

# Natural Environment Plan

2020-2030 | VERSION 2 (UPDATED IN 2022)



**DALHOUSIE**  
UNIVERSITY



# Acknowledgements

Prepared by the Office of Sustainability with over twenty students, faculty, and staff. Between 2019–2022 additional focus groups, surveys, reporting frameworks, literature and plan reviews, and a new University Strategic Plan provided revised content for the plan. These processes engaged over 1,000 people on and off campus.

## Land Acknowledgment

Dalhousie sits on the unceded territory of the Mi'kmaq people and recognizes the interconnectedness of all our relationships—to the environment and to each other—for generations to come.

We recognize that African Nova Scotians are a distinct people whose histories, legacies and contributions have enriched that part of Mi'kma'ki known as Nova Scotia for over 400 years.

*Tree planting at the Agricultural campus with the  
Landscape Architecture Student Society*



# Table of Contents

Acknowledgements	2
Executive Summary	4
1.0 Current Context	5
1.1 Natural Environment	5
1.2 Management Drivers	7
2.0 Plan Development and Management Timeline	8
3.0 Vision, Principles, and Scope	9
4.0 Goals, Actions and Targets	10
5.0 Implementation and Evaluation	12
6.0 References	13

Dalhousie recognizes and reports on the UN Sustainable Development Goals through reporting frameworks. This plan addresses Goal 3 Good Health and Well-Being, Goal 6 Clean Water and Sanitation, Goal 11 Sustainable Cities and Communities, Goal 13 Climate Action, Goal 15 Life on Land, and connects to each of the other 13 goals.



## Executive Summary

The escalating impacts of human actions on ecosystem change are increasingly evident locally and globally as the biodiversity integrity of natural spaces (sea and land) are in decline. Other impacts, such as a changing climate, urban development, disease, and pollution, also place stress on natural systems. The value of natural spaces is significant. They provide benefits from social, health, ecological and economic perspectives.

The natural environment on campus has played an important role in defining the physical character of Dalhousie University. The four Dalhousie campuses (Carleton, Studley, Sexton, and Agricultural ) feature a variety of gardens, green roofs, trees, and naturalized spaces. These spaces provide food for birds and pollinators, and hold place for cultural respect, recognition, rejuvenation, and connection.

Several new plantings, policies, and events have been developed at Dalhousie over the last decade. Our hope for the the next decade is to continue to grow and enhance natural features and spaces, expand engagement in cultural and plant education, support biodiversity and lower resource use, and work together to keep and restore these essential natural environments for all.

*Green roof on Richard Murray Design Building*



# 1.0 Current Context

## 1.1 Natural Environment

Sustainability concepts have been woven through the culture of many Indigenous societies for thousands of years, including the Mi'kmaq, Maliseet, and Passamaquoddy in Atlantic Canada and Eastern Quebec. The Mi'kmaq cultural and spiritual connection to nature is expressed in the language through many concepts such as Netukulimk, which highlights reverence and respect for the earth.<sup>1</sup>

The escalating impacts of human actions on ecosystem change are increasingly evident locally and globally as the biodiversity integrity of natural spaces (sea and land) are in decline.<sup>2</sup> Recent commitments by federal and provincial governments outline targets to reduce biodiversity loss through strategies such as protecting lands and marine areas. In addition, the local climate is changing due to greenhouse gas concentrations creating a warmer, wetter, and wilder environment.<sup>3</sup> Impacts on the campus environment include more heat extremes, milder seasons, chances for drought and extreme weather. Tree decline on the Halifax campuses is visible and can be attributed in part to factors such as encroaching development, lack of rooting volume, invasive species (Figure 1.), disease, compaction, vandalism, and winter salting.

Figure 1. Plant Origins

### **Indigenous**

Naturally occurring in the area without human intervention.

### **Native**

Naturally occurring in North America.

### **Naturalized**

From another continent, but now naturally reproducing.

### **Adapted**

Adapted (or introduced) species perform well with minimal human inputs, once established. Adapted plants are not native but are not considered invasive.

### **Invasive**

From another ecosystem/continent/area and displacing native or indigenous vegetation.

Trees are part of municipal infrastructure in the same way as are roads, sewers, electricity, and transit.<sup>4</sup> Although not always viewed as an equivalent to built infrastructure, green infrastructure is the interconnected network of green spaces that conserve ecological, social, and economic values for humans and other species.<sup>5</sup> For green infrastructure to be successful, these values need to be maintained and promoted in long-term management programs.

Canadians value birds for the several social, ecological, and economic services they provide.<sup>6</sup> Despite a strongly held appreciation for birds in Canada, urbanization is a leading cause of habitat loss and fragmentation. Development on or near wildlands directly threatens wildlife and species diversity.<sup>7</sup> Other factors influencing a change in bird populations include changing age and species composition of forests, climatic changes, wetland loss, built infrastructure, predation, and pollution.<sup>8</sup>

Trees down on campus due to Hurricane Dorion



Urban and rural landscapes often hold high levels of plant diversity, which correlates to a high invertebrate fauna with native pollinators.<sup>9</sup> Gardens, parks, and remnant natural areas increase available habitat for species and can act as conduits for wildlife. The implementation of an integrated pest management program (IPM) is integral to promoting beneficial insects.

Dalhousie's Halifax campuses are positioned at the south end of the urban Halifax peninsula and are significantly influenced by the Atlantic Ocean. Campus land has been modified for centuries. Dalhousie University falls into Zone 6b of the Canadian Plant Hardiness zones.<sup>10</sup> Artificial elements such as paving, buildings, human activity, and plant material, create a localized campus climate that influences human comfort, energy use, and air quality.<sup>11</sup> In general, urban environments are often drier than the surrounding natural landscape as vegetation is replaced with less permeable surfaces.<sup>12</sup> Plant material can positively influence the urban landscape by regulating moisture content in the air and reducing air temperature.<sup>13</sup> There is no surface water at the Halifax campuses, though underground rivers and streams run underneath the Studley and Carleton campus.

Dalhousie's Agricultural Campus (AC) is located inland from the Cobequid Bay in Bible Hill, Nova Scotia. Bible Hill experiences a unique combination of continental and maritime influences. Unlike on the Atlantic coast, the continental climate prevails causing variability in weather patterns.<sup>14</sup> The AC is set within Zone 5b of the Canadian Plant Hardiness Zones.<sup>15</sup>

Two distinct soil types are dominant on the AC: Truro and Cumberland Sandy Loam. Truro soil type is characterized by light brown sandy loam over a layer of red sandy loam. The landscape is described as gently to moderately undulating with good drainage. Cumberland Sandy Loam soil is found adjacent to the Salmon River below the main campus. The sandy soil is well drained but is flooded regularly.<sup>16</sup> In Bible Hill, the Salmon River provides an important source of irrigation to nearby agricultural land. Flooding along the river becomes an issue during high precipitation events. The land the campus sits on was once a Mi'kmaq community.<sup>17</sup>

In addition to the main campus lands, AC activities take place on a 183-hectare farm that includes pastureland, field and turfgrass facilities, greenhouses, and an orchard. Large-scale agricultural land is not included in this plan because its management, research goals, and objectives are very different than those established for intensively managed campus vegetation.



## 1.2 Management Drivers

The Federal Sustainable Development Strategy for Canada outlines a number of goals, including working with Indigenous people and conserving “25% of Canada’s land and inland waters by 2025, working toward 30% by 2030.”<sup>18</sup> The Province of Nova Scotia passed the *Environmental Goals and Climate Change Reduction Act* in 2021 with a stated goal of goal of “conserving at least 20% of the total land and water mass of the Province by 2030, either as protected areas and other effective area-based conservation measures.”<sup>19</sup> Municipal plans highlight the importance of nature-based solutions with focuses on protecting, restoring and expanding natural areas and green infrastructure.<sup>20, 21</sup>

Dalhousie University’s Carleton, Studley, and Sexton campuses are located in the urban core of the Halifax region. Campus vegetation includes trees, shrubs, and gardens (roof top and on land). There are no parks or protected areas on campus. Any streams and small ponds were infilled in the 1700 and 1800s. In the early 1900s much of the land was either developed or open grass areas. A small remnant forest persisted behind Sherriff Hall. Today, a small patch of trees, which includes the oldest tree on campus, remains. Surrounding the campus are city streets. Halifax is responsible for trees in the municipal right-of-way (i.e., alongside roads). The Halifax campuses of Dalhousie University, 32 hectares in total,<sup>22</sup> are composed of many landscape types including: tree-lined streets and paths, open greenspace, gardens, tree stands, expanses of impervious surfaces, and naturalized areas (Figure 2 & 3 & Table 1). In the last decade, 2010–2020, the % of landscape types changed marginally.

Figure 2. Halifax Campuses Landscape Type and Permeability

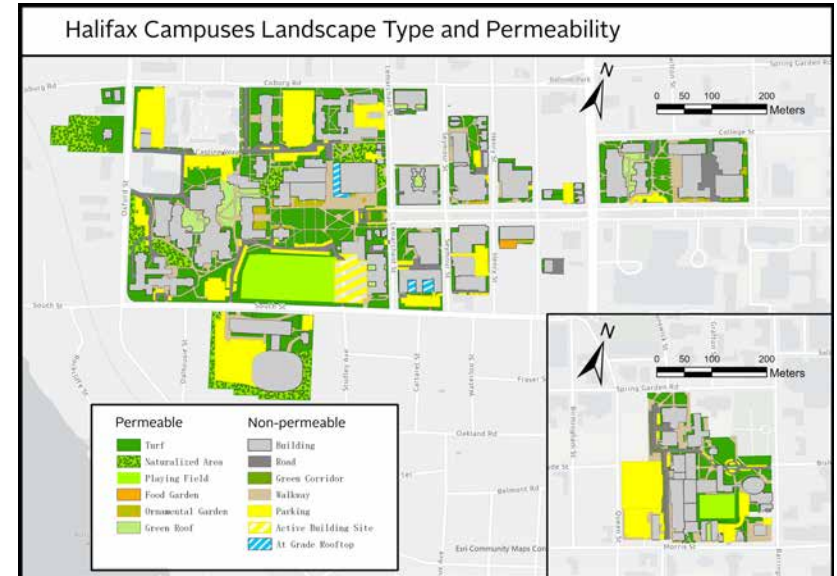


Figure 3. Agricultural Campus Landscape Type and Permeability

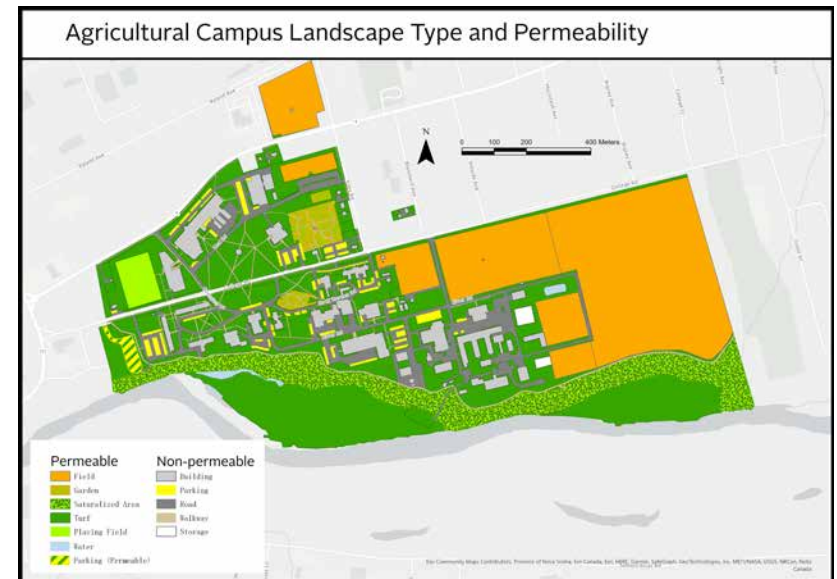


Table 1. Dalhousie's Campuses Landscape Breakdown

	Halifax	AC
<b>Non-Permeable</b>	<b>65.2%</b>	<b>20.1%</b>
Building/at Grade Roof/Bldg. Site	36%	6.7%
Parking	13%	1.8%
Roads	6%	9.3%
Walkways/AT Corridor	10%	2.0%
Storage	0%	0.3%
<b>Permeable</b>	<b>34.8%</b>	<b>79.9%</b>
Agricultural Field	0.0%	30.3%
Garden/Green Roof	3.2%	0.4%
Permeable Pavers/Surface	0.1%	0.4%
Turf	21.1%	36.4%
Surface Water	0.0%	0.4%
Playing Field	4.9%	1.3%
Naturalized Area	5.5%	10.6%

The Agricultural campus (AC) in Bible Hill, NS, is a sizable (some 200 hectares) campus that is composed of many different landscape types: ornamental gardens, food gardens, agricultural fields, tree lined paths, and naturalized areas. However, a smaller area makes up the more actively managed campus. The AC has growing conditions that are different from the other three campuses. Specifically, soil and geology, plant hardiness, and topography. With ample land available, development pressure is low on the AC.

Salmon River at the Agricultural Campus.





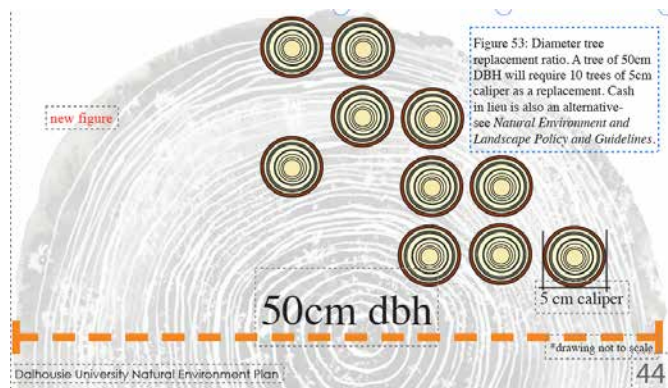
## 2.0 Plan Development and Management Timeline

At Dalhousie, several new plantings, policies, and events have been developed over the last decade (Figure 4). Campus tree and bird inventories were undertaken. A tree replacement guideline was established, so that if a tree is taken down for campus infrastructure projects, the equivalent biomass should be replaced (Figure 5). Since the tree replacement guideline was established in 2012, 215 trees were removed related to construction equalling (4,656 cm of biomass) and 736 trees were added: (3,841 cm of biomass) with some additional tree plantings left to do. Departments and faculties use the campus grounds as places for learning, teaching, research and hands-on projects and education events. Five rain gardens were implemented on the Halifax and Agricultural campuses along with eight green roof systems on four newly constructed buildings. Some areas on campus were intentionally left to naturalize. From 2020–2022, on-campus activities changed as the result of remote working and learning due the COVID-19 pandemic. During this period, however, new plantings were undertaken including a planting of a *hugelkultur* bed. Additionally, an analysis of IUCN Red Listed species and species at risk was done, an annual biodiversity week was launched and indigenous plantings and new pollinator gardens were added to the campuses.

Figure 4. Timeline information.

2008–2009	2010–2011	2012–2013	2014–2015	2016–2017	2018–2019	2020–2021
<ul style="list-style-type: none"> <li>▶ Campus Tree Inventory created</li> <li>▶ Pollinator Garden AC</li> </ul>	<ul style="list-style-type: none"> <li>▶ Bird Inventory</li> <li>▶ Mona Campbell Green Roof</li> </ul>	<ul style="list-style-type: none"> <li>▶ Coburg Rain Gardens</li> <li>▶ Biomass Replacement Guideline created</li> <li>▶ Major Tree Planting</li> </ul>	<ul style="list-style-type: none"> <li>▶ Natural Environment Plan created</li> <li>▶ Rain Gardens Killam Loop</li> <li>▶ Natural Environment and Landscape guidelines renewed</li> </ul>	<ul style="list-style-type: none"> <li>▶ BioBlitz started</li> <li>▶ LeMarchant Place &amp; Learning Commons Green Roofs</li> <li>▶ Vegetative Swale AC</li> <li>▶ Major Tree Planting</li> </ul>	<ul style="list-style-type: none"> <li>▶ Design Building Green Roof</li> <li>▶ 200 Trees for 200 year anniversary</li> <li>▶ Bicentennial Botanical Garden</li> </ul>	<ul style="list-style-type: none"> <li>▶ Launch of Biodiversity Week</li> <li>▶ Natural and pollinator gardens added</li> <li>▶ Species at Risk campus research</li> </ul>
<b>ONGOING</b> Tree Planting, Gardens, Inventories including Species at Risk, Bio Blitz, Biodiversity Week						

Figure 5. Biomass replacement guidelines



## 3.0 Vision, Principles, and Scope

### Vision

The natural environment is recognized and supported as important and valued space on university campuses. The crucial campus and societal value that natural spaces provide is significant — from social and health benefits (e.g., aesthetics, psychological well-being, connection to culture) to ecological benefits, (e.g., biodiversity, shade, carbon removal, wildlife) and economic benefits (e.g., energy savings, real estate value).

### Principles

Healthy landscapes, natural communities, and the equity and accessibility values of social campus landscapes are important principles that contribute to decision-making.

#### *Healthy Landscapes as green infrastructure*

Recognizing Dalhousie's natural environment as 'green Infrastructure' highlights the importance of the natural environment in management decisions. Through the planning documented in the Campus Master Plans, Climate Change Plan, natural environment policy and guidelines, and this plan—Dalhousie can take steps to conserve the natural environment and promote the benefits of natural, landscaped, and green solutions. Vegetation and other forms of low impact development will be used to slow the flow and restore the infiltration of stormwater.

#### *Natural Communities*

A sustainable landscape is not separate from the multi-level plant and animal communities within it. In combination with landscape naturalization efforts, habitat restoration, creation, and protection will be vital to the long-term functioning of the landscape.

#### *Social Campus Landscapes*

An accessible campus landscape provides an ideal space for students, faculty, staff, neighbours, and the public to gather, socialize, relax, study, and connect with nature. Plant material will be used to define and create comfortable spaces. Interaction with campus flora and fauna will be promoted through signage, education, projects, and events. Respecting and highlighting Indigenous cultural through plantings.

### Scope

This plan provides guidance on supporting and enhancing campus natural environment spaces to meet Dalhousie's stated values. It reflects priority areas from local, regional, national and international requirements, standards and certifications.

*Indigenous pollinator garden*



## 4.0 Goals, Actions and Targets

Table 1: Goals, Actions and Targets

GOALS	OBJECTIVES	ACTIONS	TARGETS
Increase Campus Biodiversity	<ul style="list-style-type: none"> <li>▶ Expand gene pools of native species</li> <li>▶ Reduce invasive species</li> <li>▶ Improve resilience of urban forest</li> <li>▶ Increase amount of bird-at-risk habitat</li> </ul>	<ul style="list-style-type: none"> <li>▶ Planting a mixture of evergreen and deciduous native species that have wildlife and aesthetic value.</li> <li>▶ Phasing out invasive species.</li> <li>▶ Plant food sources, establish nesting opportunities, and provide protection for related species on the International Union for Conservation of Nature's Red List and provincial and national species at risk list (e.g., monarch butterfly) and the more common species on campus.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Increase number of species planted, proportional to the number of planted material (% distribution)</li> </ul>
Maintain and increase natural spaces to provide shade, food, storm water control, shelter, carbon removal, air quality, biodiversity, aesthetic, real estate, reputation and cultural benefits	<ul style="list-style-type: none"> <li>▶ Increase the amount of vegetation (tree, shrubs, plants) on existing and new spaces</li> <li>▶ Increase area of naturalized ecosystems (landscapes left to grow and change naturally)</li> <li>▶ Maintain opportunities for local food</li> </ul>	<ul style="list-style-type: none"> <li>▶ Mandating nature-enhancing features with new development and redevelopment of the built environment including: green roof systems; modular exterior green walls; tree and shrub screening; trellises and frames for climbing plants; perennial borders; and rain gardens, swales, and berms.</li> <li>▶ Identify and protect areas suited for campus naturalization. Signalling cues of care to the campus population demonstrating that these projects are intentional and not forgotten spaces (e.g., signage, fencing, seating, and pathways).</li> <li>▶ Use vegetation to mitigate stormwater flow from impervious surfaces.</li> <li>▶ Alleviating site compaction by using aeration techniques (e.g., water and air injection, radial trenching) around valuable trees.</li> <li>▶ Modifying management practices (e.g., reduce or eliminate mowing in certain areas).</li> <li>▶ Allowing understory regeneration or planting selected native species.</li> <li>▶ Improve tree cover over frequented pedestrian and animal (e.g., cows in pasture) routes.</li> <li>▶ Maintain and support campus food gardens.</li> <li>▶ Develop a planting and resource prioritization scheme. More gardens require more time as such strategies for increasing investment in this area will be explored.</li> <li>▶ Maintain biomass replacement funding mechanism to support campus tree and plant replacement from development and natural causes.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Increase the number of trees planted and increase the planting density of trees along major walkways and sidewalks, and fields (number of, location, year over year % comparison)</li> <li>▶ Increase campus vegetation that is native or indigenous. (Type and location, year over year % comparison)</li> <li>▶ Percentage of campus that is naturalized</li> </ul>

GOALS	OBJECTIVES	ACTIONS	TARGETS
Manage with less natural resource and chemical inputs	<ul style="list-style-type: none"> <li>▶ Continue to support water efficient landscaping</li> <li>▶ Use only Integrated Pest Management and Organic Methods</li> </ul>	<ul style="list-style-type: none"> <li>▶ Vegetation is not heavily irrigated on campus, but for current and future greenspaces preference is given to landscapes that require little water. Work with plants that tolerate drought conditions. Limit lawn areas unless for practical use. Irrigate wisely during plant establishment. Improve soil health to retain soil moisture. Mulch garden beds.</li> <li>▶ Explore rainwater systems for watering.</li> <li>▶ Increase investigation and use of organic fertilizers and methods.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Maintain no irrigation other than establishment</li> <li>▶ Confirmation of only integrated pest management and organic use</li> </ul>
Support Education and Engagement	<ul style="list-style-type: none"> <li>▶ Support psychological well-being</li> <li>▶ Respect and awareness of Mi'kmaq and other Indigenous culture</li> <li>▶ Protect and highlight valuable campus plant species</li> </ul>	<ul style="list-style-type: none"> <li>▶ Number of campus landscapes that provide living and learning opportunity, campus as a 'living laboratory'.</li> <li>▶ Develop natural spaces, with Mi'kmaq led guidance, that highlight culturally important plants and trees.</li> <li>▶ Ensure plans, policies, and guidelines are updated and adequate and regular training is provided to campus staff and external professional and contractors.</li> <li>▶ Education for community about conservation with signage, interactive resources, tours, and events such as Biodiversity week.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Increase quality and quantity of opportunities for campus population to engage and learn about natural spaces and culture</li> </ul>

*Naturalized area behind Shirreff Hall.*



## 5.0 Implementation and Evaluation

Monitoring is an essential component to the continued success and growth of the Natural Environment Plan. Monitoring also allows the expected impacts of the strategy to be measured against actual changes, and this can inform future revisions of management actions. Evaluation and monitoring are typically conducted using surveys, mapping, observation, photography, and analysis. All methods will be deployed to report on key targets.

Key departments involved in planning, policies, implementation, and education include Facilities Management; Faculties such as Plant, Food and Environmental Science; Landscape Architecture; Biology; School for Resource and Environmental Studies; Art Gallery; Indigenous Student Centre; and the Office of Sustainability. Student Societies are engaged through garden, food and wildfire and pollinator groups. Facilities Management has the responsibility for campus land management.



## 6.0 References

1. Prosper, K., McMillan, L. J., & Davis, A. A. (2011). Returning to Netukulimk: Mi'kmaq cultural and spiritual connections with resource stewardship and self-governance. *The International Indigenous Policy Journal*, 2(4). Retrieved from: [ir.lib.uwo.ca/iipj/vol2/iss4/7](http://ir.lib.uwo.ca/iipj/vol2/iss4/7)
2. IPBES (2019): Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S. Díaz, J. Settele, E. S. Brondízio E.S., H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razzaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.). IPBES secretariat, Bonn, Germany. 56 pages.
3. The Dalhousie Office of Sustainability. (2020). Climate Change Operations Plan 2020–2030. *Dalhousie University*. [cdn.dal.ca/content/dam/dalhousie/pdf/dept/sustainability/resources/publications-and-plans/Climate%20Change%20Plan%20Final%202022.pdf](http://cdn.dal.ca/content/dam/dalhousie/pdf/dept/sustainability/resources/publications-and-plans/Climate%20Change%20Plan%20Final%202022.pdf)
4. Halifax Regional Municipality. (2013). Urban forest master plan. *Dalhousie University and Halifax Regional Municipality*. [cdn.halifax.ca/sites/default/files/documents/transportation/streets-sidewalks/HALREG%201246%20UrbanForestReport\\_HighRes\\_SINGLEPAGE\\_Mon20\\_Combined.pdf](http://cdn.halifax.ca/sites/default/files/documents/transportation/streets-sidewalks/HALREG%201246%20UrbanForestReport_HighRes_SINGLEPAGE_Mon20_Combined.pdf)
5. Benedict, M., & McMahon, E. (2002). Green infrastructure: smart conservation for the 21st Century. *Renewable Resources Journal*, 20(3), 12-17. [www.researchgate.net/publication/273127683\\_Green\\_Infrastructure\\_Smart\\_Conservation\\_for\\_the\\_21st\\_Century](http://www.researchgate.net/publication/273127683_Green_Infrastructure_Smart_Conservation_for_the_21st_Century)
6. North American Bird Conservation Initiative Canada. (2019). The state of Canada's birds, 2019. Ottawa: Environment Canada. [nabci.net/resources/state-of-canadas-birds-2019/](http://nabci.net/resources/state-of-canadas-birds-2019/)
7. Radeloff, V., Hammer, R., Stewart, S., Fried, J., HolcomB, S., & McKeefry, J. (2005). The wildland-urban interface in the United States. *Ecological Applications*, 15(3), 799-805. [www.jstor.org/stable/4543395](http://www.jstor.org/stable/4543395)
8. Mersey Tobeatic Research Institute. (2008). Species at risk Nova Scotia. *MTRI*. [www.speciesatrisk.ca/SARGuide/download/SAR%20Guide.pdf](http://www.speciesatrisk.ca/SARGuide/download/SAR%20Guide.pdf)
9. Colding, J. (2006). Ecological land-use complementation for building resilience in urban ecosystems. *Landscape and Urban Planning*, 81(1–2), 46-55. 10.1016/j.landurbplan.2006.10.016
10. Natural Resources Canada. (2014). Canada's plant hardiness site going beyond the zones. [www.planthardiness.gc.ca](http://www.planthardiness.gc.ca)
11. Huang, L., Li, J., Zhao, D., & Zhu, J. (2008). A fieldwork study on the diurnal changes of urban microclimate in four types of ground cover and urban heat island of Nanjing, China. *Building and Environment*, 43(1), 7-17. 10.1016/j.buildenv.2006.11.025
12. Urban, J. (2008). Up by roots: Healthy soils and trees in the built environment. *Champaign, Ill: Inter-national Society of Arboriculture*.
13. Robitu, M., Musy, M., Inard, C., & Groleau, D. (2006). Modeling the influence of vegetation and water pond on urban microclimate. *Solar Energy*, 80(4), 435-444. 10.1016/j.solener.2005.06.015
14. Nova Scotia Museum of Natural History (2013). Nova Scotia's climate. [museum.gov.ns.ca/mnh/nature/nhns/t5/t5-2.pdf](http://museum.gov.ns.ca/mnh/nature/nhns/t5/t5-2.pdf)
15. Ibid
16. Wicklund, R.E., & Smith, G.R. (1948). Soil survey of Colchester County, Nova Scotia. *Nova Scotia Department of Agriculture*. [sis.agr.gc.ca/cansis/publications/surveys/ns/ns19a/index.html](http://sis.agr.gc.ca/cansis/publications/surveys/ns/ns19a/index.html)
17. Millbrook First Nation. (2022). Culture and history. [www.millbrookband.com/new-page-4](http://www.millbrookband.com/new-page-4)
18. Environmental and Climate Change Canada. (2021). Achieving a sustainable future, Draft Federal Sustainable Development Strategy 2022 to 2026. *Environment and Climate Change Cafe*. [www.flds-sfdd.ca/downloads/2022-2026\\_DRAFT\\_FSDS.pdf](http://www.flds-sfdd.ca/downloads/2022-2026_DRAFT_FSDS.pdf)

19. Office of the Legislative Counsel, Nova Scotia House of Assembly. (2021). Environmental goals and climate change reduction act. *Government Bill*.

[nslegislature.ca/legc/bills/64th\\_1st/1st\\_read/b057.htm](https://www.legis.gov.ns.ca/legc/bills/64th_1st/1st_read/b057.htm)

20. Halifax Regional Municipality. (2019). Halifax 2050: Acting on climate together. [www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/HRM\\_HaliFACT\\_vNew%20Logo\\_.pdf](https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/HRM_HaliFACT_vNew%20Logo_.pdf)

21. Municipality of Colchester. (2021) Carbon-free Colchester. *Municipality of the County of Colchester Community Energy and Emissions Plan*. [www.colchester.ca/community-1/3522-carbon-free-colchester-community-energy-emissions-plan/file](https://www.colchester.ca/community-1/3522-carbon-free-colchester-community-energy-emissions-plan/file)

22. Dalhousie University (2012). Halifax campuses. [www.dal.ca/about/halifax-campuses.html](https://www.dal.ca/about/halifax-campuses.html)

A photograph of a stone building with a sign for 'McDonald Building' and '300 Coburg Road'. The sign also lists 'Government Department', 'MacKen Institute for Public Policy & Governance', and 'Human Rights and Equity Services'. The building has several windows and a wooden railing. There are bushes and flowers in the foreground.



McDonald  
ilding  
ement Department  
achen Institute for Public Policy & Governance  
an Rights and Equity Services  
300 Coburg Road



**DALHOUSIE**  
UNIVERSITY

Office of Sustainability, Dalhousie University  
5th Floor, 1236 Henry Street, PO Box 15000  
Halifax, Nova Scotia, Canada B3H 4R2  
rethink@dal.ca

**[dal.ca/sustainability](https://dal.ca/sustainability)**

 /DalhousieOfficeOfSustainability  /RethinkDalhousie  
 @DalOfficeSust #DalhousieU  @sustainabilityatdal