The resurgence of Evening Grosbeak *Coccothraustes vespertinus:*

A 2024-2025 winter revival in Boileau, Québec

A Research Study

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*This is a non-peer reviewed preprint submitted to EcoEvoRxiv

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Photo courtesy: Jimmy Videle, La ferme de l'Aube site, December 2024

Abstract

The Evening Grosbeak is widely distributed across Canada's forests but has exhibited significant long-term declines (77-90%) over most of its range since 1970. Project FeederWatch data gathered between 1988 and 2006 indicated a significant survey wide decline in the mean flock size, 27% in 18 years. The number of sites reporting any sighting plunged 50%. Breeding bird survey (BBS) data indicate that the Québec population fell by close to 75% between 1990 and 2014. Data from the Christmas Bird Count, throughout North America, confirm the impressions of long-time birdwatchers that numbers are plummeting dramatically.

A 2024-2025 winter research study at the Boileau Biodiversity Reserve-La Ferme de l'Aube site was undertaken to document the population of Evening Grosbeaks. They were observed 100% of survey days with a mean population size of 74.106. From the first winter period observed (2018-2019), the population increased by a dramatic 894%. This resurgence embedded this site as the most important winter residency for Evening Grosbeak, throughout North America in '24-'25, and perhaps the most significant anywhere in the last 10 years.

Introduction

The Evening Grosbeak is widely distributed across Canada's forests but has exhibited significant long-term declines (77-90%) over most of its range since 1970 (Sara 2022). Project FeederWatch data gathered between 1988 and 2006 indicated a significant survey wide decline in the mean flock size recorded over time. The proportion of sites reporting Evening Grosbeaks plunged by 50% in 18 years. At locations where the species continued to be seen, mean flock size declined by 27% (11.8 in 1989-1994 to 8.6 in 2001-2006). Similarly, analysis of data from 391 sites reporting data for at least ten consecutive years indicated significant declines in their abundance at 76 sites and increases at no sites (Bonter et al 2008). Breeding bird survey (BBS) data indicate that the Québec population of the Evening Grosbeak fell by close to 75% between 1990 and 2014, which is strongly corroborated by the Québec Breeding Bird Atlas results. Data from the Christmas Bird Count, throughout North America, confirm the impressions of long-time birdwatchers that numbers have fallen since the early 1990's (Robert et al 2019).

Population estimates vary greatly. The estimates range from 3.8 million (Partners in Flight, 2020) to 16 million (Boreal Avian Modeling Project 2020). Though the former relies on BBS data, the latter relies on modeling of species density in relation to environmental variables. The IUCN Red-List of Threatened Species latest assessment puts the population estimate at the lowest range and has classified them as vulnerable (IUCN, 2018). It is presumed that 53% of the global population size resides in Canada, with Québec being a major stronghold (SARA 2022). Once incredibly abundant, statistics professor Fred Ramsey from Oregon State University was impressed by the large grosbeak flocks. Using a randomized sampling survey in elm trees he estimated 150,000-250,000 Evening Grosbeaks were foraging on one mid 1970's spring day. The numbers have dropped precipitously since then, for a 2013-2015 statistical survey at the

same site showed a few hundred in the lowest year to less than 5,000 in the highest (Robinson et al 2022). The consensus from throughout North America is clear; populations are plummeting.

The reasons for the decline of the Evening Grosbeak are unclear, though both the IUCN and SARA have identified three major threats creating a loss of forest cover: housing and urban areas; roads and railroads; and logging & wood harvesting. They rely upon boreal forest as their breeding grounds and are heavily reliant on invertebrates as their food source, with up to 80% being spruce budworm larvae and pupae (COSEWIC 2016). In the winter they are an irruptive species traveling south from their breeding grounds and descending on deciduous forested areas when there is a low seed cone crop (Gillihan 2001). Observations within the survey area of the Boileau Biodiversity Reserve agree for the most part with these assessments. However, we would include excessive noise from off-road four-wheel use due to winter hunting and trapping as a major threat, based on their gregarious, though somewhat nervous and shy behavioral traits. The significance of well-stocked black oil sunflower seed stations in the winter months give a possibility to document populations of this declining species wherever they may roam.

Methodology

The purpose of the winter 2024-2025 research study was to document the populations of Evening Grosbeaks through hourly surveys at dawn. The surveys were conducted at the La Ferme de l'Aube site within the Boileau Biodiversity Reserve. (45.946244, -74.807516). This 6-acre site is a ½ acre regenerative veganic farm, while the remainder is allowed to re-wild.

The winter solstice of 2024 fell on December 21st and the spring equinox arrived on the 20th of March, a total of 90 potential survey days. At first light, regardless of temperature (no matter if it was –30C), the grosbeaks would congregate in the Trembling Aspens and Sugar Maples. We would exit, also regardless of temperature, and fill the three black oil sunflower seed feeders which they would frequent. After filling, we would stand in two distinct locations to observe and record the populations of the flocks.

Interestingly, not all Evening Grosbeaks would descend upon the feeders. Many would, but others would converse with their brethren and fly off in any of the four directions to whatever foraging areas they sought. It was imperative to be in the locations at dawn, for within minutes of

the highest population numbers of the day; dispersal would occur, as appears to be the habit of this somewhat apprehensive species to human encroachment.

Results

The following chart shows the daily surveys of Evening Grosbeaks as recorded on E-bird (Ebird, 2025).

Evening Grosbeak surveys from December 21st, 2024, until March 20th, 2025

Date	# of individuals	Date	# of individuals	Date	# of individuals
12/21	20	12/22	24	12/23	26
12/24	36	12/25	25	12/26	44
12/27	48	12/28	56	12/29	26
12/30	53	12/31	64	1/1	54
1/2	55	1/3	86	1/4	45
1/5	67	1/8	60	1/10	65
1/11	65	1/12	53	1/15	83
1/16	52	1/17	106	1/18	82
1/22	72	1/23	57	1/24	71
1/25	75	1/26	91	1/29	67
1/30	73	1/31	101	2/1	91
2/2	104	2/5	102	2/6	101
2/8	118	2/9	93	2/12	119
2/13	104	2/14	101	2/15	96
2/16	103	2/19	56	2/20	77
2/21	110	2/22	87	2/23	133
2/26	93	2/27	**148**	2/28	116
3/1	127	3/2	70	3/3	79
3/4	56	3/5	65	3/6	91
3/7	86	3/8	51	3/12	40
3/13	57	3/14	74	3/15	91
3/18	47	3/19	40	3/20	63

During the survey period sixty-six surveys were recorded, 73.33% of possible days, and Evening Grosbeaks were recorded 100% of the time. Anecdotally, grosbeaks were observed every day of the 90-day survey period, but point-count surveys were not always conducted due to off-site engagements. A total of 4,891 individuals were observed, for a mean of 74.106 per day.

On fifteen different occasions, 100+ individuals were observed (22.73% of the time). Interestingly, this was the first year in history of the La Ferme de l'Aube site where 100+ individuals were observed.

Discussion

Because Evening Grosbeaks have been falling dramatically since 1990, it was important to chart the progression of them at the La Ferme de l'Aube site. Beginning in 2015, surveys have been undertaken during the winter solstice thru spring equinox period.

Number of Surveys, percentages and average number per survey of Evening Grosbeaks year on year

Winter Period	# of Surveys	% of surveys Evening Grosbeaks seen	Average Number per survey
2015-2016	20	0.00%	0.000
2016-2017	34	0.00%	0.000
2017-2018	8	0.00%	0.000
2018-2019**	14	71.43%	8.286
2019-2020	10	0.00%	0.000
2020-2021	13	100.00%	9.846
2021-2022	9	88.89%	7.889
2022-2023	81	100.00%	24.519
2023-2024	40	0.00%	0.000
2024-2025	66	100.00%	74.106

**First winter period observed

2018-2019 was the first period when Evening Grosbeaks were observed. Considering that fact, the mean population size increased 894% in 2024-2025. Which is why it can be called a resurgence. They are known to be a cyclical species as indicated from the 2019-2020 and 2023-2024 survey periods where they were not recorded at all. But five out of the last seven survey periods they were, with 2024-2025 being a very good year across Québec (Ebird, 2025).

Temperature and snowfall could have been a major factor, as the winter season was stated to have been a 'classic Québec winter'. The average temperature during the period was –8 Celsius (Maximum, -3.5; Minimum –12.5). And snowfall totals were 200cm.

Temperature averages and snowfall amounts December 21-March 20; last ten years

Years	**Temperature Avg. (Max, Min.**	**Snowfall**
2015-2016	-4.75C (0.5C, -10C)	211cm
2016-2017	-5.5C (-1.5C, -9.5C)	135cm
2017-2018	-7.75C (-2.5C, -13C)	158cm
2018-2019	-9.5C (-4C, -15C)	220cm
2019-2020	-5.75C (-1C, -10.5C)	170cm
2020-2021	-6.25C (-1C, -11.5C)	156cm
2021-2022	-9.25C (-3.5C, -15C)	169cm
2022-2023	-5.25C (-1.5C, -9C)	266cm
2023-2024	-4.25C (0.5C, -9C)	139cm
2024-2025	-8.0C (-3.5C, -12.5C)	200cm
10-year average	*-7.12C (-1.75C, -12.5C)*	*182cm*

Analyzing the average snowfall reveals a correlation, of heavy snowpack and Evening Grosbeak population. Three of the five years when they were observed the snowfall totals eclipsed 200cm.

Extrapolating all the data further, looking through all ebird records, considering the number of days Evening Grosbeaks were observed, average number of individuals, and days 100+ were seen, the La Ferme de l'Aube site was the most significant location in all of Québec, Canada, and throughout all North America in 2024-2025. Further, it was most likely the most significant winter residency anywhere in the last ten years.

Conclusions

It cannot be understated how important winter backyard feeding stations are for the Evening Grosbeak within their range. Depending on seed cone production, which like the avian species themselves, is cyclical. Yet consistent refilling of black oil sunflower seed day-after-day, year-after-year, may trigger a memory response. Described as 'episodic-like memory', wild birds can discern "what" (food type); "where" (location); and "when" (time of day when foraging occurred (Davies et al. 2024). It does appear that occurred at the study site, given the fluxuations (drops and rises) in daily populations.

The importance of citizen science (i.e. e-bird or I-naturalist) data must be embraced. These data streams can cover a longer period of the year than BBS or CBC data sets. Researchers are starting to welcome this data and use it in their research articles (Neatte-Clegg et al 2020).

Considering that nowhere within Québec, Canada, or the rest of their North American range, was their winter presence greater than at the Boileau Biodiversity Reserve-La Ferme de l'Aube site in 2024-25, as well as in the last ten years, further research into the area is warranted. It is necessary to determine if the rewilding practices and low human intervention were one of the causes, as well as the diligent refilling of black oil sunflower seed.

References

Bonter, D.N., Harvey, M.G. 2008. *Winter Survey Data Reveal Rangewide Decline in Evening Grosbeak Populations*. The Condor: Ornithological Applications (110:2), 376-381

Boreal Avian Modelling Project. 2020. *BAM Generalized National Models Documentation, Version 4.0. Boreal Avian Modelling Project, Edmonton, AB*. https://borealbirds.github.io/. Last accessed: Results for Evening Grosbeak (Coccothraustes Vespertinus) September 2025.

Davies, J.R., Keuneke, L.S., Clayton, N.S., Davidson, G.L. 2024. *Episodic-like memory in wild free living blue tits and great tits*. Current Biology. (34:16), 3592-3602.e5.

EBird. 2025. *Evening Grosbeak (Coccothraustes Vespertinus) North America 2024-25 Observations*. Cornel Lab of Ornithology (EBird). https://ebird.org/lifelist/na?time=year&spp=evegro Last accessed September 13, 2025.

Gillihan, Scott W. and Bruce E. Byers. 2001. *Evening Grosbeak (Coccothraustes Vespertinus), version 2.0.* In The Birds of North America (P. G. Rodewald, editor) extracted from Cornell Lab All About Birds. Cornell Lab of Ornithology, Ithaca, New York, USA. https://www.allaboutbirds.org/guide/Evening_Grosbeak/lifehistory Last accessed September 13, 2025.

Government of Canada. 2016. *Evening Grosbeak (Coccothraustes Vespertinus): COSEWIC Assessment and Status Report 2016*. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/evening-grosbeak-2016.html#_04_1 Last accessed: September 7, 2025.

Government of Canada. 2022. *Management Plan for the Evening Grosbeak (Coccothraustes Vespertinus) in Canada 2022*. https://www.canada.ca/en/environment-climate-

change/services/species-risk-public-registry/management-plans/evening-grosbeak-2022.html Last accessed: September 7, 2025.

International Union for Conservation of Nature and Natural Resources (IUCN). 2025. *Evening Grosbeak (Coccothraustes Vespertinus)*. IUCN Red List of Threatened Species. https://www.iucnredlist.org/species/22720702/131500502 Last accessed: September 7, 2025.

Neate-Clegg, M.H.C., Horns, J.J., Adler, F.R., Aytekin, M.C.K., Sekercioğlu, C.H. 2020. *Monitoring the world's bird populations with community science data*. Biological conservation. Volume 248, 108653

Partners in Flight. 2020. *Population Estimates Database, version 3.1*. (Extracted from Cornell Lab All About Birds). Fort Collins, CO. https://www.allaboutbirds.org/guide/Evening_Grosbeak/lifehistory Last accessed: September 13, 2025.

Robert, M., M.-H. Hachey, D. Lepage, and A. R. Couturier (eds.). 2019. *Second Atlas of the Breeding Birds of Southern Quebec*. Regroupement QuebecOiseaux, Environment and Climate Change Canada and Bird Studies Canada. Montreal, QC. 720 pp.

Robinson, Douglas W., Greer, J., Masseloux, J., Hallman, T.A., Curtis, J.R. 2022. *Dramatic Declines of Evening Grosbeak at a Spring Stop-Over Site*. Diversity. 14(6). 496.