

Monitoring and Planning List for IUCN Red Listed species and national conservation list species with habits in area. (2022-2023)

Purpose: To assess, monitor, and support habitat for species at risk on Dalhousie properties. List and recommendations will be used to inform planting. Assessment will be reviewed by campus office, students, and/or committee annually.

Northern Myotis (*Myotis septentrionalis*) - Endangered (2013)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) - Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified</u> on campus	Dalhousie Campus (HFX): <u>Identified</u> on campus
<p>No (unless special accommodations are made) Bat houses could be a consideration on the AC campus. Particularly in areas with high sun exposure.¹</p> <ul style="list-style-type: none"> It is best if there is a water source nearby (Canadian Wildlife Federation, 2021) 	<p>No (unless special accommodations are made) Bat houses could improve the amount of safe habitat that Northern Myotis have access to during the summer months.¹</p> <ul style="list-style-type: none"> Usually most effective for female and infant bats¹ Best to have a nearby water source¹ 	<p>No, but possible According to INaturalist, there have not been any Northern Myotis sightings near the Dalhousie Agriculture Campus. However, bats often use barns for roosting.</p>	<p>No, but possible It is possible that the Northern Myotis could use buildings for shelter near the HFX campus. However, the species has not been identified on INaturalist in that area.</p>
<p>Research Notes:</p> <ul style="list-style-type: none"> Will sometimes use buildings to roost during the daytime² Typically found in forest habitat² Have been considered pests and exterminated in residential areas² Highest mortality linked to white-nose syndrome² Distribution includes boreal forest south of tree line, into montane forests, and deciduous and mixed-wood forests of the east³ Typically roost in forests under loose bark or in tree cavities⁴ Habitat needs include: overwintering, summering and swarming habitat³ 			

¹ Canadian Wildlife Federation. (2021). *Help the Bats*. Retrieved from: <https://cwf-fcf.org/en/explore/bats/>

² Government of Canada. (2011). Northern Myotis. Species Profile. Retrieved from: https://wildlife-species.canada.ca/species-risk-registry/species/speciesDetails_e.cfm?sid=1175

³ Government of Canada. (2019). Description of critical habitat of Little Brown Myotis, Northern Myotis, and Tri-Coloured Bat in Several National Parks of Canada. *Canada Gazette*. Vol. 153, 2. Retrieved from: <https://species-registry.canada.ca/index-en.html#/consultations/3481>

⁴ Queen’s Printer for Ontario. (2020). Northern Myotis. Retrieved from: <https://www.ontario.ca/page/northern-myotis>

Canadian Wildlife Federation. (2021). Bat House in Your Backyard. Retrieved from: <https://cwf-fcf.org/en/explore/bats/bat-house.html>

- Hibernation period from October/November - March/April, most often hibernation takes place in caves⁴

Additional Resources:

<http://www.farmbiodiversity.ca/species-at-risk-2/bats/bats-boxes/>

https://www.youtube.com/watch?v=ll_wYys3P9c

<https://www.batcon.org/article/bat-houses-the-secrets-of-success/>

Macropis Cuckoo Bee (*Epeoloides pilosulus*) - Endangered (2013)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) – Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified on campus</u>	Dalhousie Campus (HFX): <u>Identified on campus</u>
<p>No (unlikely) Although, the Annapolis Valley was noted to have sufficient habitat available for the foodplant and host bee⁵. Truro could be similar, but it is unlikely that the AC campus has this type of suitable wetland habitat.</p>	<p>No HFX campus does not have the proper habitat requirements for the foodplant (<i>Lysimachia</i>).</p>	<p>No Not found on iNaturalist.</p>	<p>No Not found on iNaturalist.</p>
<p>Research Notes:</p> <ul style="list-style-type: none"> • Habitat specialist species (host bee - <i>Macropis nuda</i> and 3 other <i>Macropis</i> species) and foodplant (<i>Lysimachia</i>, 19 species in total including Yellow Loosestrife)^{5 6} • Relies on food plant for pollen and flora oils (also relied on by host bee)⁵ • Has only been noted in one location in Nova Scotia⁵ • Species considered extinct until it was located in Nova Scotia in 2002⁵ • Host bee has been located in various areas of Nova Scotia since 2002, but not the <i>Macropis Cuckoo Bee</i>⁵ • Yellow Loosestrife grow in wetlands⁵ • The host bee (<i>Macropis</i>) are often found in “sandy soil with sun exposure and vegetative undergrowth”⁵ • Threats: loss of wetlands⁵ 			
<p>Additional Resources:</p> <p>https://wildlife-species.canada.ca/species-risk-registry/species/speciesDetails_e.cfm?sid=1142</p> <p>http://www.sarguide.speciesatrisk.ca/sites/sarguide.speciesatrisk.ca/files/SAR_Guide_Edition2%20-%20Macropis%20Cuckoo%20Bee%2087-88_0.pdf</p> <p>https://inaturalist.ca</p>			

⁵ COSEWIC. (2011). COSEWIC assessment and status report on the *Macropis Cuckoo Bee Epeoloides pilosulus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix, 25 pp. Retrieved from:
https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_macropis_cuckoo_bee_0911_eng.pdf

⁶ Seeds of Diversity. The *Macropis Cuckoo Bee*. Retrieved from:
<https://www.seeds.ca/d/?k=fe10d2132db9ee319254542e2d43e35a00003781>

Barn Swallow (*Hirundo rustica*) - Endangered (2013)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) - Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified</u> on campus	Dalhousie Campus (HFX): <u>Identified</u> on campus
<p>Yes (possibly) The AC campus could provide the proper conditions for foraging landscape (open fields, pastures, agricultural land, etc.). However, wet landscapes would also need to be accessible for nesting.</p>	<p>No Unlikely because there are no open, natural landscapes for foraging.</p>	<p>Yes</p>	<p>No</p>
<p>Research Notes:</p> <ul style="list-style-type: none"> • Considered a long-distance migratory species⁷ • Commonly nest in human-made structures (barns, houses, bridges, etc.), as well as caves in rocky cliff faces⁷ • Approx. only 1% of Barn Swallows nest in natural structures (estimated)⁷ • Nests are made of mud pellets • Forage for food in open landscapes (pastures, agricultural land, wetlands, etc.)⁷ • Will also forage above lakes and smaller water bodies for insects when the weather gets colder⁷ • Diet primarily consists of flying insects⁷ • Threats to the species are currently “poorly understood” however, they may include: modern farming techniques resulting in a loss of habitat (removal of old barns to replace with new buildings that are less easily nested in, wooden roofs vs. new metal roofs), decline in flying-insect populations, climate change (change in temperature), human interferences (nest removal) and invasive species⁷ 			
<p>Additional Resources:</p> <p>https://naturecanada.ca/news/blog/the-barn-swallow/ https://www.allaboutbirds.org/guide/Barn_Swallow/id https://www.hww.ca/en/wildlife/birds/barn-swallow.html</p>			

⁷ COSEWIC. (2011). COSEWIC assessment and status report on the Barn Swallow *Hirundo rustica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix, 37 pp. Retrieved from: https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_barn_swallow_0911_eng.pdf

Chimney Swift (*Chaetura pelagica*) - Endangered (2007)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) - Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified on</u> campus	Dalhousie Campus (HFX): <u>Identified on</u> campus
<p>No (unless special accommodations are made) Roosting chimneys have been noted in Truro.⁸</p> <p>If there are no existing chimneys that could be used for chimney swift roosting, the AC campus is unlikely to support this species, unless a chimney swift tower is constructed on campus.</p> <p>However, chimney swifts have not been identified near the AC campus.</p>	<p>No (unless special accommodations are made) Roosting towers have been successfully built for chimney swifts in urban areas.⁹</p> <p>If there are no existing chimneys that could be used for chimney swift roosting, the HFX campus is unlikely to support this species, unless a chimney swift tower is constructed on campus.</p> <p>However, chimney swifts have not been identified near the HFX campus.</p>	Yes	No
<p>Research Notes:</p> <ul style="list-style-type: none"> • Often nest in abandoned chimneys in both urban and rural areas¹⁰ • Can also roost in wells, barns, abandoned buildings and air shafts¹¹ • Most often located in areas near wetlands (for foraging insects)¹⁰ • Hollow trees were the original roosting sites for Chimney Swifts⁹ • They require ‘rough vertical surfaces’ to grip onto, rather than horizontal surfaces⁹ • Population loss is likely from pesticide use (reduction in the number of insects for food sources) and habitat loss¹¹ • The reduction of traditional chimneys has been a major threat to this species, decreasing their amount of roosting space dramatically¹¹ • Nova Scotia is a breeding location for this species¹¹ • They typically orient their roosting sites in an area close to a water source for higher insect populations (wetlands can be common nesting sites)¹¹ • Will use the same nest for multiple years, returning each year¹¹ • Habitat typically depends on availability of nesting sites and amount of insects in a particular location¹¹ 			

⁸ Willick, F. (2017). ‘Like a little tornado’: Nesting season for endangered chimney swifts begins. *CBC News, Nova Scotia*. Retrieved from: <https://www.cbc.ca/news/canada/nova-scotia/chimney-swift-nesting-season-roosting-endangered-bird-1.4126646>

⁹ Graham Jr., F. (2011). High Hopes. *Audubon*, 113(4), 44-49. Retrieved from: <https://web-b-ebcohost-com.ezproxy.library.dal.ca/ehost/detail/detail?vid=7&sid=d02476f1-b982-4e98-b45c-7465f8c55819%40sessionmgr101&bdata=JnNpdGU9ZWwhvc3QtbGl2ZQ%3d%3d#AN=62526723&db=8gh>

¹⁰ Environment Canada. (n.d.). Chimney Swift. *Species at Risk*. Retrieved from: <http://www.speciesatrisk.ca/SARGuide/download/Chimney%20Swift.pdf>

¹¹ COSEWIC. (2007). COSEWIC assessment and status report on the Chimney Swift *Chaetura pelagica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Vii, 49 pp. Retrieved from https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_chaetura_pelagica_e.pdf

Additional Resources:

https://www.allaboutbirds.org/guide/Chimney_Swift/id

<http://www.aswp.org/pages/audubon-s-chimney-swift-tower-initiative>

Black foam lichen (*Anzia colpodes*) - Threatened (2017)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) - Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified</u> on campus	Dalhousie Campus (HFX): <u>Identified</u> on campus
<p>No (unlikely) 13 observations of Black Foam Lichen have been recorded on iNaturalist in the past few years, however, most are in the Annapolis Valley and none have been reported in Truro.</p> <p>It is possible that Black Foam Lichen could grow in areas around Truro, however it is unlikely that it would grow on the AC campus, as the habitat would not be suitable.</p>	<p>No There is not sufficient habitat on the HFX campus to support this species (lack of nearby wetlands and mature forest).</p>	<p>No</p>	<p>No</p>

Research Notes:

- Grows primarily on the trunks of mature, deciduous trees in an area with high levels of humidity, such as wetlands or lakes and a high amount of light ¹²
- The major threat for this lichen species is deforestation as well as climate change and ‘grazing by molluscs’¹²
- This species is “widespread but not common in Nova Scotia” ¹² (p. iv)
- Host tree species include: Red Maple (most common), Sugar Maple, White Ash and Red Oak
- Has only been identified 35 times in Nova Scotia since 1995 (report published in 2015)¹²
- Air pollution is another possible threat to this species¹²
- Most commonly been found in Colchester, Cumberland and Queens counties (as well as Lunenburg County and in Kejimikujik National Park)¹²
- Some researchers believe that there may be more of Black Foam Lichen than there is thought to be, however, it is often difficult to see because it grows quite high on the trunks of deciduous trees (20cm – 2m from the ground)¹²
- There is a limited number of forest stands in NS with ideal conditions for Black Foam Lichen¹²

Additional Resources:

https://wildlife-species.canada.ca/species-risk-registry/species/speciesDetails_e.cfm?sid=1286

Cameron, R. & Bayne, D. M. (2020). Identifying Lichen Rich Areas in Nova Scotia. *Nova Scotia Department of Environment vol. 50, 2, pp. 227-231* [PDF]. Retrieved from: ojs.library.dal.ca

¹² COSEWIC. (2015). COSEWIC assessment and status report on the Black-foam Lichen *Anzia colpodes* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. X, 47 pp. Retrieved from https://sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Black-foam%20Lichen_2015_e.pdf

Black Ash (*Fraxinus nigra*) - Threatened (2013)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) - Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified</u> on campus	Dalhousie Campus (HFX): <u>Identified</u> on campus
Yes	Yes	No Has not been identified on INaturalist in the area. The closest observation was sighted near Burnside, NS in 2018 (INaturalist, 2018).	No Has not been identified on INaturalist in the area. The closest observation was sighted near Ragged Lake in the Halifax County in 2020 (INaturalist, 2020).
Research Notes: <ul style="list-style-type: none"> • Vulnerable to fungal diseases, stunting and poor growth¹³ • Habitat often includes locations that have poor drainage and are susceptible to flooding (swampy woodlands, wetlands and near streams)^{13 14} • Often grows in peat and moist soils¹³ • Shade intolerant¹³ • Primary threats are habitat loss (loss of wetlands), invasive species (Emerald Ash Borer), over harvesting (forestry practices) and climate change¹³ 			
Additional Resources: http://wisqoq.ca https://inaturalist.ca			

¹³ Government of Nova Scotia. (2015). Recovery and Action Plan for Black ash (*Fraxinus nigra*) in Nova Scotia. *Nova Scotia Department of Natural Resources*. Retrieved from

https://novascotia.ca/natr/wildlife/biodiversity/pdf/Black_Ash_Recovery_Plan_Nova_Scotia.pdf

¹⁴ IUCN Red List. (2021). Black Ash (*Fraxinus nigra*) Habitat and Ecology in Detail. Retrieved from:

<https://www.iucnredlist.org/species/61918683/61918721#habitat-ecology>

Olive-sided Flycatcher (*Contopus cooperi*) - Threatened (2013)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) – Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified on campus</u>	Dalhousie Campus (HFX): <u>Identified on campus</u>
<p>No (but possible) It is possible that forest openings on or near agricultural lands could support this species during their nesting period or if there are recently harvested forest areas nearby.</p>	<p>No (unlikely) Not much is known of specific habitat requirements for this species, however, residential and commercial development has been a major cause of habitat loss. Therefore, the level of development on this campus would likely not be able to support the species.</p>	<p>No</p>	<p>No</p>
<p>Research Notes:</p> <ul style="list-style-type: none"> • Species has varying habitat requirements¹⁵ • Data regarding habitat requirements and suitability is currently lacking ¹⁵ • Require breeding, migration and wintering habitat¹⁵ • Habitat sometimes include wildfire affected areas (due to “<i>low nest predator abundance</i>”)¹⁵ • According to the IUCN Red List, the most common habitat attributes include: forest edges, water edges and sometimes harvested forests¹⁶ (however not as common as areas affected by wildlife as there is a higher chance of nest predation at harvested sites)¹⁵ • Mostly found in coniferous forests¹⁷ • Climate change is a major threat to this species as well as insect species loss for feeding, fire suppression, loss of forest habitat – often due to residential and commercial development (primarily for nesting), mercury exposure and pesticide use ¹⁵ 			
<p>Additional Resources: https://www.allaboutbirds.org/guide/Olive-sided_Flycatcher/id</p>			

¹⁵ Environment Canada. 2016. Recovery Strategy for the Olive-sided Flycatcher (*Contopus cooperi*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. Vii, 52 pp. Retrieved from: https://www.sararegistry.gc.ca/virtual_sara/files/plans/rs_olive-sided%20flycatcher_e_final.pdf

¹⁶ IUCN Red List. (2021). Olive-sided Flycatcher (*Contopus cooperi*) Habitat and Ecology. Retrieved from: <https://www.iucnredlist.org/species/22699787/110734937#habitat-ecology>

¹⁷ Audubon. (n.d.). Olive-sided Flycatcher (*Contopus cooperi*). *Audubon Field Guide*. Retrieved from: <https://www.audubon.org/field-guide/bird/olive-sided-flycatcher>

Eastern Whip-poor-will (*Antrostomus vociferus*) - Threatened (2013)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) - Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified</u> on campus	Dalhousie Campus (HFX): <u>Identified</u> on campus
<p>No (but possible) Similar to the Olive-sided Flycatcher, it is possible that a recently harvested forest area near the AC campus could support this species. Or, a semi-open forest nearby the campus. However, the campus itself is unlikely to support the species.</p>	<p>No (unlikely) According to the COSEWIC report, the species has been identified in suburban areas that have large trees¹⁸. There is a possibility that the species could use developed areas with mature trees for nesting. However, the Halifax campuses could not support the other habitat requirements of this species.</p>	<p>No</p>	<p>No</p>
<p>Research Notes:</p> <ul style="list-style-type: none"> • Habitat can include: rock or sand barrens with some trees, areas affected by wildfires, harvested areas (sometimes), forest openings¹⁸ • Semi-open forest habitats are common for this species (mature deciduous, coniferous and mixed forests)^{18 19} • Nova Scotia is a breeding location for the species¹⁸ • Often associated with pine, oak, aspen and birch trees¹⁸ • Feeding locations include “shrubby pastures”, wetlands, powerlines and roadway corridors¹⁸ • Ideal habitat conditions often include areas with a small amount of ground cover vegetation¹⁸ 			
<p>Additional Resources: https://www.allaboutbirds.org/guide/Eastern_Whip-poor-will/id https://www.audubon.org/field-guide/bird/eastern-whip-poor-will</p>			

¹⁸ COSEWIC. (2009). COSEWIC assessment and status report on the Whip-poor-will *Caprimulgus vociferus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Vi, 28 pp. Retrieved from: https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_whip-poor-will_0809_e.pdf

¹⁹ Queens Printer for Ontario. (2020). Eastern whip-poor-will. Retrieved from: <https://www.ontario.ca/page/eastern-whip-poor-will>

Common Nighthawk (*Chordeiles minor*) - Threatened (2007)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) – Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified</u> on campus	Dalhousie Campus (HFX): <u>Identified</u> on campus
<p>Yes (possibly) The habitat varies so greatly for this species, that it is possible that they could use pastures, or flat roofed buildings for nesting.</p>	<p>Yes (possible) The habitat varies so greatly for this species, that it is possible that they could use flat roofed buildings or nearby parks for nesting.</p>	<p>No Not reported on INaturalist.</p>	<p>No Not reported on INaturalist.</p>
<p>Research Notes:</p> <ul style="list-style-type: none"> • Habitat can vary: species is sometimes found in areas with little to no vegetation including sand dunes, beaches, wildfire areas, forest clearings, rock barrens, peatbogs and pastures²⁰ • Has also been identified in urbanized areas on flat, graveled roofs²⁰ • Threats include: insect reduction, loss of viable habitat (including a lack of flat, graveled roofing)²⁰ • Habitats can also include: urban parks, on gravel roads and commercial blueberry fields²⁰ • Primary forest types include: mixed forests, coniferous forests and pine stands²⁰ • In urban locations, this species relies on perching near street lights to hunt insects²⁰ 			
<p>Additional Resources: https://www.audubon.org/field-guide/bird/common-nighthawk https://naturecanada.ca/discover-nature/endangered-species/common-nighthawk/ https://inaturalist.ca</p>			

²⁰ COSEWIC 2007. COSEWIC assessment and status report on the Common Nighthawk *Chordeiles minor* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Vi, 25 pp. Retrieved from: https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_chordeiles_minor_e.pdf

Evening Grosbeak (*Coccothraustes vespertinus*) - Vulnerable (2017)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) – Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified on campus</u>	Dalhousie Campus (HFX): <u>Identified on campus</u>
<p>Yes (possible) It is possible that the species could use nearby forested areas to nest. However, it is unlikely that they would use the campus itself. The species is partial to bird feeders, as noted in the COSEWIC report.²¹ Therefore, there is a potential for Dal campuses to help the species by installing bird feeders.</p>	<p>Yes (possible) Although the campus is not near many forested areas, there have been sightings of the species in urban areas (although these sightings were not in Nova Scotia).²¹ Bird feeders could also be helpful for this species on the Halifax campus.</p>	<p>Yes This species was reported on INaturalist in May, 2019 in Onslow by user ‘kevin985’. Although this is not directly on the AC campus, it is quite close by and could mean that the species uses this area of Truro.</p>	<p>Yes This species was reported on INaturalist in December, 2020 on South Park Street, Downtown Halifax by user ‘valdon05’. Although this is not directly on Halifax campus, it is nearby and could mean that the species uses this area of Halifax.</p>
<p>Research Notes:</p> <ul style="list-style-type: none"> • Habitat consists primarily of “open, mature mixed-wood forests”²¹ • Feeds on spruce budworm, for this reason, can be found in forests with a large amount of fir trees and white spruce trees²¹ • This species is attracted to bird feeders (particularly with sunflower seeds), or relies on seeds from trees in boreal forests as well as any ornamental tree species that produce berries and seeds in the winter/spring months²¹ • Nesting is typically done in conifer trees²¹ • It has been noted that the species has used urban mixed-wood areas for nesting, however, this is an uncommon occurrence for Evening Grosbeak²¹ • According to the IUCN, the species has also been found in urban parks and orchards²² • Threats include declining populations of spruce budworm, climate change, window collisions for birds who feed from bird feeders in urban areas, residential and commercial development, wood harvesting and roads (vehicle collisions)²¹ 			
<p>Additional Resources: https://www.audubon.org/field-guide/bird/evening-grosbeak https://www.hww.ca/en/wildlife/birds/evening-grosbeak.html https://inaturalist.ca</p>			

²¹ COSEWIC. (2016). COSEWIC assessment and status report on the Evening Grosbeak *Coccothraustes vespertinus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Xi, 64 pp. Retrieved from: <http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1>

²² IUCN Red List. (2021). Evening Grosbeak (*Coccothraustes vespertinus*). Habitat and Ecology in Detail. Retrieved from: <https://www.iucnredlist.org/species/22720702/131500502#habitat-ecology>

Yellow-banded bumble bee (*Bombus terricola*) - Vulnerable (2017)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) – Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified</u> on campus	Dalhousie Campus (HFX): <u>Identified</u> on campus
<p>Yes Because this species has very general habitat requirements and has been identified in agricultural areas²³, the AC campus could support it.</p>	<p>Yes Because this species has very general habitat requirements and has been identified in urban areas, the Halifax campus could support it.</p>	<p>Yes (indirectly) This species was Reported on INaturalist in August, 2017 and June, 2018 in Colchester near highway 102 by user ‘sandwich’. Noted two more times near highway 102 in 2019 and 2020.</p>	<p>Yes (indirectly) The closest identification of this species was noted on INaturalist in July 2020, around Deadmans Cove in Halifax by user ‘cmoore1’. This was the only noted sighting on INaturalist.</p>
<p>Research Notes:</p> <ul style="list-style-type: none"> • Species is a ‘habitat generalist’ as well as a ‘foraging generalist’²³ • Have been found in numerous habitats: open forests (coniferous, deciduous and mixed), wet or dry meadows, grasslands, urban parks and gardens, on roadsides and in agricultural areas²³ • The queen bees overwinter²³ • This species creates nests underground, sometimes in abandoned burrows left by other animals²³ • Threats include: pollution, climate change, negative impacts of agriculture and forestry (habitat loss and pesticide use) and invasive species²³ 			
<p>Additional Resources: https://wildlife-species.canada.ca/species-risk-registry/species/speciesDetails_e.cfm?sid=1288 https://inaturalist.ca</p>			

²³ 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. lx, 60 pp. Retrieved from: https://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=177BD170-1#_03

Blue Felt Lichen (*Degelia plumbea*) - Vulnerable (2013)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) – Habitat could <u>support</u>	Dalhousie Campus (AC): Identified on <u>campus</u>	Dalhousie Campus (HFX): Identified on <u>campus</u>
No The AC campus would not likely have the habitat requirements that are necessary for this species.	No The Halifax campus would not likely have the habitat requirements that are necessary for this species.	No Not identified on INaturalist.	No Not identified on INaturalist.
Research Notes: <ul style="list-style-type: none"> • This species is most often identified on the trunks of mature, broad-leaf trees in wetlands habitats (near streams and lakes; areas with high humidity)²⁴ • Commonly associated with maple, yellow birch and ash trees²⁴ • Has been identified on moss covered rocks, however, this is highly uncommon²⁴ • Most often identified in coastal areas²⁴ • Was voted to become Nova Scotia’s provincial lichen²⁵ 			
Additional Resources: https://wildlife-species.canada.ca/species-risk-registry/species/speciesDetails_e.cfm?sid=1123 https://inaturalist.ca			

²⁴ COSEWIC. (2010). COSEWIC assessment and status report on the Blue Felt Lichen *Degelia plumbea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. X, 42 pp. Retrieved from: https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_blue_felt_lichen_0911_eng.pdf

²⁵ Nova Scotia Forest Notes. (2019). “The beautiful Blue Felt Lichen is Nova Scotia’s new provincial lichen”. Retrieved from: <http://nsforestnotes.ca/2019/01/30/the-beautiful-blue-felt-lichen-pectenia-plumbea-is-nova-scotias-new-provincial-lichen/>

Bobolink (*Dolichonyx oryzivorus*) - Vulnerable (2013)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) - Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified</u> on campus	Dalhousie Campus (HFX): <u>Identified</u> on campus
<p>Yes Given the nature of where this bird species is known to nest (pastures, crop land, grain fields, etc.) it is likely that the agricultural campus could support it</p>	<p>No</p>	<p>No Not identified on INaturalist.</p>	<p>No Not identified on INaturalist.</p>
<p>Research Notes:</p> <ul style="list-style-type: none"> • The species nests in forage crops (hayfields and pastures that are abundant in certain plant species)²⁶ • Has also been identified in ‘no-till crop land’, small-grain fields and some wetlands²⁶ • Threats to this species include: habitat loss, habitat fragmentation, damage to nests caused by farming practices and use of pesticides²⁶ • Wintering species (breeds in Nova Scotia)²⁶ 			
<p>Additional Resources: https://www.audubon.org/field-guide/bird/bobolink https://www.natureconservancy.ca/en/what-we-do/resource-centre/featured-species/birds/bobolink.html https://inaturalist.ca</p>			

²⁶ COSEWIC. 2010. COSEWIC assessment and status report on the Bobolink *Dolichonyx oryzivorus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Vi, 42 pp. Retrieved from: https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Bobolink_0810_e.pdf

Eastern White Cedar (*Thuja occidentalis*) - Vulnerable (2006) (non-ornamental)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) – Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified</u> on campus	Dalhousie Campus (HFX): <u>Identified</u> on campus
<p>No (unlikely) Because this species is primarily found in Western Nova Scotia²⁷, it is unlikely that it would be identified in Truro. However, it has been sighted in old pastures, therefore, it may grow in Truro under the proper conditions.</p>	No	No	No
<p>Research Notes:</p> <ul style="list-style-type: none"> • Species has been identified in old pastures²⁷ • Typically found on the borders of wetland areas near streams and swamps²⁷ • Most commonly located in Western Nova Scotia²⁷ 			
<p>Additional Resources: https://www.ontario.ca/page/eastern-white-cedar http://www.borealforest.org/trees/tree14.htm</p> <p>*Unable to find COSEWIC report for this species.</p>			

²⁷ Species At Risk Guide, Eastern White Cedar (*Thuja occidentalis*). (n.d.). Government of Nova Scotia. Retrieved from: <http://www.speciesatrisk.ca/SARGuide/download/Eastern%20White%20Cedar.pdf>

Golden-crest (*Lophiola aurea*) - Vulnerable (2013)

Dalhousie Campus (AC) – Habitat could <u>support</u>	Dalhousie Campus (HFX) - Habitat could <u>support</u>	Dalhousie Campus (AC): <u>Identified</u> on campus	Dalhousie Campus (HFX): <u>Identified</u> on campus
No The agricultural campus does not likely have suitable habitat conditions for this species.	No The Halifax campus does not have suitable habitat conditions for this species.	No Not identified on INaturalist.	No Not identified on INaturalist.
<p>Research Notes:</p> <ul style="list-style-type: none"> • Habitat includes: freshwater wetlands, lakeshores, ‘graminoid-dominated peatlands’, bogs with wet, acidic soils, pine barrens and has also been identified in roadside ditches (however, this is uncommon)²⁸ • Threats of this species include: shoreline development, peat mining, eutrophication and invasive species²⁸ • Commonly found in locations of disturbance such as flooding, low nutrients and wave action (areas of high erosion)²⁸ • A large increase of shoreline and ‘cottage’ development has had a major impact on this species²⁸ • Ponhook Lake and Shingle Lake in Nova Scotia are thought to have the largest remaining population, however, shoreline development is dramatically reducing that population²⁸ 			
<p>Additional Resources:</p> <p>http://www.speciesatrisk.ca/SARGuide/download/Golden%20Crest.pdf</p> <p>https://inaturalist.ca</p>			

²⁸ COSEWIC. (2012). COSEWIC assessment and status report on the Goldencrest *Lophiola aurea* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Xi, 37 pp. Retrieved from: https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_lophiolie_doree_goldencrest_1012_e.pdf