimate the size of Ontario's population, but it likely exceeds 1000 individuals.

3.1.5. Criterion E – Quantitative analysis

Does not apply. No analysis conducted.

3.2. Application of Special Concern in Ontario

Does not apply.

3.3. Status category modifiers

3.3.1. Ontario's conservation responsibility

Although the Southeast USA / Gulf of Mexico / Caribbean wintering population of Red Knot rufa subspecies has a global ranking of T2, Imperiled, Ontario's conservation is estimated to exceed 25% and no modifier is applied.

3.3.2. Status modification based on rescue effect or level of risk in broader

biologically relevant geographic range

No rescue effect modifier applies. No potential for rescue effect applies, because other Red Knot populations (designatable units) are considered distinct.

No broader biologically relevant geographic range modifier applies. Red Knot have an extensive global range and are present in Ontario only as migrants. On this basis, precise broader biologically relevant geographic range is challenging to determine. However, regardless of how it is defined, the global population is facing widespread decline, and this condition would not permit use of the modifier.

3.4. Other status categories

3.4.1. Data deficient

Does not apply.

3.4.2. Extinct or extirpated

Does not apply.

3.4.3. Not at risk

Does not apply.

4. Summary of Ontario status

Red Knot (*Calidris canutus rufa*) rufa subspecies, Tierra del Fuego / Patagonia wintering population, is classified as Endangered in Ontario based on meeting criterion A2bc+4bc.

This status of this species is consistent with the definition of Endangered under the Endangered Species Act, 2007.

5. Information sources

Baker, A.J., E. Tavares, K. Choffe, and O. Haddrath. 2012a. Genetic differentiation among the three major wintering populations of the Red Knot (*Calidris canutus rufa*). Unpublished report. Royal Ontario Museum, Toronto, Ontario.

Baker, A., E. Tavares, P. González, O. Haddrath, K. Choffe, and L. Niles. 2012b. Genetic differentiation among the three major wintering populations of the Red Knot *Calidris canutus rufa*. Wader Study Group Bulletin 119:214.

COSEWIC. 2020. IN PRESS. COSEWIC assessment and status report on the Red Knot *Calidris canutus*, islandica subspecies (*Calidris canutus islandica*), roselaari type (*Calidris canutus roselaari*) and rufa subspecies (*Calidris canutus rufa*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxxv + 173 pp. (<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>).

Gaston, A.J. 2019. Birds of Mansel Island, Hudson Bay. Canadian Field-Naturalist 133:20-24.

Godfrey, W.E. 1986. The Birds of Canada. Revised Edition. National Museum of Natural Sciences, Ottawa.

Newstead, D.J., L.J. Niles, R.R. Porter, A.D. Dey, J. Burger, S.P. Flemming, and O.N. Fitzsimmons. 2013. Geolocation reveals mid-continent migratory routes and Texas wintering areas of Red Knots *Calidris canutus rufa*. Wader Study Group Bulletin 120:53-59.

Niles, L., H. Sitters, A. Dey, A. Baker, R.I.G. Morrison, D. Hernández, K.E. Clark, B. Harrington, M. Peck, P. González, K. Bennett, P. Atkinson, N. Clark, and C. Minton. 2005. Status of the Red Knot (*Calidris canutus rufa*) in the Western Hemisphere. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program, Trenton, New Jersey.

Niles, L.J., H.P. Sitters, A.D. Dey, P.W. Atkinson, A.J. Baker, K.A. Bennett, R. Carmona, K.E. Clark, N.A. Clark, C. Espoz, P.M. González, B.A. Harrington, D.E. Hernández, K.S. Kalasz, R.G. Lathrop, R. Matus, C.D.T. Minton, R.I.G. Morrison, M. Peck, W. Pitts, R.A. Robinson, and I.L. Serrano. 2008. Status of the Red Knot (*Calidris canutus rufa*) in the Western Hemisphere. Studies in Avian Biology 36:xviii + 1-185.

Niles, L.J., H. Sitters, A. Dey, P.W. Atkinson, A.J. Baker, K.A. Bennett, K.E. Clark, N.A. Clark, C. Espoz, P.M. González, B.A. Harrington, D.E. Hernández, K.S. Kalasz, R. Matus, C.D.T. Minton, R.I.G. Morrison, M.K. Peck, and I.L. Serrano. 2010. Red Knot Conservation Plan for the Western Hemisphere (*Calidris canutus*), Version 1.1. Manomet Center for Conservation Sciences, Manomet, Massachusetts.

¹ A change in the classification of a species during reassessment by COSSARO may be for genuine or non-genuine reasons. Genuine reasons may include a reduction in threats to a species such that status of the species has improved, or the continuation of threats to the species such that the status of the species has further deteriorated. Non-genuine reasons may include new information on population size or threats that was not available during a previous assessment, the use of previous COSSARO criteria that may have yielded a different result or, taxonomic revisions that result in changes in range, population sizes or designatable units.

Appendix 1: Technical summary for Ontario

Species: Red Knot (*Calidris canutus rufa*) rufa subspecies Southeast USA / Gulf of Mexico / Caribbean wintering population.

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.	7 years
Is there an observed, inferred, or projected continuing decline in number of mature individuals?	Yes, inferred continuing decline, based on International Shorebird Surveys and Christmas Bird Counts
Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.	Unknown
Observed, estimated, inferred, or suspected percent reduction or increase in total number of mature individuals over the last 10 years or 3 generations.	33–84% decline, inferred
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.	33–84% reduction
Are the causes of the decline (a) clearly reversible, and (b) understood, and (c) ceased?	a. Unknown b. Partly 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). <i>If value in COSEWIC status report is not applicable, then use geocat.kew.org. State source of estimate.</i>	Not calculated – present only for migration
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>	Not calculated – present only for migration
Is the total population severely fragmented?	a. No b. 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?	
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>	Not calculated – present only for migration
Number of NHIC Element Occurrences <i>Request data from MNRF.</i>	Unknown – present only for migration
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	Unknown
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	Unknown
Is there an observed, inferred, or projected continuing decline in number of sub-populations or EOs?	Unknown
Is there an observed, inferred, or projected continuing decline in number of locations?	Unknown
Is there an observed, inferred, or projected continuing decline in [area, extent and/or quality] of habitat?	Possibly
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
Southeast USA / Gulf of Mexico / Caribbean wintering population	Unknown, the population is present only as a migrant. Global population is estimated at 9,300. An estimated 25% of Red Knot rufa subspecies stopover in Ontario sites along southern James Bay

Quantitative analysis (population viability analysis conducted)

Probability of extinction in the wild is unknown.

Threats

A threats calculator completed by COSEWIC (*In Press*, 2020) found an overall threat impact of High–Medium. Threats were as follows:

- Residential & commercial development: low
 - o Housing & urban areas: low
 - o Tourism & recreation areas: low
- Agriculture & aquaculture: low
 - o Marine & freshwater aquaculture: low
- Human intrusions & disturbance: medium–low
 - o Recreational activities: medium–low
- Natural system modifications: medium–low
 - o Dams & water management/use: low
 - o Other ecosystem modifications: medium–low
- Invasive & other problematic species & genes: medium–low
 - o Problematic native species/diseases: medium–low
- Pollution: low
 - o Industrial & military effluents: low
- Climate change & severe weather: medium–low
 - o Habitat shifting & alteration: medium–low
 - o Storms & flooding: medium–low

Was a threats calculator prepared for this species and by whom? List direct threats from highest to least impact based on the threats calculator.

Rescue effect

Rescue effect attribute	Value
Does the broader biologically relevant geographic range for this species extend beyond Ontario?	Yes. The population breeds and winters outside of Ontario, and is present only as a migrant
Status of outside population(s) most likely to provide immigrants to Ontario	S1/S2
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Not applicable – other Red Knot populations (DUs) are considered distinct
Would immigrants be adapted to survive in Ontario?	Not applicable
Is there sufficient suitable habitat for immigrants in Ontario?	Not applicable
Are conditions deteriorating in Ontario?	Not applicable
Is the species of conservation concern in bordering jurisdictions?	Not applicable
Is the Ontario population considered to be a sink?	Not applicable
Is rescue from outside populations likely?	Not applicable

Rescue effect attribute	Value
Does the broader biologically relevant geographic range for this species extend beyond Ontario?	Yes. The population breeds and winters outside of Ontario, and is present only as a migrant

Sensitive species

Not a sensitive species.

Is this a data sensitive species? If so, all detailed location information should be removed from the final report.

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