

Recent amendments to the *Endangered Species Act* and an uncertain future for species at risk: a case study of Ontario's Niagara Region

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Abstract

The biodiversity crisis is a pressing global issue. In Ontario, Canada, species at risk are protected under the *Endangered Species Act* (2007). The current government amended that legislation through the *More Homes, More Choice Act* (2019), leaving species at risk with an uncertain future. This paper uses the Niagara Region as a case study and relies on interviews and data collection about listed species to illuminate the possible implications for the new amendments. The results indicate a total of 71 species at risk that exist in the Region, with as many as 37 species that could be delisted and stripped of protection under the recent changes. There is also concern around the prioritization of the economics over science in the amendments. While uncertainty surrounding the implementation of the amendments to the Ontario *Endangered Species Act* exists, there is agreement that species at risk should be protected.

Key words: *Endangered Species Act*, species at risk, Ontario, *More Homes*, *More Choice Act*

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Introduction

We are currently living in the sixth mass extinction of biodiversity where species are going extinct as a result of anthropogenic activities (Briggs 2017; Ceballos et al. 2017). Globally, land-use change and the overexploitation of Earth's natural resources are the greatest drivers contributing to the disruption of ecosystems (IPBES 2019). According to the latest United Nations report on biodiversity loss, roughly one million species are at risk of extinction and many of them within decades (IPBES 2019). As humans continue to accelerate biodiversity loss, species will perish, food chains will be disrupted, and ecosystems could be severely impacted. In light of this, humans must be part of the solution by protecting nature now and in the future.

Ontario is one of only eight subnational jurisdictions¹ in Canada to have existing species at risk (SAR) legislation (Olive 2014). Its 2007 *Endangered Species Act* (hereafter the OESA or the Act) is intended

¹The jurisdictions include six provinces and one territory: Ontario, Nova Scotia, Manitoba, Quebec, Newfoundland and Labrador, New Brunswick, Nunavut, and the Northwest Territories.

to protect and recover at-risk species and their critical habitats. The Act, often touted as the strongest SAR legislation in all of Canada (Olive and Penton 2018), requires the development of recovery strategies for threatened and endangered species that specify measures to restabilize populations and secure habitat (Ontario 2020a, 2020b, 2020c). Species are classified as endangered, threatened, special concern, extirpated, or not at risk by an external scientific body, known as the Committee on the Status of Species at Risk in Ontario (COSSARO). Data for year-end 2020 indicate that 243 species are listed on the official Species At Risk in Ontario (SARO) List, with 117 classified as endangered, 54 as threatened, 56 as special concern, and 16 as extirpated (Ontario 2020a, 2020b, 2020c). Of the 243 SAR in Ontario, only 158 recovery strategies have been published (Ontario 2020a, 2020b, 2020c).

In February 2019, the Progressive Conservative government announced that it would make changes to the OESA, with several amendments potentially resulting in serious consequences to SAR. Bill 108, eventually tabled as the *More Homes, More Choice Act, 2019*, outlined significant amendments including:

- Developers paying into a conservation fund rather than meeting proper requirements to build on species at risk habitat
- Expanding the assessment of species at risk on the COSSARO committee to include individuals with “community knowledge”
- Determining the assessment of species at risk based on their global geographical range rather than their status in Ontario
- Ministry of Environment and Conservation Parks (MECP) will have the power to suspend newly added species at risk from receiving protections for up to five years
- Species at risk may not receive automatic protection if they are listed as endangered or threatened (see Bell 2019; Wood Bull Blog 2019)

These amendments suggest the government is prioritizing economic gains while neglecting the long-term environmental and social consequences of minimizing conservation efforts (Bergman et al. 2020; Rutledge 2020). These changes could potentially pose serious threats to SAR in Ontario for several reasons. First, it changes the permit and agreement process for development projects that impact habitat and SAR (Wood Bull Blog 2019; Bergman et al. 2020). The responsible Minister can now issue a permit to an individual for an activity that would have been prohibited if that individual agrees to pay a species conservation fee. Similarly, the Act amended the ESA to include landscape agreements in which a proponent can harm habitat in a designated geographic area by agreeing to carry out “specified beneficial actions” that will assist with the protection or recovery of one or more species specified in the agreement. In some cases, these agreements may also require the proponent to pay a species conservation fee (Wood Bull Blog 2019). While it is true that developers could recreate or remediate habitat suitable for a species in a different location, these amendments still open the door to habitat destruction and signal that developers can buy their way out of obeying the OESA.

Second, allowing individuals with community knowledge to have a say in whether a species is classified as at risk (including as endangered, threatened, or special concern) could shift the decision-making process from a scientific one to a political or economic one. New members are not required to have extensive background in ecology or conservation biology. The previous members sitting on the COSSARO committee were those with expertise in Western science and (or) Aboriginal traditional ecological knowledge (Olive 2014). The new amendments do not clearly define “community knowledge” but it could mean industry and developer representatives, whose agenda is different than that of other members on the committee, will be invited to join COSSARO and participate in the classification of Ontario’s flora and fauna.

Third, if COSSARO classifies a species based on its geographic range rather than its population status in Ontario, it could become very difficult to list any new species on the SARO List. While COSSARO used to only consider species population numbers in provincial boundaries, it must now consider the species' global range. Moreover, the Ontario government can request that COSSARO reassess currently listed species at any time. Thus, COSSARO may find that many species, like the Bobolink (*Dolichonyx oryzivorus*) or Lake Erie Water Snake (*Nerodia sipedon insularum*) (which have already been listed), have stable global populations and thus do not qualify anymore for protection in Ontario even though the local population numbers are decreasing. Essentially, this amendment provides a way for the Ontario government to avoid protecting species while ignoring the possibility that if a species were to be extirpated from Ontario, it could drastically affect the existing food web and could threaten the survival of other organisms (Malmstrom 2010). It could also lead to the loss of genetically distinct populations, and it clearly pushes responsibility for the survival of species to other jurisdictions (some of which may not have SAR legislation).

Fourth, making endangered species wait up to five years to receive protection is a long period of time since species populations could rapidly decline even further, and this would increase the risk of them being extirpated in Ontario. Often a species is listed because it needs immediate protection of its critical habitat. For instance, in Australia, the Orange-bellied parrot (*Neophema chrysogaster*) barely survived extinction because immediate action was taken to protect the rapidly declining species (Martin et al. 2012). A five-year window allows for a lot of potentially irreversible harm to occur to the species and (or) its habitat.

On 6 June 2019, Bill 108, *More Homes, More Choice Act*, received Royal Assent (approval of the bill by the Lieutenant Governor on behalf of the Queen), but there has been no further update regarding the matter (Legislative Assembly of Ontario 2019). The resulting amendments to the OESA pose a significant challenge to conservation efforts in Ontario. Effective legislation can play an important role in protecting SAR. When assessing the progress of species recovery in the United States between 1990 and 2010, 35% of the listed species under the *Endangered Species Act* were seen as stable, while 8% were improving (Evans et al. 2016).

To date, only one study has examined the *More Homes, More Choice Act* amendments in detail. Bergman et al. (2020) published an Editorial in *FACETS* that outlined the main concerns that scientists have about the amendments. These include (i) potential dilution of COSSARO membership, (ii) lower threat category based on geographic range, (iii) increased delays in protection, (iv) landscape agreements that allow broadscale harm to SAR, and (v) the SAR Conservation Trust. We use these concerns as a starting place for this paper. The scientists feel that "the changes to Ontario's ESA substantially reduce protections designed to preserve Ontario's biodiversity." Here we assess the empirical evidence to support these claims.

To examine the impact of the *More Homes, More Choice Act* on the OESA and SAR in Ontario, this paper uses the Niagara Region in Ontario, Canada, as a case study. Southern Ontario is heavily populated both in terms of humans and SAR, with "one in three Canadians" residing in the region and "over one-third of Ontario's species at risk" (David Suzuki Foundation and Ontario Nature 2011). The Niagara Region is located in Southern Ontario near the border of the United States and contains 12 municipalities.² As of 2016, the region's population is 447 888, with St. Catharines containing the greatest number of residents at 133 113 (Niagara Region n.d.) (Fig. 1).

²Municipalities include: Fort Erie, Grimsby, Lincoln, Niagara Falls, Niagara-On-The-Lake, Patham, Port Colborne, St. Catharines, Thorold, Wainfleet, Welland, and West Lincoln.



Fig. 1. Map of Ontario with Niagara Region in red (commons.wikimedia.org/wiki/File:Map_of_Ontario_NIAGARA.svg).

The Niagara Region is a popular tourist destination and around 20 million people visit the region annually mostly because of Niagara Falls (Penney 2012). The region is also part of the Carolinian forest zone, which holds the most plant and animal species compared to all other ecosystems across Canada (Penney 2012). The Carolinian zone is home to 40% of Canada's native plants, 50% of their birds, and 66% of their reptiles (Jalava et al. 2015). Several bodies of water surround the Niagara Region, providing wetland habitats to the many SAR that rely on them for survival. Additionally, wetlands provide ecosystem services including water purification, flood protection, and they help to mitigate climate change (Environmental Commissioner of Ontario 2018a). Southern Ontario has lost over 72% of its wetlands (Environmental Commissioner of Ontario 2018b), and over 85% of Niagara's original wetlands have been altered for human use (Ontario Biodiversity Council 2015). In Southern Ontario, the ecosystem services that wetland habitats generate are valued at over \$51 billion (Bell 2016).

Increasing urbanization and the resulting economic growth in the Niagara Region is concerning from a conservation standpoint. If habitat is not protected, ecosystems can collapse. Protected areas can aid in protecting species from human activities, allow for stable species populations, and maintain healthy ecosystems (Scott et al. 2001). Moreover, economic growth, such as more homes for human beings, can also have indirect impacts on species and habitat through consequences including climate change and invasive species (Otero et al. 2020). This makes the Niagara Region a good case study in examining the tensions between human homes and nature's home.

The overarching goal of this research is to understand how the amendments to the OESA could impact SAR in the Niagara Region of Ontario. This paper argues that the *More Homes, More Choice Act* weakens protections for SAR and puts them at an increased risk of extinction. As described in the next section, we use data obtained through interviews with regional experts to offer insight into what the changes to the Act are and why minimizing extinctions in Ontario should matter to humans and society. While this study examines only a small region of southern Ontario, the findings are relevant to other regions where changes to the OESA could weaken species protection. The central issues

that our data highlight are that the recent amendments make it harder to list and protect Ontario's species while simultaneously prioritizing economic growth over biodiversity conservation.

Methods

The overarching research question of this study is: How might the 2019 changes to the OESA affect SAR in the province? The Niagara Region serves as a case study to develop an understanding of how species could be impacted by the amendments. We rely on a two-fold method to understand implications of the *More Homes, More Choice Act*. We created a database of potentially impacted species, and we conducted semi-structured interviews with participants who are knowledgeable about the policies and SAR. These methods will be briefly outlined below.

Species database in the Niagara Region

We assembled a list of SAR in the Niagara Region to understand their habitat needs and how many of them are threatened by the new changes to the OESA. We first consulted the federal Species at Risk Public Registry³ ([Government of Canada 2020](#)) and searched for species with range in Ontario and then systematically examined specified habitat to determine geographic range in the Niagara Region. We cross-checked this against the Ontario SARO list ([Ontario 2020a, 2020b, 2020c](#)) to ensure the species was listed in the province. Finally, we determined each species' global status using [NatureServe \(2020\)](#) and the International Union for Conservation of Nature (IUCN) Red List ([IUCN 2020](#)). NatureServe Explorer is a tool that provides the global and national statuses of a species. NatureServe ranks species from "G5" which they list as "secure" to "GX" where the species is presumed extinct.⁴ This step consisted of recording the species' statuses and noting the rounded rank for species that were provided a Range Rank.⁵ For instance, if a species were to be ranked G4G5, it would be rounded to G4.⁶

Interviews

Semi-structured interviews were conducted to better understand the importance of biodiversity in the region (and province) as well as how SAR might be impacted by the OESA changes.⁷ With institutional review board approval, we sent an email requesting an interview to 28 individuals within three broad groups of experts. First, we contacted government organizations, including individuals who work for the Niagara Peninsula Conservation Authority (NPCA) and workers in municipalities across the Niagara Region. This also included members of the municipal planning departments and the recreational departments since they would be familiar with SAR, protected areas, and economic development. Second, we contacted members involved in the Niagara River Remedial Action Plan ([Government of Canada 2019](#)) to discuss how SAR are being managed in the Niagara River as well as the status of SAR in other municipalities across the region. Third, we contacted nonprofit

³The species at risk public registry contains files about the plant and animal species at risk in Canada. It includes species information, status reports, recovery strategies, permits, latest news, and consultation documents concerning the species.

⁴G5 = Secure; G4 = Apparently Secure; G3 = Vulnerable; G2 = Imperiled; G1 = Critically Imperiled; GH = Possibly Extinct; GX = Presumed Extinct/Presumed Collapsed; GU = Unrankable.

⁵Range Rank is a numeric range rank (e.g., G4G5) that is used to indicate uncertainty about the exact status of a taxon or ecosystem type, whether it be G4 or G5. If a species were ranked as "G#G#", NatureServe Explorer provides a rounded status ranking.

⁶This analysis is intentionally conservative because it rounds categories down (as opposed to up). If a species is listed a G4G5 we round down to G4. However, if one wanted to de-list a species, they could round up to G5 instead to make the point that the species does not need to be listed in Ontario.

⁷See interview questions in the [Supplementary Material 1](#).

organizations that focus heavily on SAR as well as people within those organizations who could speak to the policy changes to the OESA.

Interviews took place via phone, lasting up to 45 min. See [Supplementary Material 1](#) for a list of questions. In total, only six interviews were conducted, which is a very limited data set. We interviewed three government representatives and three nongovernmental representatives. No NPCA employees were willing to discuss changes to OESA and the potential impacts to biodiversity. Also of note, we contacted the Provincial Species at Risk Team in the Ministry of Environment, but no one from the office was willing to participate in an interview. Instead, we received a generic email stating their support for the new OESA and referring us to a website for more information. Despite these gaps, we feel that the six individuals who participated in the study were each very knowledgeable about the region and about the OESA. We heard the same concerns and issues raised by the interviewees and believe that more interviews would only confirm the data as opposed to providing new information.

Results

The results of our study are divided into two sections. First, we examine the results of the species list to illustrate the number of species that could be impacted by the OESA amendments. Second, we present the results of the interviews to contextualize the species list and to further expand on other possible implications of the OESA.

Potentially impacted species at risk

We identified 71 SAR in the Niagara Region that are listed as threatened or endangered and are protected under the 2019 pre-amended OESA (see [Table A1](#)). More importantly, as many as 37 of those species have a globally stable population. This includes 3 amphibians, 11 birds, 2 fish, 1 lichen and moss, 1 mollusc, 16 plants, and 3 reptiles (see [Table 1](#)). We arrive at this number by using the IUCN and NatureServe databases. Under the IUCN, 35 species are listed as least concern (i.e., their global population is stable), and NatureServe indicates that 37 of the 71 SAR are listed as “G5,” which is ranked as being a globally stable species.

These 37 species would not be listed on the OESA if assessed by COSSARO today given the amendments under the *More Homes, More Choice Act*. Moreover, when COSSARO reassesses these species, it may delist them from the Act on the basis that their geographic range outside Ontario is stable. Indeed, the new amendments enable the government to “require COSSARO to reconsider the classification of a species where the Minister is of the opinion that credible scientific information indicates that the classification *may not be* appropriate” ([Wood Bull Blog 2019](#)). This means, for example, the Bobolink (*Dolichonyx oryzivorus*), a small blackbird, recognized as “G5” under the NatureServe Explorer and is listed as “least concern” under the IUCN Red List, could be removed from the OESA if COSSARO is required to reassess its classification. This would be similar for all 37 species in [Table 1](#). The end result of the amendments is that it is more difficult to list new species and as many as 37 species in the Niagara Region could be delisted if reclassified by COSSARO.

In addition to these 37 species, we also note that 21 species are ranked as G4 (Apparently Secure) by The NatureServe Explorer. One species, the Jefferson salamander dependent population (*Ambystoma laterale*-(2) *jeffersonianum*), is listed as “GU” since their status could not be determined. See [Table A1](#). These 21 species could also be impacted by the OESA amendments, but it is less clear because their IUCN status and Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status are less consistent—sometimes indicating the species is not secure globally or in Canada.

Table 1. Ontario-listed species at risk in Niagara Region ranked as “G5” under NatureServe.

Taxon	Common name	Scientific name	SARO status	NatureServe status (rounded)	IUCN Red List status
Amphibian	Allegheny Mountain Dusky Salamander	<i>Desmognathus ochrophaeus</i>	Endangered	G5	Least concern
Amphibian	Fowler’s Toad	<i>Anaxyrus fowleri</i>	Endangered	G5	Least concern
Amphibian	Northern Dusky Salamander	<i>Desmognathus fuscus</i>	Endangered	G5	Least concern
Bird	Acadian Flycatcher	<i>Empidonax virescens</i>	Endangered	G5	Least concern
Bird	Bank Swallow	<i>Riparia riparia</i>	Threatened	G5	Least concern
Bird	Barn Owl	<i>Tyto alba</i>	Endangered	G5	Least concern
Bird	Barn Swallow	<i>Hirundo rustica</i>	Threatened	G5	Least concern
Bird	Bobolink	<i>Dolichonyx oryzivorus</i>	Threatened	G5	Least concern
Bird	Eastern Meadowlark	<i>Sturnella magna</i>	Threatened	G5	Near threatened
Bird	Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	Threatened	G5	Near threatened
Bird	Louisiana Waterthrush	<i>Parkesia motacilla</i>	Threatened	G5	Least concern
Bird	Prothonotary Warbler	<i>Protonotaria citrea</i>	Endangered	G5	Least concern
Bird	Red-Headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Special Concern	G5	Least concern
Bird	Yellow-breasted Chat	<i>Icteria virens</i>	Endangered	G5	Least concern
Fish	Black Redhorse	<i>Moxostoma duquesnei</i>	Threatened	G5	Least concern
Fish	Lake Chubsucker	<i>Erimyzon sucetta</i>	Threatened	G5	Least concern
Lichens and Mosses	Spoon-leaved Moss	<i>Bryoandersonia illecebra</i>	Endangered	G5	N/A
Mollusc	Lilliput	<i>Toxolasma parvum</i>	Threatened	G5	Least concern
Plant	American Columbo	<i>Frasera caroliniensis</i>	Endangered	G5	N/A
Plant	American Water-willow	<i>Justicia americana</i>	Threatened	G5	Least concern
Plant	Bird’s-foot Violet	<i>Viola pedata</i>	Endangered	G5	N/A
Plant	Cherry Birch	<i>Betula lenta</i>	Endangered	G5	Least concern
Plant	Cucumber Tree/Magnolia	<i>Magnolia acuminata</i>	Endangered	G5	Least concern
Plant	Deerberry	<i>Vaccinium stamineum</i>	Threatened	G5	N/A
Plant	Drooping Trillium	<i>Trillium flexipes</i>	Endangered	G5	N/A
Plant	Dwarf Hackberry	<i>Celtis tenuifolia</i>	Threatened	G5	N/A
Plant	Eastern Flowering Dogwood	<i>Cornus florida</i>	Endangered	G5	Least concern
Plant	Four-leaved Milkweed	<i>Asclepias quadrifolia</i>	Endangered	G5	N/A
Plant	Pink milkwort	<i>Polygala incarnata</i>	Endangered	G5	N/A
Plant	Purple Twayblade	<i>Liparis liliifolia</i>	Threatened	G5	Least concern
Plant	Red Mulberry	<i>Morus rubra</i>	Endangered	G5	Least concern
Plant	Round-leaved Greenbrier	<i>Smilax rotundifolia</i>	Threatened	G5	N/A
Plant	Spotted Wintergreen	<i>Chimaphila maculata</i>	Threatened	G5	N/A
Plant	White Wood Aster	<i>Eurybia divaricata</i>	Threatened	G5	N/A

(continued)

Table 1. (concluded)

Taxon	Common name	Scientific name	SARO status	NatureServe status (rounded)	IUCN Red List status
Reptile	Queensnake	<i>Regina septemvittata</i>	Endangered	G5	Least concern
Reptile	Spiny Softshell	<i>Apalone spinifera</i>	Endangered	G5	Least concern
Reptile	Spotted Turtle	<i>Clemmys guttata</i>	Endangered	G5	Endangered

Note: SARO, Species at Risk in Ontario; IUCN, International Union for Conservation of Nature.

Results from interviews

The six interviewees provided important insight on the current state of development in the Niagara Region and help to contextualize the main threats to biodiversity. The focus of the interviews was on general threats to biodiversity in Niagara, Ontario, and Canada in the next 5–10 years as well as knowledge about the *More Homes, More Choice Act* and its implications for the region.

All of the respondents agreed that biodiversity is important and should not be disregarded in activities within the province. They agreed that species are important for the well-being of ecosystems, in addition to the ecosystem services they provide. Plus, several interviewees mentioned that humans are only one piece of the entire biodiversity system, and that the biodiversity crisis is a significant issue that humans need to address before it is too late.

With regard to local threats, the interviewees agreed that while most municipalities across Niagara are expanding and pursuing infrastructure projects, growth is mainly occurring within existing urban areas and along the shorelines. All interviewees connected this to a concern for biodiversity as they felt the changes to the OESA are expected to have a negative impact on SAR in Ontario. All of the respondents agreed that the 2007 Act provided important protections for species, but with the new amendments those protections have now been lost. One interviewee stated, “the only piece of legislation to put species at risk in the forefront of consideration was the OESA in its earlier form and now it’s a useless law. They stripped it to the point where most of the obligations that tend to the recovery of species is gone.”

When asked if Bill 108 was developed simply for economic purposes, all six interviewees agreed. Several interviewees explained that the changes are put in place to reduce “red tape” for developers, which the SAR and their habitat are recognized as being. By removing the “red tape”, developers will be able to access land that would have originally been protected under the OESA. This is evident through the pay-in-lieu fee amendment as well as the ability to prevent listing or potentially delisting species if their population is stable elsewhere outside of Ontario.

Another key theme emerging from the conversations was that interviewees remain unsure about the impact Bill 108 will have on SAR since it is still unclear about how the changes will actually be implemented. For instance, respondents found that the pay-in-lieu fund is a significant issue since it could allow developers to pay into a fund to work on land where SAR reside; however, they were hesitant about how the fund would help to protect SAR and which species it would support. Additionally, when asked about the long-term impacts of the new Act, it was difficult to foresee its impacts and whether it would lead to species extinction. Certainly, the changes to the OESA could impact species populations in Ontario, but in terms of the extent to which it could impact them is unclear.

When asking the experts about what they thought the worst change to the Act would be, the most frequent answer was that basing species status on their geographic range was alarming.

When explaining the impact of amending the OESA, one interviewee mentioned that the removal of protections will allow for human activities to significantly disrupt habitat to an even greater extent. They said, “when you remove these protections, you are going to see habitat degraded, destroyed, fragmented, disappear, and the animals and plants that are dependent on them will likewise start to decline.” Overall, these concerns from interviewees indicate the *More Homes, More Choice Act* results in amendments to the OESA that prioritize economic activities and discount the environmental impacts, such that biodiversity will continue to decline in Ontario.

Discussion

Our central research question is how might the 2019 amendments to the OESA affect SAR in the province? In a previous overview of the amendments by a group of scientists from Carleton University, [Bergman et al. \(2020\)](#), suggested there are five reasons to be concerned: (i) potential dilution of COSSARO membership, (ii) lower threat category based on geographic range, (iii) increased delays in protection, (iv) landscape agreements that allow broadscale harm to SAR, and (v) the SAR Conservation Trust. We found support mainly for reasons (ii), (iv), and (v). Indeed, our main finding, based on data collection about existing listed species as well as interviews with local actors, is that the amendments will have numerous implications, but the central concern is that the Ontario government has made it harder to list and protect species with a geographical distribution beyond provincial borders.

Specifically, we illustrate that as many as 37 currently listed species in the Niagara Region could be impacted by the 2019 classification amendment. That is an incredible array of species threatened with possible extinction in a small region of the province. There are 71 species from the Region listed on the OESA, but if COSSARO is asked to reassess those species—and the amendment enables the government to request reclassification—then 37 species could be delisted because their population numbers outside Ontario are potentially secure. Plants and birds, which constitute 53% of all listed species in Ontario, are facing the greatest likelihood of delisting in Niagara, with 73% having a globally secure population according to NatureServe (16 of the 37 species being plants and 11 being birds).⁸ To support this concern, we interviewed local experts in the Niagara Region, and the majority of interviewees felt that basing species classification on their global geographic range was the most alarming change to the OESA. There was suspicion from three interviewees that the provincial government is attempting to remove species from the SARO list, leading to less species that would require recovery strategies or any form of protection.

Our second finding, emerging from the interviews, is that the pay-in-lieu fee could have significant negative effects on the OESA. Here the amendment enables a party to conduct harmful activities to list species (and (or) habitat) if they make a financial payment to a new fund called the Species-at-Risk Conservation Fund. All six respondents were concerned about this change and had serious questions about how it will be implemented. The government has discretion over how the fund is used and which species will benefit. How can one claim that SAR will be protected while also claiming that developers can pay into a fund that would allow them to build on critical habitat for these species? The interviewees agreed that the changes to the Act are expected to negatively impact SAR as some of their protections have been removed. It also led the interviewees to conclude that the amendments are driven by economics and not science.

Third, we found that interviewees were very concerned about growth and development in the Niagara Region, especially in urban areas and along the shorelines. We examined our data set of the 71 listed

⁸Ontario has 77 plants, 44 birds, 31 fish, 23 insects, 23 reptiles, 21 molluscs, 16 mammals, 10 amphibians, and 4 lichen/mosses listed on the OESA.

species and acknowledge that many of these species have range in such areas. According to the recovery plans posted on the Ontario government website for listed species in the region, 11 species have been threatened by urban development, and four have been threatened by shoreline development⁹ (Ontario 2020a, 2020b, 2020c). We found that several species are also threatened by pollution and runoff from urban and agricultural activities. Specifically, aquatic species and ones that depend on wetlands for habitat, such as the Lilliput (*Toxolasma parvum*), can be threatened by this pollution. The *More Homes, More Choice Act* does not necessary amplify these risks to Niagara species, but as the name of the Act suggests, development is the goal. This is another example of how the economy is being prioritized over biodiversity, as feared by the interviewees.

Lastly, our study illustrates that government and nongovernmental organization actors see the Niagara Region as rich in biodiversity and believe that species need more protections, not less. Along with their intrinsic value, species can provide ecosystem services, such as water purification and providing recreational benefits to people (Millennium Ecosystem Assessment 2005). Recent studies have tried to quantify these ecosystem services in an attempt to depict their actual value in the market. For instance, the Greenbelt in Ontario provides approximately \$2.6 billion in ecosystem services annually (Wilson 2008). At a time when the biodiversity crisis is a significant global issue, the government should not remove key protection measures that are meant to help SAR. Instead, the government should address the causes that are impacting SAR, especially development activities that lead to habitat destruction. For example, wetlands need to be protected instead of being converted for development purposes. Forest cover should remain intact, especially in regions where many SAR reside. Bodies of water, such as the Niagara River, need to be remediated so the polluted water does not contaminate our drinking water. These are all serious threats for the SAR in the Niagara Region. While interviewees agreed it is too soon to evaluate the amendments since in many cases they have yet to be fully implemented in the region, there was still widespread concern that biodiversity will decline as a result of the *More Homes, More Choice Act*.

Therefore, based on a small case study of the Niagara Region, we concur with Bergman et al. (2020) that recent amendments to the threat category based on geographic range and the economic prioritization of development that allows for broadscale harm via a Conservation Trust is very concerning for biodiversity in Ontario. While our interviewees did not specifically discuss COSSARO membership¹⁰ or increased delays in protection, there was widespread concern that economics—as opposed to science—is now the basis for decision-making on SAR in the province.

Conclusion

This paper is a first step in providing some empirical data on what the 2019 *More Homes, More Choice Act* could mean for SAR in Ontario. That Act introduced at least five changes that scientists are worried about: (i) potential dilution of COSSARO membership, (ii) lower threat category based on geographic range, (iii) increased delays in protection, (iv) landscape agreements that allow broadscale harm to SAR, and (v) the SAR Conservation Trust (Bergman et al. 2020). While we examined only one region of the large province, we found good reason for the scientists' concern.

⁹Species threatened by urban development include: Barn Owl, Black Redhorse, Drooping Trillium, Jefferson Salamander, Lilliput, Northern Bobwhite, Pink Milkwort, Queensnake, Redside Dace, Round-leaved Greenbrier, and the Jefferson Salamander Dependent Population. Species threatened by shoreline development include: Fowler's Toad, King Rail, Least Bittern, and Pugnose Shiner.

¹⁰We acknowledge that "community knowledge" is an intentionally vague requirement of COSSARO membership. It could open the door to industry or development representatives joining the committee. However, it could also mean many individuals, like anglers, hunters, and fishers, who do have extensive knowledge of ecological systems, animal movement patterns, spawning season, etc. who are not scientific experts, but whose opinions are nonetheless valuable, could join COSSARO. More research is needed to track membership changes overtime.

In the Niagara Region alone, 37 species could be delisted if COSSARO—an agency that includes community members—is asked to assess species based on their entire geographic range as opposed to only their status in the province. We suspect this finding holds true for species in other regions of the province. The exact number of species that could lose protection across the province is unknown, but we now know the minimum is 37 species. Thus, just the change in classification—let alone the other amendments—could result in half of the listed species in this region losing their protection. The other amendments would likely compound this and could perhaps put even more species at risk. Future research should track COSSARO membership changes (as nonscientists join), classification decisions, and requests by the government to reassess currently listed species. We anticipate that fewer species will be listed moving forward and that some species will be delisted in the next few years as COSSARO is asked to assess classifications.

When first passed into law, the 2007 OESA was celebrated as the most stringent species-at-risk policy in Canada (Nixon et al. 2012; Olive and Penton 2018). Over time, exemptions and problems with implementation and enforcement eroded public trust and scientific confidence in the protection of SAR (Nixon et al. 2012; Olive 2014). However, the *More Homes, More Choice Act* was the first time that major amendments to the policy were legislated by government. It is important to note that the Progressive Conservative majority government did not to open up the OESA for discussion in the Legislative Assembly, but instead opted to make the amendments through an entirely different Act—one aimed at economic development that necessitated removing barriers, like SAR protection. While it may be true that Ontarians need homes, the *More Homes, More Choice Act* overlooks the basic scientific fact that SAR also need homes. Failure to find a sustainable balance will have detrimental effects for biodiversity, including humans, in Ontario.

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Author contributions

AB and AO conceived and designed the study. AB performed the experiments/collected the data. AB and AO analyzed and interpreted the data. AB contributed resources. AB and AO drafted or revised the manuscript.

Competing interests

Dr. Andrea Olive is one of the guest editors for the special collection.

Data availability statement

All relevant data are within the paper and Supplementary Material.

Supplementary material

The following Supplementary Material is available with the article through the journal website at doi:[10.1139/facets-2020-0074](https://doi.org/10.1139/facets-2020-0074).

Supplementary Material 1

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Appendix A

Table A1. Species at risk in the Niagara Region, historic and current.

Number	Type of species	Species at risk name	Latin name	SARO status	NatureServe status (rounded)	IUCN Red List status	COSEWIC status
1	Amphibian	Allegheny Mountain Dusky Salamander	<i>Desmognathus ochrophaeus</i>	Endangered	G5	Least concern	Endangered
2	Amphibian	Fowler's Toad	<i>Anaxyrus fowleri</i>	Endangered	G5	Least concern	Endangered
3	Amphibian	Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	Endangered	G4	Least concern	Endangered
4	Amphibian	Northern Dusky Salamander	<i>Desmognathus fuscus</i>	Endangered	G5	Least concern	Endangered
5	Amphibian	Unisexual Ambystoma (Jefferson salamander dependent population)	<i>Ambystoma laterale</i> -(2) <i>jeffersonianum</i>	Endangered	GU	N/A	Endangered
6	Bird	Acadian Flycatcher	<i>Empidonax virens</i>	Endangered	G5	Least concern	Endangered
7	Bird	Bank Swallow	<i>Riparia riparia</i>	Threatened	G5	Least concern	Threatened
8	Bird	Barn Owl	<i>Tyto alba</i>	Endangered	G5	Least concern	Endangered/Threatened
9	Bird	Barn Swallow	<i>Hirundo rustica</i>	Threatened	G5	Least concern	Threatened
10	Bird	Bobolink	<i>Dolichonyx oryzivorus</i>	Threatened	G5	Least concern	Threatened
11	Bird	Cerulean Warbler	<i>Setophaga cerulea</i>	Threatened	G4	Near threatened	Endangered
12	Bird	Chimney Swift	<i>Chaetura pelagica</i>	Threatened	G4	Vulnerable	Threatened
13	Bird	Eastern Meadowlark	<i>Sturnella magna</i>	Threatened	G5	Near threatened	Threatened
14	Bird	Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	Threatened	G5	Near threatened	Threatened
15	Bird	Henslow's Sparrow	<i>Ammodramus henslowii</i>	Endangered	G4	Least concern	Endangered
16	Bird	King Rail	<i>Rallus elegans</i>	Endangered	G4	Near threatened	Endangered

(continued)

Table A1. (continued)

Number	Type of species	Species at risk name	Latin name	SARO status	NatureServe status (rounded)	IUCN Red List status	COSEWIC status
17	Bird	Least Bittern	<i>Ixobrychus exilis</i>	Threatened	G4	Least concern	Threatened
18	Bird	Loggerhead Shrike	<i>Lanius ludovicianus</i>	Endangered	G4	Near threatened	Endangered
19	Bird	Louisiana Waterthrush	<i>Parkesia motacilla</i>	Threatened	G5	Least concern	Threatened
20	Bird	Northern bobwhite	<i>Colinus virginianus</i>	Endangered	G4	Near threatened	Endangered
21	Bird	Piping Plover	<i>Charadrius melodus</i>	Endangered	G3	Near threatened	Endangered
22	Bird	Prothonotary Warbler	<i>Protonotaria citrea</i>	Endangered	G5	Least concern	Endangered
23	Bird	Red-Headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Threatened	G5	Least concern	Endangered
24	Bird	Wood Thrush	<i>Hylocichla mustelina</i>	Special Concern	G4	Near threatened	Threatened
25	Bird	Yellow-breasted Chat	<i>Icteria virens</i>	Endangered	G5	Least concern	Endangered
26	Fish	American Eel	<i>Anguilla rostrata</i>	Endangered	G4	Endangered	Threatened
27	Fish	Black Redhorse	<i>Moxostoma duquesnei</i>	Threatened	G5	Least concern	Threatened
28	Fish	Channel Darter	<i>Percina copelandi</i>	Special Concern	G4	Least concern	Endangered
29	Fish	Eastern Sand Darter	<i>Ammocrypta pellucida</i>	Endangered	G4	Least concern	Threatened
30	Fish	Lake Chubsucker	<i>Erimyzon sucetta</i>	Threatened	G5	Least concern	Endangered
31	Fish	Lake Sturgeon	<i>Acipenser fulvescens</i>	Endangered	G3	Least concern	Threatened
32	Fish	Northern Madtom	<i>Noturus stigmosus</i>	Endangered	G3	Near threatened	Endangered
33	Fish	Pugnose Shiner	<i>Notropis anogenus</i>	Threatened	G3	Least concern	Threatened
34	Fish	Redside dace	<i>Clinostomus elongatus</i>	Endangered	G3	Least concern	Endangered
35	Insect	Monarch	<i>Danaus plexippus</i>	Special Concern	G4	N/A	Endangered
36	Lichens and Mosses	Spoon-leaved Moss	<i>Bryoandersonia illecebra</i>	Endangered	G5	N/A	Threatened
37	Mammal	Little Brown Myotis	<i>Myotis lucifugus</i>	Endangered	G3	Endangered	Endangered
38	Mammal	Northern Myotis	<i>Myotis septentrionalis</i>	Endangered	G1	Near threatened	Endangered
39	Mammal	Tri-Colored Myotis	<i>Perimyotis subflavus</i>	Endangered	G2	N/A	Endangered
40	Mollusc	Hickorynut	<i>Obovaria olivaria</i>	Endangered	G4	Least concern	Endangered
41	Mollusc	Kidneyshell	<i>Ptychobranhus fasciolaris</i>	Endangered	G4	Near threatened	Endangered
42	Mollusc	Lilliput	<i>Toxolasma parvum</i>	Threatened	G5	Least concern	Endangered
43	Mollusc	Round Pigtoe	<i>Pleurobema sintoxia</i>	Endangered	G4	Least concern	Endangered
44	Mollusc	Snuffbox	<i>Epioblasma triquetra</i>	Endangered	G3	Endangered	Endangered
45	Plant	American Chestnut	<i>Castanea dentata</i>	Endangered	G4	Critically endangered	Endangered
46	Plant	American Columbo	<i>Frasera caroliniensis</i>	Endangered	G5	N/A	Endangered

(continued)

Table A1. (concluded)

Number	Type of species	Species at risk name	Latin name	SARO status	NatureServe status (rounded)	IUCN Red List status	COSEWIC status
47	Plant	American Ginseng	<i>Panax quinquefolius</i>	Endangered	G3	N/A	Endangered
48	Plant	American Water-willow	<i>Justicia americana</i>	Threatened	G5	Least concern	Threatened
49	Plant	Bird's-foot Violet	<i>Viola pedata</i>	Endangered	G5	N/A	Endangered
50	Plant	Butternut	<i>Juglans cinerea</i>	Endangered	G4	Endangered	Endangered
51	Plant	Cherry Birch	<i>Betula lenta</i>	Endangered	G5	Least concern	Endangered
52	Plant	Cucumber Tree/Magnolia	<i>Magnolia acuminata</i>	Endangered	G5	Least concern	Endangered
53	Plant	Deerberry	<i>Vaccinium stamineum</i>	Threatened	G5	N/A	Threatened
54	Plant	Drooping Trillium	<i>Trillium flexipes</i>	Endangered	G5	N/A	Endangered
55	Plant	Dwarf Hackberry	<i>Celtis tenuifolia</i>	Threatened	G5	N/A	Threatened
56	Plant	Eastern Flowering Dogwood	<i>Cornus florida</i>	Endangered	G5	Least concern	Endangered
57	Plant	Four-leaved Milkweed	<i>Asclepias quadrifolia</i>	Endangered	G5	N/A	Endangered
58	Plant	Pink milkwort	<i>Polygala incarnata</i>	Endangered	G5	N/A	Endangered
59	Plant	Purple Twayblade	<i>Liparis liliifolia</i>	Threatened	G5	Least concern	Threatened
60	Plant	Red Mulberry	<i>Morus rubra</i>	Endangered	G5	Least concern	Endangered
61	Plant	Round-leaved Greenbrier	<i>Smilax rotundifolia</i>	Threatened	G5	N/A	Threatened
62	Plant	Small White Lady's-slipper	<i>Cypripedium candidum</i>	Endangered	G4	Vulnerable	Threatened
63	Plant	Spotted Wintergreen	<i>Chimaphila maculata</i>	Threatened	G5	N/A	Threatened
64	Plant	Virginia Mallow	<i>Sida hermaphrodita</i>	Endangered	G3	N/A	Endangered
65	Plant	White Wood Aster	<i>Eurybia divaricata</i>	Threatened	G5	N/A	Threatened
66	Reptile	Blanding's Turtle	<i>Emydoidea blandingii</i>	Threatened	G4	Endangered	Threatened
67	Reptile	Gray Ratsnake	<i>Pantherophis spiloides</i>	Endangered	G4	Least concern	Endangered/ threatened
68	Reptile	Massasauga (Carolinian population)	<i>Sistrurus catenatus</i>	Endangered	G3	Least concern	Endangered
69	Reptile	Queensnake	<i>Regina septemvittata</i>	Endangered	G5	Least concern	Endangered
70	Reptile	Spiny Softshell	<i>Apalone spinifera</i>	Endangered	G5	Least concern	Endangered
71	Reptile	Spotted Turtle	<i>Clemmys guttata</i>	Endangered	G5	Endangered	Endangered

Note: ICUN, International Union for Conservation of Nature; COSEWIC, Committee on the Status of Endangered Wildlife in Canada.