

**Ontario Species at Risk Evaluation Report for Evening  
Grosbeak (*Coccothraustes vespertinus*)**

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

Assessed by COSSARO as Special Concern

May 2017

Final

## Gros-bec errant (*Coccothraustes vespertinus*)

Le gros-bec errant (*Coccothraustes vespertinus*) est un oiseau chanteur jaune et noir au bec volumineux de forme conique de la famille des *Fringillidae*. Nichant dans les forêts de conifères du Nord de l'Ontario, jusque dans le Sud de la baie Georgienne, il se nourrit souvent aux mangeoires en hiver. La taille de sa population varie beaucoup, directement en fonction des cycles de la tordeuse des bourgeons de l'épinette. Nouveau venu dans l'avifaune de l'Ontario, ayant migré de l'Ouest du Canada de la fin des années 1880 au début des années 1900, il satisfait aujourd'hui aux critères d'espèce indigène. Son aire de répartition s'étend maintenant dans tout le Sud du Canada, aussi loin vers l'est que Terre-Neuve. Les menaces potentielles pour l'espèce sont notamment les collisions dans les fenêtres et avec les véhicules, la perte d'habitat attribuable à l'exploitation forestière et aux changements climatiques, le sel de voirie et les mesures pour contrôler les populations de tordeuse des bourgeons de l'épinette. Selon le Relevé des oiseaux nicheurs, la population de gros-bec errant est en forte baisse au Canada, ayant chuté de 5,2 % par année de 1970 à 2012, un déclin de 90 % en 42 ans, puis de 5 % par année de 2004 à 2014 seulement, pour un total de 42 % pour ces dix ans. Les données de l'Atlas des oiseaux nicheurs, du recensement des Oiseaux de Noël et du Project FeederWatch confirment cet important déclin de la population en Ontario au fil des ans. Même s'il satisfait aux critères quantitatifs de la désignation en tant qu'espèce menacée (critère A1) vu les indices montrant un déclin important dans les 10 dernières années, le gros-bec errant est plutôt considéré comme espèce préoccupante en Ontario en raison du potentiel d'immigration de source externe et de l'interrelation entre les niveaux de population de l'espèce et les cycles de la tordeuse des bourgeons de l'épinette, qui doivent être pris en compte dans l'évaluation des tendances démographiques.

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## Executive summary

The Evening Grosbeak (*Coccothraustes vespertinus*) is a colourful yellow and black songbird with a heavy conical bill, and is in the Fringillidae family. It nests in conifer-dominated forests across northern Ontario, as far south as southern Georgian Bay, and is a common winter bird at feeders. Its abundance varies substantially in direct response to Spruce Budworm cycles. Evening Grosbeak is a relatively recent addition to the avifauna of Ontario, expanding into Ontario from western Canada in the later 1880s and early 1900s, and now meets the criteria for a native species. It is now distributed right across southern Canada as far east as Newfoundland. Potential threats include window strikes, habitat loss from forestry, climate change impacts on habitat, road salt, collisions with vehicles, and budworm control measures. Breeding Bird Survey data indicate a significant negative population decrease in Canada of -5.2% a year from 1970-2012, representing a 90% population decline over 42 years, and a significant decline of -5% per year, or 42% cumulatively, for the 10-year period from 2004-2014. Breeding Bird Atlas, Christmas Bird Count and Project FeederWatch data all support the conclusion that the Ontario population has declined significantly in recent decades. Based upon indices showing a significant population decline over the past 10 years, the Evening Grosbeak meets quantitative criteria for Threatened designation under Criterion A1 however it is classified as Special Concern in Ontario due to potential for rescue and the species' close relationship between population levels and Spruce Budworm cycles which must be taken into account when evaluating population trends.

# 1. Eligibility for Ontario status assessment

## 1.1. Eligibility conditions

### 1.1.1. Taxonomic distinctness

**Yes.** There is no dispute that the Evening Grosbeak (*Coccothraustes vespertinus*) is a distinct taxon. Two subspecies are differentiated on the basis of colouration, bill structure and calls (see 2.1.2).

### 1.1.2. Designatable units

**One.** There are two subspecies in Canada, *C. v. vespertinus* in eastern Canada and *C. v. brooksi* in western Canada, although COSEWIC (2016) considered only one DU and designated Evening Grosbeak only at the species level. All Ontario birds are *C. v. vespertinus*.

### 1.1.3. Native status

**Yes.** The Evening Grosbeak is a native species in Canada, and also in Ontario. This species was apparently not present in Ontario during pre-European settlement times. Originally a western species occurring primarily in British Columbia, it expanded into eastern North America in the late 1800s and early 1900s (COSEWIC 2016). It was first recorded as breeding in Ontario at Lake of the Woods in 1920 (Godfrey 1976). Taverner (1937) noted that it breeds “in the northern coniferous forests from western Ontario westward”, and also noted documented breeding in the area north of Lake Superior. It has been a continuous resident species in Ontario since that time. Populations since the 1980s have been lower than the high populations evidenced during the period from the 1940s to the 1980s when there were large Spruce Budworm outbreaks (Hoar 2007).

The Evening Grosbeak has been documented as breeding in Ontario for almost a century, and thus meets both COSEWIC’s (as adapted for Ontario) and COSSARO’s (May 2017) definition of a “Native Wildlife Species”, i.e.,

- “a wildlife species that occurs in (Ontario) naturally, or that has expanded its range into (Ontario) without human intervention from a region where it naturally occurred, has produced viable subpopulations, and has persisted in (Ontario) for at least 50 years” (COSEWIC November 2015).
- “a native wildlife species is one that occurs in Ontario naturally, including those that have expanded their range into Ontario without human intervention from a region where it naturally occurred, and has produced viable subpopulations in Ontario” (COSSARO May 2017).

The eastward range expansion was largely driven by growing Spruce Budworm outbreaks, which were likely influenced by both natural and human factors (e.g., landscape-level forest habitat modifications). Increases in Pin Cherry populations could similarly have had both natural and human sources; some other cited factors, such as the human-mediated range expansion of Manitoba Maple and the increase in the use of winter bird feeders could be more directly attributed to human causes (Taverner 1937,

COSEWIC 2016). It has become well established and naturalized in Ontario for an estimated 25-33 generations, and is a regularly occurring breeding species;

#### 1.1.4. Occurrence

**Yes.** Evening Grosbeak regularly occurs in Ontario as both a breeding and wintering bird.

### 1.2. Eligibility results

Evening Grosbeak (*C. vespertinus*) is eligible for status assessment in Ontario.

## 2. Background information

### 2.1. Current designations

- GRANK: G5 (NatureServe 2017)
- NRANK Canada: N5 (NatureServe 2017)
- COSEWIC: Special Concern (November 2016) (Species at Risk Public Registry 2017)
- SARA: No status (no schedule) (Species at Risk Public Registry 2017)
- ESA 2007: No status (not previously assessed)
- SRANK: S4B (NatureServe 2017)

### 2.2. Distribution in Ontario

Originally found primarily in western Canada, the Evening Grosbeak expanded into eastern Canada in the late 1800s and early 1900s, with the first breeding in Ontario documented at Lake of the Woods in 1920 (Godfrey 1974). In Ontario, the Evening Grosbeak now breeds across northern Ontario from Opasquia Provincial Park to Pickle Lake, Moosonee in the north, and south to southern Georgian Bay and the southern edge of the Canadian Shield (Hoar 2007) (Figures 1 and 2).

The number of locations for Evening Grosbeak in Ontario is currently unknown, but given its wide distribution and relatively large breeding population it is assumed to be quite large (COSEWIC 2016).

The abundance of Evening Grosbeak varies considerably across its range, largely reflecting the status of Spruce Budworm (*Choristoneura fumiferana*) infestations. During the most recent Breeding Bird Atlas, areas with the highest breeding densities were those with major budworm outbreaks (Hoar 2007) (Figure 2). The population of Evening Grosbeaks in Ontario is estimated at 500,000 adult birds<sup>1</sup> (COSEWIC 2016).

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<sup>1</sup> estimate likely corresponds to normal population levels between peaks of Spruce Budworm outbreaks (COSEWIC 2016)

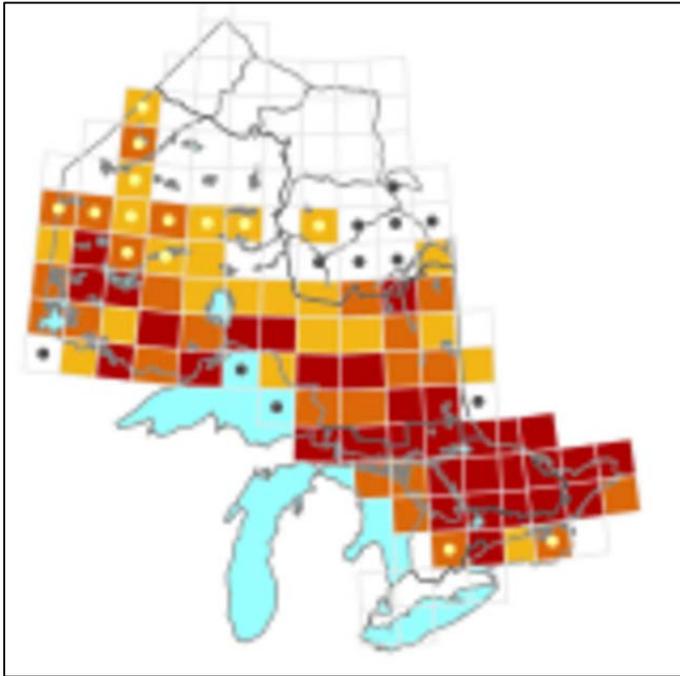


Figure 1. Breeding distribution of the Evening Grosbeak in Ontario based upon 100 x 100 km grids from the Breeding Bird Atlas records (Hoar 2007, Bird Studies Canada 2017).

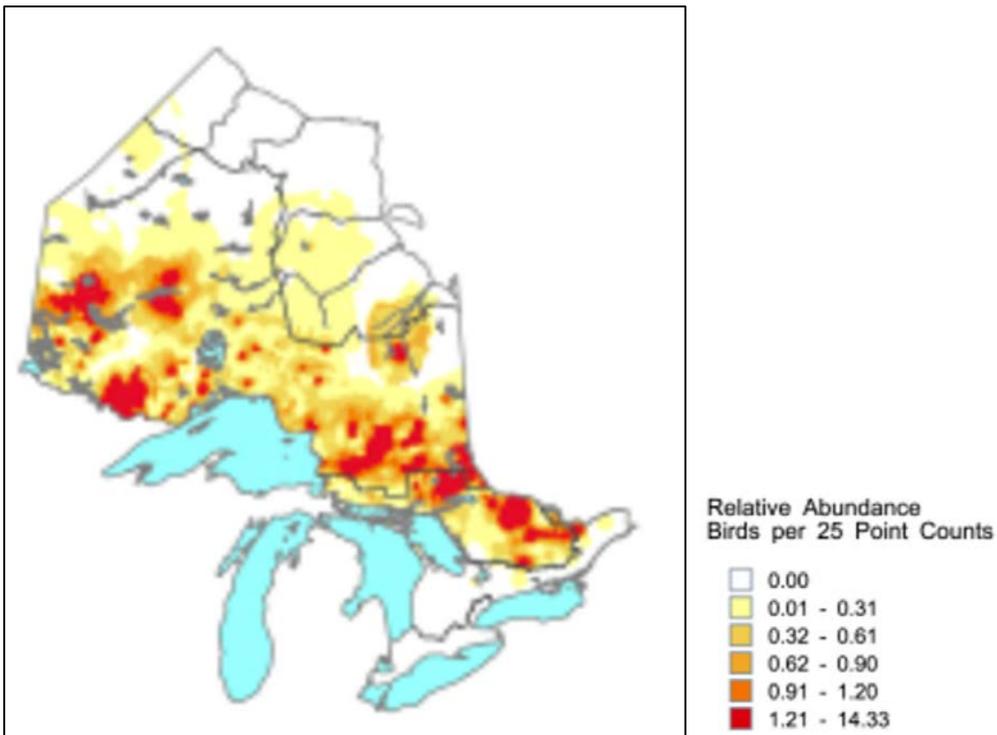


Figure 2. Relative abundance of Evening Grosbeaks in Ontario during the most recent

Breeding Bird Atlas, based upon 25-point counts (Hoar 2007, Bird Studies Canada 2017)

### 2.3. Distribution and status outside Ontario

The Evening Grosbeak is distributed across the boreal forest and other conifer-dominated forests in Canada from the Yukon Territory to Newfoundland and Labrador; it also occurs in the northwestern United States, excluding Alaska, and the northern portion of a number of eastern states from Minnesota to Maine (Figure 3). Isolated and disjunct resident populations also occur in Mexico (COSEWIC 2016). Winter range roughly corresponds with the breeding range, although the species will move long distances in response to food abundance, occasionally as far as the southern United States (COSEWIC 2016).



Figure 3. North American/global range of Evening Grosbeak (from COSEWIC 2016).

Breeding season densities are low across Canada, averaging 5 pairs/km<sup>2</sup> (COSEWIC 2016). Based upon Breeding Bird Survey data, abundance is greatest in southern British Columbia and the Maritime provinces, intermediate in Ontario and Québec, and lowest in the prairie provinces (COSEWIC 2016). An estimated 2.2 million Evening Grosbeaks occur in Canada, with the greatest estimated proportion of these being in British Columbia (27%), Ontario (23%) and Québec (23%) (COSEWIC 2016). An analysis of point count and habitat data indicate that greatest areas of high value habitat are located in northwestern Ontario, central Québec, New Brunswick, Nova Scotia and Newfoundland (COSEWIC 2016).

Project FeederWatch data from 1989-2006 have shown a contraction in the wintering range in the Rocky Mountain, Great Lakes, Atlantic Canada and Appalachian regions (COSEWIC 2016). Based upon Breeding Bird Survey data, there has been a significant negative population trend in Canada of -5.2% a year from 1970-2012, representing a 90% population decline over 42 years (COSEWIC 2016), and a significant decline of -5% per year, or 42% cumulatively, for the 10-year period from 2004-2014 (COSEWIC 2016). Significant BBS annual long-term declines of 4.1-9.0% have been estimated for British Columbia, Manitoba, Québec and New Brunswick (COSEWIC 2016) (see also Appendix 2).

## 2.4. Ontario conservation responsibility

Ontario represents an estimated 12.8% of the global population of the Evening Grosbeak (COSEWIC 2016).

## 2.5. Direct threats

The COSEWIC (2016) threats calculator has identified a number of relatively low impact threats:

**Window Strikes** – The Evening Grosbeak is one of the 10 species most frequently killed by window strikes near bird feeders in North America (COSEWIC 2016). Overall this is considered a low threat.

**Habitat Loss from Forestry** – Clearcutting of mature forests, and their replacement with younger or less diverse forests, reduces available habitat for Evening Grosbeaks. The replacement of Balsam Fir (*Abies balsamea*) with faster-growing and more commercially-attractive conifer species may also reduce habitat availability. Evening Grosbeaks are generally absent from clearcut second-growth forests (COSEWIC 2016). Overall this is considered a low threat.

**Climate Change Impacts on Habitat** – Trends towards warmer and drier climates are expected to lead to a northward shift in Balsam Fir forests and a reduction in the total area (COSEWIC 2016). This will reduce the availability of optimal foraging habitat (i.e. Spruce Budworm-infested forests) for the Evening Grosbeak. Based upon analysis of Spruce Budworm defoliation, winter temperatures, Balsam Fir and White Spruce (*Picea glauca*) composition in the forest, and spring and summer minimum temperature, Candau and Fleming (2011) projected a net increase in the area of forest defoliated due to climate change of between 22.8% and 25.5%, with less certainty in the mean frequency of defoliation. The short-term impact of this threat is expected to be negligible. In the longer term, budworm outbreaks are projected to last 6 years longer and average 15% greater defoliation as a result of climate change (Gray 2008).

**Road Salt** – Evening Grosbeaks are strongly attracted to sodium chloride and calcium chloride used for winter ice control. Although limited, data suggest that road salt is toxic to a number of songbird species (COSEWIC 2016). The impact of this threat is unknown, and requires further study.

**Collisions with Vehicles** – Mortality from vehicle collisions can have an impact on Evening Grosbeak populations, especially during Spruce Budworm outbreaks, (COSEWIC 2016), but the overall impact of this threat is unknown.

**Spruce Budworm Control Measures** – Spruce Budworm control measures using the biological agent *Bacillus thuringiensis*, and preventative logging practices to reduce the susceptibility of vulnerable forest stands to Spruce Budworm, are expected to have an indirect impact on Evening Grosbeaks through reductions in budworm populations, although the degree of impact is unknown (COSEWIC 2016).

## 2.6. Specialized life history or habitat use characteristics

Evening Grosbeak population cycles are strongly linked with the cycle of Spruce Budworm infestations (COSEWIC 2016). According to COSEWIC (2016), the “25-40 year natural cycle of Spruce Budworm (especially in eastern Canada) is likely to have a greater influence on Evening Grosbeak numbers than any threats, and largely correlates with declines in Evening Grosbeak populations since the 1970s” (Figure 4; COSEWIC 2016).

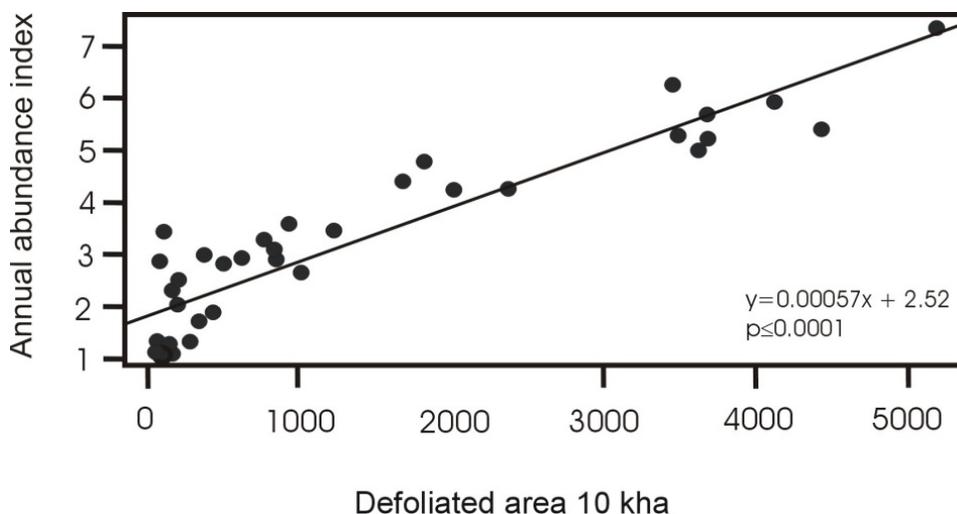


Figure 4. Association between the total area of forest defoliated by Spruce Budworm and the BBS annual abundance index for Evening Grosbeak between 1974 and 2012 in Canada (M. Bélisle, unpubl. data; from COSEWIC 2016).

The most recent budworm cycle in Ontario peaked in 1980 and was completed by 1996 (Figure 5; OMNRF 2012). Spruce Budworm outbreaks in eastern Canada generally occur at 25/35-40 year intervals, with damage being most severe where there are “uninterrupted forest stands dominated by mature balsam fir and white spruce” (Natural Resources Canada 2016). Applying these figures to Ontario would suggest that the next outbreak should have peaked between 2005/2015-2020, but this has not yet occurred. In Ontario, a relatively small infestation of 850,000 ha peaked between 2006-2007, and has now declined to around 300,000 ha (Natural Resources Canada 2016). Recent defoliation occurred primarily in northeastern Ontario in the North Bay and Sudbury

Districts, and budworm populations appeared to be declining between 2012 and 2013 (OMNR 2012).

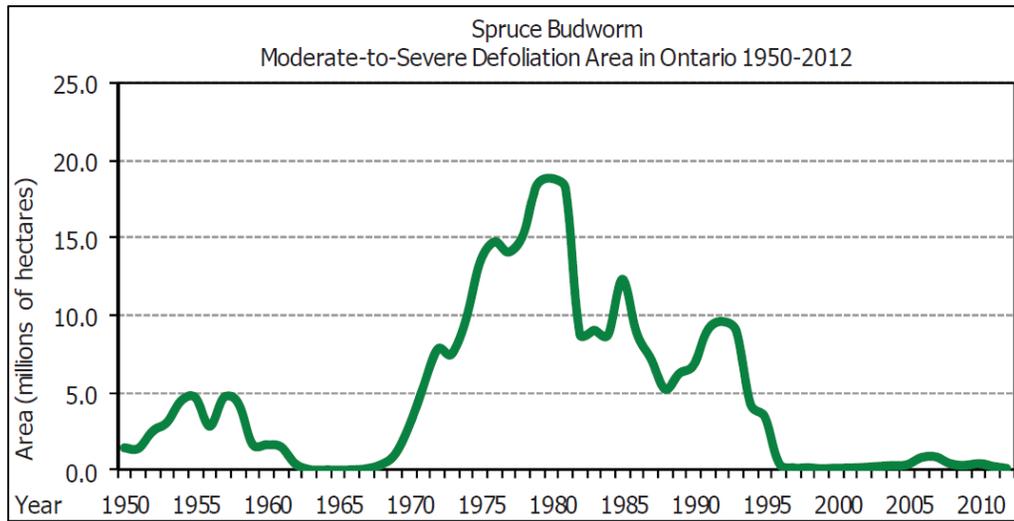


Figure 5. Spruce Budworm defoliation trends in Ontario, 1950-2012 (OMNR 2012)

There are indications that a major Spruce Budworm outbreak may occur in eastern North America early in the 21<sup>st</sup> century. The area of forest defoliated in Québec, New Brunswick and eastern Ontario has expanded from 2005 to 2015, and the number of Evening Grosbeaks appears to be responding. If current projections continue, “Evening Grosbeak in eastern Canada may rebound to levels observed in the 1970s and 1980s” (COSEWIC 2016).

### 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

**Threatened. A2b.** Breeding Bird Survey (BBS) data for Ontario indicate that there has been a significant -9.6% annual decline in the breeding population over a 10-year period (2005-2015), representing 2.5-3.3 generations, and equating to an overall 10-year decline of 63.6% (Figure 6) (USGS 2017). This rate of decline is greater than for several Canadian jurisdictions, and is greater than the national rate of decline. Based upon an annual -7.4% decline over a 50-year period (1966-2015), the overall percentage decline in Ontario has been 96.0%. Ontario Breeding Bird Atlas data suggest a significant decline of 30% in the probability of observation at the provincial level between the first and second atlases (20 years, or 5-6.7 generations, based upon a generation time of 3-4 years), and significant declines occurred in all OBBA regions except the Carolinian, where the species does not occur (Hoar 2007). There are many bird atlas squares where breeding activity was observed in the first atlas but not the second, and very few squares where new breeding activity was observed (Figure 7; Bird Studies Canada 2017).

Nationally, COSEWIC (2016) indicated that Evening Grosbeak potentially qualified as Threatened under Criterion A2b based upon BBS data, but other data including Christmas Bird Count data suggested a more stable recent population trend. However, this was not the same case for Ontario, where Christmas Bird Count data indicate a statistically significant long-term (1970-2012) annual decline of -11.9% in Ontario (1970-2012), and a recent (2002-2012), non-statistically significant ten-year decline of -12.5% (COSEWIC 2016). This contrasts with a national trend of a slight long-term decline (-1.12%) and a recent slight increase (4.36%) (COSEWIC 2016).

Although not as long-term and not as quantitative, Project FeederWatch data also show a similar trend across northeastern North America, with a reduced proportion of feeders visited in northeastern North America (including Ontario) in recent years (Figure 8) (Project FeederWatch 2017). There has been a slight but lower reduction in average flock size over this same period.

Ontario Forest Bird Monitoring Program data show a negative but not significant decline in Ontario between 1987-2007 (-1.4% per year, Government of Canada 2008).

Using BBS data, Evening Grosbeak meets Endangered criterion, but in consideration of OBBA and other data, Threatened is applied.

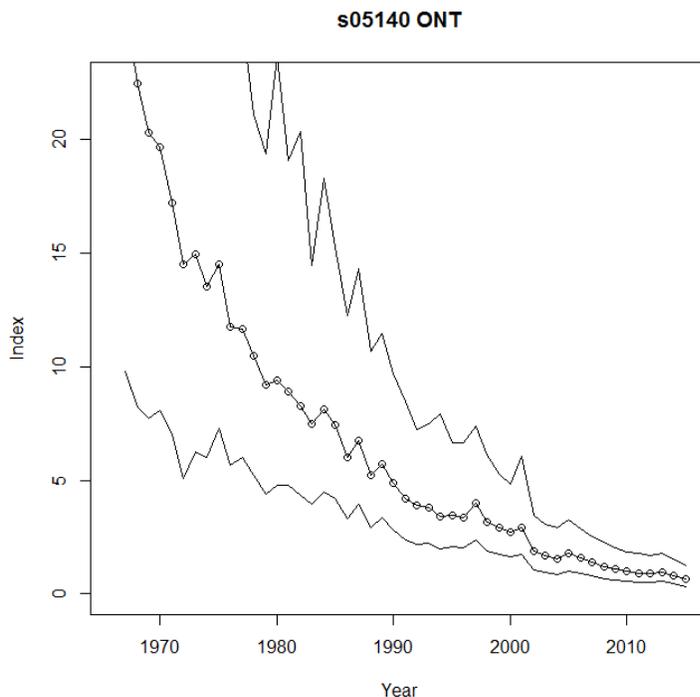


Figure 6. Trends in Breeding Bird Survey data for Evening Grosbeak in Ontario (USGS 2017).

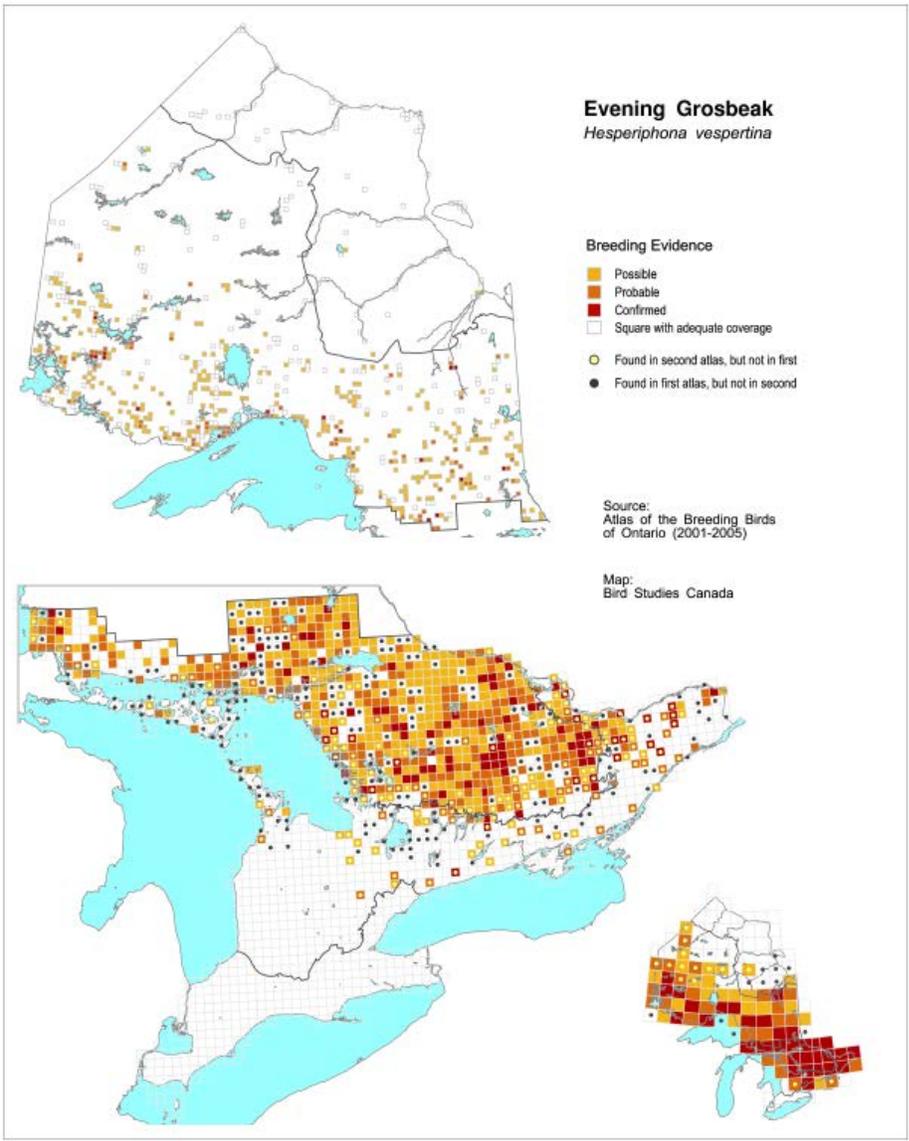


Figure 7. Evening Grosbeak breeding evidence during the second breeding bird atlas, 2001-2005 (Bird Studies Canada 2017).

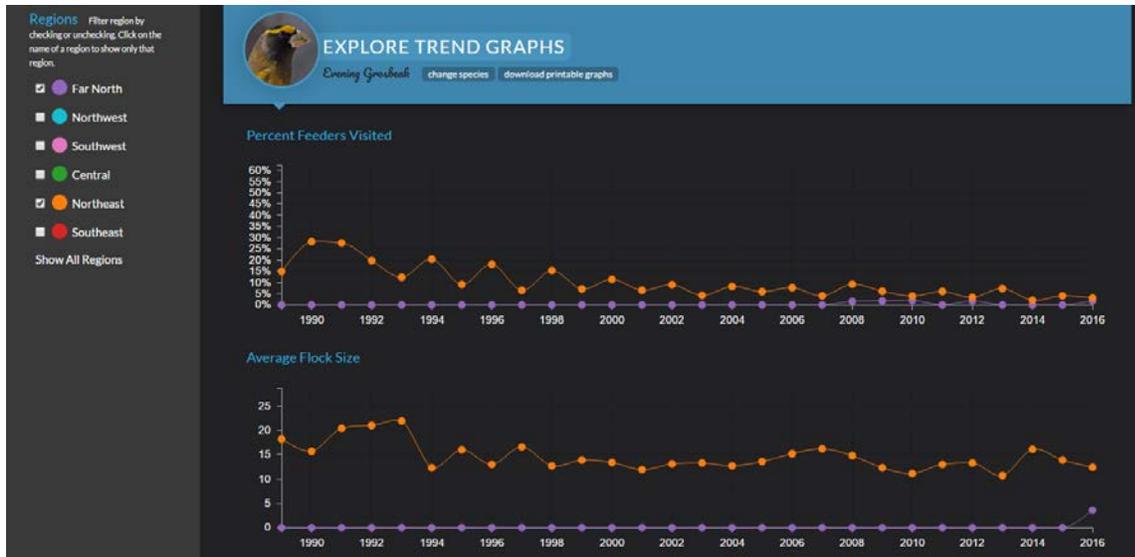


Figure 8. Trends in the percentage of feeders visited by Evening Grosbeak (above), and the average flock size (below), in northeastern North America from 1989-2016 (Project FeederWatch 2017).

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

**Not applicable.**

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

**Not applicable.**

### 3.1.4. Criterion D – Very small or restricted total population

**Not applicable.**

### 3.1.5. Criterion E – Quantitative analysis

**Insufficient information.** Quantitative analysis has not been conducted.

## 3.2. Application of Special Concern in Ontario

Despite meeting decline criteria for Threatened in Ontario, a Special Concern designation was considered because of the apparent close relationship between observed population declines and Spruce Budworm declines. Based on a well-established 25-40 year Spruce Budworm cycle for eastern North America, a large outbreak is currently due or overdue in Ontario. However, outbreaks do not occur regularly within regions and the timing of future outbreaks cannot be predicted based upon past outbreaks (Blais 1968). Whether this outbreak eventually occurs, and whether its extent is sufficient to reverse Evening Grosbeak population declines, remain to be seen. However, there are indications of a new major Spruce Budworm outbreak in eastern Canada (Morin et al. 2008). The area defoliated by Spruce Budworm in Quebec

between 2005-2015 has recently increased by several orders of magnitude, and is apparently expanding into Ontario and New Brunswick. Evening Grosbeak increases are expected in response to this expanding outbreak. Historically, past budworm outbreaks have occurred most frequently and been most severe in the area encompassed by southern Québec-Maine-New Brunswick (Blais 1968). Spruce Budworm outbreaks have been less predictable in Ontario than they have been in Québec and the Maritimes. Venier *et al.* (2009) found evidence of a positive population response to Spruce Budworm numbers in 18 boreal forest breeding birds including Evening Grosbeak, and concluded that “Given the numerical response in many species and the potential influence of budworm on bird populations because of the vast extent of outbreaks, we believe that the population cycle of spruce budworm should be considered in any evaluation of population trends in eastern boreal birds.”

### 3.3. Status category modifiers

#### 3.3.1. Ontario’s conservation responsibility

Does not apply.

#### 3.3.2. Rescue effect

Although Evening Grosbeak meets the criteria for Threatened status, a strong case can be made for potential rescue effect. Rescue effect is feasible and realistic, although dependent on an increasing Spruce Budworm population. The species has previously been shown to have great (re-)colonizing potential, and has expanded its range from British Columbia across Canada over several decades. Evening Grosbeak occurs in Canadian jurisdictions both east and west of Ontario, and has demonstrated that it can readily exploit new food sources such as a Spruce Budworm outbreak or expanded Manitoba Maple populations. There is suitable habitat within Ontario, and immigrants are likely to survive and reproduce, dependent upon available food sources. Immigration is considered especially possible since several US states bordering or near Ontario (e.g. New York, Maine, Vermont, New Hampshire) show long-term population increases of more than 1.5% per year since 1966 (see Figure 16 in COSEWIC [2016]).

### 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

Although it technically qualifies for Threatened under A2b, Evening Grosbeak (*Coccothraustes vespertinus*) is classified as Special Concern in Ontario, based upon potential rescue effect and a close relationship with Spruce Budworm cycles.

## 5. Information sources

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# Appendix 1: Technical summary for Ontario

Species: Evening Grosbeak (*Coccothraustes vespertinus*)

## 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>	3-4 years
<p>Is there an observed, inferred, or projected continuing decline in number of mature individuals?</p>	Yes based on BBS and OBBA data
<p>Estimated percent of continuing decline in total number of mature individuals within 5 years or 2 generations.</p>	Unknown
<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>	64% reduction, however the Spruce Budworm cycle, which has a major influence on Evening Grosbeak populations, occurs on a much longer timeframe.
<p>Projected or suspected percent reduction or increase in total number of mature individuals over the next 10 years or 3 generations.</p>	Unknown but but the number of mature individuals is expected to increase in the short term due to expanding Spruce Budworm outbreaks
<p>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.</p>	Unknown but but the number of mature individuals is expected to increase in the short term due to expanding Spruce Budworm outbreaks
<p>Are the causes of the decline (a) clearly reversible, and (b) in part, and (c) ceased?</p>	<p>a. In part b. Yes c. No</p> <p>The most important known limiting factor (Spruce Budworm outbreaks) is clearly reversible as a natural process, but has not ceased.</p> <p>The other threats are probably not reversible, are not well understood</p>

Demographic attribute	Value
	and have probably not ceased.
Are there extreme fluctuations in number of mature individuals?	Yes – fluctuations in boreal tree seed crop production (2-3 year cycle); Spruce Budworm outbreaks (25-40 year cycle).

### Extent and occupancy information in Ontario

Extent and occupancy attributes	Value
Estimated extent of occurrence (EOO).	Approximately 850,000 km <sup>2</sup> (using Google maps and based upon the range map in COSEWIC (2016))
Index of area of occupancy (IAO). Estimation based upon COSEWIC (2016) method of estimated Ontario population (500,000) divided by an estimated average 5 pairs/ km <sup>2</sup> .	Estimated as 100,000 km <sup>2</sup> (certainly much greater than 2000 km <sup>2</sup> ).
Is the total population severely fragmented? i.e., is >50% of its total area of occupancy is in habitat patches that are: (a) smaller than would be required to support a viable population, and (b) separated from other habitat patches by a distance larger than the species can be expected to disperse?	a. No b. No
Number of locations.	Unknown but certainly greater than 10
Number of NHIC Element Occurrences	Not available
Is there an observed, inferred, or projected continuing decline in extent of occurrence?	No, not in short term
Is there an observed, inferred, or projected continuing decline in index of area of occupancy?	No, not in short term
Is there an observed, inferred, or projected continuing decline in number of populations?	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?	No, a probable short-term increase due to Spruce Budworm infestations
Are there extreme fluctuations in number of populations?	Yes
Are there extreme fluctuations in number of locations?	Unknown but likely
Are there extreme fluctuations in extent of occurrence?	Unknown but likely

<b>Extent and occupancy attributes</b>	<b>Value</b>
Are there extreme fluctuations in index of area of occupancy?	Unknown but likely

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

<b>Sub-population (or total population)</b>	<b>Number of mature individuals</b>
Ontario	An estimated total breeding season population of 500,000 (Rocky Mountain Bird Observatory 2013)

Quantitative analysis (population viability analysis conducted)

No population viability analysis has been conducted.

Threats

Threats calculator was prepared. Potential threats discussed in section 1.5.

Rescue effect

<b>Rescue effect attribute</b>	<b>Value</b>
Status of outside population(s) most likely to provide immigrants to Ontario	An estimated 200,000 birds in Manitoba (S3), an estimated 500,000 in Québec (S4) (COSEWIC 2016). Populations in adjacent NY, VT, NH, ME reportedly expanding by >1.5% per year over the long term.
Is immigration of individuals and/or propagules between Ontario and outside populations known or possible?	Yes, known and highly probable
Would immigrants be adapted to survive in Ontario?	Yes
Is there sufficient suitable habitat for immigrants in Ontario?	Probably
Are conditions deteriorating in Ontario?	Probably not
Is the species of conservation concern in bordering jurisdictions?	Considered Special Concern in Canada (COSEWIC 2016). Manitoba – S3 Québec - S4 Michigan - S5 Minnesota – SNR New York – S5 Ohio – SNR

<b>Rescue effect attribute</b>	<b>Value</b>
	Pennsylvania – S5 Wisconsin - S2S3B
Is the Ontario population considered to be a sink?	No
Is rescue from outside populations likely?	Yes

**Sensitive species**

Does not apply

## Appendix 2: Adjoining jurisdiction status rank and decline

Information regarding rank and decline for Evening Grosbeak  
(*Coccothraustes vespertinus*)

Jurisdiction	Subnational rank	Annual population trend (1966-2015)	Annual population trend (2005-2015)	Sources
Ontario	S4B	-7.4%	-9.6%	USGS (2017), NatureServe (2017)
Quebec	S4	-6.48%	-5.04%	USGS (2017), NatureServe (2017)
Manitoba	S3	-9.14%	-8.69%	USGS (2017), NatureServe (2017)
Michigan	S5	-4.66%	-5.41%	USGS (2017), NatureServe (2017)
Minnesota	SNRB, SNRN	-3.35%	-3.07%	USGS (2017), NatureServe (2017)
Nunavut	Not ranked	Not applicable	Not applicable	Not applicable
New York	S5	-3.06%	-12.16%	USGS (2017), NatureServe (2017)
Ohio	SNRN	NA	NA	NatureServe (2017)
Pennsylvania	S5N	Primarily a winter visitor, a rare breeder, irruptions into PA have become rarer and less frequent since 1990s		McWilliams and Brauning (2000), NatureServe (2017)
Wisconsin	S2S3B	-2.25%	-4.64%	USGS (2017), NatureServe (2017)

### Acronyms

BBA: Breeding Bird Atlas

BBS: Breeding Bird Survey

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

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

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

OBBA: Ontario Breeding Bird Atlas

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

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