Species and Ecosystems at Risk in the Duffins Rouge Agricultural Preserve: Considerations for a Federal Cumulative Effects Study

Report researched and written by Karl Heide, M.Sc.

Submitted to
Environmental Defence Canada

April 20, 2023

Executive Summary

The Duffins Rouge Agricultural Preserve (DRAP) is a 17-square-kilometer area of farms, forests and wetlands situated on the east side of the Greater Toronto Area (GTA) between the Rouge River and Duffins Creek watersheds. Immediately to the west is the Rouge National Urban Park (RNUP), which extends from Lake Ontario to the headwaters of the Rouge River.

The Duffins Rouge Agricultural Preserve Repeal Act (2022) is a measure recently taken by the Ontario government to revoke the long-standing protections put in place for the DRAP under the Duffins Rouge Agricultural Preserve Act (2005). A number of concerns have arisen with regards to the impacts of the Repeal Act and any future development of these lands. In this report, I describe the anticipated effects of development that would occur in the DRAP on species listed under the federal Species at Risk Act (SARA), fisheries habitat, migratory birds, other lands protected under provincial legislation and overall biodiversity. I provide a review of the literature and, using data from a variety of sources, provide quantitative estimates, where possible, of the risks inherent if development of the DRAP lands was to proceed.

My desktop analysis revealed that opening the DRAP to development would negatively affect a minimum of 33 SARA listed species and 49 species of birds protected under the Migratory Birds Convention Act. The DRAP contains 14 stream tributaries, all of them fish-bearing and at least seven of them supporting coldwater benthic communities. Development would also impact up to 400 ha of forest and wetland in a headwater zone and compromise the ecological integrity of the nearby RNUP. In addition, the cumulative effects of ongoing urban expansion across the Golden Horseshoe is expected to result in widespread habitat fragmentation and the further degradation of many natural communities and at-risk species populations found in the DRAP, meaning that the value of these areas remaining intact will likely increase over time.

Based on my findings, I support the March 21, 2023 announcement by the federal Minister of Environment and Climate Change to require that the Impact Assessment Agency (IAA) conduct a thorough assessment of the expected impact of DRAP development on SAR, water quality, migratory birds, natural areas (including the federally-owned RNUP) and biodiversity. I recommend that the federal impact assessment include in its study the forecasted long-term contaminant levels within DRAP lands and downstream waterbodies under a range of infrastructure and climate scenarios and that these predictions account for cumulative impacts of other current and future development projects in the region. I emphasize the importance of ensuring that all natural lands within the DRAP are evaluated for their significance and protected accordingly. Finally, I encourage the IAA to revisit the need and scope of the proposed rezoning for housing and commercial development and to explore possible alternatives and mitigation measures.

TABLE OF CONTENTS

List of Acronyms

COSEWIC – Committee on the Status of Endangered Wildlife in Canada
DRAP – Duffins Rouge Agricultural Preserve
GTA – Greater Toronto Area
IAA – Impact Assessment Agency
IUCN – International Union for Conservation of Nature
NHIC – Natural Heritage Information Centre
OBBA – Ontario Breeding Bird Atlas
OMNMNRF – Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry
RNUP – Rouge National Urban Park
SARA – Species at Risk Act (Federal Legislation)
SARO – Species at Risk in Ontario (Provincial Legislation)

Section 1. Species at Risk under SARA

Consulting a variety of sources,[1] I compiled information on the habitat requirements and threats associated with wildlife Species at Risk under Schedule 1 of SARA known to occur in Southern Ontario. Where possible, I then used data from the Natural Heritage Information Centre (NHIC) to map element occurrences of these species at a 1-km resolution within, and very near (<1km), the Duffins Rouge Agricultural Preserve (DRAP). An element occurrence is a globally-recognized tool developed by the NatureServe network to identify where elements of biodiversity (species, vegetation communities or wildlife concentration areas) are found, or have been found, based on recent and historical vetted reports from a variety of sources.[2] As defined by NatureServe,[3] an element occurrence record is "a data management tool that has both spatial and tabular components including a mappable feature and its supporting database. EOs are typically represented by bounded, mapped areas of land and/or water." Element occurrences follow a set of standardized guidelines[4] and usually indicate that the element is known to regularly breed or persist in the given geographical area defined within a square (i.e., excludes migratory records and one-off breeding reports). In some cases, element occurrences may indicate geographical areas where the element was present until recently and where conservation efforts are likely to be fruitful in aiding recovery of the element due to favourable conditions. Element occurrences in Ontario are updated annually by the NHIC[5].

To test whether the NHIC element occurrences were accurate and current within the DRAP, I also analyzed and compared data from the past five years from eBird,[6] iNaturalist,[7] the Ontario Breeding Bird Atlas,[8] the Ontario Butterfly Atlas,[9] the Ontario Reptile and Amphibian Atlas,[10] the OMNMNRF [11] and recent COSEWIC status reports. In most cases, I found that the distributions of recent species detections from these data sources agreed closely with those of the NHIC element occurrences. For some rarer or harder-to-detect SARA listed species (e.g., Cerulean Warbler, Redside Dace), there were no detections from the past five years from the squares with element occurrences. However, element occurrences are designed to account for data deficiency of rare species and consider the quality of the habitat and probability that the

[1] Sources included COSEWIC status reports, Birds of the World species accounts, the Ontario Reptile and Amphibian Atlas, the Ontario Breeding Bird Atlas, published databases, and non-profit organizations.

[2] Sources include reviewed citizen-science data, organized surveys, and other types of observations.

[3] NatureServe. 2022. https://natureserve.org

[4] For a complete description of the EO protocol, see: NatureServe. 2002. Element occurrence data standard. http://downloads.natureserve.org/conservation_tools/element_occurence_data_standard.pdf

[5] Government of Ontario Data Catalogue. 2012-2021. Provincially tracked species (1km grid). https://data.ontario.ca/dataset/provincially-tracked-species-1km-grid

[6] eBird. 2022. eBird: An online database of bird distribution and abundance [web application]. eBird, Cornell Lab of Ornithology, Ithaca, New York. Available: http://www.ebird.org. (Accessed: [February 2022]).

[7] iNaturalist. 2022. https://www.inaturalist.org.

[8] Cadman, M.D. et al (Editors). 2007. *Atlas of the Breeding Birds of Ontario*. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, Ontario, Canada

[9] Toronto Entomologists' Association. 2021. Ontario Butterfly Atlas. https://www.ontarioinsects.org/atlas/

[10] Ontario Nature. 2020. Ontario Reptile and Amphibian Atlas: a citizen science project to map the distribution of Ontario's reptiles and amphibians. Ontario Nature, Ontario. https://www.ontarioinsects.org/herp

[11] Stream data (Aquatic Resource Area) are available from Ontario GeoHub at: https://geohub.lio.gov.on.ca/datasets/aquatic-resource-area-line-segment/explore?location=49.291899%2C-84.834657%2C2.98

species may persist undetected in very low abundance within the square.[12] At a minimum, element occurrences presented in this report can be defined as regular occurrences of a species within a 1-km grid square at some point within the past 25 years and with a meaningful probability that the population in the square may still exist or be readily restored.

By analyzing both NHIC element occurrence data and additional sources of information,[13] I determined that breeding populations of 33 SARA listed species are likely to occur within or very near (<1km) the DRAP (Table 1). I also identified an additional 26 SARA listed species known to breed in other parts of the GTA or that regularly occur within or very near the DRAP outside the breeding season (Table 2). It is possible that some of these additional species may breed within the DRAP intermittently or in very low densities, but further study would be required to draw such a conclusion. It is also possible that many of these additional species were once widespread and abundant throughout the GTA before European settlement and could theoretically be reintroduced to the DRAP or adjacent Rouge National Urban Park (RNUP) lands.

Table 1. Summary of 33 SARA listed species with either A) likely breeding distributions within or very near (<1km) the DRAP or B) historical breeding distributions within 1km of the DRAP and a possibility for reintroduction due to remaining suitable habitat.

Species common name	Type	SARA status[A]	SARO status[B]	Global status (IUCN)[C]	Estimated mature individuals (Canada)[D]	Change since 1966 (Canada)[E]	Breeding habitat[F]	Breeding status in the DRAP (past 5 years)[G]
Bobolink	bird	T	T	LC	2.6 million	-73.7%	grassland	probable
Red-headed Woodpecker	bird	EN	EN	LC	4,000-14,000	-25.0%	woodland	possible
Eastern Wood-pewee	bird	SC	SC	LC	360,000	-60.0%	forest	probable
Barn Swallow	bird	SC	T	LC	6.4 million	-67.4%	structures	probable
Bank Swallow	bird	T	T	LC	2.4 million	-91.3%	banks	possible
Wood Thrush	bird	T	SC	LC	530,000	-65.2%	forest	probable
Eastern Meadowlark	bird	T	T	NT	680,000	-85.1%	grassland	probable
Canada Warbler	bird	SC	SC	LC	2 million	-48.0%	forest	possible
Cerulean Warbler	bird	EN	T	T	7,200	0.0%	forest	possible
Golden-winged Warbler	bird	T	SC	T	63,000	+100%	shrubland	possible
Yellow-breasted Chat	bird	EN	EN	LC	8,300	+16%	shrubland	possible within 1km
Least Bittern	bird	T	T	LC	unknown	0.0%	wetland	possible
Eastern Loggerhead Shrike	bird	EN	EN	T	50	unknown	grassland	passage migrant only
Eastern Whip-poor-will	bird	T	T	NT	1.7 million	-15.2%	woodland	passage migrant only
Common Nighthawk	bird	SC	T	LC	20 million	-60.6%	barrens	passage migrant only
Black Tern	bird	SC	NR	LC	unknown	-59.9%	wetland	habitat within 1km

[12] NatureServe. 2002. Element occurrence data standard. http://downloads.natureserve.org/conservation_tools/element_occurence_data_standard.pdf

[13] eBird, iNaturalist, Ontario Breeding Bird Atlas, Ontario Butterfly Atlas, Ontario Reptile and Amphibian Atlas, recent COSEWIC status reports

Species common name	Type	SARA status[A]	SARO status[B]	Global status (IUCN)[C]	Estimated mature individuals (Canada)[D]	Change since 1966 (Canada)[E]	Breeding habitat[F]	Breeding status in the DRAP (past 5 years)[G]
Acadian Flycatcher	bird	EN	EN	LC	unknown	unknown	forest	possible
Midland Painted Turtle	reptile	SC	NA	LC	NA	unknown	wetland	probable
Blanding's Turtle	reptile	T	T	EN	<50,000	declining	wetland	possible within 1km
Northern Map Turtle	reptile	SC	SC	NA	unknown	unknown	aquatic	possible within 1km
Snapping Turtle	reptile	SC	SC	LC	unknown	unknown	wetland	probable
Eastern Milksnake	reptile	SC	NR	LC	unknown	unknown	structures	probable
Redside Dace	fish	EN	EN	LC	unknown	declining	aquatic	possible within 1km
Atlantic Salmon	fish	NA	NA	LC	unknown	increasing	aquatic	possible
Little Brown Myotis	mammal	EN	EN	EN	unknown	-90%	structures	possible
Long-eared Myotis	mammal	EN	EN	NT	unknown	-90%	forest	possible
Tricolored Bat	mammal	EN	EN	LC	unknown	declining	forest	unknown
Yellow-banded Bumblebee	Invert.	SC	SC	V	unknown	declining	meadow	possible
Monarch	Invert.	EN	SC	LC	unknown	declining	milkweed	probable
Eastern Pondmussel	Invert.	SC	SC	VU	unknown	unknown	aquatic	possible within 1km
Black Purse Web Spider	Invert.	NA	NA	NA	unknown	unknown	woodland	possible within 1km
Butternut	plant	EN	EN	EN	20,000+	declining	forest	probable
Black Ash	plant	T	EN	CR	162 million	declining	wetland	probable

LC=least concern, SC=special concern, VU=vulnerable, T=threatened, NT=near threatened, EN=endangered, CR=critically endangered, NR=not at risk, NA=not assessed.

A. Species at Risk Public Registry[14]
B. Species at Risk in Ontario[15]
C. The IUCN Red List of Threatened Species[16]
D. Population estimates are taken from Partners in Flight Database[17]
E. IC = "increasing in Canada." Per cent change is based on data from the North American Breeding Bird Survey[18]
F. Categories were assigned using habitat information from published species accounts and COSEWIC status reports
G. Categories were assigned based on NHIC Element occurrences and citizen-science detections from the past five years

[14] Government of Canada. 2022. Species at Risk Public Registry. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

[15] Government of Ontario. 2022. Species at Risk in Ontario. https://www.ontario.ca/page/species-risk-ontario

[16] IUCN. 2022. The IUCN Red List of Threatened Species. Version 2021-3. https://www.iucnredlist.org

[17] Partners in Flight. 2022. Avian Conservation Assessment and Population Estimates Databases. https://pif.birdconservancy.org/population-estimate-database-scores/

[18] Sauer, J.R., Link, W.A., and Hines, J.E., 2020, The North American Breeding Bird Survey, Analysis Results 1966 - 2019: U.S. Geological Survey data release, https://doi.org/10.5066/P96A7675.

1.1. Birds

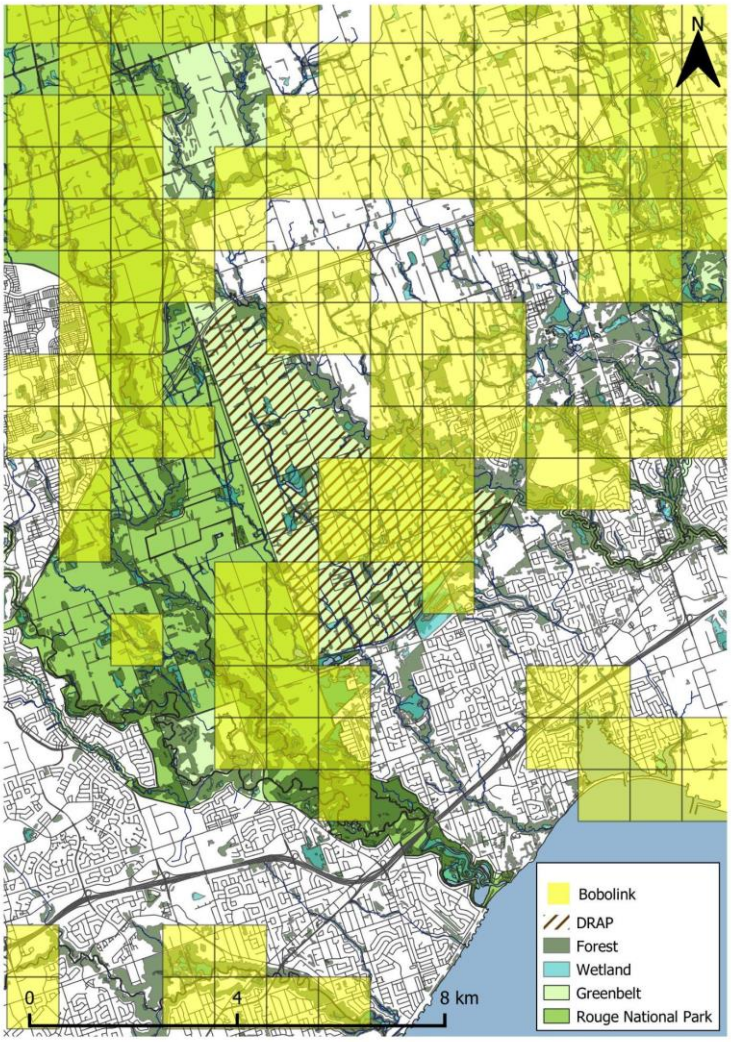

Figure 1. NHIC element occurrence of Bobolinks within 5km of the DRAP

Bobolink (*Dolichonyx oryzivorus*)
The bobolink is a songbird that breeds in grasslands across North America and winters in South America.[19] It has declined severely due to a number of threats, including the loss of tallgrass prairie and disturbance to its nest sites from mowing and other human activities during the breeding season.[20] In Ontario, Bobolinks primarily nest in agricultural areas with a high proportion of land devoted to alfalfa and cattle grazing.[21] Based on Canada's Annual Crop Inventory data,[22] these are both common land uses within the DRAP, particularly in the southern portion of the site. Opening the DRAP to development would result in the permanent displacement of many breeding pairs that may struggle to find suitable nesting habitat elsewhere.

Ontario Species at Risk legislation has failed to protect Bobolinks, issuing 2,010 conditional exemptions and 39 permits affecting the species since implementation of the Endangered Species Act (SARO) in 2007, often with no follow-up monitoring or transparent reporting of outcomes.[23] The majority of these

[19] Renfrew, R. A. M. et al. 2020. Bobolink (*Dolichonyx oryzivorus*), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

[20] Tews, J. D. G. & P. Mineau. 2013. Estimated mortality of selected migratory bird species from mowing and other mechanical operations in Canadian agriculture. Avian Conservation and Ecology 8(2): 8.

[21] Cadman, M.D. et al (Editors). 2007. *Atlas of the Breeding Birds of Ontario*. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, Ontario, Canada, p. 587.

[22] Annual Space-Based Crop Inventory for Canada. 2019. Centre for Agroclimate, Geomatics and Earth Observation, Science and Technology Branch, Agriculture and Agri-Food Canada.

[23] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 50

permits and exemptions have been issued to the infrastructure and development sector.[24] I recommend that a comprehensive review be undertaken to identify all suitable habitat within the DRAP. Because Bobolink breeding sites likely shift annually with natural succession,[25] this study should occur over at least two breeding seasons and ideally extend up to five years.

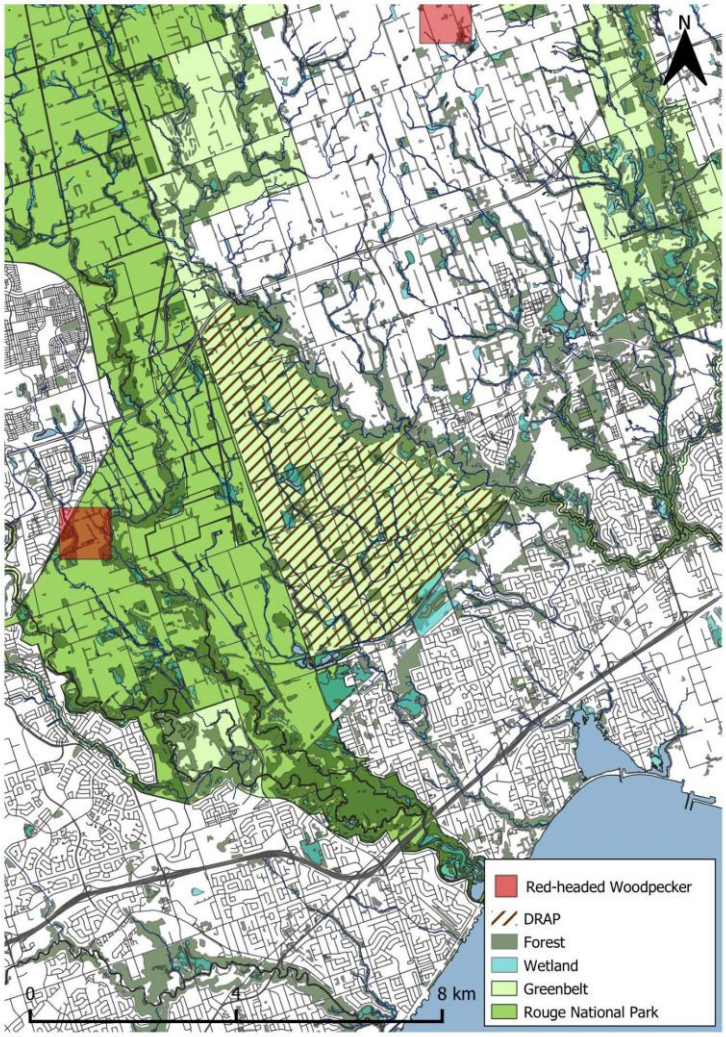

Figure 2. NHIC element occurrence of Red-headed Woodpecker within 5km of the DRAP

Red-headed Woodpecker
(*Melanerpes erythrocephalus*)
Red-headed Woodpeckers were once abundant across North America, but today, intensifying agriculture, wildfire mitigation, competition with invasive nest predators and loss of habitat have driven them out of many areas.[26] They depend on open deciduous woodlands, savannas, hedgerows and other semi-wooded landscapes, particularly with an abundance of large dead trees.[27,28] In Ontario, remnant suitable Red-headed Woodpecker habitat disproportionately occurs in agricultural areas, making this species especially vulnerable to negative impacts caused by development of farmland around the GTA.

While there have been no permits or exemptions issued under SARO specifically for Red-headed Woodpeckers, there has also been little to no reporting on recovery efforts at the provincial level.[29] Because these woodpeckers forage

[24] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 43

[25] Cadman, M.D. et al. (Editors). 2007. *Atlas of the Breeding Birds of Ontario*. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, Ontario, Canada, p. 586

[26] Frei, B. K. G. et al. 2020. Red-headed Woodpecker (Melanerpes erythrocephalus), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

[27] Kilgo, J. C. & M. A. Vukovich. 2014. Can snag creation benefit a primary cavity nester: Response to an experimental pulse in snag abundance. Biological Conservation 171:21-28.

[28] Burleigh, T. D. 1958. Georgia birds. University of Oklahoma Press, Norman, OK, USA.

[29] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk.

over large areas during the migration and nonbreeding seasons,[30] individuals breeding outside the GTA may routinely be affected by development as they pass through more urbanized areas. Although there are no confirmed recent breeding occurrences of the species within the DRAP (Figure 2), based on the quality of habitat and geography it is likely that the area may be used intermittently for breeding. During the breeding season of 2021, an individual was detected about 3km west of the DRAP, within RNUP, by an atlasser with the Ontario Breeding Bird Atlas project.[31] A comprehensive multi-year breeding study across the DRAP, in conjunction with the ongoing OBBA, would ensure that all habitat patches suitable to Red-headed Woodpeckers are identified and that the impacts of any new development projects are assessed accordingly.

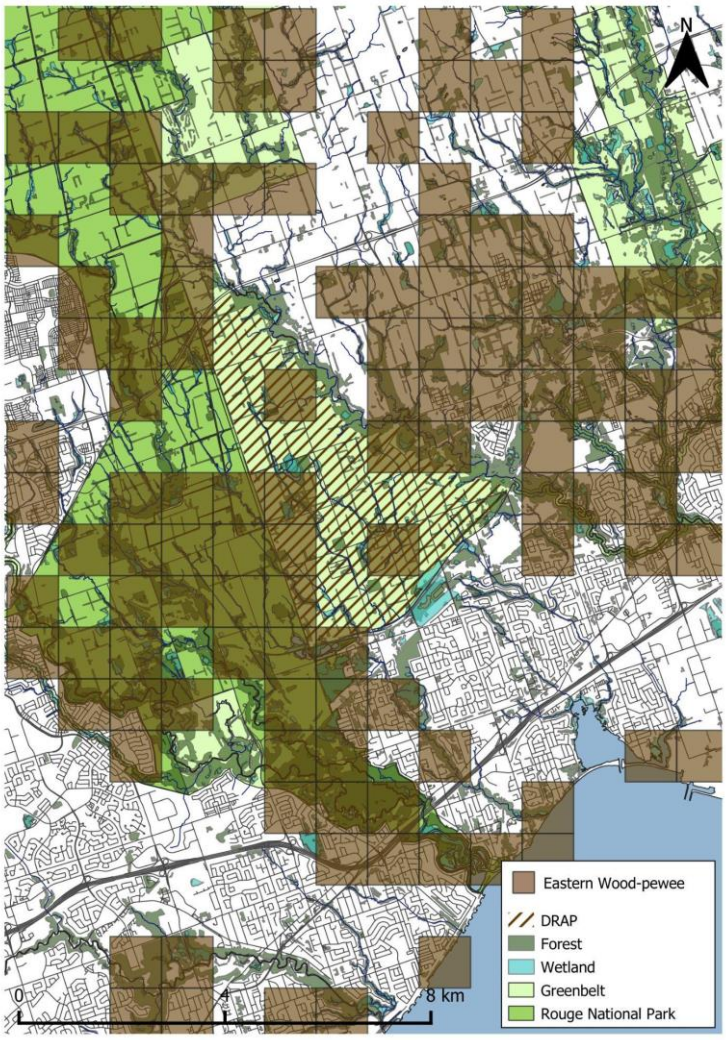

Figure 3. NHIC element occurrence of Eastern Wood-pewee within 5km of the DRAP

Eastern Wood-pewee (*Contopus virens*)

The Eastern Wood-pewee is a member of the family *Tyrannidae* (Tyrant flycatchers).[32] It winters in South America and breeds in mature deciduous forest of Eastern North America, where its whistled song is one of the most commonly-heard summertime sounds.[33] In Canada, it remains an abundant breeder, occupying almost any small patch of suitable forest,[34] but it can be sensitive to development near its breeding habitat.[35] recent steep decline has

[30] Frei, B. K. G. et al. 2020. Red-headed Woodpecker (Melanerpes erythrocephalus), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

[31] Birds Canada. 2023. Ontario Breeding Bird Atlas. Accessed February 1, 2023 at: https://www.birdsontario.org/

[32] Based on taxonomy updated by Boyd III, J.H. 2020. Taxonomy in Flux Checklist: Family Index, 252 Families. Available at http://jboyd.net/Taxo/fam_index.html

[33] Watt, D. J. et al 2020. Eastern Wood-Pewee (*Contopus virens*), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

[34] Cadman, M. D. et al. (Editors). 2007. *Atlas of the Breeding Birds of Ontario*. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, Ontario, Canada, p. 341

[35] Friesen, L. E. et al. 1995. Effects of residential development on forest-dwelling neotropical migrant songbirds. *Conservation Biology* 9, 1408–

placed it on Schedule 1 of SARA. Forest loss, especially the narrowing of riparian forest corridors, is a primary reason this species has declined.[36] Currently, many of the forest fragments within the DRAP provide breeding habitat for Eastern Wood-pewees (Figure 3). Even if forest fragments were protected as greenspace, development of the surroundings would likely render much of the forest habitat unsuitable for breeding.

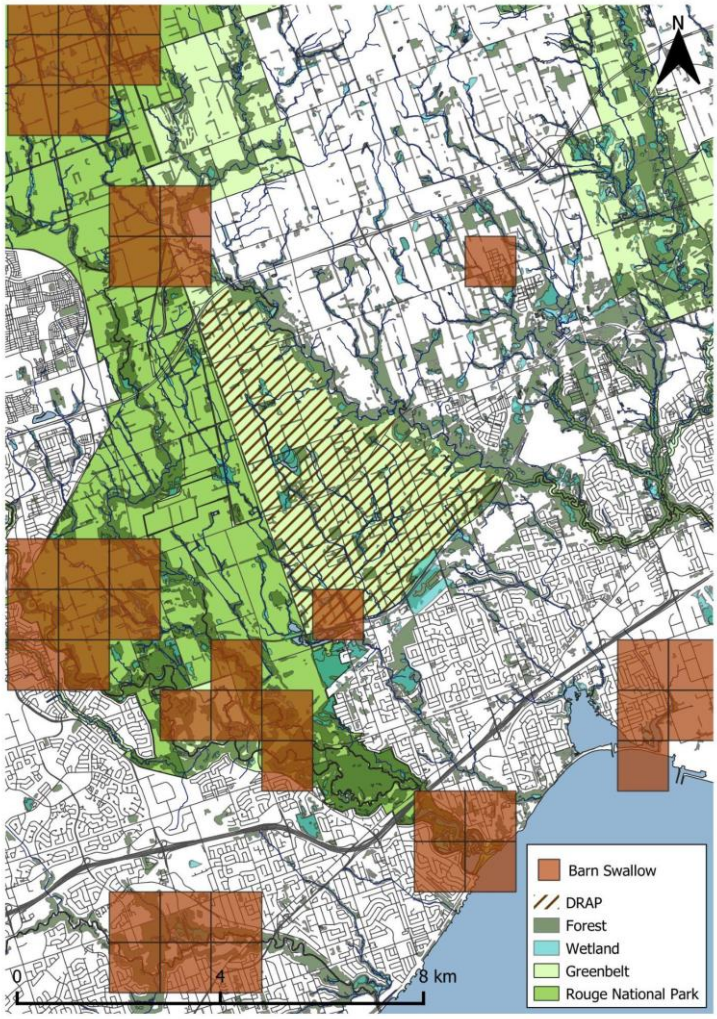

Figure 4. NHIC element occurrence of Barn Swallow within 5km of the DRAP

Like other Species at Risk, Ontario provincial legislation has failed to protect habitat for the Eastern Wood-pewee. Since the creation of SARO in 2007, the act has granted 6,539 approvals for projects affecting SAR, only 34% of which have provided clear plans to mitigate adverse effects, and the Ontario government typically conducts no compliance inspections.[37] Given its status as a federal Schedule-1 listed species, I urge that the habitat and migration requirements of the Eastern Wood-pewee be considered when assessing the severity of threats posed by developing the DRAP. Evidence should come from peer-reviewed scientific data, collected independently of the provincial government.

Barn Swallow (*Hirundo rustica*)
A familiar summertime sight around barns and structures built near water, the Barn Swallow is a globally distributed bird that has suffered steep declines in North America.[38] Declines have occurred due to a number of anthropogenic pressures, but loss of suitable breeding habitat is a major threat.[39] Urbanization of lands within

1414.

[36] Keller, C. M. E. et al. 1993. Avian communities in riparian forests of different widths in Maryland and Delaware. Wetlands 13(2): 137–144.

[37] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 7

[38] Brown, M. B. & C. R. Brown. 2020. Barn Swallow (*Hirundo rustica*), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

[39] Brown, M. B. & C. R. Brown. 2020. Barn Swallow (*Hirundo rustica*), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

the DRAP would involve the demolition of many old structures potentially used by Barn Swallows for nesting, which have replaced dead trees as the birds' preferred nesting sites since colonization of North America by Europeans. New buildings and infrastructure built in their place would not be expected to attract Barn Swallows for nesting, even if planned specifically for this purpose.

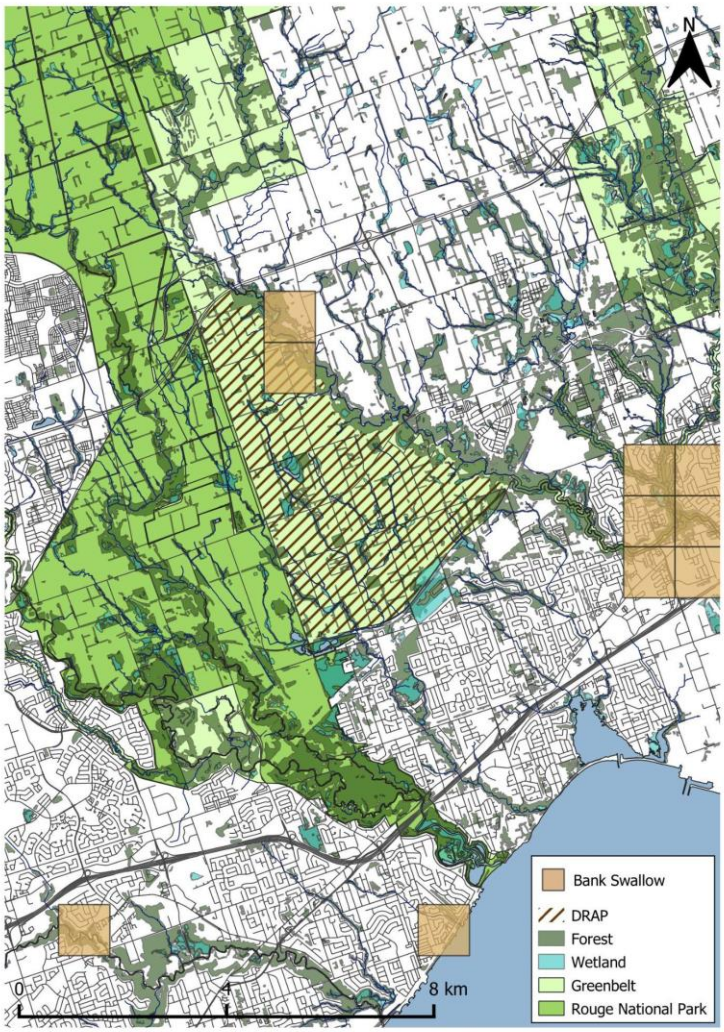

Figure 5. NHIC element occurrence of Bank Swallow within 5km of the DRAP

Barn swallows are among the species most affected by poor enforcement of SARO legislation. Evidence has found that constructing shed-like structures may not be an effective offset for the loss of existing nest substrates,[40] yet the government continues to grant permit approvals with a condition that such structures be created, often in an expedited manner.[41] Until I learn more about the nesting requirements of Barn Swallows, existing structures used as nest sites continue to hold a great deal of value to the species. A comprehensive inventory should be completed during the breeding season (May-July) to identify all such nest sites within the DRAP.

Bank Swallow (*Riparia riparia*)
Bank Swallows build their nest burrows on eroded banks, bluffs, road cuts and in mounds of earth produced by construction activities, aggregate operations and other human activities.[42] The North American Bank Swallow population has declined dramatically, largely due to erosion control measures, which tend to eliminate bluffs and remove breeding habitat,[43,44] and the destruction of

[40] Campomizzi, A. J. et al. 2019. Conspecific cues encourage Barn Swallow (Hirundo rustica erythrogaster) prospecting, but not nesting, at new nesting structures. Canadian Field-Naturalist 133(3): 235–245. https://doi.org/10.22621/cfn.v133i3.2233

[41] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 46

[42] Garrison, B. A. and A. Turner (2020). Bank Swallow (*Riparia riparia*), version 1.0. In Birds of the World (S. M. Billerman, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

[43] Garrison, B. A. et al. 1987. Bank Swallow distribution and nesting ecology on the Sacramento River, California. Western Birds 18:71-76.

[44] James, D. A. & J. C. Neal. 1986. Arkansas Birds: Their Distribution and Abundance. University of Arkansas Press, Fayetteville, AR, USA.

nesting colonies during road construction.[45] Based on NHIC and eBird data, at least one Bank Swallow breeding colony likely persists along Duffins Creek adjacent to the DRAP (Figure 5). Due to its history of fast-tracking projects that negatively impact Bank Swallows and their habitat,[46] I have concerns about the Ontario government's ability to identify and protect this colony. To create overall benefit for this species, a federal EA will be an important step in identifying the current location of the colony and ensuring that any nearby development does not disturb either the nesting site or the foraging requirements of individuals in the colony.

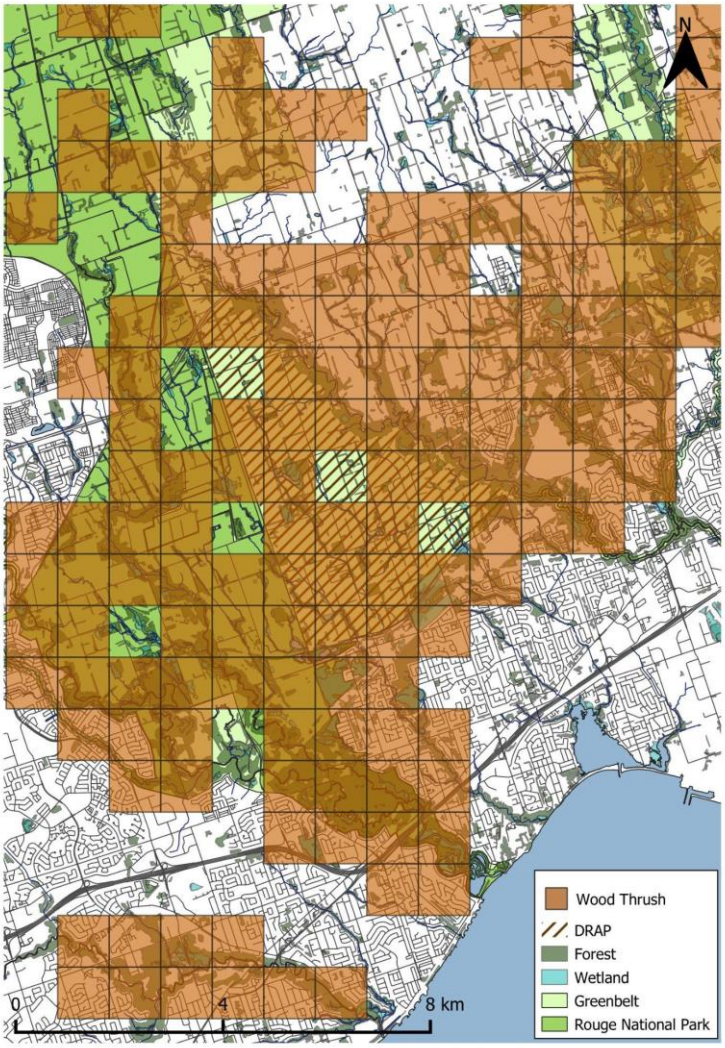

Figure 6. NHIC element occurrence of Wood thrush within 5km of the DRAP

Wood Thrush (*Hylocichla mustelina*)
The Wood Thrush is a medium-sized songbird that breeds in dense deciduous forest across Eastern North America and winters in Central America.[47] Though Wood Thrush have been found nesting in forest fragments as small as 2 ha,[48] populations thrive in landscapes with a high degree of forest cover and core areas of interior habitat.[49] Wood Thrush may benefit from small-scale disturbances and can be tolerant of nearby development, yet large amounts of urbanization in the landscape have been shown to lead to localized population declines.[50] NHIC

[45] Petersen, P. C. and A. J. Mueller. 1979. Longevity and colony loyalty in Bank Swallows. Bird-Banding 50:69-70.

[46] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 49

[47] Evans, M. et al. (2020). Wood Thrush (*Hylocichla mustelina*), version 1.0. In Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology,
Ithaca, NY, USA.

[48] Friesen, L. E. et al. 1999. Nesting success of neotropical migrant songbirds in a highly fragmented landscape. Conservation Biology 13, 327–337.

[49] Burke, D. M. & E. Nol. 2000. Landscape and fragment size effects on reproductive success of forest-breeding birds in Ontario. *Ecological Applications* 10, 1749–1761.

[50] Heide, K. 2022. *Urbanization influences breeding abundance of a migratory songbird: a 20-year before-and-after study in 73 forest fragments.*

data suggest that the majority of the forest fragments within the DRAP are likely occupied by Wood Thrush (Figure 6), and because movements during the breeding season are known to extend up to 1 km,[51] fragments thought to be vacant may still be occupied from time to time. Even if the forest fragments themselves are preserved as parks, the surrounding development will likely render the forest habitat unsuitable within a few years due to encroachment and other urban pressures, as has been the case in other parts of the Golden Horseshoe such as in Kitchener-Waterloo.[52]

In Southern Ontario, development projects typically follow provincial requirements to minimize direct negative impacts to woodlots,[53,54] and as such, there have been no permits or conditional exemptions granted to impact Wood Thrush. However, there have also been no protection or recovery permits issued despite the species' steeply declining status.[55] Because nesting locations tend to shift around the landscape from year to year, and because Wood Thrush can be difficult to detect, surveys have likely missed occupied habitat, possibly leading to negative impacts occurring without a permit. To thoroughly assess the status of Wood Thrush within the DRAP, I recommend a multi-year study be carried out by observers trained in detecting Wood Thrush using cues other than song and more rigorous methods than the traditional point count. The presence of Wood Thrush in forest fragments within the DRAP should indicate a need for further assessment of the significance of these features.

[Master's thesis, University of Guelph]. The Atrium.

[51] Macintosh, T. et al. 2011. Gap-crossing by Wood Thrushes (*Hylocichla mustelina*) in a fragmented landscape. *Canadian Journal of Zoology* 89, 1091–1097.

[52] Heide, K. 2022. *Urbanization influences breeding abundance of a migratory songbird: a 20-year before-and-after study in 73 forest fragments.*
[Master's thesis, University of Guelph]. The Atrium.

[53] McWilliam, W. J. 2007. *Residential encroachment within suburban forests: Are Ontario municipal policies sufficient for protecting suburban forested natural areas for the long term?* [Master's thesis, University of Waterloo].

[54] McWilliam, W. J., Brown, R., Eagles, P., & M. Seasons. 2013. Barriers to the effective planning and management of residential encroachment within urban forest edges: a southern Ontario, Canada case study. Urban Forestry & Urban Greening. http://dx.doi.org/10.1016/j.ufug.2013.08.002

[55] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk.

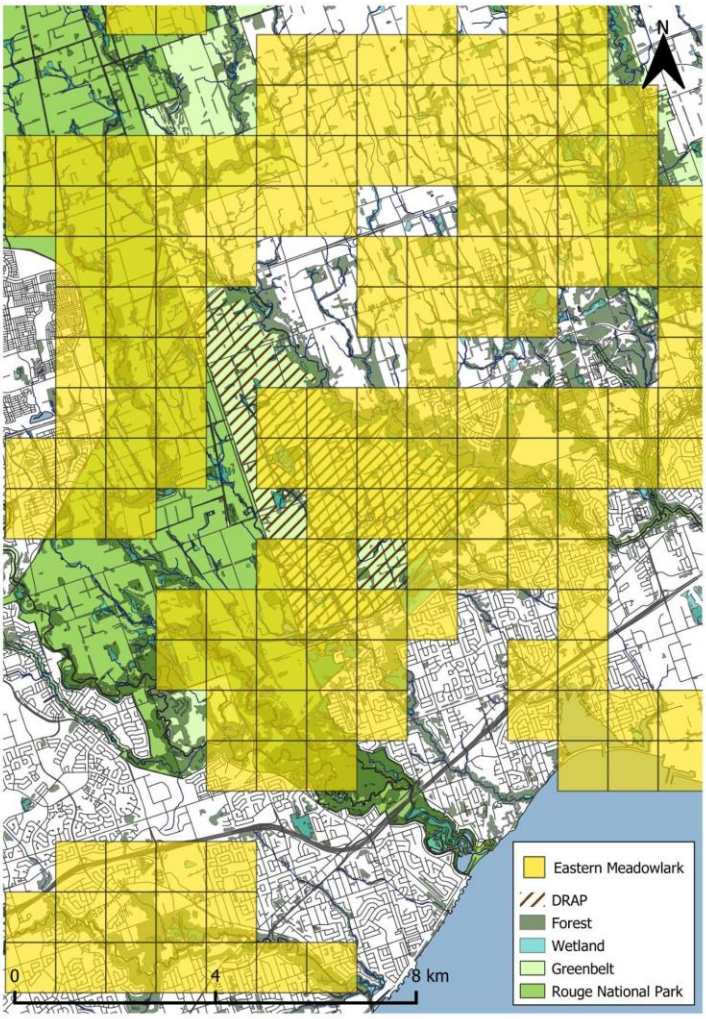

Figure 7. NHIC element occurrence of Eastern Meadowlark within 5km of the DRAP

Eastern Meadowlark (*Sturnella magna*)

Eastern Meadowlarks are relatively common in open country, inhabiting areas such as hayfields, pastures, abandoned fields, roadsides and even airport grounds[56]. NHIC data indicate that more than half of the DRAP is likely occupied by Meadowlarks during the breeding season (Figure 7). One of the key drivers of decline for the Eastern Meadowlark is loss of habitat resulting from urbanization. Urban expansion throughout this area would disrupt or permanently destroy large portions of irreplaceable habitat.

There have been 1,964 conditional exemptions issued under SARO for Eastern Meadowlark and the Ontario government response statement was less ambitious than the recommended long-term goal outlined in the recovery strategy for the species.[57] Because the Eastern Meadowlark is a fairly common and widely reported species, it is straightforward to detect using survey methods. I recommend establishing a network of point-count stations within suitable habitat and assigning a skilled observer to survey the points for two to three breeding seasons in conjunction with the ongoing Breeding Bird Atlas. Identifying areas where

[56] Jaster, L. A. et al. 2020. Eastern Meadowlark (*Sturnella magna*), version 1.0. In Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

[57] Office of the Auditor General of Ontario. November 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 35 & p. 44.

Meadowlarks prefer to breed could help inform the strategic placement of parks and protected areas in the landscape were the DRAP to be opened up to development.

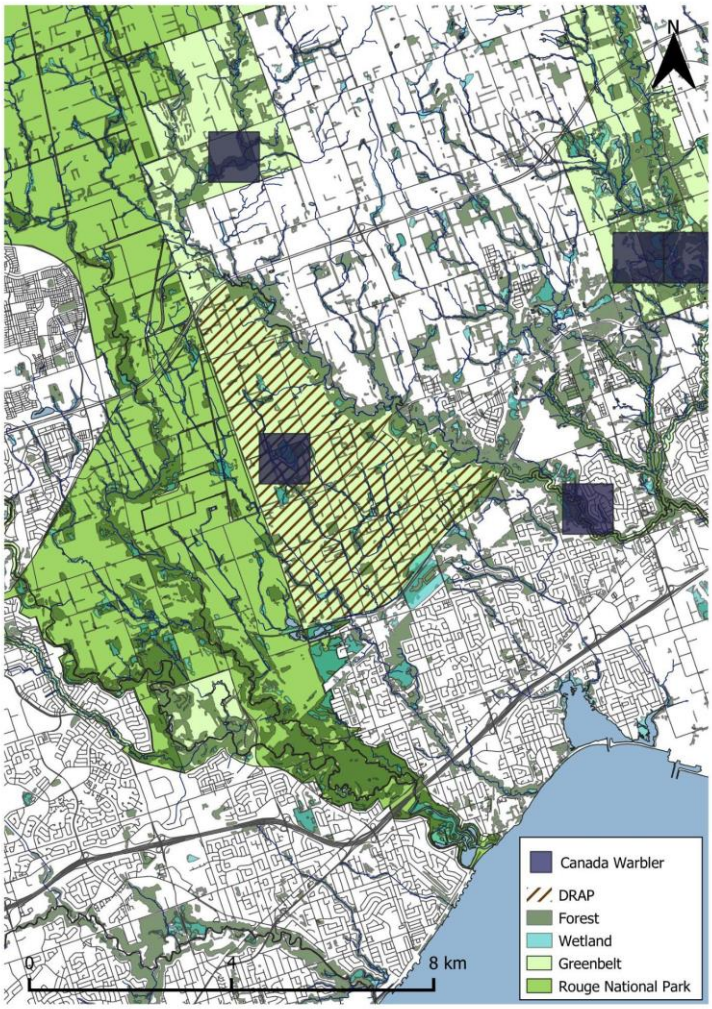

Figure 8. NHIC element occurrence of Canada Warbler within 5km of the DRAP

Canada Warbler (Cardellina canadensis)

The Canada Warbler is a migratory songbird that breeds in mixed forests with a dense understory and an abundance of moss.[58] The DRAP is located at the southern limit of the species' breeding range, but it is unknown whether any breeding populations exist within the DRAP. However, suitable breeding habitat is common throughout the region and NHIC and eBird data suggest at least one occupied area within the Cherrywood Swamp Provincially Significant Wetland (Figure 8). One study found that Canada Warbler abundance is negatively associated with the presence of roads in the landscape;[59] the species' specialized habitat requirements mean that poorly-placed new roads could wipe out any small, potentially unknown populations, leaving them with nowhere to relocate. The Cherrywood Swamp Wetland Complex (a locally significant wetland) consists of two parcels connected by a narrow corridor. The precise location of the Canada Warbler population within the wetland complex is unknown. Even if the wetland were retained as a natural feature when developing the landscape, new arterial roads severing the corridor could result in the displacement of any remaining Canada Warblers in this area. A suitable EA for this property would identify the locations of breeding pairs and plan infrastructure accordingly. However,

[58] Reitsma, L. R. et al. 2020. Canada Warbler (*Cardellina canadensis*), version 2.0. In Birds of the World (P. G. Rodewald and B. K. Keeney, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA.

[59] Solymos, P. et al. 2020. Effects of energy sector development and recovery on the threatened Canada Warbler. Alberta Biodiversity Monitoring Institute.

even with appropriate measures in place, this population is likely to be lost if the area were developed due to other pressures associated with adjacent urbanization[60].

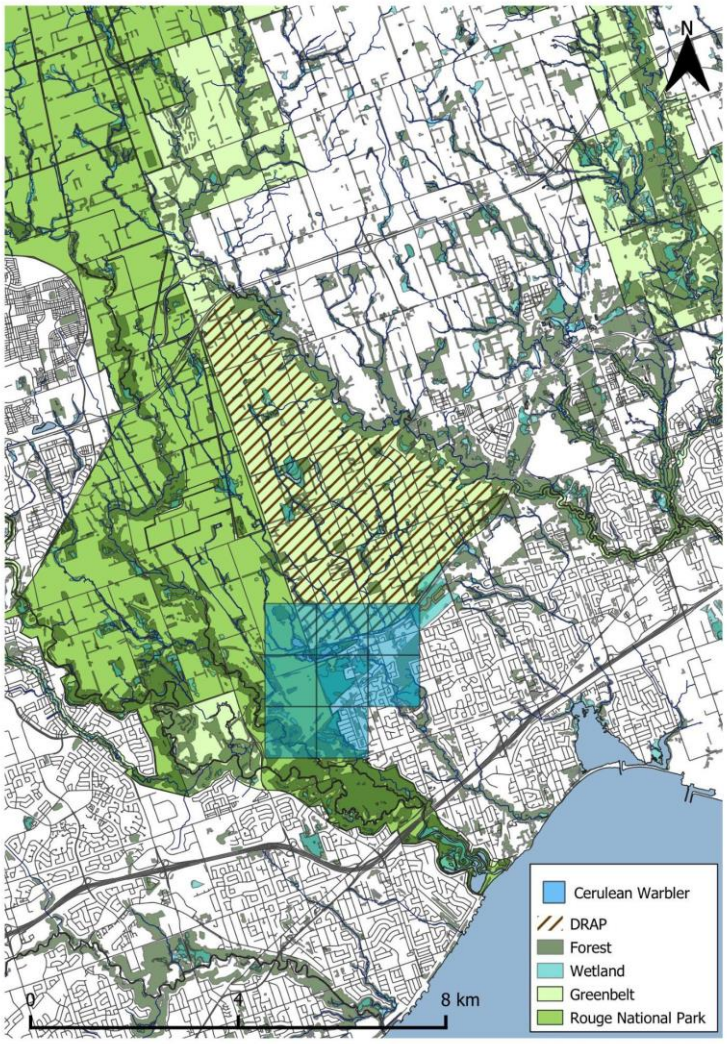

Figure 9. NHIC element occurrence of Cerulean Warbler within 5km of the DRAP

Cerulean Warbler (Setophaga cerulea)

Cerulean Warblers reach the northern limit of their breeding range in Southern Ontario, where they are a rare summer inhabitant of deciduous forests, especially those dominated by oaks and hickories.[61] They are area-sensitive but may nest in forest fragments as small as 10 ha.[62] The southwest corner of the DRAP, near the Rouge Valley and Amos Pond, is known to provide habitat for breeding Cerulean Warblers (Figure 9). The current status of this population is not well known and should be investigated thoroughly before any redesignation of the lands within the DRAP occurs. Because of the rarity of the species and difficulty of detection (nests are usually placed high in the canopy and songs can be easily overlooked[63]), existing efforts to document bird species, like the OBBA and eBird, may not be sufficient. Targeted surveys should be carried out in forest fragments throughout the DRAP, and I recommend that automated recording units be placed in or near the canopy in areas of quality habitat.

[60] Friesen, L. E. et al. 1999. Nesting success of neotropical migrant songbirds in a highly fragmented landscape. Conservation Biology 13, 327–337.

[61] Barg JJ, Jones J, Girvan MK, Robertson RJ (2006) Within-pair interactions and parental behavior of Cerulean Warblers breeding in eastern Ontario. Wilson J Ornithol 118:316–325.

[62] Cerulean Warbler (Setophaga cerulea), version 1.0. In Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

[63] Cerulean Warbler (Setophaga cerulea), version 1.0. In Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

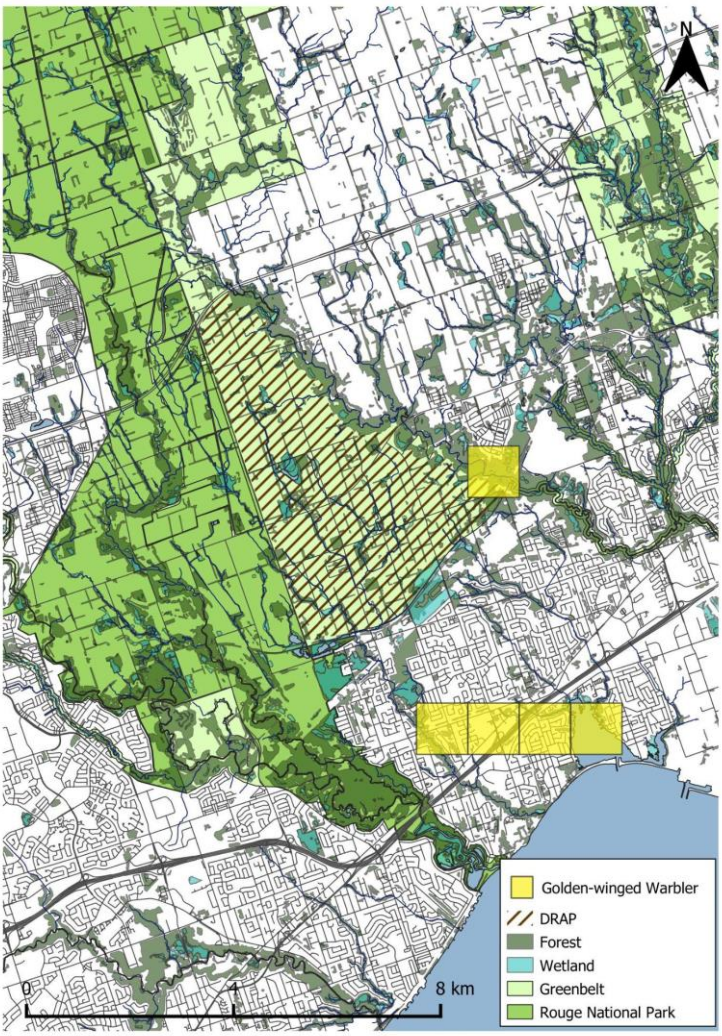

Figure 10. NHIC element occurrence of Golden-winged Warbler within 5km of the DRAP

Golden-winged Warbler (Vermivora chrysoptera)

Golden-winged Warblers are uncommon to rare in early successional areas throughout their relatively small breeding range of Northeastern North America.[64] Data indicate that the Canadian population may be increasing due to the regeneration of old farmland.[65] However, regenerating areas (shrubland, old pasture, abandoned orchards, fallow fields, hydro corridors and vacant lots) are often the first pieces of land to be slated for development due to their presumed poor farmland values. NHIC data indicate the presence of Golden-winged Warblers in the eastern end of the DRAP (Figure 10), where several hydro corridors and regenerating fields are located. Environmental assessments carried out in an expedited manner or during the wrong season may fail to detect the presence of Golden-winged Warblers. I therefore encourage the government to consider long-term data (currently being collected by the OBBA) when assessing whether pieces of apparently degraded low-value land in the DRAP may serve as breeding habitat for Golden-winged Warblers. This research should be accompanied by targeted surveys of suitable habitat, which may not be regularly visited by citizen scientists due to being situated on privately-leased land.

[64] Confer, J. L., P. Hartman, and A. Roth (2020). Golden-winged Warbler (Vermivora chrysoptera), version 1.0. In Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

[65] Partners in Flight Databases. 2023. Avian Conservation Assessment and Population Estimates Database. https://pif.birdconservancy.org/population-estimate-database-scores/

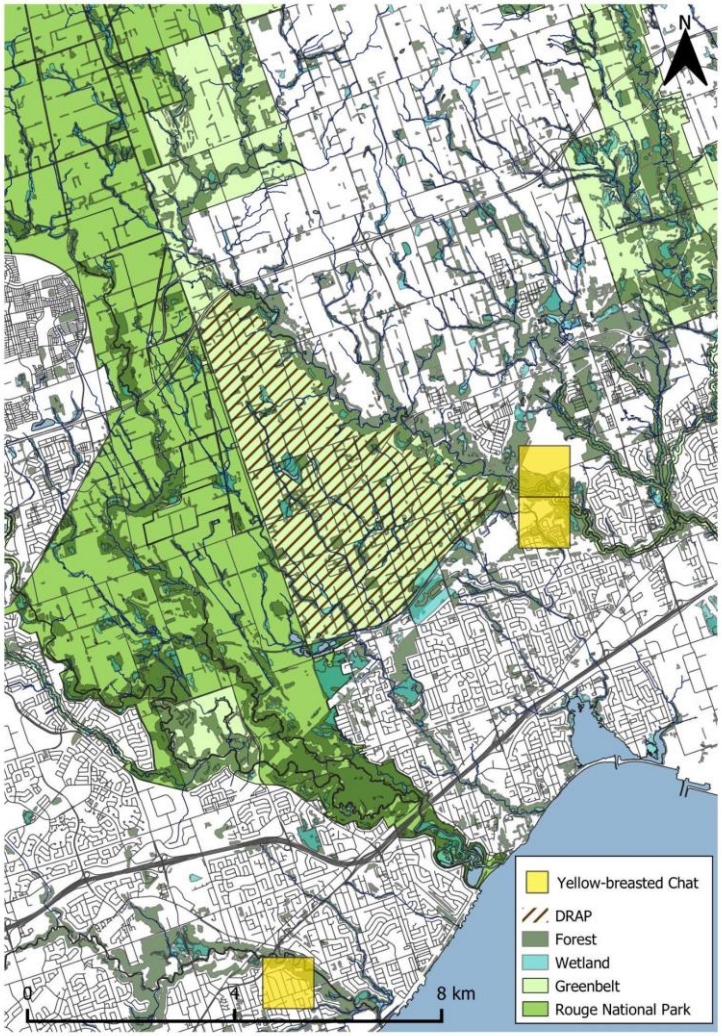

Figure 11. NHIC element occurrence of Yellow-breasted Chat within 5km of the DRAP

Yellow-breasted Chat (Icteria virens) One characteristic that makes the DRAP so valuable ecologically is its concentration of species with Southerly ranges, and the Yellow-breasted Chat is a prime example of this. This bird is abundant in the United States, but its Canadian breeding population is extremely small and confined to a few localities, one being the lower Duffins Creek valley. Though it is not known whether any Chats still breed there, a probable breeding occurrence was documented between 2001 and 2005 during the 2nd OBBA. Since that time, landcover data[66] reveal that considerable succession has occurred adjacent to the river valley, potentially creating new suitable habitat (dense shrubland) extending into the southeast corner of the DRAP. This possibility should be explored further before new development projects are allowed to threaten the establishment of this federally endangered species.

[66] Potapov P., Hansen M.C., Pickens A., Hernandez-Serna A., Tyukavina A., Turubanova S., Zalles V., Li X., Khan A., Stolle F., Harris N., Song X.-P., Baggett A., Kommareddy I., Kommareddy A. (2022) The global 2000-2020 land cover and land use change dataset derived from the Landsat archive: first results. Frontiers in Remote Sensing [https://doi.org/10.3389/frsen.2022.856903]

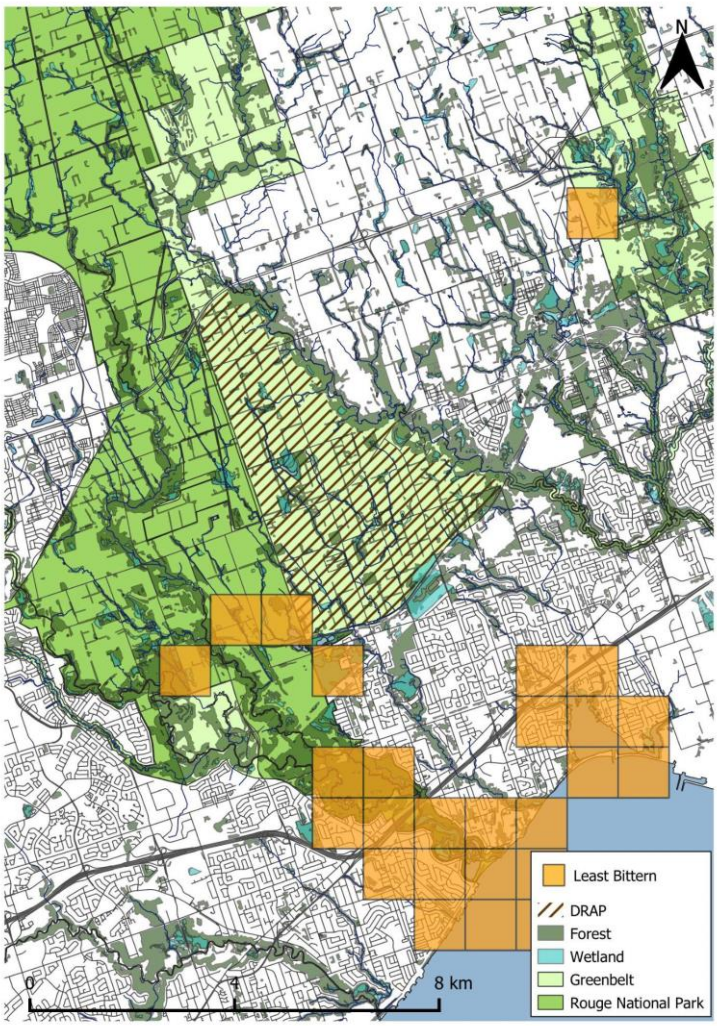

Figure 12. NHIC element occurrence of Least Bittern within 5km of the DRAP

Least Bittern (Ixobrychus excillis)
A cryptic member of the Heron family, the Least Bittern is an uncommon breeder across the GTA. It is seldom seen but occasionally heard uttering its *jug-jug-jug* call from dense marsh vegetation, especially cattails.[67] Least Bitterns have been known to breed in the Townline Swamp Wetland Complex, immediately adjacent to the southwest corner of the DRAP (Figure 12). Given their extremely low detection rate[68] and the lack of data from many unevaluated wetlands, Least Bitterns may be present in scattered locations elsewhere throughout the DRAP as well.

Major threats to this species include loss and contamination of wetland habitat and, because they fly low to the ground, collisions with motor vehicles.[69] One study found that Least Bitterns were area sensitive and therefore negatively affected by fragmentation of wetlands.[70] I recommend that the remaining unevaluated wetlands in the DRAP, especially those near the Cherrywood Swamp Provincially Significant Wetland, which is known to contain wading bird nesting colonies,[71] be formally evaluated to determine their significance level and to identify possible unknown populations

[67] Poole, A. F. et al. 2020. Least Bittern (Ixobrychus exilis), version 1.0. In Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

[68] COSEWIC. 2009. COSEWIC assessment and update status report on the Least Bittern Ixobrychus exilis in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 36 pp. (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/least-bittern.html)

[69] Guillory, H. D. 1973. Motor vehicles and barbed wire fences as major mortality factors for the Least Bittern in southwestern Louisiana. Inland Bird Banding News 45:176-177.

[70] Brown, M. and J. J. Dinsmore. 1986. Implications of marsh size and isolation for marsh bird management. Journal of Wildlife Management 50:392-397.

[71] Based on element occurrences from the NHIC provincially-tracked 1-km grid. Data can be downloaded from: Government of Ontario Data Catalogue. 2012-2021. Provincially tracked species (1km grid). https://data.ontario.ca/dataset/provincially-tracked-species-1km-grid

of Least Bittern. This can be done in conjunction with existing citizen-science programs, the Great Lakes Marsh Monitoring Program,[72] and the OBBA.

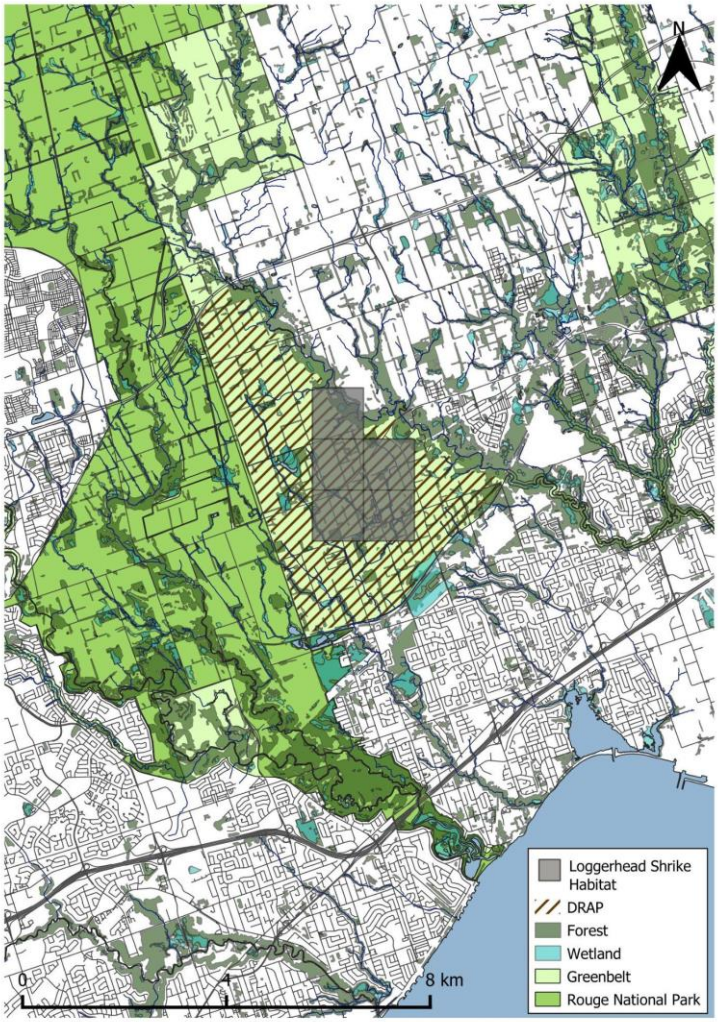

Figure 13. NHIC element occurrence of Loggerhead Shrike within 5km of the DRAP

Eastern Loggerhead Shrike

Informally known as the "butcherbird," this predatory songbird hunts insects, lizards, small mammals and even birds, then impales them on a thorn or piece of barbed wire.[73] It requires grassland landscapes rich in either thorny shrubs (especially Hawthorns) or barbed-wire fences. In Ontario, both of these features are most commonly associated with cattle pasture.[74] The Ontario breeding population of Loggerhead Shrikes has been nearly extirpated, persisting (thanks to captive breeding) in only a few localities including the Carden Alvar near Lake Simcoe, and an area near Napanee.[75]

Although Shrikes no longer breed within the DRAP, suitable habitat exists, and evidence suggests that the area is an important stopover site for the grassland-dependent birds during migration. In the fall of 2019, three Loggerhead Shrikes equipped with MOTUS tags were detected at the nearby Toronto Zoo tower, and all three appeared to pass through the DRAP on their way south from the Carden Alvar captive breeding

[72] Tozer, D.C. 2020. Great Lakes Marsh Monitoring Program: 25 years of conserving birds and frogs. Birds Canada, Port Rowan, Ontario, Canada. 24 pp.

[73] Yosef, R. (2020). Loggerhead Shrike (*Lanius ludovicianus*), version 1.0. In Birds of the World (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.logshr.01

[74] Cadman, M. D. et al. (Editors). 2007. *Atlas of the Breeding Birds of Ontario*. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, Ontario, Canada, p. 341

[75] Wildlife Preservation Canada. 2023. Eastern Loggerhead Shrike Recovery Program. https://wildlifepreservation.ca/eastern-loggerhead- shrike-program/

release site.[76] The value of the DRAP in facilitating movement of these endangered birds across Lake Ontario (and ultimately to their wintering grounds) justifies the protection of the property against future development. Further, pasture habitat within the DRAP should be evaluated for its potential in serving as a future reintroduction site, as the NHIC database indicates that much of the property may contain suitable and/or formerly occupied habitat (Figure 13).

Eastern Whip-poor-will (*Antrostomus vociferus*)

Eastern Whip-poor-wills are crepuscular (most active at dawn and dusk) aerial insectivores that breed in open deciduous forests of Northeastern North America and winter in Florida, the Gulf Coast and Central America.[77] Like most aerial insectivores, they have been declining in recent years.[78] Reasons for their decline may include urbanization,[79,80] habitat degradation[81] and a decline in the abundance of the moths on which they prey.[82] No Eastern Whip-poor-wills have been known to breed within the DRAP in recent years, but the area is likely to serve as an important migration corridor. Whip-poor-wills fitted with MOTUS tags in Muskoka, ON, have routinely been found to head straight south in fall before turning west when they encounter lake Ontario.[83] The Rouge Valley and adjacent farmland is the last contiguous area of suitable foraging habitat for Whip-poor-wills along Lake Ontario before they enter the built expanse of the GTA. At least two tagged individuals were detected in the fall of 2020 at the Toronto Zoo MOTUS tower, about 3 km west of the DRAP, indicating that they likely chose the area as a stopover site along their migration route.[84] Were the DRAP developed, the amount of habitat available for Whip-poor-wills for foraging during their journey would be reduced significantly, likely resulting in higher competition for a dwindling supply of food and ultimately lower migratory success rates.

[76] Wheeler, H. Wildlife Preservation Canada OntLOSH. Data accessed from the Motus Wildlife Tracking System. Birds Canada. Available: http://www.motus.org/

[77] Cink, C. L., P. Pyle, and M. A. Patten (2020). Eastern Whip-poor-will (*Antrostomus vociferus*), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.whip-p1.01

[78] Sauer, J. R., and S. Droege (1992). Geographic patterns in population trends of Neotropical migrants in North America. In Ecology and Conservation of Neotropical Migrant Landbirds (J. M. Hagan III and D. W. Johnston, Editors). Smithsonian Institution Press, Washington, DC, USA. pp. 26–42.

[79] Souza-Cole, I., Ward, M.P., Mau, R.L., Foster, J.T., and T.J. Benson. 2022. Eastern Whip-poor-will abundance declines with urban land cover and increases with moth abundance in the American Midwest. Ornithological Applications 124:1-13. https://doi.org/10.1093/ornithapp/duac032

[80] Santner, S. (1992f). "Whip-poor-will." In Atlas of breeding birds in Pennsylvania., edited by D. W. Brauning, 172-173. Pittsburgh, PA: Univ. of Pittsburgh Press.

[81] Cink, C. L., P. Pyle, and M. A. Patten (2020). Eastern Whip-poor-will (*Antrostomus vociferus*), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.whip-p1.01

[82] Wagner, D.L. 2012. Moth decline in the northeastern United States. News of the Lepidopterists' Society 54(2): 52-56.

[83] Grahame, E.R.M. 2023. Unpubl. Data.

[84] Grahame, E. 2020. Grahame Nightjars. Data accessed from the Motus Wildlife Tracking System. Birds Canada. Available: http://www.motus.org/

Whip-poor-will populations in Canada have shown no signs of improvement in recent years,[85] yet COSEWIC is currently considering a redesignation for the species,[86] which could leave it vulnerable to losing its protections. I encourage the IAA to consider the importance of the existing protected lands around the GTA (especially the DRAP) as a safety net for species like the eastern Whip-poor-will whose requirements may not be met through legislation. I also encourage the government to offer financial support to the OBBA in order to hire a technician to conduct targeted Nightjar surveys within the DRAP, where volunteer efforts are currently lacking. This would provide a more accurate and up-to-date picture of the status of the species on the property.

Common Nighthawk (*Chordelies minor*)

Like the Whip-poor-will, the Common Nighthawk is a crepuscular aerial insectivore in the *Caprimulgidae* family. From May to August, Nighthawks take advantage of the abundant insect populations found across Canada and the United States, then retreat to South America for the winter months.[87] Unlike the Whip-poor-will, Nighthawks are more associated with open country and have been documented nesting in both natural and urban environments.[88] Nighthawks do not likely breed in the DRAP or the Rouge Valley, but the area appears to be an important migratory corridor for the species. At least eight tagged individuals have been detected passing by the MOTUS tower at the Toronto Zoo in the past five years on their way both to and from their wintering grounds.[89]

Nighthawks forage on the wing over open areas with flying insects, which tend to decrease in abundance with urbanization.[90] Developing the DRAP would therefore likely mean a reduction in food available to migrating Nighthawks during their journey. Though Nighthawks have been known to nest on urban rooftops, these rooftops need to be large, flat, gravel roofs, typically only found in older industrial areas.[91] If business or industrial parks were to be incorporated into the development plans for the DRAP, this could provide an opportunity to create breeding habitat, but only if rooftops were designed using gravel instead of newer synthetic materials. Even then, the potential benefits to the species would need to be weighed against the likely risks to the food supply and the many risks to other species discussed in this document.

[85] Sauer, J.R., Link, W.A., and Hines, J.E., 2020, The North American Breeding Bird Survey, Analysis Results 1966 - 2019: U.S. Geological Survey data release, https://doi.org/10.5066/P96A7675.

[86] News release provided by COSEWIC. https://www.newswire.ca/news-releases/looking-out-for-canadian-biodiversity-818348465.html

[87] Brigham, R. M., J. Ng, R. G. Poulin, and S. D. Grindal (2020). Common Nighthawk (*Chordeiles minor*), version 1.0. In Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.comnig.01

[88] Brigham, R. M., J. Ng, R. G. Poulin, and S. D. Grindal (2020). Common Nighthawk (*Chordeiles minor*), version 1.0. In Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.comnig.01

[89] Grahame, E. 2020. Grahame Nightjars. Data accessed from the Motus Wildlife Tracking System. Birds Canada. Available: http://www.motus.org/

[90] Piano, E., et. al. 2023. Urbanization drives cross-taxon declines in abundance and diversity at multiple spatial scales. Archivio Istituzionale Open Access dell'Università di Torino [preprint version]

[91] Newberry, G.N., and D.L. Swanson. 2018. Common Nighthawks (Chordeiles minor) in the Western Corn Belt: Habitat Associations and Population Effects of Grassland and Rooftop Nesting Habitat Conversion. American Midland Naturalist 180:216-232

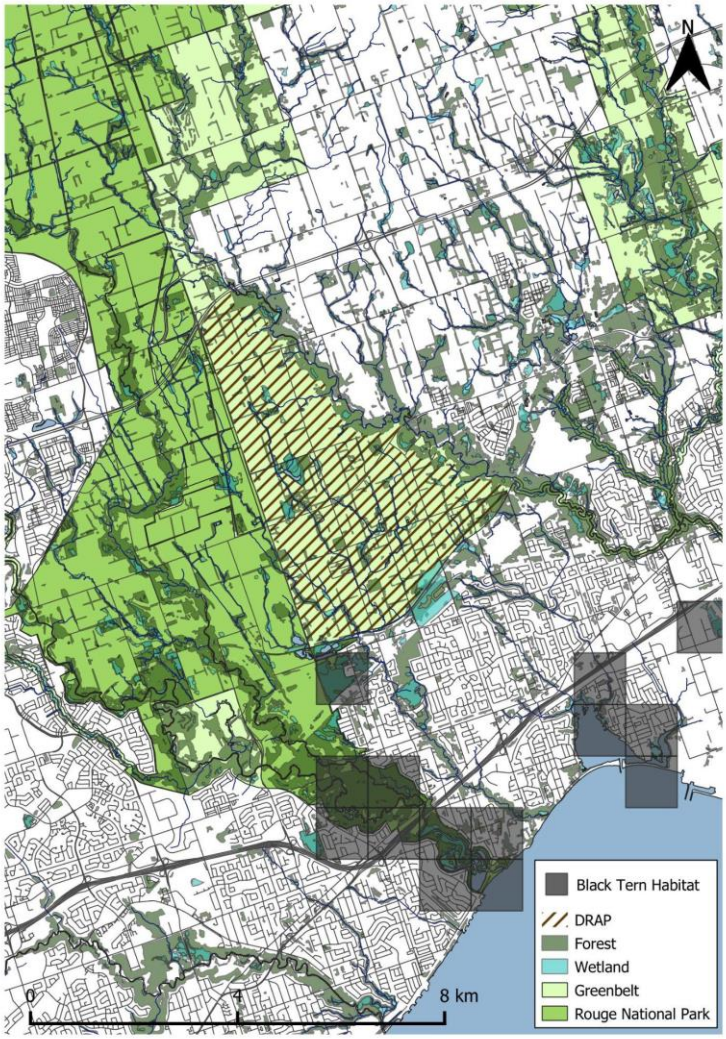

Figure 14. NHIC element occurrence of Black Tern within 5km of the DRAP

Black Tern

Strongly associated with emergent wetlands, Black Terns are a semi-colonial species that requires large, contiguous areas of relatively undisturbed marsh for successful breeding[92]. They have been nearly extirpated from the GTA but historically (as recently as the 1980s) bred near the mouth of the Rouge River[93] (Figure 14). They are negatively affected by agriculture and development in the landscape, which can both be a source of sedimentation, pollution and nutrient loading.[94] Since the creation of the RNUP and naturalization of hundreds of hectares of former agricultural lands, it may one day be possible to reestablish a population of Black Terns in the lower Rouge River Marsh. However, if the DRAP is opened to development, contaminant loads in the marsh would be likely to increase further and the possibility of reintroduction may be futile. For the benefit of Black Terns and other wetland-obligate species, I recommend further evaluation of the redesignation of the DRAP lands.

[92] Heath, S. R., E. H. Dunn, and D. J. Agro (2020). Black Tern (*Chlidonias niger*), version 1.0. In Birds of the World (S. M. Billerman, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.blkter.01

[93] Cadman, M. D. et al. (Editors). 2007. *Atlas of the Breeding Birds of Ontario*. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, Ontario, Canada, p. 341

[94] Peter S. Burke. 2012. Management Plan for the Black Tern (Chlidonias niger) in Ontario. Ontario Management Plan Series. Prepared for the Ontario Ministry of Natural Resources (OMNR), Peterborough, Ontario. vi + 47 pp.

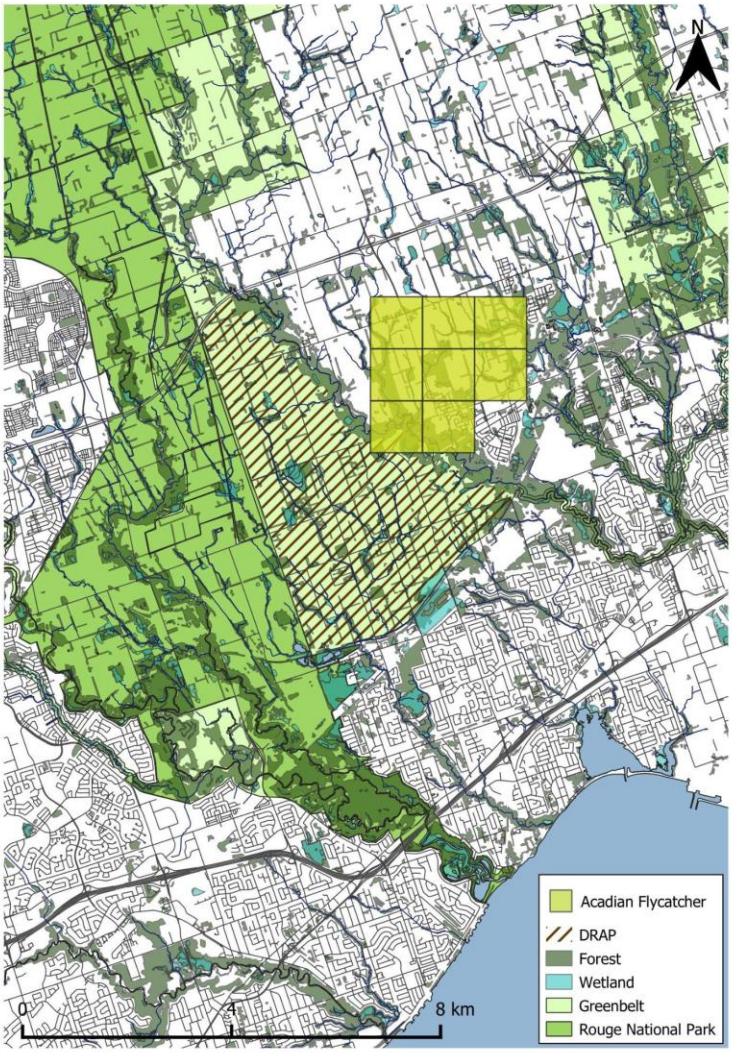

Figure 15. NHIC element occurrence of Acadian Flycatcher within 5km of the DRAP

Acadian Flycatcher (*Empidonax virescens*)

The Acadian Flycatcher is abundant in moist deciduous forests of the Eastern United States, and rare in extreme Southern Ontario. Few, if any, known populations persist in the GTA, but between 2001 and 2005, the 2nd OBBA found a possible breeding occurrence of the flycatcher in the lower Duffins Creek watershed, near the east side of the DRAP (Figure 15).[95] As the habitat has not changed significantly since then,[96] it is possible that the area remains intermittently used by breeding Acadian Flycatchers. The current (ongoing) 3rd OBBA will provide insight into whether this may be the case. A study in Ohio found that urbanization surrounding 35 riparian forest stands had a negative effect on the reproductive productivity of Acadian Flycatcher nests, and that forests in urbanized landscapes experienced lower site fidelity by the flycatchers than nearby rural forests.[97] I recommend that the results of the current OBBA be interpreted before a decision is made to open the DRAP to development in order to safeguard the habitat requirements for Acadian Flycatchers should they become established in the area.

[95] Cadman, M.D. et al. (Editors). 2007. *Atlas of the Breeding Birds of Ontario*. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, Ontario, Canada, p. 586

[96] Potapov P., Hansen M.C., Pickens A., Hernandez-Serna A., Tyukavina A., Turubanova S., Zalles V., Li X., Khan A., Stolle F., Harris N., Song X.-P., Baggett A., Kommareddy I., Kommareddy A. (2022) The global 2000-2020 land cover and land use change dataset derived from the Landsat archive: first results. Frontiers in Remote Sensing [https://doi.org/10.3389/frsen.2022.856903]

[97] Rodewald, A.D., and D.P. Shustack. 2008. Urban flight: understanding individual and population-level responses of Nearctic–Neotropical migratory birds to urbanization. Journal of Animal Ecology 77:83-91. doi: 10.1111/j.1365-2656.2007.01313.x

1.2 Reptiles

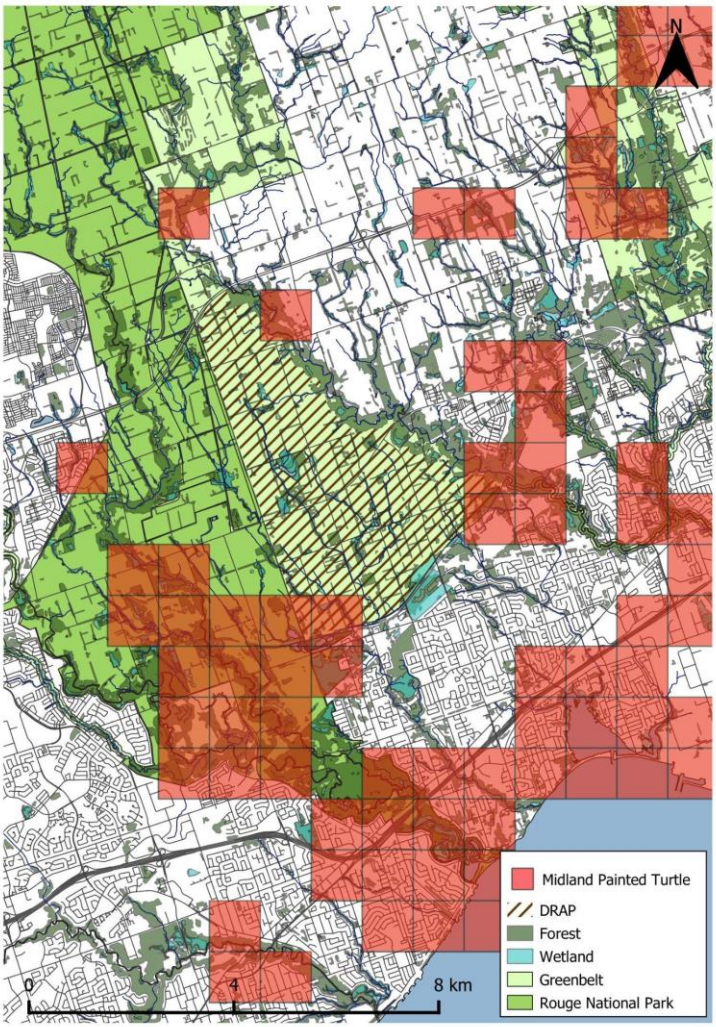

Figure 16. NHIC element occurrence of Painted Turtle within 5km of the DRAP

Midland Painted Turtle
(*Chrysemys picta marginate*)
Ontario's most common turtle is listed as "special concern" by the federal government due to ongoing threats posed by wetland loss and road mortality.[98]

Painted Turtles inhabit all types of wetlands, slow-moving watercourses, lakes and ponds,[99] and can be found throughout the GTA, including the DRAP (Figure 16). Because Painted Turtles are long-lived, the loss of even a single individual can have serious impacts on a population.[100] Recent changes to SARO allowing species with healthy populations outside of Ontario to be downlisted puts the Painted Turtle at risk of losing protection in the province.[101] This, coupled with the recent Minister's Zoning Orders that have targeted significant wetlands,[102] could lead to further declines of the species, especially in the GTA where many new development projects have been proposed. Adverse effects on Painted Turtles and their habitat must not be overlooked during any federal IA process. Because of the species' widespread distribution,

[98] COSEWIC. 2018. COSEWIC assessment and status report on the Midland Painted Turtle Chrysemys picta marginata and the Eastern Painted Turtle Chrysemys picta in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvi + 107 pp. (http://www.registrelepsararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1).

[99] Ontario Nature. 2010-2022. Midland Painted Turtle. https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/midland-painted-turtle/

[100] Ontario Nature. 2010-2022. Midland Painted Turtle. https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/midland-painted-turtle/

[101] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 4.

A. [102] CBC News. Ford government fast-tracks 6 new GTA development deals using controversial MZOs https://www.cbc.ca/news/canada/toronto/ford-mzos-toronto-development-1.5942671

affected sites likely include a large number of small, unevaluated wetlands.

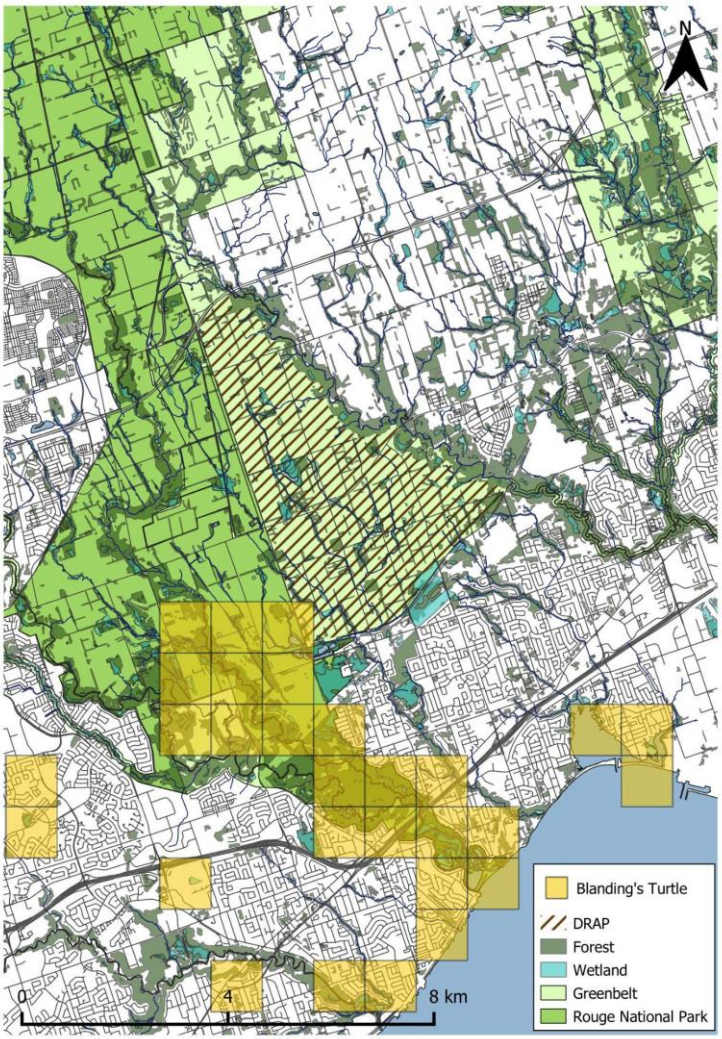

Figure 17. NHIC element occurrence of Blanding's Turtle within 5km of the DRAP

Blanding's Turtle (*Emydoidea blandingii*)

Blanding's Turtles require shallow water bodies with clean water and mucky bottoms and are restricted to a relatively small global range encompassing the Great Lakes lowlands and U.S. Midwest.[103] Their Canadian population has been severely diminished by wetland loss, shoreline alteration and road mortality.[104] In the GTA, Blanding's Turtles occur in a few scattered locations, including the lower Rouge River and adjacent areas (Figure 17). Because water quality is important to their survival, any upstream activities that may leach contaminants, such as a new road or housing project, could hinder the long-term viability of these populations. In addition, Blanding's Turtles travel several km between breeding and overwintering sites and adding new roads to the landscape only increases the probability that turtles will cross a road during this already risky journey.[105]

With 1,403 SARO permit approvals impacting them since 2007, Blanding's Turtles are a prime

[103] Ontario Nature. 2010-2022. Blanding's Turtle. https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/blandings-turtle/

[104] COSEWIC. 2016. COSEWIC assessment and status report on the Blanding's Turtle *Emydoidea blandingii*, Nova Scotia population and Great Lakes/St. Lawrence population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xix + 110 pp. (Species at Risk Public Registry website).

a. [105] Seburn, D.C, & K. Gunson. 2016. Appendix 3. Estimating the effect of road mortality on Blanding's Turtles across Ontario: a report in support
b. of the COSEWIC Update Status Report and Status Assessment in progress. https://www.canada.ca/en/environment-climate
c. change/services/species-risk-public-registry/cosewic-assessments-status-reports/blanding-turtle-2016/appendix-3.htm

example of how provincial legislation has failed Species at Risk in Ontario.[106] There have been repeated cases of harmful activities being permitted without appropriate habitat replacement or follow-up monitoring, yet permits for activities benefitting the species have been delayed, negatively impacting conservation efforts[107]. Removing protections from development across the DRAP would likely impact Blanding's Turtle in a complex variety of ways, including increased road mortality, downstream pollution of waterways, and cumulative effects of other current development projects in the area. To better assess threat levels for this species, I would encourage the IAA to consider modelling the future trajectory of Blanding's Turtle abundance under a range of landscape-level development scenarios. To do this, it may first be necessary to obtain initial population estimates at sites within the DRAP and downstream near the mouth of the Rouge River.

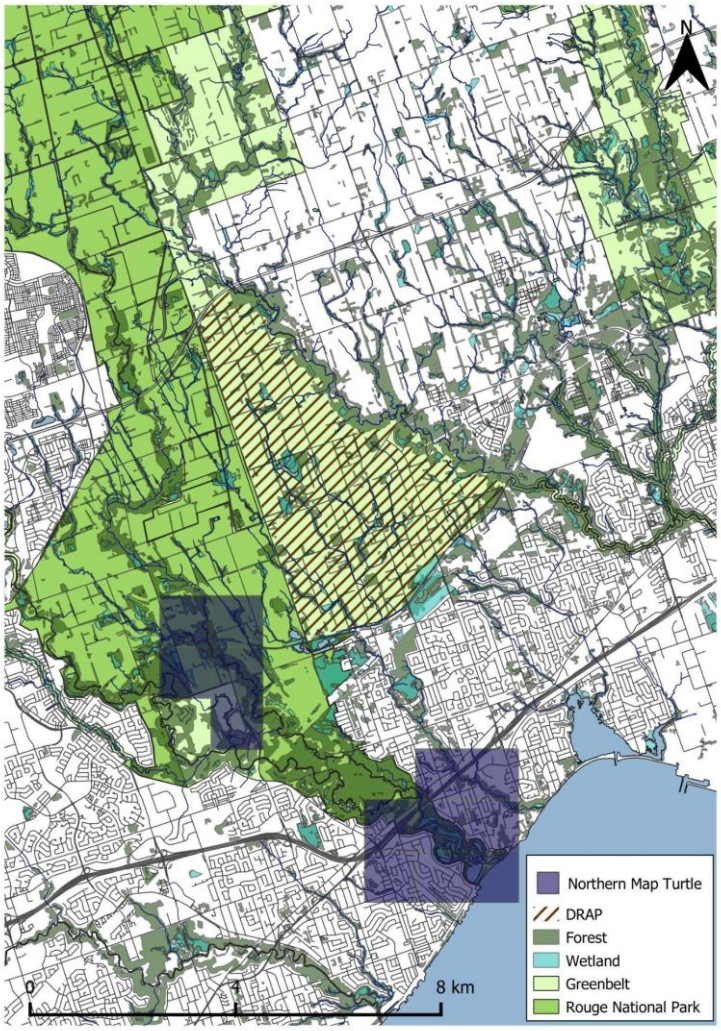

Figure 18. NHIC element occurrence of Northern Map Turtle within 5km of the DRAP

Northern Map Turtle
(*Graptemys geographica*)
Northern Map Turtles gather in groups along large, shallow water bodies with soft bottoms.[108] In addition to wetland loss, shoreline alteration and road mortality, Map Turtles are particularly sensitive to water pollution causing the die-off of their mollusk prey.[109] Populations in the lower Rouge River (Figure 18) likely already experience a great deal of pressure from a variety of urban

[106] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 5.

[107] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 44, 46 & 48

[108] Ontario Nature. 2010-2022. Northern Map Turtle. https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/northern-map-turtle/

[109] Ontario Nature. 2010-2022. Northern Map Turtle. https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/northern-map-turtle/

pollutants,[110,111] and adding thousands of additional structures upstream could have further negative effects. I recommend that the federal EA consider cumulative effects of the DRAP rezoning proposal and other development in the region on the Northern Map Turtle.

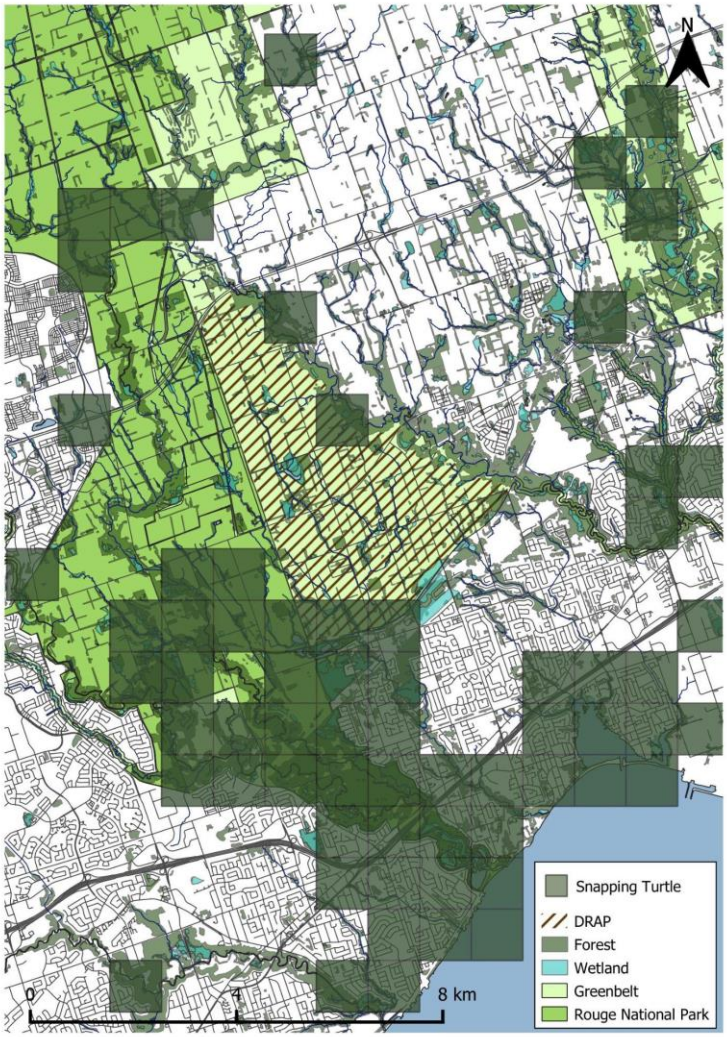

Figure 19. NHIC element occurrence of Snapping Turtle within 5km of the DRAP

Snapping Turtle (*Chelydra serpentina*) Canada's largest land turtle, the Snapping Turtle utilizes all types of shallow water bodies with a soft mud or sand bottom and abundant vegetation, including roadside ditches and ephemeral wetlands.[112] Because of their habit of burrowing into gravel road shoulders for nesting, Snapping Turtles are frequently reported as road casualties.[113] This is a serious problem for the species, whose long-lived, slow reproductive strategy means that the loss of even a few individuals can lead to population decline.[114] Snapping Turtles are known to breed in parts of the DRAP, particularly in the southern end of the property near Amos Pond (Figure 19). Introducing new suburban roads to this landscape would likely result in a high number of road casualties and fragment populations in the southern end of the DRAP from those to the north along Duffins Creek. Given the poor performance of the provincial legislation in creating overall benefit for Species at Risk from approved projects, a federal IA is necessary to ensure the protection of the Snapping Turtle. I recommend that the federal IA assess the level of threat posed by the rezoning with and

[110] Credit Valley Conservation. 2014. Credit River Estuary: Species at Risk Research Project. V + 100 pp.

[111] Ontario Streams. 2011. Lower Humber River Wetland Complex Class Environmental Assessment: Draft Environmental Study Report. x + 101 pp.

[112] Ontario Nature. 2010-2022. Snapping Turtle. https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/snapping-turtle/

[113] Ontario Nature. 2010-2022. Snapping Turtle. https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/snapping-turtle/

[114] Piczak, M. L. et al. 2019. Decades of Road Mortality Cause Severe Decline in a Common Snapping Turtle (Chelydra serpentina) Population from an Urbanized Wetland. Chelonian Conserv Biol 18:231–240. https://doi.org/10.2744/CCB-1345.1

without mitigation measures incorporated into the design of new roadways. These measures could include inexpensive ecopassages[115] and exclusion fencing,[116] which have both been shown to be effective at reducing turtle mortality.

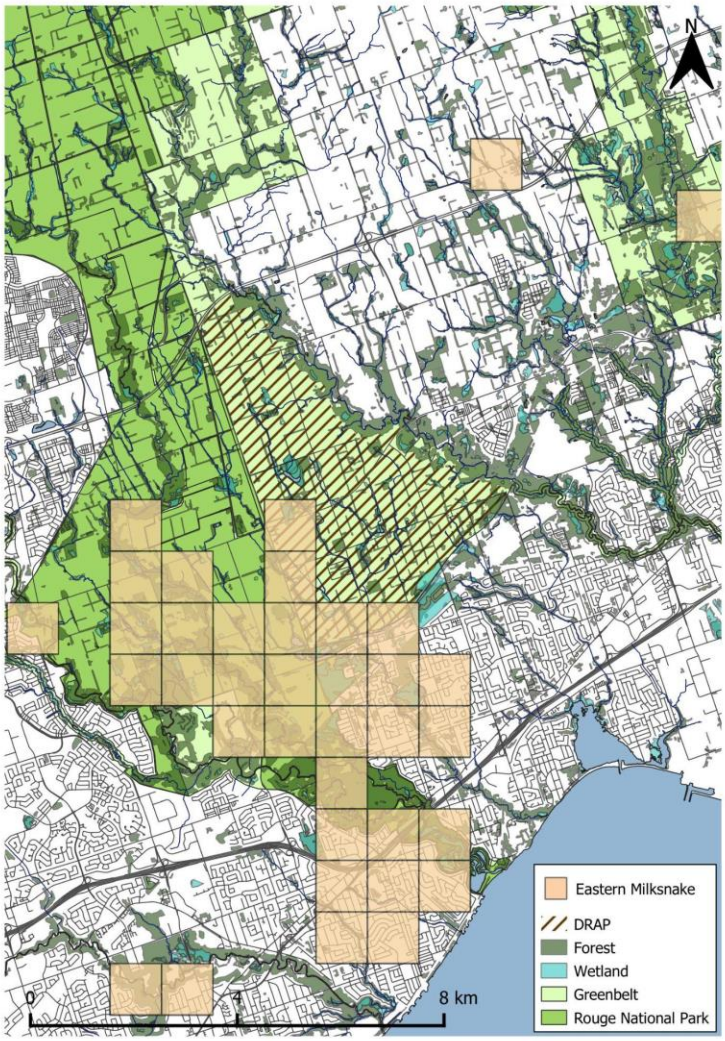

Figure 20. NHIC element occurrence of Eastern Milksnake within 5km of the DRAP

Eastern Milksnake (*Lampropeltis triangulum*)
This non-venomous member of the Kingsnake family is often mistaken throughout its global range for venomous lookalike species.[117] In Ontario, it can be found in rocky outcrops, along forest edge and in rural areas around barns.[118] In addition to deliberate persecution by misinformed people, milksnakes are threatened by road mortality and habitat loss.[119] Milksnakes are common in the Rouge Valley and have been reported in the DRAP near York-Durham Townline and Amos Pond (Figure 20). In assessing the level of threat to this species, I advise that all barns and other existing older structures within the DRAP are thoroughly checked by a trained biologist for evidence of Eastern Milksnake nesting sites and hibernacula.

[115] Read, K. D. & B. Thompson. 2021. Retrofit ecopassages effectively reduce freshwater turtle road mortality in the Lake Simcoe Watershed. Conservation Science and Practice 3:1–12. https://doi.org/10.1111/csp2.491

[116] Piczak, M. L. et al. 2019. Decades of Road Mortality Cause Severe Decline in a Common Snapping Turtle (Chelydra serpentina) Population from an Urbanized Wetland. Chelonian Conservation Biology 18:231–240. https://doi.org/10.2744/CCB-1345.1

[117] Ontario Nature. 2010-2022. Milksnake. https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/milksnake/

[118] Ontario Nature. 2010-2022. Milksnake. https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/milksnake/

[119] Ontario Nature. 2010-2022. Milksnake. https://ontarionature.org/programs/community-science/reptile-amphibian-atlas/milksnake/

1.3 Fish

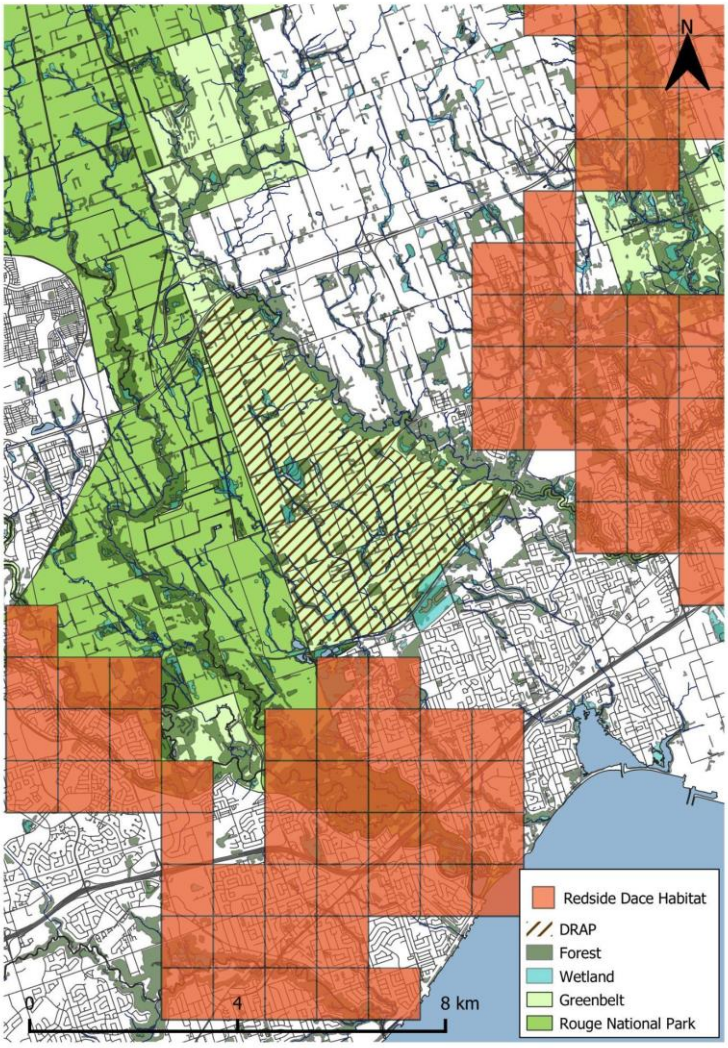

Figure 21. NHIC element occurrence of Redside Dace within 5km of the DRAP

Redside Dace (*Clinostomus elongatus*)

The Redside Dace is an endangered minnow with a global range restricted to certain tributaries of the lower Great Lakes.[120] In Canada, it has recently only been found in a few rivers connecting to Lake Huron, Erie and Simcoe, and around a dozen rivers connecting to western Lake Ontario, all of which flow through the GTA[121] (Figure 21). Redside Dace have specific habitat requirements: clear rivers and streams with a sand or gravel bottom less than 10m wide with slow-moving sections, pools and overhanging vegetation, and a temperature of 14-23 degrees Celsius.[122] Because of the intense urban development that has occurred in the GTA, many sections of river no longer meet these requirements and Redside Dace have been pushed upstream to occupy headwater sections that have experienced disturbance.[123] Primary threats to the species include pollution of streams resulting in turbidity or water temperature increases, and removal of vegetation next to streams.[124] The Ontario government continuously

[120] Hubbs, C. L. et al. 2004. Fishes of the Great Lakes Region, revised edition. University of Michigan Press. Ann Arbor, MI. xvii + 276 pp.

[121] COSEWIC. 2017. COSEWIC assessment and status report on the Redside Dace Clinostomus elongatus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 63 pp. (http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1).

[122] Ontario Freshwater Fishes Life History Database. Redside Dace. https://www.ontariofishes.ca/fish_detail.php?FID=39

[123] COSEWIC. 2017. COSEWIC assessment and status report on the Redside Dace Clinostomus elongatus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 63 pp. (http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1).

[124] COSEWIC. 2017. COSEWIC assessment and status report on the Redside Dace Clinostomus elongatus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 63 pp. (http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1).

grants permits for projects that negatively affect Redside Dace. In particular, an overall benefit permit was issued in 2021 for the construction of a highway bridge that damaged 0.46 hectares of Redside Dace habitat while only requiring that 0.08 hectares be improved[125].

The DRAP currently supplies clean water to both the Rouge River and Duffins Creek watersheds by way of 14 headwater streams (Figure 26). Some of these, particularly those in the northern part of the property flowing into Duffins Creek, are coldwater streams. While Redside Dace have not been detected in the lower Rouge River or any of the streams within the DRAP during recent OMNMNRF water sampling efforts, NHIC data suggest a much more widespread occurrence (Figure 21). It is possible that the species persists in very low numbers throughout the Rouge River and its many tributaries as well as the lower portion of the Duffins Creek watershed.

I encourage the IAA to carefully consider the implications of opening a large area of potentially suitable Redside Dace habitat to development. Because the global range is small and populations are also struggling elsewhere, the extirpation of Redside Dace from Ontario could have a significant impact on the global population. To improve the population, reintroduction efforts may be necessary in the future, and the DRAP is one important area where such efforts should be targeted.

Atlantic Salmon (*Salmo salar*)

The Lake Ontario population of Atlantic Salmon went extinct during the industrial revolution and colonial land clearing due to overfishing and habitat disturbance. Efforts to reintroduce the species to the region by stocking non-native fish have been ongoing but have so far struggled to establish a self-reproducing population.[126] The Rouge River and Duffins Creek are regularly stocked with Atlantic Salmon by the TRCA, and in recent years there have been increasing numbers of salmon successfully migrating upstream to spawn.[127] Atlantic Salmon prefer cool or coldwater streams with clear, clean water for spawning.[128] Because urbanization typically results in higher stream temperatures and increased turbidity, it is seen as a major barrier to successful salmon reintroduction.[129] Atlantic Salmon have recently been detected in one cold headwater tributary flowing into West Duffins Creek in the northern portion of the DRAP.[130] Developing this area would likely render this tributary unsuitable for salmon and inhibit reintroduction efforts in the Duffins Creek watershed.

[125] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 46.

[126] COSEWIC 2006. COSEWIC assessment and status report on the Atlantic salmon Salmo salar (Lake Ontario population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 26 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

[127] TRCA. 2015. Surveying Salmon in Duffins Creek: 2015 Update. https://trca.ca/news/surveying-salmon-in-duffins-creek-2015-update/

[128] COSEWIC 2006. COSEWIC assessment and status report on the Atlantic salmon Salmo salar (Lake Ontario population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 26 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

[129] COSEWIC 2006. COSEWIC assessment and status report on the Atlantic salmon Salmo salar (Lake Ontario population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 26 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

[130] Listed as present in one stream within the DRAP by the OMNRF aquatic resources shapefile available on Ontario GeoHub.

1.4. Invertebrates

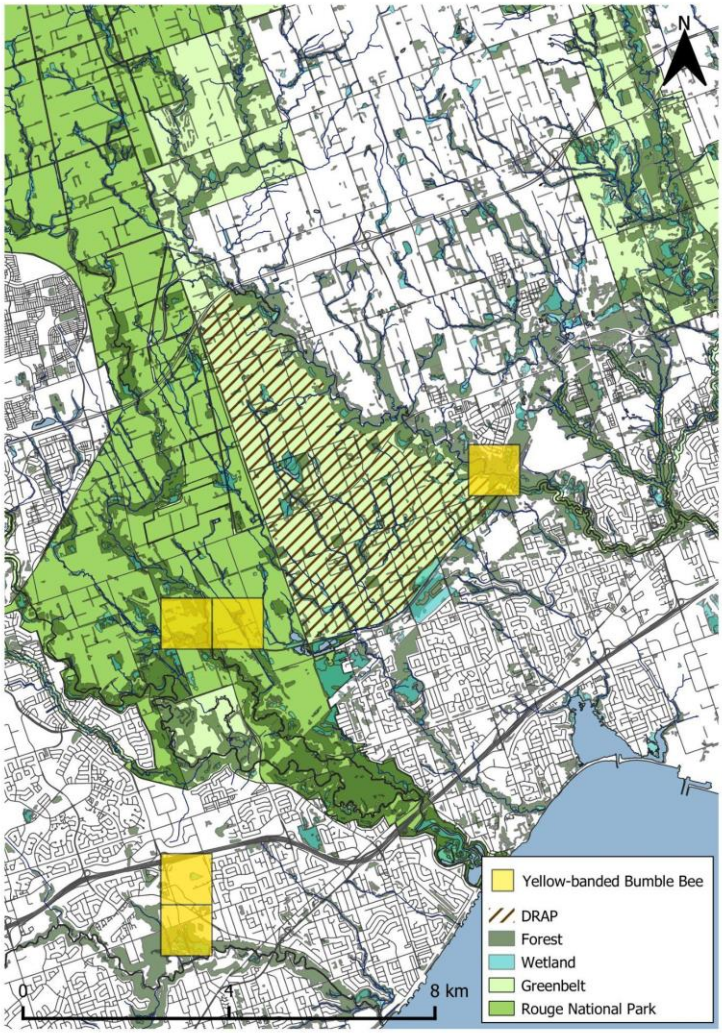

Figure 22. NHIC element occurrence of Yellow-banded Bumble Bee within 5km of the DRAP

Yellow-banded Bumble Bee
(*Bombus terricola*)
Native North American bumble bees have declined substantially across their range since the 1970s.[131] Bumble Bee declines are likely a result of several factors working together, which include pesticide use, habitat loss, and climate change.[132] The Yellow-banded Bumble Bee is a habitat generalist, meaning that it exploits a wide range of open and semi-wooded environments for foraging and pollinates a variety of native wildflowers and crops.[133] The Yellow-banded Bumble Bee has been found in the Rouge Valley as well as the southeastern corner of the DRAP (Figure 22).

landscape-scale development may affect struggling bumble bee populations both directly through the loss of habitat, and indirectly by contributing to climate change. As stated in the COSEWIC status report for the American Bumble Bee, "Any activities that have impacts on nesting sites and/or local floral resources potential

[131] Rusty-patched Bumble Bee: COSEWIC. 2010. COSEWIC assessment and status report on the Rusty-patched Bumble Bee Bombus affinis in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 34 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
American Bumble Bee: COSEWIC. 2018. COSEWIC assessment and status report on the American Bumble Bee Bombus pensylvanicus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 52 pp. (http://www.registrelep sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1).
Yellow-banded Bumble Bee: COSEWIC. 2015. COSEWIC assessment and status report on the Yellow-banded Bumble Bee Bombus terricola in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 60 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

[132] Based on information from COSEWIC reports for American, Yellow-banded and Rusty-patched Bumble Bees

[133] See COSEWIC reports for American, Yellow-banded and Rusty-patched Bumble Bees

could impact colony success."[134] If development goes forward, the incorporation of pollinator-friendly, native landscaping into urban design may create habitat for Bumble Bees and other declining pollinators. Many Bumble Bee species, including the Yellow-banded, are restricted to temperate climates and are highly sensitive to rising temperatures linked to climate change.[135] Vehicles burning fossil fuels are a major source of climate change-inducing carbon emissions,[136] and evidence suggests that building new communities on the urban fringe will encourage people to drive more.[137] As such, I recommend that the IAA reevaluate the rationale of opening the DRAP to development given the current climate crisis and the city's capacity to add density to its core.

Monarch butterfly (*Danaus plexippus*)

One of North America's best-known butterflies, the Monarch has experienced steep declines, largely due to pesticides and to the loss of its Milkweed host plants.[138] 11 of 14 Milkweed species in Canada are used by Monarchs, and the butterflies can be found in any habitat where these plants grow (typically meadows, overgrown agricultural fields and roadsides).[139] Although NHIC does not track Monarch occurrences in Ontario, data from the Ontario Butterfly Atlas indicate that Monarchs are relatively common in the GTA but occur in slightly lower abundance there than more rural parts of the province, possibly due to lack of habitat.[140] Road casualties of Monarchs have been reported to increase with traffic volume and road width.[141,142] Developing the DRAP would mean widening roads and introducing vehicle traffic to the landscape. While there is potential for urban gardens to provide habitat for Monarchs, there are few, if any, incentives to incorporate Milkweed into gardens, and some people still view it as a nuisance plant. In addition, Monarch populations may be affected by climate change[143] and urban sprawl is a large contributor to this problem. I recommend that a federal environmental assessment weighs the possible benefit of habitat creation in the form of gardens against the potential

[134] See Table 3 in COSEWIC. 2018. COSEWIC assessment and status report on the American Bumble Bee Bombus pensylvanicus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 52 pp. (http://www.registrelep - sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1

[135] See COSEWIC reports for Yellow-banded and Rusty-patched Bumble Bees

[136] Chapman, L. 2007. Transport and climate change: a review. Journal of Transportation Geography 15: 354–67

[137] Mattioli, G. et al. 2020. The political economy of car dependence: A systems of provision approach. Energy Research and Social Science 66: 101486.

[138] COSEWIC. 2016. COSEWIC assessment and status report on the Monarch Danaus plexippus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 59 pp. (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/monarch-2016.html)

[139] COSEWIC. 2016. COSEWIC assessment and status report on the Monarch Danaus plexippus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 59 pp. (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/monarch-2016.html)

[140] Toronto Entomologists' Association. 2022. Ontario Butterfly Atlas. https://www.ontarioinsects.org/atlas/

[141] McKenna, D. D. et al. 2001. Mortality of lepidoptera along roadways in central Illinois. Journal of the Lepidoperists' Society 55(2): 63-68

[142] Skórkaa, P. et al. 2013. Factors affecting road mortality and the suitability of road verges for butterflies. Biological Conservation 159: 148-157.

[143] COSEWIC. 2016. COSEWIC assessment and status report on the Monarch Danaus plexippus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 59 pp. (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/monarch-2016.html)

adverse effects of road mortality, carbon emissions and the direct loss of habitat (through bulldozing of overgrown fields) on the Monarch's global population.

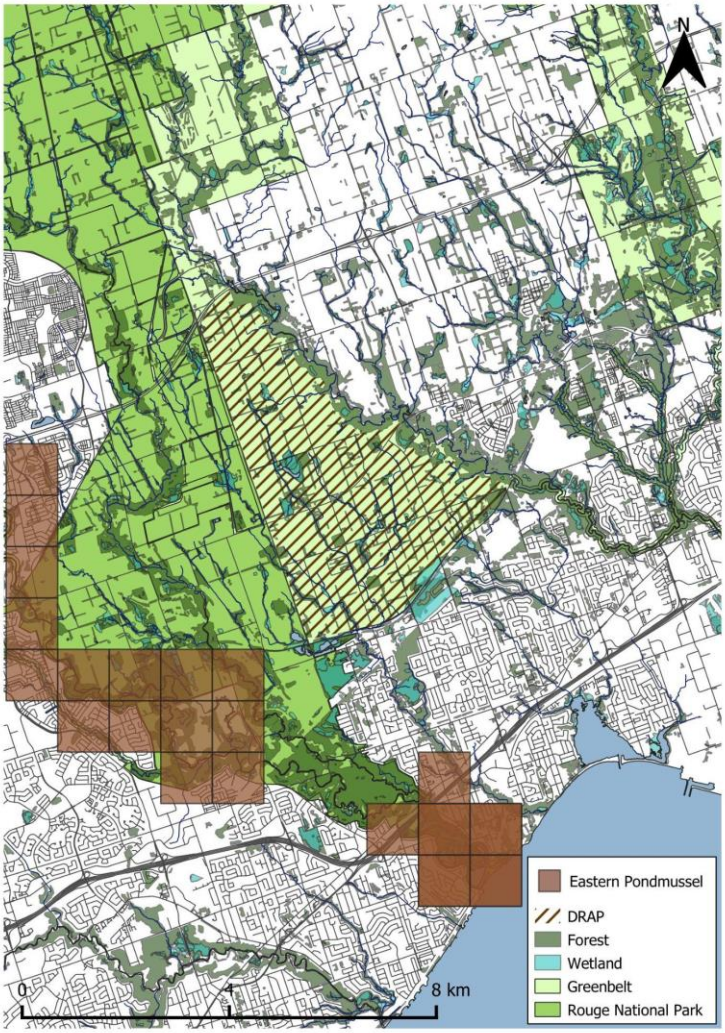

Figure 23. NHIC element occurrence of Eastern Pondmussel within 5km of the DRAP

Eastern Pondmussel (*Ligumia nasuta*)

Like most of Ontario's native freshwater mussels, the Eastern Pondmussel has experienced severe competition from invasive *Dreissena* (Zebra and Quagga) mussels.[144] However, its population is likely to persist in very low numbers in the lower Rouge River (Figure 23), as there were a few detections there in 2012 and 2015 during OMNMNRF surveying.[145] Because they live in the substrate of water bodies, freshwater mussels are very sensitive to contamination from industrial chemicals, road salts and sewage.[146] Contaminant levels in Lake Ontario and the Rouge River are already high and adding additional structures and paved surfaces to the landscape in the upstream DRAP would only add to this problem. I recommend assessing the expected cumulative level of contaminant loading from the proposed development that would occur within the DRAP before permitting the area to be stripped of its current protections.

[144] COSEWIC. 2017. COSEWIC assessment and status report on the Eastern Pondmussel Ligumia nasuta in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 61 pp.

[145] COSEWIC. 2017. COSEWIC assessment and status report on the Eastern Pondmussel Ligumia nasuta in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 61 pp.

[146] COSEWIC. 2017. COSEWIC assessment and status report on the Eastern Pondmussel Ligumia nasuta in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 61 pp.

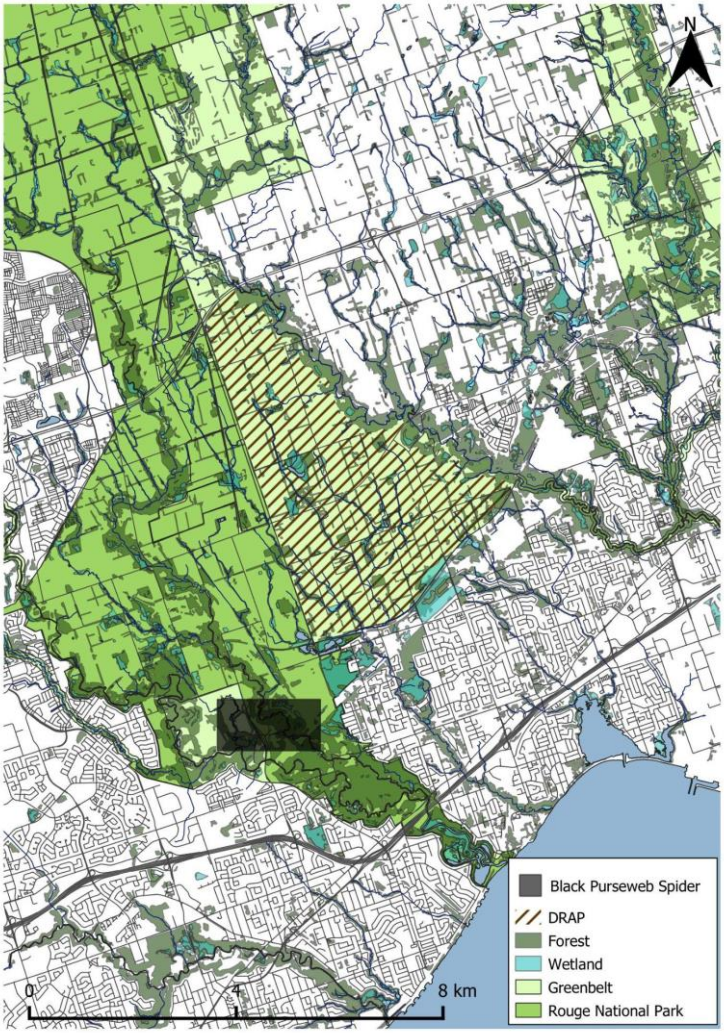

Figure 24. NHIC element occurrence of Black Purseweb Spider within 5km of the DRAP

Black Purseweb Spider (*Sphodros niger*)

Although tiny (~2cm), the Black purseweb spider is actually a member of the Theraphocidae (Tarantula) family.[147] It lives in sandy open areas and woodlands and constructs a well-camouflaged underground silk tunnel from which it catches its prey.[148]

Little is known about the Black Purseweb Spider in Canada, except that it has been found in 17 localities across southern Ontario including the lower Rouge Valley about 1km southwest of the DRAP (Figure 24). The species has not yet been assessed by COSEWIC, SARO, or even the IUCN RedList, an indication of how little data exists for the species as a whole. However, the scarcity of detections suggests that it is likely at-risk. As it may inhabit disturbed sites, its habitat is especially vulnerable to loss during construction. It is important that trained biologists are given a chance to thoroughly search for the spider throughout the DRAP before the area is opened to development.

[147] Nature Conservancy Canada. 2023. Black Purse-web Spider. https://www.natureconservancy.ca/en/what-we-do/resource-centre/featured-species/insects-and-spiders/black-purse-web-spider.html

[148] Nature Conservancy Canada. 2023. Black Purse-web Spider. https://www.natureconservancy.ca/en/what-we-do/resource-centre/featured-species/insects-and-spiders/black-purse-web-spider.html

1.5. Plants

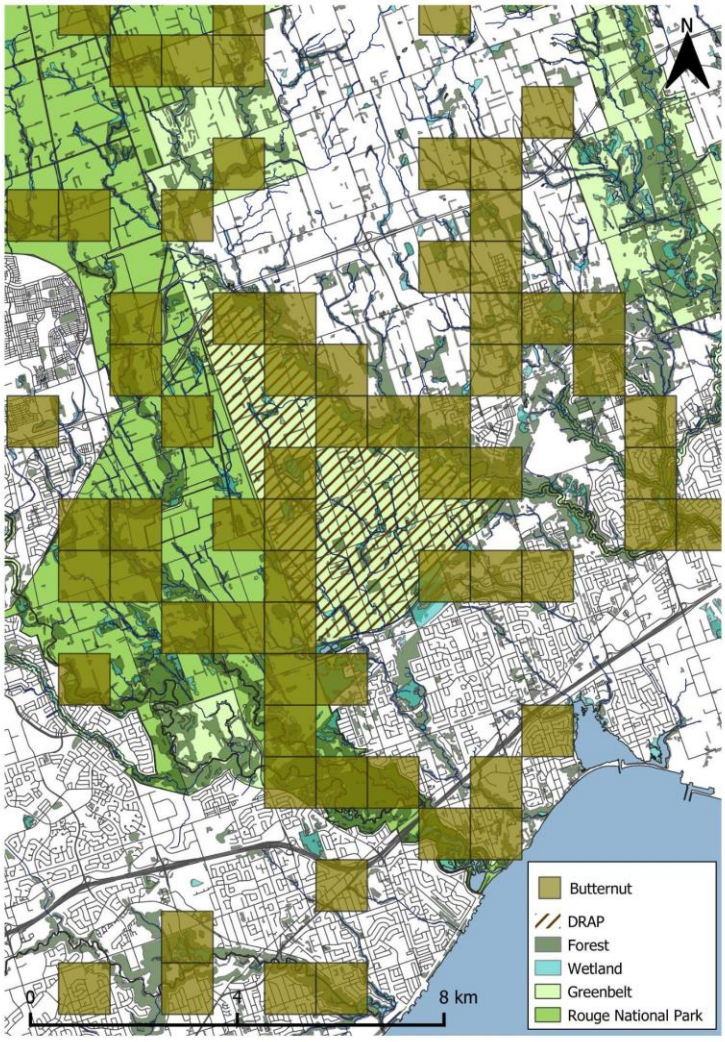

Figure 25. NHIC element occurrence of Butternut within 5km of the DRAP

Butternut (*Juglans cinerea*)
Butternut trees grow in mesic forest with neutral or calcareous soil over limestone, especially in floodplains.[149] Their population has been decimated by the invasive Butternut Canker (Sirococcus clavigignenti-juglandacearum), a fungal disease.[150] Living trees are still widespread throughout eastern North America, but few are completely disease-free, and those with disease resistance are highly important to the future of the species.[151] Mature Butternuts are scattered throughout the GTA in low densities, including in several woodlots within the DRAP (Figure 25).

Although Butternut is listed provincially as endangered, it has received little protection under SARA. Permits have routinely been granted for the removal of Butternut or the destruction of its habitat without any requirement for compensations.[152] A comprehensive federal EA must assess the status, size and health of any known Butternut populations that may be affected by development as well as initiate a search for additional unknown populations, as it is not

[149] COSEWIC. 2017. COSEWIC assessment and status report on the Butternut Juglans cinerea in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 74 pp. (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/butternut-2017.html)

[150] Ostry, M. & K. Woeste. 2004. Spread of butternut canker in North America, host range, evidence of resistance within butternut populations and conservation genetics. Proceedings of the 6th Walnut Council Research Symposium: 114-120.

[151] Ostry, M. & K. Woeste. 2004. Spread of butternut canker in North America, host range, evidence of resistance within butternut populations and conservation genetics. Proceedings of the 6th Walnut Council Research Symposium: 114-120.

[152] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 41.

known how recently the area has been surveyed. I strongly recommend that any living Butternut specimens, especially those showing signs of disease resistance, are protected within a buffer radius that allows for their long-term survival.

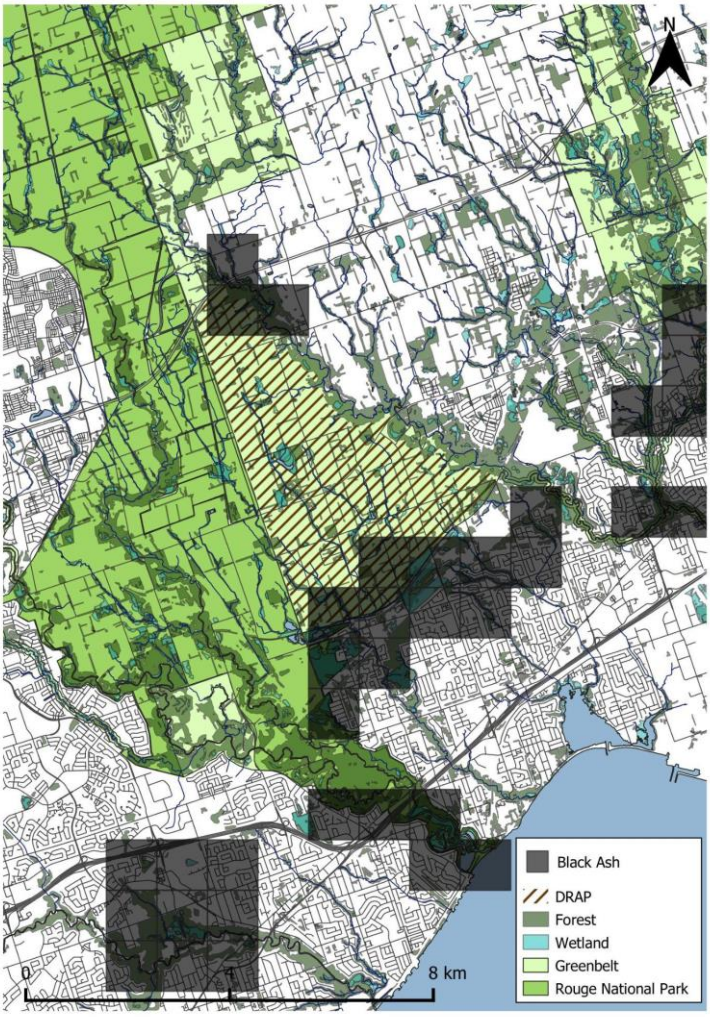

Figure 26. NHIC element occurrence of Black Ash within 5km of the DRAP

Black Ash (*Fraxinus nigra*)

The Black Ash occurs in seasonally flooded wetlands with at least some alkalinity on a wide variety of soils, and occasionally in moist upland sites.[153] All native ash trees including the Black Ash have suffered catastrophic effects of the introduced Emerald Ash Borer.[154] In addition, Black Ash is vulnerable to wetland loss and flooding for hydroelectric projects.[155] At least two Black Ash populations are known from within the DRAP (Figure 26). If the proposed development involves any alterations to the local hydrology, which is often the case with large-scale projects, these populations could be negatively affected.

Although Black Ash has recently been added to SARO, it is also subject to a temporary two-year suspension of protections that began in 2022, leaving it essentially unprotected at the provincial level at the time the DRAP was considered for rezoning.[156] Therefore, it is especially important that the federal government take responsibility for ensuring that this

[153] COSEWIC. 2018. COSEWIC assessment and status report on the Black Ash Fraxinus nigra in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Xii + 95 pp. (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/black-ash-2018.html)

[154] COSEWIC. 2018. COSEWIC assessment and status report on the Black Ash Fraxinus nigra in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Xii + 95 pp. (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/black-ash-2018.html)

[155] COSEWIC. 2018. COSEWIC assessment and status report on the Black Ash Fraxinus nigra in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Xii + 95 pp. (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/black-ash-2018.html)

[156] Office of the Auditor General of Ontario. 2021. Value-for-money Audit: Protecting and Recovering Species at Risk, p. 64.

species is protected within the DRAP, considering both direct effects of wetland loss as well as potential long-term effects of altered hydrology on population survival.

Bashful Bulrush/Few-flowered Clubrush/Few-flowered Spikerush (*Trichophorum planifolium*)

Though not included on the list of 33 Species at Risk present in or near the DRAP, I provide a brief account of this species because of its uniqueness in the adjacent RNUP and the potential to restore it on DRAP lands. Despite its many names, the Bashful Bulrush is actually a member of the Sedge family (Cyperaceae). In Canada, the species is known from only two locations: Royal Botanical Gardens in Hamilton, and the lower Rouge Valley. These populations are both found on well-drained soils within open forest situated in areas with a climate moderated by Lake Ontario. The population in the Rouge Valley was in steady decline until 1999 when it apparently collapsed to only a few individual plants, likely due to disturbance from a nearby fox den.[157] It is unknown whether any plants now persist at this site but confirming the species' presence would require expert experience. Any remaining plants would be highly vulnerable to human and animal foot traffic within the forest, as well as to pollution, erosion and alteration of climate.

Development of the DRAP would add even more traffic to the already popular RNUP where the plants formerly were found, and construction activities upstream could potentially affect the water quality and site conditions that the species depends on, hindering any potential for reintroduction. I stress the importance of maintaining the current protections outlined in the DRAP Act to prevent irreversible loss of range-restricted native plant species like the Bashful Bulrush. I also advocate for an exhaustive search to be carried out by skilled biologists, as it is unknown when the last such search occurred.

1.6. Mammals

Little Brown Bat (*Myotis lucifugus*)

North American hibernating bat species have been steeply declining over the past decade due to the prevalence of white-nose syndrome, an introduced fungus that spreads from bat to bat and thrives in the cold, humid conditions of bat hibernacula.[158] Few data exist, but the Little Brown Bat (or Little Brown Myotis) likely breeds within the DRAP, or at least uses the area for routine foraging and roosting. The GTA bat-tracking project deployed a MOTUS tag on a Little Brown bat in the RNUP and found that it migrated to Luther Marsh approximately 90 km to the west.[159] Before migrating, it spent at least a week foraging in the Rouge Valley. Individuals that migrate north instead of west would be expected to forage for some time over the DRAP,

[157] COSEWIC. 2000. COSEWIC assessment and status report on the bashful bulrush Trichophorum planifolium in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 8 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

[158] COSEWIC. 2013. COSEWIC assessment and status report on the Little Brown Myotis lucifugus, Northern Myotis septentrionalis and Tri-colored Bat Perimyotis subflavus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp.

[159] Thorne, T. 2021. GTA Bat Tracking. Data accessed from the Motus Wildlife Tracking System. Birds Canada. Available: http://www.motus.org/.

possibly taking advantage of abundant insect supplies over its wetlands and forests. Compared to other bat species, the Little Brown Bat may be relatively adaptable to urban environments.[160] It may be possible to design new buildings in a way that favours bat roosting, such as by using bat-access shingles.[161] However, such benefits would likely not outweigh the negative effects of the development on the insect supplies that bats depend on.[162]

Northern Long-eared Myotis (*Myotis septentrionalis*) and **Tricolored Bat** (*Perimyotis subflavis*)

Like the Little Brown Bat, the Northern Long-eared Myotis and Tri-colored bat are hibernating bats that have succumbed to White-nose syndrome.[163] While they may also roost in man-made structures, they are more strongly associated with forest and may therefore be more sensitive than the Little Brown Bat to urbanization.[164] MOTUS data found at least one tagged Long-eared Myotis foraging over RNUP during the summer of 2021,[165] indicating that the forests of this region provide important habitat for this species. Development pressure adjacent to forests may affect bat populations in unknown ways, and the cumulative effects with white-nose syndrome could spell disaster for the Northern Long-eared Myotis and Tri-colored bat in the Rouge Valley. I therefore urge the IAA to reconsider repealing the DRAP Act and focus instead on strengthening conservation measures.

1.7. Additional Species at Risk

In addition to the 33 SARA-listed species described in detail above (summarized in Table 1)**,** I also identified 25 SARA-listed species that are known to breed in other parts of the GTA or that regularly occur in the DRAP outside the breeding season (Table 2). It is possible that some of these additional species may also breed within DRAP or RNUP intermittently or in very low densities, but further study would be needed to draw such a conclusion. Many of these species were likely much more abundant and widespread before European colonization and could theoretically be reintroduced to the DRAP and/or RNUP if habitat were deemed suitable.

---

[160] Wolf, J.M., Jeschke, J.M., Voigt, C.C., and Y. Itescu. 2021. Urban affinity and its associated traits: A global analysis of bats. Global Change Biology 28:5667-5682. DOI: 10.1111/gcb.16320

[161] See, for example, this supplier: https://www.nhbs.com/bat-access-tile-set

[162] Piano, E., et. al. 2023. Urbanization drives cross-taxon declines in abundance and diversity at multiple spatial scales. Archivio Istituzionale Open Access dell'Università di Torino [preprint version]

[163] COSEWIC. 2013. COSEWIC assessment and status report on the Little Brown Myotis Myotis lucifugus, Northern Myotis Myotis septentrionalis
and Tri-colored Bat Perimyotis subflavus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp.

[164] COSEWIC. 2013. COSEWIC assessment and status report on the Little Brown Myotis Myotis lucifugus, Northern Myotis Myotis septentrionalis and Tri-colored Bat Perimyotis subflavus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp.

[165] Thorne, T. 2021. GTA Bat Tracking. Data accessed from the Motus Wildlife Tracking System. Birds Canada. Available: http://www.motus.org/.

Table 2. List of 25 SARA-listed Species at Risk that either A) breed in the GTA outside the DRAP, or B) are present in or near the DRAP (<1km) outside the breeding season or were likely present there before European colonization.

Species common name	Type	SARA status[A]	SARO status[B]	Global status (IUCN) [C]	Estimated mature individuals (Canada)[D]	Estimated decline Since 1966 (Canada)[E]	Habitat[F]	Status within the GTA (past 5 years)[G]
Evening Grosbeak	bird	SC	SC	VU	2 million	77.4%	other	winter resident
Olive-sided Flycatcher	bird	SC	SC	T	1.1 million	67.6%	forest	passage migrant
Chimney Swift	bird	T	T	V	74,000	85.9%	other	confirmed breeding
Grasshopper Sparrow	bird	SC	SC	LC	930,000	34.4%	grassland	possible breeding
Short-eared Owl	bird	T	SC	LC	280,000	90.9%	grassland	possible breeding
King Rail	bird	EN	EN	NT	unknown	declining	wetland	extirpated
Peregrine Falcon	bird	SC	SC	LC	unknown	808% (^)	other	confirmed breeding
Rusty Blackbird	bird	SC	SC	VU	5.9 million	75.5%	wetland	passage migrant (seen in DRAP)
Spotted Turtle	reptile	EN	EN	EN	unknown	declining	wetland	extirpated
Wood Turtle	reptile	T	EN	EN	unknown	declining	other	extirpated
Eastern Musk Turtle	reptile	SC	SC	LC	unknown	unknown	wetland	probable breeding
Eastern Ribbonsnake	reptile	T	SC	LC	unknown	unknown	wetland	possible breeding
Western Chorus Frog	amphibian	T	NR	LC	unknown	declining	other	probable breeding
Jefferson Salamander	amphibian	EN	EN	LC	unknown	declining	forest	confirmed breeding
Unisexual Ambystoma	amphibian	EN	EN	LC	unknown	declining	forest	confirmed breeding
Silver Shiner	fish	T	T	LC	unknown	unknown	aquatic	possible breeding
Silver Lamprey	fish	SC	SC	LC	unknown	unknown	aquatic	possible breeding
Lake Sturgeon	fish	EN	NA	EN	unknown	unknown	aquatic	possible breeding
Northern Brook Lamprey	fish	SC	SC	LC	unknown	unknown	aquatic	possible breeding
American Eel	fish	EN	NA	EN	unknown	unknown	aquatic	possible breeding
Rapids Clubtail	invertebrate	EN	EN	LC	>/= 106	unknown	riparian	probable breeding
Rusty-patched Bumblebee	invertebrate	EN	EN	CR	unknown	declining	unknown	extirpated
American Bumblebee	invertebrate	SC	NA	VU	unknown	unknown	unknown	possible breeding
Bashful Bulrush	plant	EN	EN	LC	unknown	99%	forest	possible in RNUP

LC=least concern, SC=special concern, VU=vulnerable, T=threatened, NT=near threatened, EN=endangered, CR=critically endangered, NR=not at risk, NA=not assessed.

A. Species at Risk Public Registry[166]
B. Species at Risk in Ontario[167]
C. The IUCN Red List of Threatened Species[168]
D. Population estimates are taken from Partners in Flight Database[169]
E. Based on data from the North American Breeding Bird Survey[170]
F. Categories were assigned using habitat information from published species accounts and COSEWIC status reports.
G. Categories were assigned based on NHIC Element occurrences and citizen-science detections from the past five years

[166] Government of Canada. 2022. Species at Risk Public Registry. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

[167] Government of Ontario. 2022. Species at Risk in Ontario. https://www.ontario.ca/page/species-risk-ontario

[168] IUCN. 2022. The IUCN Red List of Threatened Species. Version 2021-3. https://www.iucnredlist.org

[169] Partners in Flight. 2022. Avian Conservation Assessment and Population Estimates Databases. https://pif.birdconservancy.org/population-estimate-database-scores/

[170] Sauer, J.R., Link, W.A., and Hines, J.E., 2020, The North American Breeding Bird Survey, Analysis Results 1966 - 2019: U.S. Geological Survey data release, https://doi.org/10.5066/P96A7675.

Section 2. Fisheries and Aquatic Habitat

All fish and their habitat are protected at the federal level under the *Fisheries Act.*[171] I analyzed stream data obtained by the OMNMNRF [172] to determine the scale of risk that development within DRAP may have on fisheries and aquatic habitat. I found that the DRAP makes up the catchment area of 14 headwater streams. Seven of these streams are connected to the Duffins Creek watershed, one to the Frenchman's Bay watershed and the remaining six to the Petticoat Creek watershed. Petticoat Creek itself also runs through the southwest portion of the site before flowing directly into Lake Ontario 5 km to the south. All of the streams within the DRAP are fish-bearing and five are classified as coldwater streams, meaning that they have low average water temperatures capable of supporting fish communities that many streams in the GTA cannot (Figure 27). The five coldwater streams are all located in the northeastern part of the property and are connected to West Duffins Creek, which itself is classified as a coldwater stream until it approaches Taunton Rd.

Water sampling by the OMNMNRF has documented the federally-endangered and recently reintroduced Atlantic Salmon in one headwater stream originating within the DRAP, as well as in a portion of the West Duffins Creek adjacent to the DRAP. Sampling has also revealed that the lower portion of West Duffins Creek is home to the endangered American Eel. Based on NHIC element occurrence data, the federally-endangered Redside Dace is not likely to occur in waters within or adjacent to the DRAP but may persist in the lower portion of the Duffins Creek watershed (Figure 21).

Developing the DRAP would drastically change the conditions of the streams and water bodies found within it, likely rendering them unsuitable for many of the species currently inhabiting them. Most aquatic and riparian-obligate organisms are dependent on specific levels of shade, vegetative cover, water depths, temperatures, clarity, flow rates or bottom types (see Section 1.1, Species at Risk under SARA). During construction, it would be difficult or impossible to keep all of the disturbed topsoil out of the water, especially during storm events that have become more frequent with climate change.[173] After construction, the increased proportion of impervious surfaces in the landscape would require streams to accommodate a much larger volume of water than they did before. Some wetlands may be converted to stormwater ponds to buffer this unnatural amount of runoff, effectively eliminating the ecological function of these wetlands and removing habitat for wetland-obligate species like the Least Bittern and Blanding's Turtle. Depending on engineering approaches used by developers, some streams may be diverted or channeled to expel water more quickly from the area. Others may be buried entirely to allow for the construction of new roads and widening of existing ones. These

[171] Government of Canada. 2021. Introducing Canada's modernized fisheries act. Available online from: https://www.dfo-mpo.gc.ca/campaign-campagne/fisheries-act-loi-sur-les-peches/introduction-eng.html

[172] Stream data (Aquatic Resource Area) are available from the Ontario GeoHub at: https://geohub.lio.gov.on.ca/datasets/aquatic-resource-area-line-segment/explore?location=49.291899%2C-84.834657%2C2.98

[173] Soulis, E. et al. 2016. Extreme precipitation time trends in Ontario, 1960–2010. Hydrological Processes 22: 4090- https://doi.org/4100. 10.1002/hyp.10969

processes would raise turbidity by disturbing sediments, and would eliminate meanders, pools, natural banks and other habitat features used by sensitive species. The removal of riverbank vegetation from headwater streams will likely cause erosion and contribute to rising water temperatures,[174] potentially leading to the collapse of coldwater fish communities.

Water bodies receiving stormwater runoff from roadways and developed land become contaminated with harmful pollutants, many of which will remain in the system for generations. Residential and commercial areas, which are expected to make up a large percentage of the DRAP's developed land, are known to be an important contributor to non-point-source pollution of waterways.[175] This pollution may come in the form of lawn fertilizers,[176] insecticides,[177] herbicides,[178] pet waste,[179] cooking oils[180] and lubricants.[181] Major contaminants known to leach from roadways through stormwater runoff include de-icing salts (Chloride), Polycyclic Aromatic Hydrocarbons (PAHs)[182] and metals.[183] In addition, several tire-wear compounds, including one that may cause mortality of salmon, have been identified in GTA waterways near high-traffic corridors.[184] Chloride found in de-icing salts can inadvertently be transported through groundwater, potentially affecting surface water quality over a large area and for a period of time extending well beyond the winter application season.[185] The long-term effects of elevated chloride levels on ecosystems can be devastating and include increased algal blooms,[186] changes in soil chemistry,[187] altered lake stratification,[188] disruption of fish and

---

[174] Garner, G. et al. 2017. The role of riparian vegetation density, channel orientation and water velocity in determining river temperature dynamics. Journal of Hydrology 553: 471-485. https://doi.org/10.1016/j.jhydrol.2017.03.024

[175] Toor, G.S, Occhipinti, M.L., Yang, Y., Majcherek, T., Haver, D., and L. Oki. 2017. Managing urban runoff in residential neighborhoods: Nitrogen and phosphorus in lawn irrigation driven residential runoff. PLoS ONE 12: e0179151.

[176] Toor, G.S, Occhipinti, M.L., Yang, Y., Majcherek, T., Haver, D., and L. Oki. 2017. Managing urban runoff in residential neighborhoods: Nitrogen and phosphorus in lawn irrigation driven residential runoff. PLoS ONE 12: e0179151.

[177] Weston, D.P., Holmes, R.W., and M.J. Lydy. 2009. Residential runoff as a source of pyrethroid pesticide to urban creeks. Environmental Pollution 157: 287–294.

[178] Budd, R., Ensminger, M., Wang, D., and K.S. Goh. 2015. Monitoring fipronil and degradates in California surface waters, 2008–2013. Journal of Environmental Quality 44: 1233–1240.

[179] Reano, D.C., Haver, D.L., Oki, L.R., and M.V. Yates. 2015. Long-term characterization of residential runoff and assessing potential surrogates of fecal indicator organisms. *Water Resource* 74: 67–76.

[180] Fraga, J.L., Da Silva Pereira, A., Diniz, M.M., Fickers. P., and Amaral, P.F.F. 2021. Valorization of urban waste oil by microbial conversions. Case Studies in Chemical and Environmental Engineering 4: 100145. https://doi.org/10.1016/j.cscee.2021.100145

[181] Anisuzzaman, S.M., Jumaidi, M.H., and N.N.M. Nasir. 2021. IOP Conferene Series: Materials Science and Engineering 1195: 012031. doi:10.1088/1757-899X/1195/1/012031.

[182] Van Metre, P.C. Mahler, B.J., & Furlong, E.T. 2000. Urban sprawl leaves its PAH signature. Environmental Science and Technology 34: 4064-4070.

[183] Mayer, T. et al. 2011. Environmental characterization of surface runoff from three highway sites in Southern Ontario, Canada: 1. Chemistry. Water Quality Research Journal of Canada 46(2): 110-120. https://doi.org/10.2166/wqrjc.2011.035

[184] Johanssen, C. Helm, P., & Metcalfe, C.D. (2021). Detection of selected tire-wear compounds in urban receiving waters. Environmental Pollution 287. DOI: https://doi.org/10.1016/j.envpol.2021.117659

[185] Mackie, C., Lackey, R., Levison, J., and L. Rodrigues. 2022. Groundwater as a source and pathway for road salt contamination of surface water in the Lake Ontario Basin: a review. Journal of Great Lakes Research 48 (1): 24-36. https://doi.org/10.1016/j.jglr.2021.11.015

[186] Paerl, H.W. and Jef Huisman. 2008. Blooms like it hot. Science 320: 57.

[187] Green, S.M., Machin, R., and M.S. Cresser. 2008. Effect of long-term changes in soil chemistry induced by road salt applications on N-transformations in roadside soils. Environmental Pollution, Volume 152, Issue 1, pp.20-31

[188] Mackie, C., Lackey, R., Levison, J., and L. Rodrigues. 2022. Groundwater as a source and pathway for road salt contamination of surface water in the Lake Ontario Basin: a review. Journal of Great Lakes Research 48 (1): 24-36. https://doi.org/10.1016/j.jglr.2021.11.015

amphibian breeding[189] and reduced cell performance of trees.[190] While human growth inevitably comes at an environmental cost, accommodating this growth in the form of low density sprawl means introducing sources of contaminants to lands and waterbodies that were formerly much less affected. Many of these contaminant sources could be avoided by simply improving density of the existing city instead of increasing the amount of developed land.[191]

A number of mitigation measures may somewhat alleviate the negative effects of DRAP development on Fisheries and aquatic habitat. These include the use of semi-permeable pavements to reduce runoff,[192] the use of sediment control measures during construction,[193] and reduction in the amount of salt applied to roadways and parking lots in winter.[194] The possibility of using alternative deicing agents or methods of salt application should be explored.[195] In addition, it is important to consider the materials used in constructing culverts and drains, as some can be sources of metal contamination.[196] Ensuring proper infrastructure maintenance is another way to reduce the amount of pollution leached into the watershed.[197] Finally, future weather and climate are important in predicting contaminant loads.[198]

I recommend that the IAA model expected pollutant loadings under a range of climate and development scenarios, following existing methodology, such as that used recently on a study in Texas.[199] If loadings of one or more pollutants are forecast to exceed federally-set thresholds anywhere within or downstream of the DRAP under the most conservative scenario, it is unlikely that developers would be able to develop the land in a way that meets federal guidelines for water quality. Long-term monitoring of stream health and regular maintenance of infrastructure will be important components to factor in when assessing the level of impact of development on fisheries and aquatic habitat. To obtain baseline data to aid in modeling and

[189] Karraker, N.E., and J.P. Gibbs. 2011. Road deicing salt irreversibly disrupts osmoregulation of salamander egg clutches. Environmental Pollution 159: 833-835.

[190] Ordóñez-Barona, C., Sabetzki, V., Millward, A.A., and J. Steenberg. 2018. De-icing salt contamination reduces urban tree performance in structural soil cells. Environmental Pollution 234: 562-571.

[191] Wang, R., Kim, J., & M Li. 2021. Predicting stream water quality under different urban development pattern scenarios with an interpretable machine learning approach. Science of the Total Environment 761: 144057.

[192] Zhu et al (2019). Simulation study on effect of permeable pavement on reducing flood risk of urban runoff.

[193] Hendrick et al (2007). Effects of highway construction on sediment and benthic macroinvertebrates in two tributaries of the lost river, West Virginia.

[194] Mayer, T. et al. 2011. Environmental characterization of surface runoff from three highway sites in Southern Ontario, Canada: 2. Toxicology. Water Quality Research Journal of Canada 46(2): 121-136. https://doi.org/10.2166/wqrjc.2011.036

[195] Hintz, W.D., Fay, L., and R.A. Relyea. 2021. Road salts, human safety, and the rising salinity of our fresh waters. Frontiers in Ecology and the Environment 20(1): 22-30. doi:10.1002/fee.2433

[196] Mayer, T. et al. 2011. Environmental characterization of surface runoff from three highway sites in Southern Ontario, Canada: 2. Toxicology. Water Quality Research Journal of Canada 46(2): 121-136. https://doi.org/10.2166/wqrjc.2011.036

[197] Mayer, T. et al. 2011. Environmental characterization of surface runoff from three highway sites in Southern Ontario, Canada: 1. Chemistry. Water Quality Research Journal of Canada 46(2): 110-120. https://doi.org/10.2166/wqrjc.2011.035

[198] Mayer, T. et al. 2011. Environmental characterization of surface runoff from three highway sites in Southern Ontario, Canada: 1. Chemistry. Water Quality Research Journal of Canada 46(2): 110-120. https://doi.org/10.2166/wqrjc.2011.035

[199] Wang, R., Kim, J., & M Li. 2021. Predicting stream water quality under different urban development pattern scenarios with an interpretable machine learning approach. Science of the Total Environment 761: 144057.

forecasting, the agency can partner with local conservation authorities already conducting regular watershed monitoring.[200]

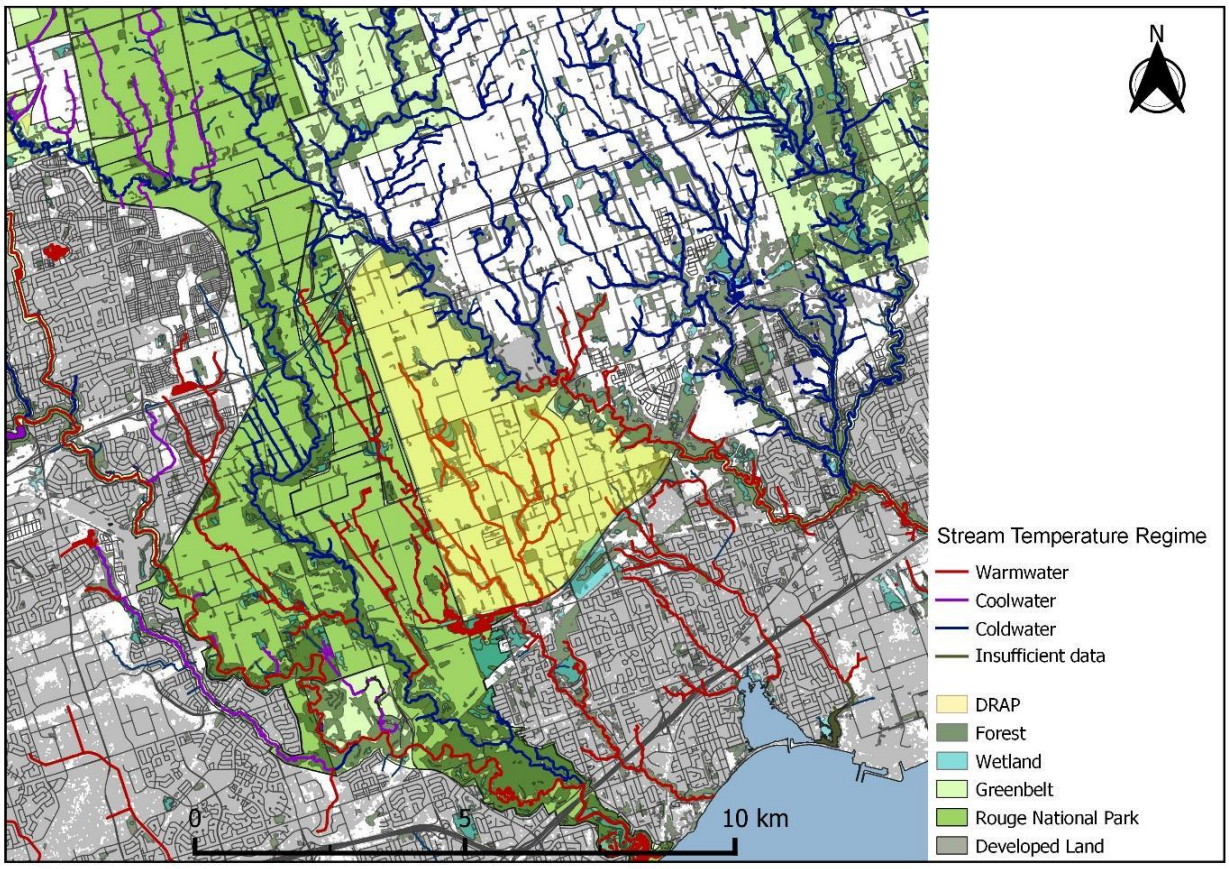

Figure 27. Temperature regime of streams in the lower Rouge Valley, lower Duffins Creek and Petticoat Creek watersheds. OMNMNRF data indicate that all streams within the DRAP are fish-bearing.

Section 3. Migratory Birds Convention Act

Many of Canada's bird species are protected under the Federal *Migratory Birds Convention Act* (1994).[201] In the past five years alone, at least 49 protected bird species have been reported within the DRAP, most of which are likely to breed there (Table 3). The area is relatively under-studied and the actual number of species occupying the DRAP is likely significantly higher. Furthermore, the adjacent RNUP is home to at least 247 species of birds,[202] most of which are protected under the Act.

[200] See, for example: Credit Valley Conservation. Tracking the Ecosystem Health of the Credit River Watershed. 5 pp.

[201] Government of Canada. Birds protected under the migratory birds convention act. https://www.canada.ca/en/environment-climate-change/services/migratory-birds-legal-protection/convention-act.html#_004

[202] Finkelstein, M.W. 2018. RNUP. The Canadian Encyclopedia. https://www.thecanadianencyclopedia.ca/en/article/rouge-national-urban-park.

Some birds protected under the Act occupy a variety of habitats and may be able to adapt to landscape-level changes, while others depend on specialized habitat types or specific sites for stopover or nesting. For example, the NHIC database indicates that the Cherrywood Swamp Wetland Complex and portions of the West Duffins Creek are used by wading birds (herons, bitterns and egrets) as colonial nesting sites.[203] By analyzing landcover data from the Annual Crop Inventory[204] (see Appendix 1), I found that migratory bird habitat would be adversely affected by development across the DRAP. This is especially true in the southern portion of the site where much of the land is currently fallow or managed as pasture, providing habitat to grassland obligate birds like the federally-listed Bobolink and Eastern Meadowlark.

Urbanization has been linked to a global loss of biodiversity, particularly among migratory birds.[205] Even under the most "eco-conscious" scenario, development of the DRAP will certainly fragment bird habitat and render remaining patches unsuitable for breeding by sensitive species.[206] Some species may avoid settling in close proximity to human activities due to a Neophobic instinct.[207] Others may suffer from increased nest predation by urban-associated species like Raccoons (*Procyon lotor*) and *Accipiter* hawks,[208] or from increased mortality due to collisions with vehicles and structures.[209] In addition, noise from roads and industry may be problematic to the communication systems of some birds.[210] Light pollution associated with urbanization could interrupt the life cycles of many insect species and lead to further reductions in their abundance. Insects are a critical food source for provisioning nestlings in nearly all terrestrial bird species.

In addition to providing habitat for breeding birds, the DRAP harbours a wide variety of passage migrants (species which are only found in the region during migration). Patches of habitat used by these migrants (known as stopover sites) include forest fragments, wetlands, seasonally flooded agricultural fields, and other areas with abundant food resources or structure resembling the breeding habitat of the species. If disturbed, these sites may no longer serve as suitable stopover habitat. Birds that do not breed in Southern Ontario are not always well-adapted to urban environments and may therefore be at a higher risk of colliding with buildings and vehicles and being predated by urban-associated animals like domestic cats. As such, it is important that these less-adapted species are able to quickly navigate their way

---

[203] Government of Ontario. Natural Heritage Information Centre. https://www.ontario.ca/page/natural-heritage-information-centre

[204] Annual Space-Based Crop Inventory for Canada. 2020. Centre for Agroclimate, Geomatics and Earth Observation, Science and Technology Branch, Agriculture and Agri-Food Canada. https://open.canada.ca/data/en/dataset/d90a56e8-de27-4354-b8ee-33e08546b4fc

[205] Aronson, M. et al. 2014. A global analysis of the impacts of urbanization on bird and plant diversity reveals key anthropogenic drivers. Proceedings of the Royal Society B: Biological Sciences. 281(1780). https://doi.org/10.1098/rspb.2013.3330

[206] Information taken from the Individual EA prepared on behalf of TRCA: Dhalla, S. 2020. GTA West Transportation Corridor Individual Environmental Assessment: Stage 2 Update

[207] Whitcomb, R. F. et al. 1981. Effects of forest fragmentation on avifauna of the eastern deciduous forest. – In: Burgess, R. L. and Sharpe, D. M. (Editors), Forest island dynamics in man-dominated landscapes. Springer, pp. 125–205.

[208] Vincze, E. et al. 2017. Does urbanization affect predation of bird nests? A meta-analysis. Frontiers in Ecology and Evolution 5(29):1-12. https://doi.org/ 10.3389/fevo.2017.00029

[209] Chace, J & J. Walsh. 2006. Urban effects on native avifauna: A review. Landscape and Urban Planning 74(1): 46-69. https://doi.org/10.1016/j.landurbplan.2004.08.007

[210] Fahrig, L. & T. Rytwinski. 2009. Effects of roads on animal abundance: An empirical review and synthesis. Ecology and Society 14(1). https://doi.org/10.5751/ES-02815-140121

around urban centres like the GTA. Much like an ecopassage over a busy highway, the DRAP and adjacent Rouge Valley together act as a “corridor” that facilitates safe passage of migratory birds between Lake Ontario and their northern breeding grounds, allowing them to refuel and rest along their way without being subjected to the many dangers of the city.

Table 3. Bird species protected under the Migratory Birds Convention Act (1994) that have been reported on DRAP lands within the past five years. Due to data deficiency, the actual number may be significantly higher, and the adjacent RNUP is known to harbour a much wider range of migratory avifauna.

Species Common Name	Scientific Name	Status in DRAP	Breeding Habitat
American Black Duck	Anas rubripes	possible breeding	wetland
American Goldfinch	Spinus tristis	possible breeding	generalist
American Pipit	Anthus rubescens	winter resident	generalist
American Redstart	Setophaga ruticilla	possible breeding	forest
American Robin	Turdus migratorius	confirmed breeding	generalist
Baltimore Oriole	Icterus galbula	possible breeding	generalist
Bank Swallow	Riparia	breeding	other
Barn Swallow	Hirundo rustica	possible breeding	other
Black-capped Chickadee	Poecile atricapillus	confirmed breeding	generalist
Bobolink	Dolichonyx oryzivorus	possible breeding	grassland
Brown Thrasher	Toxostoma rufum	possible breeding	shrubland
Chipping Sparrow	Spizella passerina	possible breeding	generalist
Downy Woodpecker	Dryobates pubescens	possible breeding	generalist
Eastern Bluebird	Sialia sialis	confirmed breeding	shrubland
Eastern Meadowlark	Sturnella magna	possible breeding	grassland
Eastern Phoebe	Sayornis phoebe	possible breeding	generalist
Eastern Wood-Pewee	Contopus virens	possible breeding	forest
Field Sparrow	Spizella pusilla	possible breeding	shrubland
Gray Catbird	Dumetella carolinensis	possible breeding	shrubland
Great Blue Heron	Ardea herodias	possible breeding	wetland
Hairy Woodpecker	Dryobates villosus	possible breeding	forest
Horned Lark	Eremophila alpestris	possible breeding	generalist
House Finch	Haemorhous mexicanus	possible breeding	generalist
House Wren	Troglodytes aedon	possible breeding	generalist
Indigo Bunting	Passerina cyanea	possible breeding	shrubland
Killdeer	Charadrius vociferus	possible breeding	generalist
Mourning Dove	Zenaida macroura	possible breeding	generalist
Northern Cardinal	Cardinalis	possible breeding	generalist
Northern Flicker	Colaptes auratus	confirmed breeding	generalist
Northern Mockingbird	Mimus polyglottos	possible breeding	shrubland
Northern Rough-winged Swallow	Stelgidopteryx serripennis	possible breeding	wetland
Pileated Woodpecker	Dryocopus pileatus	possible breeding	forest

Red-bellied Woodpecker	Melanerpes carolinus	possible breeding	forest
Red-eyed Vireo	Vireo olivaceus	possible breeding	forest
Rock Pigeon	Columba livia	possible breeding	generalist
Rose-breasted Grosbeak	Pheucticus ludovicianus	possible breeding	forest
Savannah Sparrow	Passerculus sandwichensis	possible breeding	grassland
Snow Bunting	Plectrophenax nivalis	winter resident	generalist
Song Sparrow	Melospiza melodia	possible breeding	generalist
Spotted Sandpiper	Actitis macularius	possible breeding	generalist
Swamp Sparrow	Melospiza georgiana	possible breeding	wetland
Tree Swallow	Tachycineta bicolor	confirmed breeding	generalist
Vesper Sparrow	Pooecetes gramineus	possible breeding	shrubland
White-breasted Nuthatch	Sitta carolinensis	possible breeding	generalist
White-throated Sparrow	Zonotrichia albicollis	passage migrant	generalist
Wood Duck	Aix sponsa	possible breeding	forest
Wood Thrush	Hylocichla mustelina	possible breeding	forest
Yellow Warbler	Setophaga petechia	possible breeding	wetland
Cackling Goose	Branta hutchinsii	passage migrant	generalist

Section 4. Cumulative Impacts

The negative effects of development within the DRAP reach far beyond the site and its immediate surroundings. The Rouge River and Duffins Creek watersheds are already highly stressed by contaminants and have a long history of urbanization. Many species that were once common in these two watersheds have been extirpated or experienced steep local declines. For an endangered species inhabiting the mouth of Duffins creek (for example, the American Eel), the effect of pollution from construction within the DRAP, combined with pollution from existing upstream infrastructure (e.g., highway 401, highway 407, cities of Pickering and Ajax), may be enough to push the Duffins Creek population over the edge. Likewise, species that migrate through the GTA already have a high chance of succumbing to fatal obstacles. Obstructing a key migratory pathway with more potential hazards further reduces these organisms' chances of successfully completing their migration.

Developing the DRAP is only one part of a larger pro-sprawl strategy being set in motion by the current provincial government. This strategy includes the weakening of urban intensification rules, changes to rules used to identify and protect provincially significant wetlands, weakening of municipal natural heritage protections, largely removing the role of Conservation Authorities in reviewing development proposals, and many other changes. Opening the DRAP to development will occur within this context of a broad weakening of long standing measures designed to mitigate impacts on the natural environment when development does proceed. This altered policy and legislative reality should be expressly evaluated as part of assessment of the cumulative impact that developing the DRAP would have on all areas of federal jurisdiction.

Section 5. Significant Natural Areas

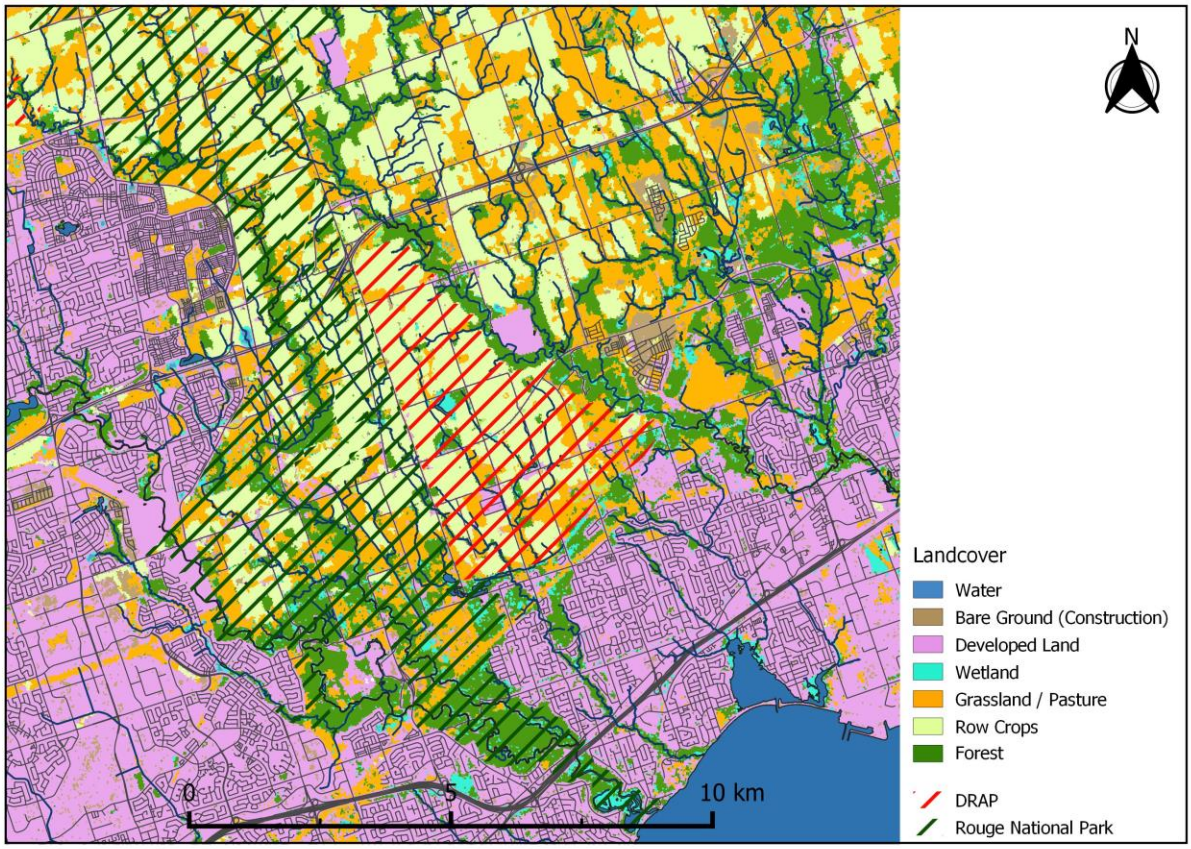

Figure 28. Annual Crop Inventory-derived landcover classification of the DRAP, RNUP and surrounding areas as of 2020.

5.1. Significant Wetland Habitat

Wetlands are refuges of biodiversity that also provide important ecological services such as contaminant filtration and stormwater retention.[211] Approximately 90 ha of wetland exist within the DRAP. If the area were developed, some of these wetlands would likely be lost or diminished due to road-widening and stream diversion projects. Others may be converted into stormwater ponds to handle the excess runoff from the built landscape. Even those wetlands protected as parks would likely experience altered hydrology and altered nutrient loadings that may cause a permanent shift in the vegetation community. Wildlife that depend on these wetlands will be forced to find suitable habitat elsewhere, which is not common in southern Ontario. In some instances, important nest or roost sites associated with wetlands may be destroyed or adversely affected. For example, the Cherrywood Swamp Wetland Complex, located in the middle of the DRAP near Altona Rd and 4th Concession, is known to contain a

[211] Clarkson B. R. et al. 2013. Wetland ecosystem services. In Dymond JR ed. Ecosystem services in New Zealand – conditions and trends. Manaaki Whenua Press, Lincoln, New Zealand.

regionally significant nesting colony of Great Blue Herons (*Ardea herodias*).[212] The success of this colony may be jeopardized by road-widening, increased traffic volumes, or introduced predators associated with urban landscapes.

Of the wetlands within the DRAP, only the Cherrywood Swamp Wetland Complex has been evaluated under the Ontario Wetland Evaluation System (OWES),[213] and this was done by the Toronto and Region Conservation Authority in 1998. The wetland was found to be locally significant and made up of four distinct swamp vegetation community types (S1, S2, S3 and S4). The S3 vegetation type is notable in that it contains Black Ash as a dominant tree, making the Cherrywood Swamp an important protection zone for this provincially and federally listed species. The remaining wetlands within the boundary of the DRAP are not named and have not been assessed. Riverine wetlands can be found in the adjacent valley of West Duffins Creek and within the RNUP, and extensive lacustrine wetlands occur at the mouths of Duffins Creek, the Rouge River and in Frenchman's Bay. Riverine and lacustrine wetlands that occur downstream of the DRAP would all be subjected to increased runoff and contaminant loadings originating within the DRAP were the area opened to development.

Though Provincially and Locally significant wetlands are supposed to be protected from development under the Planning Act,[214] the current Ontario government has issued a number of Ministerial Zoning Orders in an attempt to permit the draining and development of wetlands in the GTA.[215] In addition, the role of completing wetland evaluation has been turned over to developer proponents, Conservation Authorities no longer have comment function in planning decisions affecting wetlands, all wetlands less than 2 ha. are prohibited from being categorized for protection as Provincially Significant, groups of wetlands cannot be evaluated as a complex, and the presence of endangered species cannot be included in the evaluation score for wetland significance (and hence eligibility for protection). Therefore, I have little confidence that wetlands within DRAP would be protected as part of the planning associated with a large development application. I recommend the IAA require a re-evaluation of the Cherrywood Swamp Wetland Complex at the federal level, especially because of the relative scarceness of wetlands in this region, because many years have passed since its last evaluation and because the wetland may contain federally listed species like Black Ash and Canada Warbler. In addition, I recommend that the federal EA require all unevaluated wetlands to be assessed by a certified agency such as the TRCA (and ideally also by the federal government) using pre-January 2023 OWES protocols[216] to determine their classification and regional or provincial significance.

---

[212] Toronto and Region Conservation. August 2012. Petticoat Creek Watershed Action Plan. 69 pp. https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2018/10/17165515/Petticoat-Creek-Watershed-Action-Plan-2012.pdf

[213] Ontario Wetland Evaluation System: Southern Manual (3rd Edition, Version 3.2). 2013. Ontario Ministry of Natural Resources.

[214] Government of Ontario. 2020. Provincial Policy Statement, 2020 Under the Planning Act. (https://files.ontario.ca/mmah-provincial-policy-statement-2020-accessible-final-en-2020-02-14.pdf)

[215] As reported by the Auditor General in 2021. See: Global News. 2021. Key Findings from Ontario Auditor General's Report. https://globalnews.ca/news/8415848/ontario-auditor-general-report-2021/

[216] Ontario Ministry of Natural Resources. 2013. Ontario Wetland Evaluation System: 3rd edition (version 3.2).

Although it does not appear from an analysis of aerial imagery that any wetlands within RNUP are directly fed by DRAP tributaries, it is possible that some (particularly the Townline Swamp Wetland Complex) may be connected by intermittent stormwater channels or underground flows. If true, this would put them at a direct risk of contamination by construction and urban land uses. Furthermore, runoff from the DRAP entering the Rouge River passes through several riparian wetlands within the park, and eventually reaches the provincially significant Rouge Marsh at the mouth of the river. Any wetlands within federal jurisdiction (i.e., within RNUP) should be evaluated to determine their hydrological connectivity to the DRAP, and contaminant levels entering Rouge Marsh should be forecast under a range of possible development scenarios.

5.2. Significant Woodland Habitat

Woodland habitat is scarce in the GTA, representing only around 18-20% of the land base.[217] Consequently, many forested lands are managed as parks and conservation areas, and municipal governments have enacted protection measures for the remaining patches.[218] However, forests still typically receive less protection than wetlands and other significant natural features and are therefore often seen as expendable during the conception of large-scale development projects. The significance of woodlands within the DRAP, especially unevaluated ones, has likely been underestimated by the provincial government.

The DRAP contains approximately 307 hectares of woodland in the form of managed and unmanaged woodlots, treed swamps, plantations, and hedgerows. Certain species like the federally-listed Eastern wood-pewee require a minimum amount of core forest for breeding.[219] Forest fragments that are reduced in area due to construction may no longer continue to support such species. Species that do remain in these fragmented patches may become more susceptible to edge effects like competition with invasive species and nest parasitism by Brown-headed cowbirds (*Molothrus ater*).[220] Forests not directly lost during construction would become increasingly encroached upon by development and also suffer from edge effects once the construction reaches their borders.

The long-term effects of landscape-level urbanization on the health of forest communities are well-documented in the literature.[221] These effects include structural vegetation changes, invasive species, altered predation regimes and pollution. While larger patches of forest may be protected as parks thanks to the greenspace and property value they offer, numerous hedgerows and narrow riparian corridors would inevitably be severed by new

---

[217] Elliot, K. 1998. The forests of southern Ontario. Forestry Chronicle 74(6): p. 853.

[218] McWilliam, W. J., Brown, R., Eagles, P., & M. Seasons. 2013. Barriers to the effective planning and management of residential encroachment within urban forest edges: a southern Ontario, Canada case study. Urban Forestry & Urban Greening.

[219] Many studies have shown this relationship. See, for example: Blake, J. & J. Karr. 1987. Breeding birds of isolated woodlots: Area and habitat relationships. Ecology 68(6): 1724-1734.

[220] Brittingham, M. C., and S. A. Temple. 1983. Have cowbirds caused forest songbirds to decline? BioScience 33:31-35

[221] For examples of potential impacts, see Friesen, L. E. et al. 1998. Impacts of urbanization on plant and bird communities in forest ecosystems. Forestry Chronicle 74(6): 855-860.

roads or lost entirely due to the higher cost of incorporating these narrow strips of vegetation into subdivision plans. These linear features serve as important dispersal routes for many organisms whose movements would become cut off.

I recommend a comprehensive study on all forested properties within the DRAP to evaluate their provincial and regional significance. The analysis should consider the proportion of core habitat as well as the connectivity of the patch with other natural habitats. Where new roads would be proposed to intersect linear wooded features, ecopassages or wildlife crossings should be incorporated into the design. The study should provide a standard for minimum buffer widths around all significant woodlot features to limit effects of encroachment, encompassing future developments as well as roads and trails.

5.3. RNUP

The lands comprising the lower Rouge River valley, along with adjacent agricultural areas that include the DRAP, were expropriated by the federal government in 1970 for an airport that was never built.[222] In 1995, Rouge Park was established, and in 2015, it gained the status of "National Urban Park."[223]

The park's ecological value has been well-documented for decades. Like the adjacent DRAP, it sits on the border of ecozones 7E (Carolinian) and 6E (Great Lakes-St. Lawrence).[224] Thus, it contains some of the northernmost examples of Carolinian flora and fauna as well as southerly representations of Boreal species. For example, the Rouge Valley may be the only place in the world where the ranges of the Fisher and the Yellow-breasted Chat overlap.[225] Add to this the fact that Rouge Park is home to around 1,000 plant species (1/4 of all plants in Canada), 247 bird species, 73 fish species, 44 mammal species and 27 reptile/amphibian species,[226] and it becomes clear that the park is a critical refuge of biodiversity. It is also a refuge for a number of Species at Risk, as discussed in Section 1 of this report. Some of these Species at Risk, such as the Bashful Bulrush, can be found in few other locations in Canada. Furthermore, Rouge Park encompasses Toronto's largest coastal wetland, the Rouge Marsh, located at the mouth of the river.

---

[222] Finkelstein, M.W. 2018. RNUP. The Canadian Encyclopedia. https://www.thecanadianencyclopedia.ca/en/article/rouge-national-urban-park.

[223] Finkelstein, M.W. 2018. RNUP. The Canadian Encyclopedia. https://www.thecanadianencyclopedia.ca/en/article/rouge-national-urban-park.

[224] Crins, W. J. et al. 2009. The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions. Ontario Ministry of Natural Resources Science & Information Branch (Inventory, Monitoring and Assessment Section). Queen's Printer for Ontario: Ontario, CA.

[225] Fisher is mentioned as occurring in the park in: Finkelstein, M.W. 2018. RNUP. The Canadian Encyclopedia. https://www.thecanadianencyclopedia.ca/en/article/rouge-national-urban-park.
Yellow-breasted Chat was noted as a probable breeder in the Rouge Valley during the 2nd Ontario Breeding Bird Atlas (Cadman, M. D. et al. (Editors). 2007. *Atlas of the Breeding Birds of Ontario*. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, Ontario, Canada

[226] Finkelstein, M.W. 2018. RNUP. The Canadian Encyclopedia. https://www.thecanadianencyclopedia.ca/en/article/rouge-national-urban-park.

Being an "urban" park, the Rouge is already subjected to a plethora of anthropogenic stressors. Much of the park is actively and intensively farmed.[227] Two major highways and many arterial roads, a busy rail line, a pipeline and several hydroelectric corridors all bisect the park.[228] The Toronto Zoo is located within the park and attracts around 1.3 million visitors per year.[229] The Rouge Valley's bustling network of trails and recreational facilities is one of Toronto's most popular local day-trip destinations. RNUP is a working landscape that serves many purposes that are carefully managed by park authorities to maintain a balanced ecosystem. The fight against invasive species is ongoing to maintain the integrity of the park's native flora and fauna communities.[230] As the GTA expands outwards, traffic on arterial roadways within RNUP increases, posing a risk to endangered species like the Blanding's Turtle that are susceptible to road mortality.[231] Pollution of waterways in the form of road salts, chemicals, fertilizers and metals is a significant concern for the health of aquatic organisms,[232] and bioaccumulation is a concern for the health of the provincially significant Rouge Marsh, which captures and stores contaminants.

Developing the DRAP would only exacerbate the problems already faced by those responsible for managing Rouge Park's ecosystem. Adding thousands of new housing units to the east would encourage more driving to occur across the park on busy arterial roads like Steeles Avenue and Highway 7. This increased traffic would not only pose a risk to animal movement, but also create noise pollution that could be detrimental to the communication of certain breeding birds.[233] Stormwater runoff from paved surfaces would enter the Rouge River, potentially affecting bank stability and introducing harmful contaminants that may accumulate in the river and downstream wetlands. Even a slight alteration to water quality could spell disaster for endangered aquatic species, such as the American Eel,[234] Eastern Pondmussel[235] and recently reintroduced Atlantic Salmon.[236] Homes built near the park's boundary would be a potential source of encroachment by invasive non-native plant species used in gardening, such

[227] Government of Canada. 2021. Multi-species Action Plan for RNUP of Canada. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/action-plans/multi-species-rouge-national-urban-park-2021.html

[228] Finkelstein, M.W. 2018. RNUP. The Canadian Encyclopedia. https://www.thecanadianencyclopedia.ca/en/article/rouge-national-urban-park

[229] Toronto Zoo. N.d. Toronto Zoo: Facts and Figures. https://www.torontozoo.com/EducationAndCamps/Elementary/InformationBooklets/Toronto%20Zoo-%20Facts%20and%20Figures.pdf

[230] Finkelstein, M.W. 2018. RNUP. The Canadian Encyclopedia. https://www.thecanadianencyclopedia.ca/en/article/rouge-national-urban-park.

[231] Government of Canada. 2021. Multi-species Action Plan for RNUP of Canada. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/action-plans/multi-species-rouge-national-urban-park-2021.html

[232] Toor, G.S, Occhipinti, M.L., Yang, Y., Majcherek, T., Haver, D., and L. Oki. 2017. Managing urban runoff in residential neighborhoods: Nitrogen and phosphorus in lawn irrigation driven residential runoff. PLoS ONE 12: e0179151.

[233] Goodwin, S., and Shriver, G. 2010. Effects of traffic noise on occupancy patterns of forest birds. Conservation Biology 25(2): 406-411. DOI: 10.1111/j.1523-1739.2010.01602.x

[234] COSEWIC. 2012. COSEWIC assessment and status report on the American Eel Anguilla rostrata in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 109 pp.

[235] COSEWIC. 2017. COSEWIC assessment and status report on the Eastern Pondmussel Ligumia nasuta in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 61 pp.

[236] COSEWIC 2006. COSEWIC assessment and status report on the Atlantic salmon Salmo salar (Lake Ontario population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 26 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

as Periwinkle, English Ivy and Norway Maple.[237] Opportunistic predators like Raccoons, Opossums and domestic cats are associated with urban areas and pose a threat to the nesting success of many bird species.[238] Finally, developing the adjacent landscape would likely increase recreational activity within the park. While promoting outdoor recreation is an important goal of the urban park, recreation can come at a heavy cost to ecosystems. Excessive hiking, mountain-biking and off-leash pets in Rouge Park have already caused widespread erosion and trampling of vegetation, resulting in the destruction of entire populations of endangered plants or nests of endangered animals.[239] Due to the risks that adjacent development would pose to the ecological integrity of RNUP, I advise the IAA to consider a thorough assessment of any projects proposed on the adjacent DRAP.

5.4. Greenbelt Lands

The *Greenbelt Act* (2005) was enacted in response to rapid outward expansion of metropolitan areas that has occurred in Southern Ontario over the past several decades.[240] Under the "Greenbelt Plan" laid out by the Act, new development projects on lands assigned to the Greenbelt are no longer permitted unless they conform to the objectives of the plan. The *DRAP Act* (2005) was later created to contribute to the objectives of the recently enacted Greenbelt Act. All lands within the DRAP boundary, most of them owned by the federal government and leased to tenant farmers, were added to the land base already protected by the Greenbelt Plan under the existing *Niagara Escarpment Planning and Development Act* and *Oak Ridges Moraine Conservation Act* (2001)," effectively granting them the same protections.

In all, the Greenbelt Plan lays out 12 objectives:[241]

"(a) to establish a network of countryside and open space areas which supports the Oak Ridges Moraine and the Niagara Escarpment.

(b) to sustain the countryside, rural and small towns and contribute to the economic viability of farming communities.

(c) to preserve agricultural land as a continuing commercial source of food and employment.

(d) to recognize the critical importance of the agriculture sector to the regional economy.

(e) to provide protection to the land base needed to maintain, restore and improve the ecological and hydrological functions of the Greenbelt Area.

---

[237] McWilliam, W.J., Eagles, P., Seasons, M., & R. Brown. Assessing the degradation effects of local residents on urban forests in Ontario, Canada.
2010. Arboriculture & Urban Forestry 36(6): 253-260.

[238] Friesen, L. E. et al. 1999. Nesting success of neotropical migrant songbirds in a highly fragmented landscape. Conservation Biology 13, 327–337.

[239] Government of Canada. 2021. Multi-species Action Plan for RNUP of Canada. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/action-plans/multi-species-rouge-national-urban-park-2021.html

[240] Ontario. Greenbelt Act, 2005, S.O. 2005, c. 1. https://www.ontario.ca/laws/statute/05g01

[241] Ontario. Greenbelt Act, 2005, S.O. 2005, c. 1. https://www.ontario.ca/laws/statute/05g01

(f) to promote connections between lakes and the Oak Ridges Moraine and Niagara Escarpment.

(g) to provide open space and recreational, tourism and cultural heritage opportunities to support the social needs of a rapidly expanding and increasingly urbanized population.

(h) to promote linkages between ecosystems and provincial parks or public lands.

(i) to control urbanization of the lands to which the Greenbelt Plan applies.

(j) to ensure that the development of transportation and infrastructure proceeds in an environmentally sensitive manner.

(k) to promote sustainable resource use.

(l) any other prescribed objectives. 2005, c. 1, s. 5"

The *DRAP Repeal Act* (2022) is in direct contradiction of each of the above objectives. The Act removed a large area of productive farmland from protections of the Greenbelt Plan, opening it up to urbanization and therefore permanent loss of its agricultural function. If rezoning from agricultural to urban development follows, it would sever connections to public lands, including RNUP, as well as an important connection between Lake Ontario and the Oak Ridges Moraine. This would jeopardize the ability of the land to contribute to the ecological and hydrological function of adjacent Greenbelt lands. It would also reduce the amount of open space available for recreation, tourism and cultural heritage opportunities, and would put rural communities at risk of becoming urbanized. Finally, large scale housing and commercial development would ensure that transportation and infrastructure are developed in and around the park in a manner that is very likely to have high levels of ecological impact.

Section 6. Biodiversity

Ontario is home to more than a third of Canada's biodiversity.[242] The majority of Ontario's species have ranges that are restricted to the Mixedwood Plains south of the shield, where many of their populations persist in small, isolated patches of habitat experiencing a great deal of urban pressure. The DRAP sits on the boundary of two ecoregions: Zone 7E (Carolinian) and 6E (Great Lakes-St. Lawrence).[243] This transitional overlap zone lies near the edge of the ranges of many southern and northern species, making the area especially diverse. Consequently, patches of natural land within the DRAP hold a great deal of value in terms of their capacity to harbour biodiversity.

Data indicate that a number of federal listed species whose ranges barely extend into Canada may be present within or near the DRAP (see Section 1 of this report). In addition,

[242] Based on an estimate of 30,000 species for Ontario (SONR Report (2021)) and 80,000 for Canada (Wild Species 2020: the general Status of Species in Canada)

[243] Crins, W. J. et al. 2009. The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions. Ontario Ministry of Natural Resources Science & Information Branch (Inventory, Monitoring and Assessment Section). Queen's Printer for Ontario: Ontario, CA.

several globally imperiled or vulnerable vegetation communities may be present within the DRAP or have the potential to be restored there. As such, the DRAP is an attractive site for reintroduction of rare Carolinian species with populations that were once better established in the area.[244] It may even have the potential to serve as a research site for studying the effectiveness of different restoration techniques in response to climate change. Further, the RNUP is a hotbed of biodiversity, and development adjacent to the national park could severely impact this biodiversity. A thorough assessment must be done to classify natural lands in and adjacent to the DRAP, especially those that have not yet been assessed. I recommend that the IAA consider the role of the DRAP in harbouring biodiversity and improving biodiversity in the future, as well as its role in protecting biodiversity of adjacent areas.

Section 7. Conclusions and Recommendations

My analyses and review of the literature overwhelmingly show that possible large scale residential and commercial development in the DRAP poses numerous threats to ecological values under federal jurisdiction. I have reason to be concerned that developing the DRAP would negatively affect at least 33 federally-listed Species at Risk and 49 birds protected under the Migratory Birds Convention Act. It would contribute to the pollution of 14 headwaters streams and pave over hundreds of hectares of productive cropland and pasture. It would negatively affect up to 400 hectares of woodland and wetland used by at-risk species for breeding and migration stopover, and reduce the ecological integrity of the RNUP, an important wildlife corridor and biodiversity hotspot. Each of these impacts would be exacerbated by the ongoing effects of climate change to which any future proposed development would in itself contribute due to increased vehicle and home heating emissions and the destruction of carbon sinks.

Based on my analysis of available information, I support the decision made on March 21, 2023 by the federal Minister of Environment and Climate to direct the Impact Assessment Agency to undertake a cumulative effects study for any planned residential or commercial development in the DRAP. I recommend that the study include the following:

1. The impact of proposed development on Species at Risk is assessed based on field studies conducted by trained biologists over multiple years during the appropriate season.
2. A comprehensive study on projected contaminant levels in the DRAP and downstream water bodies under a range of climate and infrastructure scenarios.
3. Impacts are considered along with cumulative effects of other development occurring across the region, in particular, the development planned within the Durham and York regions adjacent to RNUP and DRAP.

[244] For example: tallgrass prairie, oak open woodland, Beech-Maple forest, and White Cedar-Yellow-Birch forest communities. Based on information from NatureServe. https://explorer.natureserve.org/Search

4. All natural lands within the DRAP, including woodlands, wetlands, shrublands and pastures, are evaluated for their significance using standardized protocols and protected accordingly under federal jurisdiction.
5. Consideration of the impacts DRAP development would have on the ecological integrity of the federally-owned RNUP.