COSEWIC
Rapid Review of Classification

on the

Savannah Sparrow *princeps* subspecies
Passerculus sandwichensis princeps

in Canada

SPECIAL CONCERN
2023

COSEWIC
Committee on the Status
of Endangered Wildlife
in Canada

COSEPAC
Comité sur la situation
des espèces en péril
au Canada

The Rapid Review of Classification process is used by COSEWIC for wildlife species that have not changed status since the previous COSEWIC assessment. Readily available information from the previous status report or status appraisal summary, recovery documents, recovery teams, jurisdictions, conservation data centres, and species experts was initially reviewed by the relevant Species Specialist Subcommittees before being reviewed by COSEWIC. The following is a summary of the relevant information.

COSEWIC Rapid Review of Classification are working documents used in assigning the status of wildlife species suspected of being at risk in Canada. This document may be cited as follows:

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COSEWIC
Assessment Summary

Assessment Summary – May 2023

Common name
Savannah Sparrow *princeps* subspecies

Scientific name
Passerculus sandwichensis princeps

Status
Special Concern

Reason for designation
This Canadian endemic sparrow subspecies is largely restricted to breeding in sand dune systems in the Sable Island National Park Reserve, 175 km east of mainland Nova Scotia. The size of the breeding population of about 5100 mature individuals has remained relatively stable over the past two decades. The major wintering areas on the northeast coast of the United States are also in protected areas. This sparrow is exposed to threats associated with storms and shoreline development. Although well-adapted to extreme marine weather conditions, this sparrow's habitats are vulnerable to the long-term effects of sea-level rise, and the increasing frequency and intensity of Atlantic storms resulting from climate change.

Occurrence
Nova Scotia

Status history
Designated Special Concern in April 1979. Status re-examined and confirmed in May 2000, November 2009, and May 2023.

COSEWIC
Rapid Review of Classification

Assessment Summary

English name
Savannah Sparrow *princeps* subspecies

French name
Bruant des prés de la sous-espèce *princeps*

Scientific name
Passerculus sandwichensis princeps

Status
Special Concern

Reasons for designation (COSEWIC 2009)

This songbird is largely restricted to breeding in the sandy dune systems of Sable Island, NS. The population has increased over recent decades and now shows signs of stability because the island has reached carrying capacity. The bird is not prone to human disturbance because the breeding location is well protected. The subspecies is also multi-brooded and currently experiences good nesting success, which confers good reproductive potential to cope with potential catastrophic events. Nevertheless, its breeding range is restricted to a very small area of Canada, and it has a relatively small population. It is also exposed to ongoing threats associated with development of its shoreline wintering habitat in the eastern U.S., and is vulnerable to sea-level rise and increasing frequency and intensity of Atlantic storms that are projected to occur as a result of climate change

PREFACE

Almost the entire global population of Savannah Sparrow (*Passerculus sandwichensis princeps* subspecies), or Ipswich Sparrow, estimated to be just over 5000 mature individuals, nests on Sable Island, a low sandy 43 km-long island in the North Atlantic Ocean, about 175 km southeast of mainland Nova Scotia. Sable Island is now protected as a Migratory Bird Sanctuary and National Park Reserve. A few females may interbreed annually with the more common *savanna* subspecies of Savannah Sparrow on the adjacent mainland of Nova Scotia (COSEWIC 2009). The *princeps* subspecies is thus a Canadian endemic.

Wintering ground surveys show that Assateague Island in coastal Maryland and Virginia forms the centre of Ipswich Sparrow abundance during the non-breeding season, with wintering numbers tapering off rapidly to the north and south (Watts 2020). This low, 60-km-long barrier island is largely protected within the Assateague Island National Seashore and Assateague State Park.

Population estimates and trends of Ipswich Sparrow show that numbers are relatively unchanged since its status in Canada was last assessed in 2009 (COSEWIC 2009), based on breeding ground censuses in 2013 and 2018 (Horn 2013; Kehler pers. comm. 2021), and annual Christmas Bird Counts (National Audubon Society 2020).

Recent migration and wintering habitat studies (Bliss 2020; Watts 2020; Taylor pers. comm. 2021) have further clarified threats outside the breeding season, when most mortality thought to limit the size of the Canadian population likely occurs (COSEWIC 2009). Tracking data from over 100 radio-tagged Ipswich Sparrows migrating from wintering grounds in Maryland and Virginia to Sable Island show frequent stopovers at many sites along the Atlantic coast, most of which lack formal protection (Bliss 2020). Tracking shows that the final crossing from mainland Nova Scotia to Sable Island presents the most risk (Bliss 2020). Stopover periods and non-migratory movements within Nova Scotia are longer than during previous migration steps, abandoned crossing attempts (flights looping over the ocean and back to the mainland) are frequent, and survival is lower during trans-oceanic crossings than during coastal migration (Bliss 2020). Thus, threats along coastal mainland Nova Scotia where sparrows prepare to cross to Sable Island, and during the crossing itself, appear to be particularly important for this population (Bliss 2020).

Habitat trends on the Sable Island breeding grounds have been reassessed through analysis of 60 years of air photos (Eamer *et al.* 2021). COSEWIC (2009) reviewed similar studies, which showed no substantive trends across the past century. However, additional data and improved image analyses now suggest a net recession of the island's shoreline of about 0.5 m/year across 1959–2019, driven mainly by continuing sea level rise (Eamer *et al.* 2021). Assuming that this trend will continue yields a projected net loss of 4% by 2039 of the climax heath vegetation community, an optimal habitat for the sparrow. However, other habitats used for nesting, including widespread areas of Marram Grass (*Ammophila breviligulata*), will likely increase in extent (Eamer *et al.* 2021).

These projections reflect net effects of gradual changes across the whole island, with some vegetated areas increasing and some decreasing, rather than whole-island effects that might signal loss of significant areas (Eamer *et al.* 2021), and do not account for the gradual development of new heath habitat. Neither do they account for normal episodic factors that may destroy or create local habitat patches, such as dune movement and over-wash (Eamer *et al.* 2021), which may intensify as the predicted frequency (Muramaki *et al.* 2018) and documented severity (Elsner 2020) of tropical cyclones increase (Eamer *et al.* 2021). Overall, there does not appear to be a net loss in extent or quality of nesting habitat, and previous assessments have indicated that availability of nesting habitat is not limiting (COSEWIC 2009).

The northern Atlantic Ocean has been undergoing an increase in hurricane and tropical storm frequency and magnitude since 1995 as a consequence of climate change (Murakami *et al.* 2018), with significant effects in coastal Nova Scotia related to storm surge, wind speed, and rising sea level (Natural Resources Canada 2023), and the number, timing and intensity of summer storms varies markedly among years. The linear extent of Ipswich Sparrow breeding range on Sable Island of about 40 km reduces its susceptibility to the effects of stochastic storm events, which may impact the island during the nesting period. This subspecies seems well-adapted to surviving storm events (Stobo and McLaren 1975), and its relatively high fecundity (COSEWIC 2009) enables it to rebuild numbers following periods of low productivity related to storms.

Designatable Unit

Ipswich Sparrow was considered to be a separate Designatable Unit (DU) in previous COSEWIC status assessments (e.g., COSEWIC 2009), as it meets criteria in the former COSEWIC guidelines for recognizing DUs (e.g., COSEWIC 2019) in being a named subspecies. Genetic, morphological and geographic evidence separating it from mainland Savannah Sparrow DUs is summarized in COSEWIC (2009) and expanded here, and is considered with respect to updated DU guidelines (COSEWIC 2020).

DUs are defined on the basis of discreteness, in which there is very little transmission of heritable information with other populations, and evolutionarily significance, in which there are distinct adaptive traits or evolutionary history not found in other Canadian populations (COSEWIC 2020). Discreteness is recognized on the basis of heritable traits or markers that clearly distinguish the DU (criterion D1), or on the basis of “natural […] geographic disjunction […] such that transmission of information […] has been severely limited for an extended time” (criterion D2; COSEWIC 2020).

D1. Plumage differences between Ipswich and mainland Savannah Sparrows are clear and are not clinal. Ipswich Sparrow has plumage that is paler, likely related to its use of pale sand dune habitats in summer and winter, and is distinct in PCA analysis as compared to all other Savannah Sparrows; *a posteriori* tests correctly identify 89% of Sable Island birds as having a Sable Island origin based on plumage characteristics (n = 36 birds; Rising *et al.* 2009). Similarly, size differences (overall body size, wing and tarsus length) between Ipswich and mainland Savannah Sparrows are not clinal; Ipswich Sparrow is larger with longer wing and tarsus (n = 36; Rising 2001). Migration routes between mainland Nova Scotia and Sable Island are unique to Ipswich Sparrow, indicating that there is no or limited transmission of this heritable information with mainland DUs. Together, evidence of putatively heritable morphological traits and unique migration routes clearly distinguish the Ipswich Sparrow population from mainland birds, and criterion D1 is thus supported.

D2. Genetic differences between mainland Savannah Sparrows and Ipswich Sparrows are not evident for ND2 and ND3 mitochondrial genes (Zink *et al.* 2005) and are very weak for recent SNP data (Benham *et al.* 2022), such that any reduction of gene flow, if present, has occurred for a limited time. Preliminary SNP research focused on an exome capture analysis of the nuclear genome across the entire range of Savannah Sparrow and included three putative Ipswich Sparrow samples (Benham *et al.* 2022). However, only limited conclusions can be drawn, given the limited Ipswich Sparrow sample size and the timing of sample collection, during winter in Massachusetts. A larger sample size with samples from Sable Island may produce clearer SNP results to assess the genetic distinctiveness of Sable Island birds.

The discordance between morphological and genetic data may reflect the relatively recent isolation of Sable Island (*ca*. 6,000–13,000 YBP; Shaw *et al.* 2002), in conjunction with rapid evolution of morphological traits, and incomplete lineage sorting for other loci subject to longer evolutionary processes (lineage sorting is the process by which genetic variants become location-specific, and it lags behind isolation events, often by several thousand years; Taylor pers. comm. 2023). Finally, lighter plumage colouration and larger size in Ipswich Sparrow may be a rapid adaptation that has occurred despite ongoing gene flow at other loci. Although there is no robust genetic evidence for D2, morphological data support a natural geographic disjunction, and there are strong theoretical explanations for the discordance between the genetic and morphological data. Thus, there is some evidence in support of criterion D2.

Evolutionary significance is based on evidence or strong inference that DUs have been on independent evolutionary trajectories over a significant period, often reflecting origins in separate Pleistocene refugia (criterion S1), or that they possess adaptive, heritable traits that cannot be practically reconstituted if lost (criterion S2; COSEWIC 2020).

S1. The large area of Sable Island Bank that likely served as a Pleistocene refugium (Stobo and McLaren 1975) became isolated from the mainland by about 13,000 YBP, and rising sea level left Sable Island in about its present form by about 6,000 YBP (Shaw *et al.* 2002). Because genetic studies have suggested that the Sable Island population is of relatively recent origin (Zink *et al.* 2005), phenotypic differences noted in these birds may also be of recent origin.

S2. Paler plumage colouration is considered to be an adaptive heritable trait that provides crypsis in sand dune environments occupied by Ipswich Sparrow throughout the year, likely as protection against aerial, visual predators such as raptors and gulls (*Larus* spp; Horn pers. comm. 2023). Such crypsis has been noted in many other avian species vulnerable to visual predators. The species' larger size may be an adaptation to living on an island with long, cool and moist summers (Rising 2001). The non-clinal nature of this phenotype (colour and size) and its distinctiveness from other subspecies examined in Canada and the rest of its range (Rising *et al.* 2009), together with unique migration routes followed by Ipswich Sparrow, provide strong inference that these traits could not be practically reconstituted if lost.

As Savanah Sparrow *princeps* subspecies meets criteria for both discreteness (D1 and some support for D2) and evolutionary significance (S2) as set out in COSEWIC (2020), it is considered here as a separate DU.

Current Status

Designated Special Concern in April 1979. Status re-examined and confirmed in May 2000, November 2009, and May 2023. Criteria not applicable.

Updated Map

No indication of changes in distribution (eBird 2021); see map in previous status assessment (COSEWIC 2009).

TECHNICAL SUMMARY

Passerculus sandwichensis princeps

Savannah Sparrow *princeps* subspecies (Ipswich sparrow)

Bruant des prés de la sous-espèce *princeps* (Bruant Ipswich)

Range of occurrence in Canada (province/territory/ocean): Nova Scotia

Demographic Information

Generation time (usually average age of parents in the population)	Approximately 2.2 years	Based on IUCN estimate (Bird *et al.* 2020) calculated at the species level.
Is there an observed continuing decline in number of mature individuals?	No	Breeding population estimates from two recent censuses are statistically indistinguishable (estimate ± SE: 5500±970 in 2013; 5100±870 in 2018). Christmas Bird Count trends on US wintering grounds (number of birds/party-hour: 2009-2019) are relatively stable, but have high uncertainty (+18% change (95% CI = -75%, 111%; National Audubon Society 2020).
Estimated percent of continuing decline in total number of mature individuals within [5 years or 2 generations, whichever is longer up to a maximum of 100 years]	Not applicable	No continuing decline; see 2 (above).
Estimated percent change in total number of mature individuals over the last 10 years.	No change detected	No continuing decline; see 2 (above).
Projected percent change in total number of mature individuals over the next 10 years.	No decline projected	Based on recent relative population stability and threats having a low level of concern.
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any period [10 years, or 3 generations, whichever is longer up to a maximum of 100 years], including both the past and the future.	No decline suspected	Based on recent relative population stability and threats having a low level of concern.
Are the causes of the decline clearly understood?	Not applicable	
Have the causes of the decline ceased?	Not applicable	
Are the causes of the decline clearly reversible?	Not applicable	
Are there extreme fluctuations in number of mature individuals?	No	

Extent and Occupancy information

Estimated extent of occurrence (EOO)	90 km²	Calculated based on a minimum convex polygon around known breeding occurrences on Sable Island, disregarding occasional individuals paired with birds of the mainland subspecies of Savannah Sparrow in mainland Nova Scotia (from COSEWIC 2009).
Index of area of occupancy (IAO), reported as 2x2 km grid value.	80 km²	Calculated by overlaying a 2x2-km grid over suitable vegetated habitat on Sable Island (from COSEWIC 2009).
Is the population "severely fragmented" i.e., is >50% of its total area of occupancy 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"∗ (use plausible range to reflect uncertainty if appropriate)	One	A few individuals may pair with birds of the mainland subspecies of Savannah Sparrow at scattered sites in mainland Nova Scotia. Otherwise, the global population breeds exclusively on one offshore island, so the whole population could potentially be affected by one threat, such as a severe storm.
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 subpopulations?	Not applicable	No subpopulations.
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	Gradual decline in area of heath breeding habitat projected to continue at a rate of about 2% per 10 years (Eamer *et al.* 2021), but no inferred or projected net loss in extent or quality of nesting habitat overall.

∗ See Definitions and Abbreviations on COSEWIC website for more information on this term.

Are there extreme fluctuations in number of subpopulations?	Not applicable	No subpopulations.
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 subpopulation)

Subpopulations (no subpopulations)	N Mature Individuals (give plausible ranges)	Notes on individual estimates
Total	5100±870 (Estimate ± standard error)	Based 2018 population estimate from Kehler (pers. comm. 2021).

Quantitative Analysis

Is the probability of extinction in the wild at least 20% within 20 years or 10% within 100 years?	Unknown	Analysis not conducted

Threats and Limiting Factors

Was a threats calculator completed for this species?	No	Overall threat impact: Unknown (based on COSEWIC 2009)

Key threats were identified in COSEWIC (2009) as:

i. IUCN 1 Residential and commercial development: 1.1. Housing and urban areas
ii. IUCN 11 Climate change and severe weather: 11.1. Habitat shifting & alteration, and 11.4. Storms and flooding

The level of impact of these threats is unknown, but is likely to be low. Sable Island has become a National Park Reserve since the previous status report, and most birds apparently winter in a protected area (Assateague Island National Seashore; Watts 2020), so threats to breeding and wintering habitat are likely to be low. Tracking studies show that migrants rely on stopover habitat, much of which is not formally protected, and that the final crossing by northbound migrants from mainland Nova Scotia to Sable Island may sometimes be hazardous (Bliss 2020).

What additional limiting factors are relevant?
The global population of this subspecies breeds almost exclusively on one offshore island, with most individuals overwintering on a second coastal island, and is thus potentially vulnerable to the effects of a single catastrophic event, such as a severe storm, on nests and on breeding or wintering adults.

Rescue Effect (natural immigration from outside Canada)

Status of outside population(s) most likely to provide immigrants to Canada.	Not applicable	Subspecies does not breed outside Canada.
Is immigration known or possible?	Not applicable	

∗ See Definitions and Abbreviations on COSEWIC website for more information on this term.

Would immigrants be adapted to survive in Canada?	Not applicable	
Is there sufficient habitat for immigrants in Canada?	Not applicable	
Are conditions deteriorating in Canada?+	No	
Are conditions for the source (i.e., outside) population deteriorating?+	Not applicable	
Is the Canadian population considered to be a sink?+	Not applicable	
Is rescue from outside populations likely?	No	Subspecies does not breed outside Canada.

Occurrence Data Sensitivity

Are occurrence data of this species sensitive?	No	

Status History

COSEWIC: Designated Special Concern in April 1979. Status re-examined and confirmed in May 2000, November 2009, and May 2023.

Status and Reasons for Designation

NOTE: Recommended status is changed to Current status after a Wildlife Species Assessment Meeting when the report is finalized.	
Status:	Special Concern
Alpha-numeric codes:	Not applicable
Reason for change of status	Not applicable - no change in status
Reasons for designation (2023):	This Canadian endemic sparrow subspecies is largely restricted to breeding in sand dune systems in the Sable Island National Park Reserve, 175 km east of mainland Nova Scotia. The size of the breeding population of about 5100 mature individuals has remained relatively stable over the past two decades. The major wintering areas on the northeast coast of the United States are also in protected areas. This sparrow is exposed to threats associated with storms and shoreline development. Although well-adapted to extreme marine weather conditions, this sparrow's habitats are vulnerable to the long-term effects of sea-level rise, and the increasing frequency and intensity of Atlantic storms resulting from climate change.

Applicability of Criteria

A: Decline in total number of mature individuals	Not applicable. There is no decline in total number of mature individuals.

+ See Table 3 (Guidelines for modifying status assessment based on rescue effect).

B: Small distribution range and decline or fluctuation	Not applicable. Although extent of occurrence of 90 km² and index of area of occupancy of 80 km² are both below thresholds for Endangered, and (a) the population is known to exist at one location; there is no continuing decline in (i) extent of occurrence, (ii) index of area of occupancy, (iii) area, extent and/or quality of habitat, (iv) number of locations or subpopulations, or (v) number of mature individuals, and (c) there is no evidence of extreme fluctuations.
C: Small and declining number of mature individuals	Not applicable. Population estimate of 5100±870 mature individuals is lower than the Threatened threshold of 10,000, but there is no evidence of a continuing decline in number of mature individuals.
D: Very small or restricted population	Not Applicable. Population estimate of 5100±870 mature individuals is above the Threatened threshold for D1. D2 Threatened is not applicable. Although there is only one location, index of area of occupancy of 80 km² exceeds the typical threshold of <20 km², and this robust population is not at risk of extinction or extirpation from stochastic events, such as storms, within 1-2 generations (2-5) years.
E: Quantitative analysis	Not applicable. Analysis not conducted.

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INFORMATION SOURCES

Benham, P.M., J. Walsh, and R.C.K. Bowie. 2022. The genetic basis of adaptation in an ecologically widespread North American songbird, the Savannah Sparrow. Paper presented at the joint annual meeting of the American Ornithological Society and BirdsCaribbean, San Juan, Puerto Rico, 27 June-2 July 2022.

Bird, J.P., R. Martin, H.R. Akçakaya, J. Gilroy, I.J. Burfield, S.T. Garnett, A. Symes, J. Taylor, Ç.H. Şekercioğlu, and S.H.M. Butchart. 2020. Generation lengths of the world's birds and their implications for extinction risk. Conservation Biology 34:1252–1261.

Bliss, S. 2020. Using automated radio-telemetry to assess spring migratory ecology and survival of Ipswich sparrows (*Passerculus sandwichensis princeps*). MSc thesis, Dalhousie University, Halifax, Nova Scotia. 94 pp.

COSEWIC. 2009. COSEWIC assessment and status report on the Savannah Sparrow *princeps* subspecies *Passerculus sandwichensis princeps* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 21 pp. (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/savannah-sparrow-2009.html).

COSEWIC. 2019. Guidelines for recognizing designatable units. Appendix F5 in Committee on the Status of Endangered Wildlife in Canada Operations and Procedures Manual, revised March 2019. Committee on the Status of Endangered Wildlife in Canada, Environment and Climate Change Canada, Ottawa, Ontario. 8pp.

COSEWIC. 2020. Guidelines for recognizing designatable units. Appendix F5 in Committee on the Status of Endangered Wildlife in Canada Operations and Procedures Manual, revised November 2020. Committee on the Status of Endangered Wildlife in Canada, Environment and Climate Change Canada, Ottawa, Ontario. 7pp.

Eamer, J.B., D. Didier, D. Kehler, I. Manning, D. Colville, G. Manson, A. Jagot, and V.E. Kostylev. 2021. Multi-decadal coastal evolution of a North Atlantic shelf-edge vegetated sand island - Sable Island, Canada. Canadian Journal of Earth Sciences 99:1-14.

eBird. 2021. eBird: An online data base of bird distribution and abundance [web application]. eBird, Ithaca, New York. Website: http://ebird.org [accessed June 2021].

Elsner, J.B. 2020. Continued increases in the intensity of strong tropical cyclones. Bureau of American Meteorological Society, E1301-E1303.

Horn, A.G. 2013. The 2013 census of Ipswich sparrows. Unpublished report for Parks Canada and Canadian Wildlife Service, Dartmouth, Nova Scotia.

Horn, A.G., pers. comm. 2023. *Email correspondence with R.D. Elliot.* February 2023. Adjunct Research Professor, Department of Biology, Dalhousie University, Halifax, Nova Scotia.

Kehler, D., pers. comm. 2021. *Email correspondence to A.G. Horn.* February 2021. Park Ecologist, Sable Island National Park Reserve. Parks Canada, Halifax, Nova Scotia.

Murakami, H, E. Levin, T.L. Delworth, R. Gudgel, and P.-C. Hsu. 2018. Dominant effect of relative tropical Atlantic warming on major hurricane occurrence. Science 362:794-799.

National Audubon Society 2020. The Christmas Bird Count Historical Results [Online]. Website: http://www.christmasbirdcount.org [accessed March 2021]

Natural Resources Canada. 2023. Atlantic Canada: climate and climate-related trends and projections. Website: https://natural-resources.canada.ca/changements-climatiques/impacts-adaptation/climate-and-climate-related-trends-and-projections/10261 [accessed May 2023].

Rising, J.D. 2001. Geographic variation in size and shape of Savannah Sparrows (*Passerculus sandwichensis).* Studies in Avian Biology 23:1–65.

Rising, J.D, D.A. Jackson, and H.B. Fokidis. 2009. Geographic variation in plumage pattern and coloration of Savannah Sparrows. Wilson Journal of Ornithology 121:253–264.

Shaw, J., P. Gareau, and R.C. Courtney. 2002. Palaeogeography of Atlantic Canada 13–0 kyr. Quaternary Science Reviews 21:1861–1878.

Stobo, W.T., and I.A. McLaren. 1975. The Ipswich Sparrow. Nova Scotia Institute of Science, Halifax.

Taylor, P.D., pers. comm. 2021. *Meeting with A.G. Horn.* February 2021. Professor, Department of Biology. Acadia University, Wolfville, Nova Scotia.

Taylor, S.S., pers. comm. 2023. *Email correspondence with R.D. Elliot.* February 2023. Weaver Brothers Distinguished Professor, School of Renewable Natural Resources, Louisiana State University, Baton Rouge, Louisiana.

Watts, B. 2020. Ipswich winter ecology comes into focus. The Center for Conservation Biology, Williamsburg, Virginia. Website: https://ccbbirds.org/2020/04/04/ipswich-winter-ecology-comes-into-focus/ [accessed February 2021]

Zink, R.M., J.D. Rising, S. Mockford, A.G. Horn, J.M. Wright, M. Leonard, and M.C. Westberg. 2005. Mitochondrial DNA variation, species limits, and rapid evolution of plumage coloration and size in the Savannah Sparrow. Condor 107:21-28.

Writer of Rapid Review of Classification:

- Andrew G. Horn

COSEWIC HISTORY

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

DEFINITIONS
(2023)

Wildlife Species	A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)**	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)***	A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

* Formerly described as "Vulnerable" from 1990 to 1999, or "Rare" prior to 1990.

** Formerly described as "Not In Any Category", or "No Designation Required."

*** Formerly described as "Indeterminate" from 1994 to 1999 or "ISIBD" (insufficient scientific information on which to base a designation) prior to 1994. Definition of the (DD) category revised in 2006.

Environment and Climate Change Canada
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