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LA NATURE À L'ŒUVRE

FINAL REPORT

# NATURAL AREAS CONSERVATION PLAN FOR THE TOWN OF HUDSON

HUDSON

## HABITAT

Habitat is an environmental solutions company founded in 2017 (initially known as Eco2urb) and based in Montreal.

It offers nature-based solutions to fuel and drive the ecological transition of its clients, particularly in the context of a green recovery. Habitat was born from the pooling of expertise from three leading laboratories in the fields of human and natural sciences. At the head of the company are Professors Dupras, Gonzalez, and Messier, all internationally recognized in their fields.

Over the past five years, Habitat has catalyzed the ecological transition of a diverse clientele. The team collaborates with numerous universities, research centres, and non-governmental organizations to facilitate the implementation of scientific work related to ecology, forestry, and land management. It offers innovative approaches and cutting-edge environmental strategies. Habitat's team of scientific consultants guides you in the sustainable management of ecosystems, biodiversity conservation, and the consideration of services provided by your natural infrastructures, applying the best available science.

Our mission is to accelerate your ecological transition with solutions rooted in nature and science.

## PROJECT TEAM

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## EXECUTIVE SUMMARY


The Natural Areas Conservation Plan for the Town of Hudson aims to strengthen the town's ability to protect, restore, and enhance its natural areas while responding to the challenges posed by climate change and biodiversity loss. This document is a milestone and strategic lever, rather than an end in and of itself, to guide concrete conservation actions in the short, medium, and long term.

The Conservation Plan is based primarily on an in-depth territorial analysis that identifies important natural areas, habitats to be preserved, and major ecological threats. Among the key findings of this analysis are:

- High ecological connectivity between the territory's natural areas, particularly along watercourses and wetlands, which is essential for species movement and ecosystem resilience.
- Moderate functional diversity of forest areas, combined with a marked vulnerability to drought and biotic pressures (spongy fungus, Asian longhorn beetle).
- The presence of a significant bird observation hotspot in the Choisy plain/Alstonvale escarpment area, as well as a high concentration of herpetofauna sightings in the eastern part of the municipality.
- Increased sensitivity of forest areas bordering watercourses to climate hazards, particularly drought.
- The identification of three ecological corridors of interest: Viviry River (from downtown to Sandy Beach), Black Creek (Como sector), and the Rivière des Fiefs (Alstonvale escarpment), all recognized for their role in regional connectivity.

The Action Plan, for its part, stems directly from the Conservation Plan, defining specific measures to conserve Hudson's natural areas. It is based on a two-pronged approach that allows for both general guidelines and targeted interventions to be articulated around a vision for Hudson's natural areas for 2030.

***Vision 2030: Hudson's natural areas are healthy and contribute to the conservation of biodiversity corridors. They are resilient to climate change while providing an exceptional quality of life for current and future generations.***

**Part 1 – General guidelines and actions at the regional level**

This first part proposes key actions applicable to the entire territory of the Town of Hudson, based on four main guidelines to:

1. Protect natural areas and ecological corridors
2. Restore degraded ecosystems through active management
3. Engage the community in conservation
4. Improve sustainable access to nature

**Part 2 – Strategic planning by priority sector**

The second part targets specific areas of the territory considered to be high priorities for conservation:

- Viviry Corridor
- Black Creek/Como Forest Corridor
- West Forest/Alstonvale Escarpment Corridor

Citizen engagement is at the heart of the Action Plan, as it relies on collaboration among all parties. It is through the collective mobilization of each stage of the Plan (planning, implementation, and monitoring) that the successful conservation of Hudson's natural areas will be ensured with a better guarantee of their benefits for future generations.

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## LIST OF ACRONYMS

*Denote acronyms have been retained in their original French format as they are commonly used in both French and English in Quebec. Translation is provided in both languages for clarity.

AARQ: Atlas of Amphibians and Reptiles of Quebec

CDPNQ*: Quebec Natural Heritage Data Centre/ *Centre de Patrimoine National du Québec*

GBF: Kunming-Montreal Global Biodiversity Framework

CMM*: Montreal Metropolitan Community / *Communauté Métropolitaine de Montréal*

NCCC: Nature Conservancy of Canada

COBAVER-VS*: Vaudreuil-Soulanges Watershed Council /*Conseil du Bassin Versant Vaudreuil-Soulanges*

COP 15: 15th International Conference of the Parties on Biodiversity held in Montreal from December 7 to 19, 2022

COSEWIC: Committee on the Status of Endangered Wildlife in Canada

CWG: Conservation Working Group

IAS: Invasive alien species

SAR: Species at risk

GBIF: Global Biodiversity Information Facility

IEQM: Southern Quebec Ecoforestry Inventory / *Inventaire écoforestier du Québec Méridional*

LAU*: Act respecting Land Use Planning and Development / *Loi sur l'aménagement et l'urbanisme*

LCMHH*: Act respecting the conservation of wetlands and water environments (or Act 132) / *Loi concernant la conservation des milieux humides et hydriques (ou loi 132)*

LCMVF*: Act respecting the conservation and enhancement of wildlife / *Loi sur la conservation et la mise en valeur de la faune*

LCPN*: Cultural Heritage Conservation Act / *Loi sur la conservation du patrimoine culturel*

LEMV*: Act Respecting Endangered or Vulnerable Species / *Loi sur les espèces menacées ou vulnérables*

SARA: Species at Risk Act

LQE*: Environment Quality Act / *Loi sur la qualité de l'environnement*

MELCCFP*: Ministry of the Environment, Climate Change, Wildlife and Parks / *Ministère de l'Environnement et la Lutte contre les Changement Climatique, Faune et Parc*

RCM: Regional county municipality

NAQ: Nature-Action Québec

NPO: Non-profit organization

OGAT*: Government guidelines for land use planning / *Orientations gouvernementales en aménagement du territoire*

PAB*: Tree and woodland policy / *Politique de l'arbre et des boisés*

PAE*: Comprehensive development plan / *Plan d'aménagement ensemble*

PDZA*: Agricultural zone development plan / *Plan de développement de la zone agricole*

PIIA*: Site planning and architectural integration plan / *Plan d'implantation et d'intégration architecturale*

PMAD*: Greater Montreal Metropolitan Land Use and Development Plan / *Plan métropolitain d'aménagement et de développement du Grand Montréal*

PPCMOI*: Special project for the construction, modification or occupation of a building / *Projet particulier de construction, de modification ou d'occupation d'un immeuble*

PPU*: Special urban planning programs / *Programmes particuliers d'urbanisme*

PRMHH*: Regional wetland and water environment plan/ *Plan regional de milieux humides et hydriques*

UP: Urban plan

RCI*: Interim control by-law / *Règlement de contrôle intérimaire*

SADR: Regional land use and development plan / *Schéma d'aménagement et développement révisée*

## TERMINOLOGY USED

Natural areas: Refers to a forest, wetland, riverbank, or body of water that is undeveloped, but may include trails.

Conservation[1]: A set of actions taken to ensure that natural areas will remain undeveloped, but improvements such as the addition of public access may be made.

Protection: A set of actions aimed at maintaining the natural state and dynamics of ecosystems.

Restoration: A set of actions aimed at restoring a more natural character to a degraded or artificial ecosystem.

Management: A set of actions aimed at maintaining or increasing the productivity of an ecosystem's ecological services and causing little or no harm to the environment.

[1] The definitions of the terms "conservation," "protection," "restoration," and "management" are taken from the article by Limoges et al. (2013).

# INTRODUCTION

In the current context of global change, natural areas are subject to a growing number of threats (e.g. insects and diseases) and numerous stress factors (e.g. more challenging climatic conditions), increasing the risk of their degradation and disappearance. The last few decades have witnessed widespread loss of natural ecosystems and a loss of connectivity between them.

In addition to their aesthetic, recreational, and heritage roles, these natural areas are essential to our well-being and health. They provide us with many benefits and services, collectively known as ecosystem services, such as carbon storage and sequestration, temperature regulation, and maintenance of biodiversity. To ensure the persistence of these natural areas in the context of global change, it is vital to increase their resilience, i.e., their ability to recover or adapt following disturbances.

Studies on the subject show that ecosystems are more resilient when they form a well-connected network, which supports biodiversity and increases their ability to adapt to the impacts of unforeseen events. Restoring and conserving ecosystem connectivity therefore contributes importantly to the resilience of the ecosystem and the services it provides.

Aware of the current and future threats to natural ecosystems, the Town of Hudson has made the conservation of natural areas a priority in recent years, carrying out a series of projects to characterize and prioritize the conservation of natural areas within its territory, the latest of which dates from 2020 and was conducted jointly with Habitat.

The Town of Hudson is regional leader on environmental issues as demonstrated through its actions to protect the health of the public and its ecosystems. The Town of Hudson was a pioneer in this area, as it was the first municipality in 1991 to ban the use of pesticides for aesthetic purposes and to limit the use of pesticides to areas where application is deemed essential on its territory. This bylaw was subsequently updated in 2021[2]. It has had several achievements since then, such as the tree planting subsidy program adopted in 2021 and the “Bird-Friendly City” certification obtained in 2023. Its support for innovative learning methods focuses on observing and understanding nature. The natural areas within its territory are Hudson's identity and its appeal to the region's population. The population's strong commitment to actively participating in environmental protection demonstrates a collective concern for nature.

Hudson is part of the regional green corridor of the Vaudreuil-Soulanges RCM, which connects Saint-Lazare’s Saddlebrook neighbourhood, Rigaud, and Vaudreuil-Dorion. The ecological connectivity of its natural areas, i.e., the preservation of a continuum of wetlands and forests throughout the town, is therefore of regional importance.

The Town of Hudson commissioned Habitat to update the Conservation plan developed in 2020. The purpose of that conservation plan was to respond to growing development pressures and concerns regarding the protection of biodiversity, ecosystem services, and connectivity within the municipality. This report follows up on work carried out by Teknika HBA (2008) and CIMA+ (2016). For this update, Habitat once again used historical data, recent forest inventories, and landscape modeling software to prioritize natural areas according to their conservation value from a resilience perspective. An action plan is presented in this document which proposes the implementation of suggested conservation actions over

[2] City of Hudson, 2021

a five-year period, facilitating the achievement of several objectives for the conservation and resilience of the territory's natural areas.

This Natural Area Conservation Plan incorporates the latest scientific advances in ecology and landscape connectivity modelling to provide a portrait of the current state of the natural areas across the Town of Hudson. This portrait is used to develop strategies for land management and conservation of priority natural areas, using a suite of scientific indicators shown to support biodiversity and which are commonly understood and accepted by both the municipality and its population.

## Methodological overview

The methodology used to develop this Natural Areas Conservation Plan closely follows that used to develop the 2021 Conservation Plan. Since the 2020 field inventory used in the 2021 report, many natural areas have undergone land use changes in favour of residential areas. The first step was to compile and consolidate existing datasets on natural areas across the town~~ship~~ and conduct a field inventory during the summer of 2024 to update the field data for a subset of sites identified as having potentially undergone a decline in ecological integrity. This process made it possible to retrace the geospatial boundaries of natural areas and update data on natural and anthropogenic disturbances.

Three consultation activities were carried out during the development of the Conservation Plan to gather comments and priorities from the population for conservation of natural areas across the territory. The results were used to produce a final map summarizing conservation priorities and to develop an action plan.

# 1 - PORTRAIT OF THE TERRITORY

## 1.1 Background

The territory of the Town of Hudson is located west of the Island of Montreal and on the south shore of the Ottawa River before in joins the St. Lawrence. It occupies an ecological valuable space between the Ottawa River and a large forest located further inland within the Vaudreuil-Solange RCM. Comprising 889.7 hectares of natural forest and wetland areas, Hudson is in a biodiversity corridor that connects Rigaud, Hudson, Saint-Lazare, and Vaudreuil-Dorion (see **Figure 1**). This regional corridor also connects with the natural areas of Oka and Kanesatake, notably via the Ottawa River, which freezes over in winter.

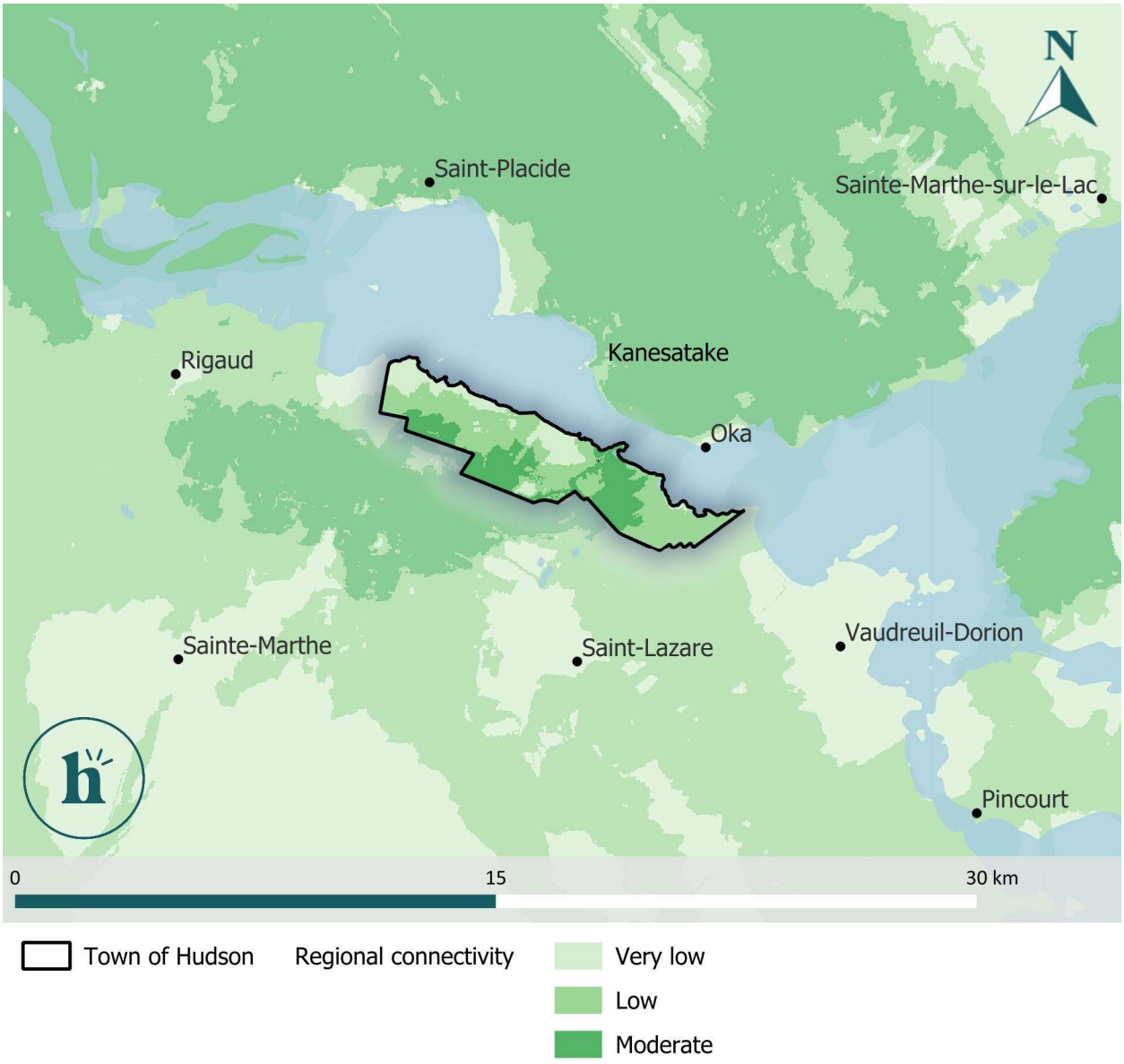


**Figure 1.** Regional connectivity of natural areas.

**Figure 1** shows how Hudson's territory contributes to regional connectivity[3]**.** Darker colours indicate high connectivity between natural areas, which is important for maintaining the movement of forest-associated animals between regional protected areas. These natural areas are therefore important at both the municipal and regional levels.

This strategic positioning and the high value of natural areas in Hudson's territory are recognized in the mapping and prioritization of areas of interest not only at the municipal level, but also at scale within the Montreal Metropolitan Community (CMM) and the St. Lawrence Lowlands.

Within Hudson, several wetland and forest areas have been identified as areas of metropolitan interest (objective 3.4 of the PMAD under review and 3.3 of the PMAD in force of the CMM) (**Figures 2, 3, 4, and 5**). The following figures are maps from the CMM's natural environment mapping (2022) which include the territory of the Town of Hudson.

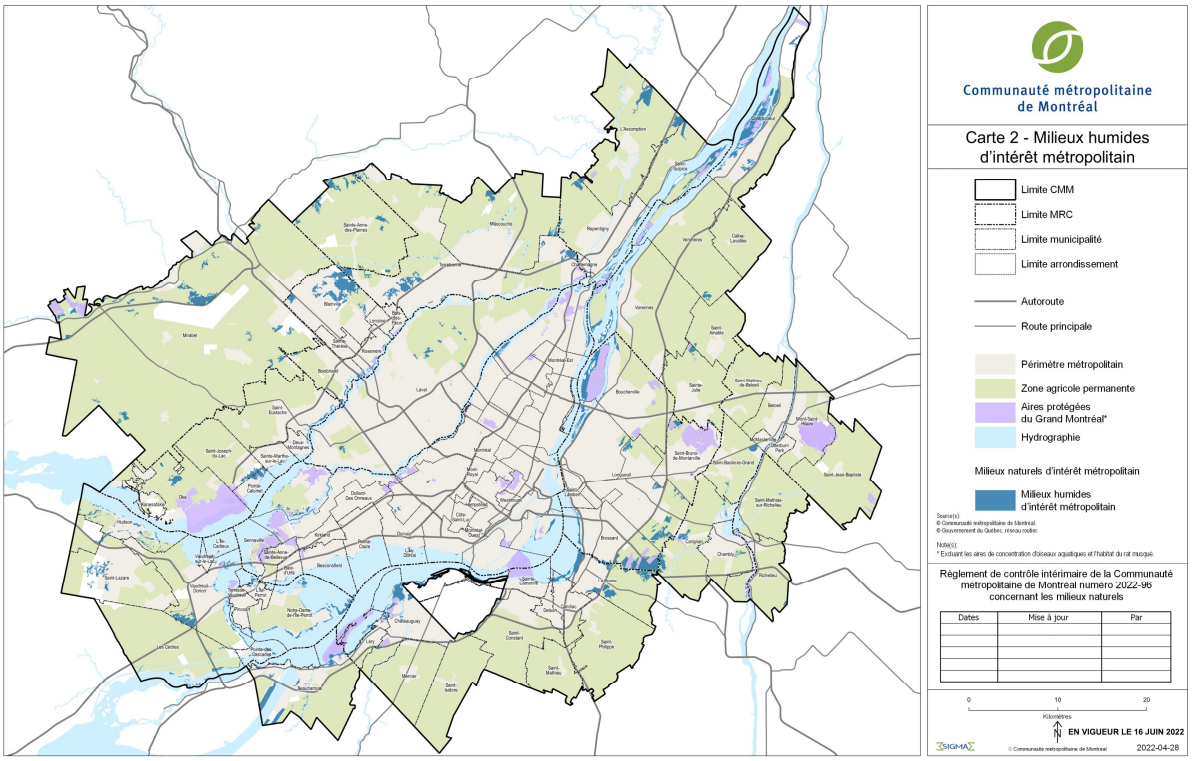


**Figure 2.** Wetlands of metropolitan interest across the CMM (in blue).

[3] MINISTRY OF THE ENVIRONMENT, CLIMATE CHANGE, WILDLIFE AND PARKS. Database on the ecological connectivity of natural areas in the St. Lawrence Lowlands, [Data set], in Données Québec, 2023, updated June 26, 2023. [https://www.donneesquebec.ca/recherche/dataset/connectivite-ecologique-des-milieux-naturels-dans-les-basses-terres-du-saint-laurent], (accessed April 28, 2025)

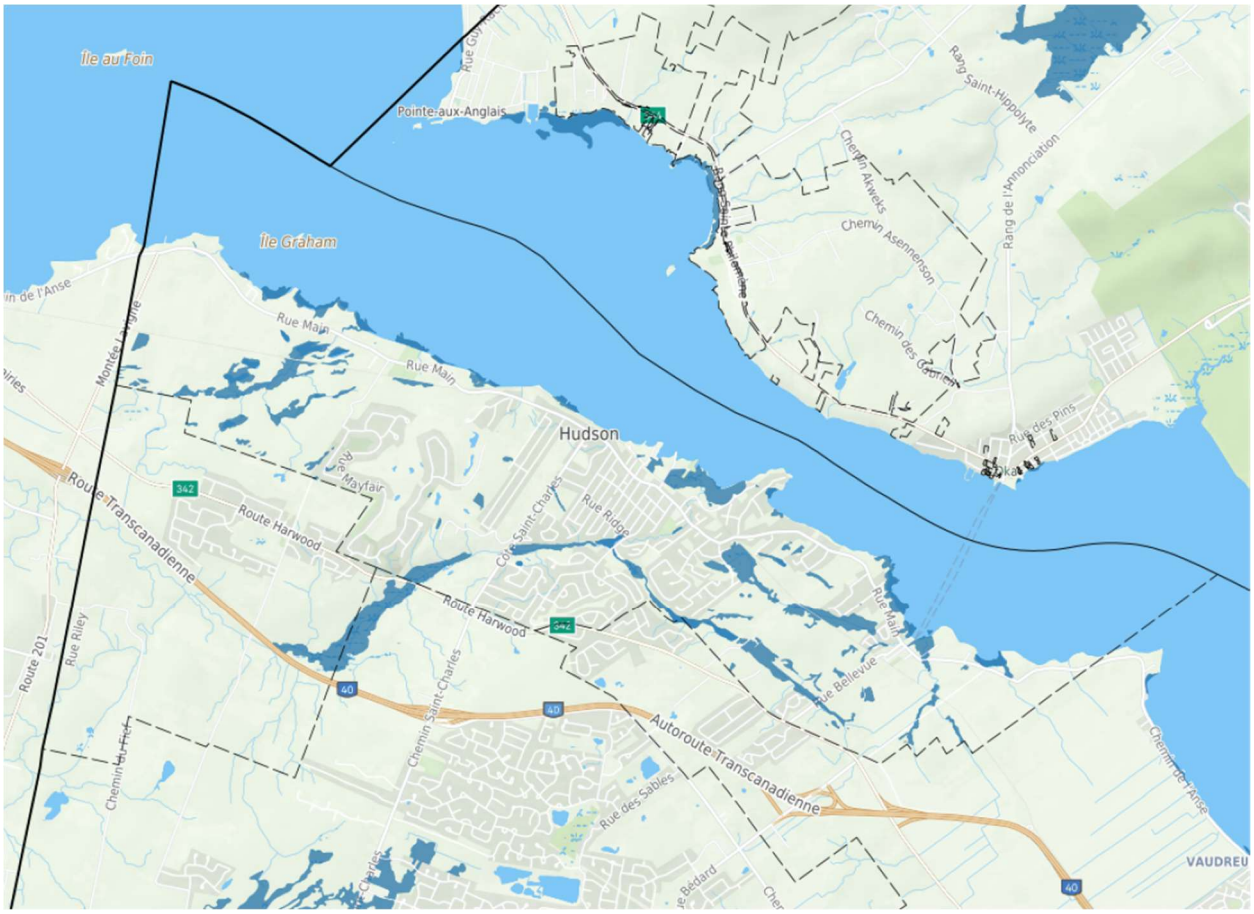


**Figure 3.** Wetlands of metropolitan interest on the territory of Hudson as identified by the CMM.

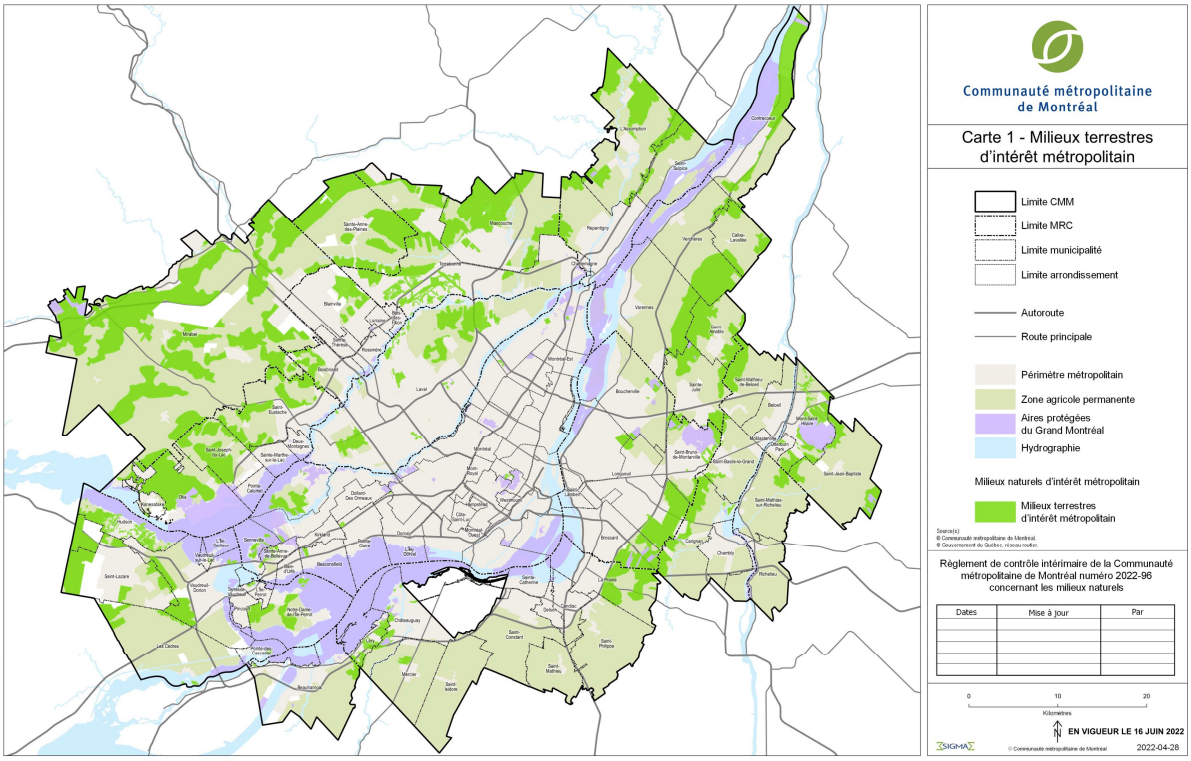


**Figure 4.** Forest areas of metropolitan interest across the CMM (in green).


**Figure 5.** Forest areas of metropolitan interest on the territory of Hudson area identified by the CMM.

### 1.1.2 Characterization of the territory

#### 1.1.2.1 Physiographic units

The territory of the Town of Hudson is divided into several distinct physiographic units, i.e., geomorphological formations and relief features that influence natural areas. The Town of Hudson urban plan refers to different areas of its territory using these units (Operational Bylaw No. 525). For this reason, this Conservation Plan also uses these units to designate the different sectors of the territory.

The seven physiographic units defining the territory of Hudson are:

- **The Choisy clay plain**, used for agricultural purposes;
- **The Alstonvale escarpment**, serving as a transition between the upper plateau and the plain;
- **The upper Hudson Heights plateau**, where the Falcon golf course and two residential developments (Hudson Valley and Alstonvale) are located;
- **The Viviry River valley**, at the bottom of which the river flows and where green spaces and residential developments were built between the 1960s and 1990s;
- **The Hudson slopes,** where the village centre and its rear extensions are located;
- **The Cameron escarpment**, which corresponds to a drop of about 30 metres between the Viviry River valley and Route 342;
- **The Como clay plain,** used for agriculture, vacation homes, and residential purposes. This plain generally encompasses the lowlands north of the railway.

The boundaries of each physiographic unit are shown in **Figure 6** representing Plan 2 extracted from the Town of Hudson urban plan (UP).

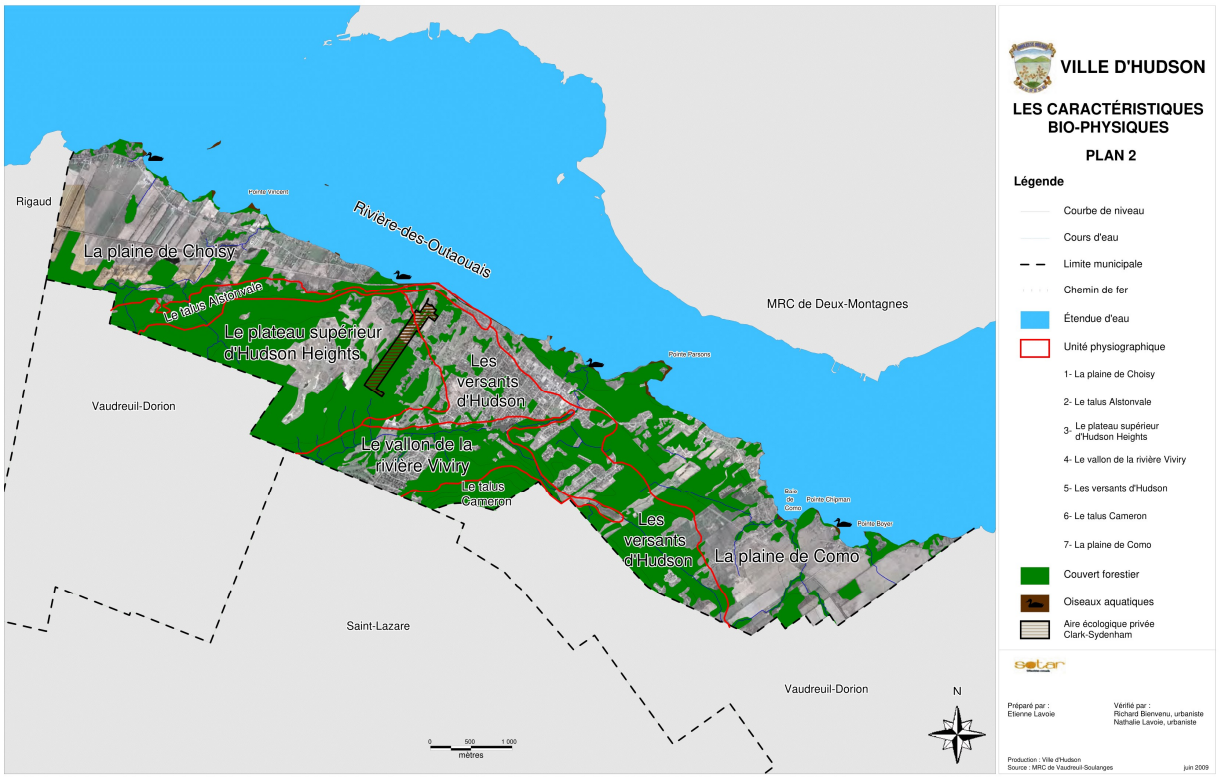


**Figure 6.** Physiographic units of the territory of Hudson.

### 1.1.2.2. Land cover

In order to obtain an overview of land use in Hudson, Habitat used land use data from the MELCCFP (2020). This public data covers southern Quebec and is generated by a semi-automated classification of high-resolution satellite images, which allows for more accurate identification of land use types. Land use is defined as the physical and biological cover of the ground. It includes artificial surfaces, agricultural areas, forests, semi-natural areas, wetlands, and water bodies. Land use for the territory of Hudson is shown in **Figure 7**.

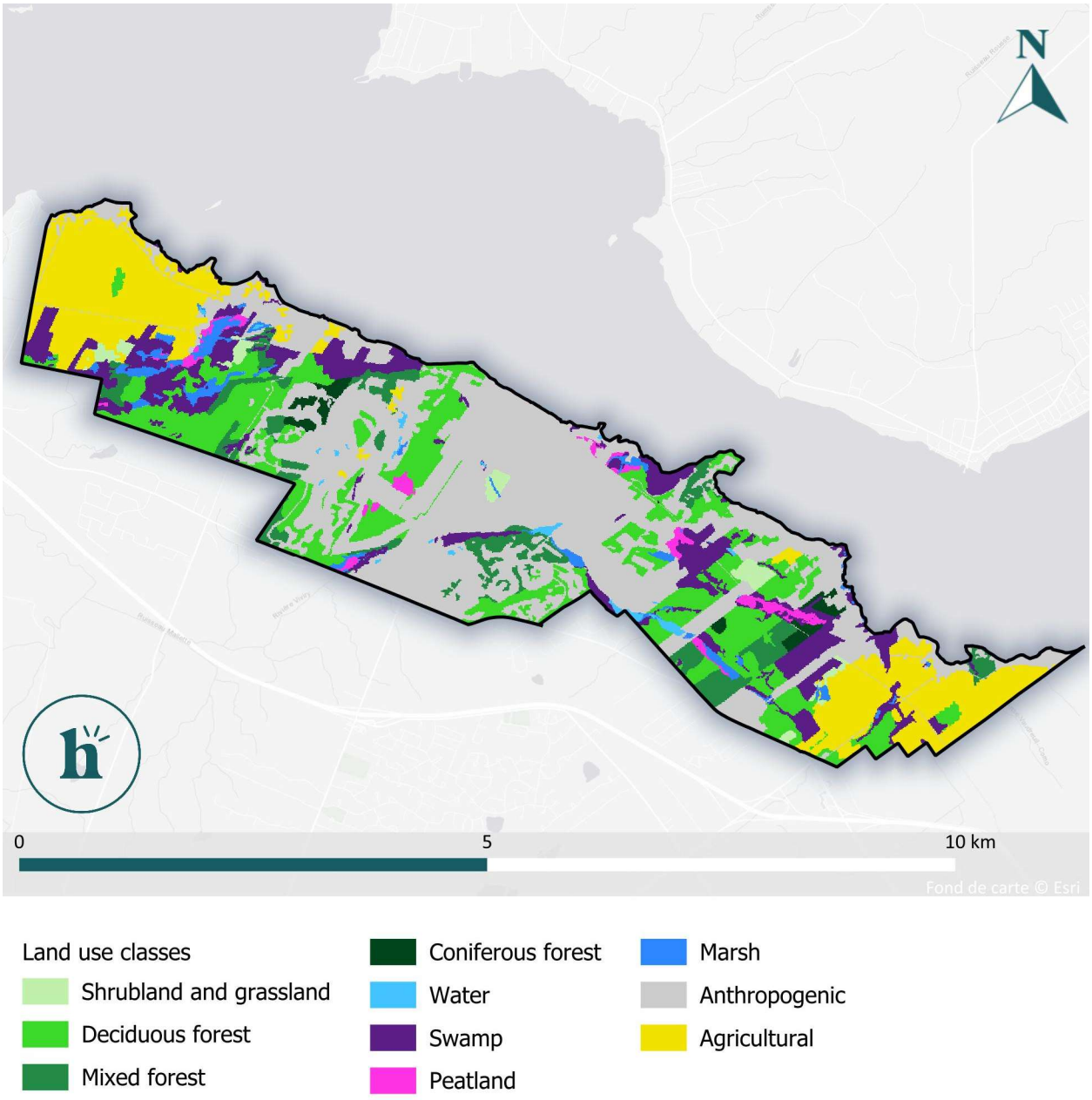


**Figure 7.** Map of land use across the territory of Hudson.

According to this map, more than half of the Town of Hudson's land area is anthroposized (i.e., changed by human developement / activities), including agricultural areas (58.2% of the territory, shown in gray and yellow in **Figure 7**), while the other half is represented by agricultural areas and natural areas (forests and wetlands) and aquatic areas (41.2%). The relative areas of each type of land use are presented in **Table 1**.

**Table 1.** Distribution of land use in the Town of Hudson

| LAND USE | AREA (HA) | RELATIVE AREA (%) |
|---|---|---|
| **Terrestrial natural areas** | **889.7** | **41.2** |
| **Forest areas** | **578.5** | **26.8** |
| Coniferous forest | 25.4 | 1.2 |
| Deciduous forest | 394.1 | 18.2 |
| Mixed forest | 129.2 | 6.0 |
| Schrubland and grassland | 29.9 | 1.4 |
| **Wetlands** | **311.2** | **14.4** |
| Marsh | 49.9 | 2.3 |
| Swamp | 230.9 | 10.7 |
| Peatland | 30.4 | 1.4 |
| **Water** | **12.7** | **0.6** |
| **Anthropized or transformed areas** | **1263.6** | **58.2** |
| Anthropogenic (urban, roads, etc.) | 888.7 | 41.1 |
| Agricultural | 375.0 | 17.2 |
| **All types of land use** | **2166.0** | **100.0** |

#### 1.1.2.3. Hudson natural areas

According to land use data from the MELCCFP, forest areas are predominately deciduous forest (18.2% of the territory), with a small number of mixed stands (6%), but very few coniferous forests. Wetlands account for just over a tenth (14.4%) of the study area and are mainly composed of marshes.

However, the boundaries of the territory's natural areas based on the MELCCFP dataset are slightly different than the boundaries established by the IEQM (5th Ecoforestry Inventory of Southern Quebec)[4]

[4] MINISTRY OF NATURAL RESOURCES AND FORESTRY. Original ecoforestry map and current inventory results, [Data set], in Données Québec, 2017, updated on January 28, 2025. [https://www.donneesquebec.ca/recherche/dataset/resultats-d-inventaire-et-carte-ecoforestiere], (accessed on April 23, 2025).

and the update of the boundaries of natural areas carried out using data from the inventory conducted in the summer of 2024. The IEQM provides a set of forest stand characteristics across southern Quebec updated on a 10-year basis, which are used in many of the analyses underpinning this conservation plan. According to IEQM data and the 2024 field inventory, the area of forest across Hudson is 796.6 ha (36.8% of the territory) while that of wetlands is only 81.6 ha (3.8% of the territory) (**Figure 8**). These differences are mainly due to wooded wetlands being considered forest areas in the IEQM dataset.

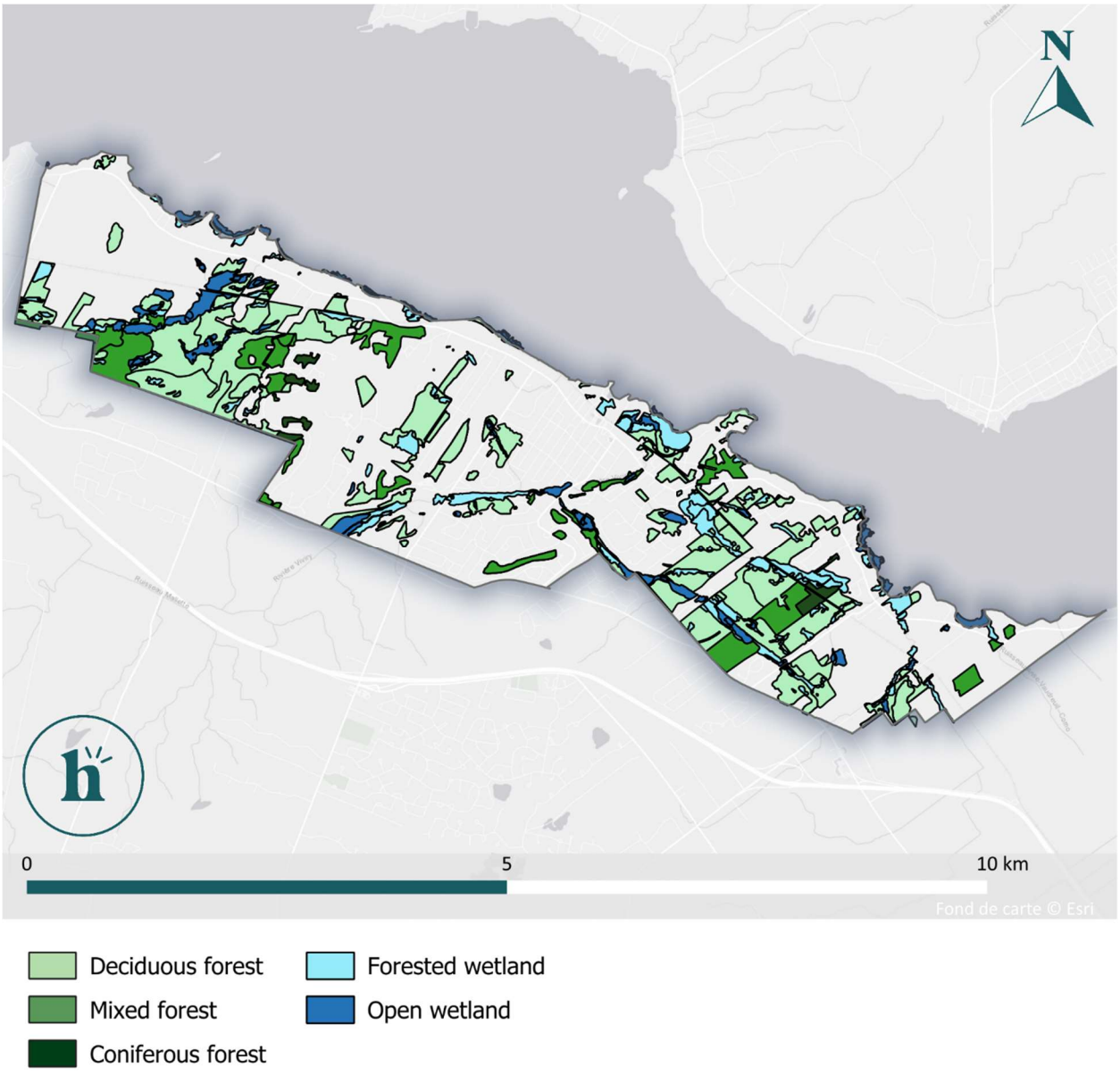


**Figure 8.** Distribution of natural areas in Hudson.

### 1.1.3 Conservation types and measures in place

The territory of the Town of Hudson, located in the Vaudreuil-Soulanges RCM, covers a total of 3,694 hectares, of which 5.6% belongs to the Town of Hudson. Of the total territory, 878 hectares are natural areas (wetlands and forests), of which 10.4% belong to the municipality (**Figure 9**).

Of the natural areas, 153 hectares are already designated as conservation areas. These include the Clarke-Sydenham Reserve, Le Nichoir and the Driscoll-Naylor Bird Sanctuary, all three of which have the status of “natural sites protected by voluntary conservation,”. In addition, a conservation easement north of Davidson Park (Como Gardens Street) and the Creek 53 Conservation Trust to the west of the territory area have also been established. Together, these conservation areas represent 6.9% of Hudson's total territory and 17% of its natural areas. The Creek 53 Conservation Trust, located in the western part of the territory, has the largest area of conserved land, preserving 103 hectares of natural areas on private land.

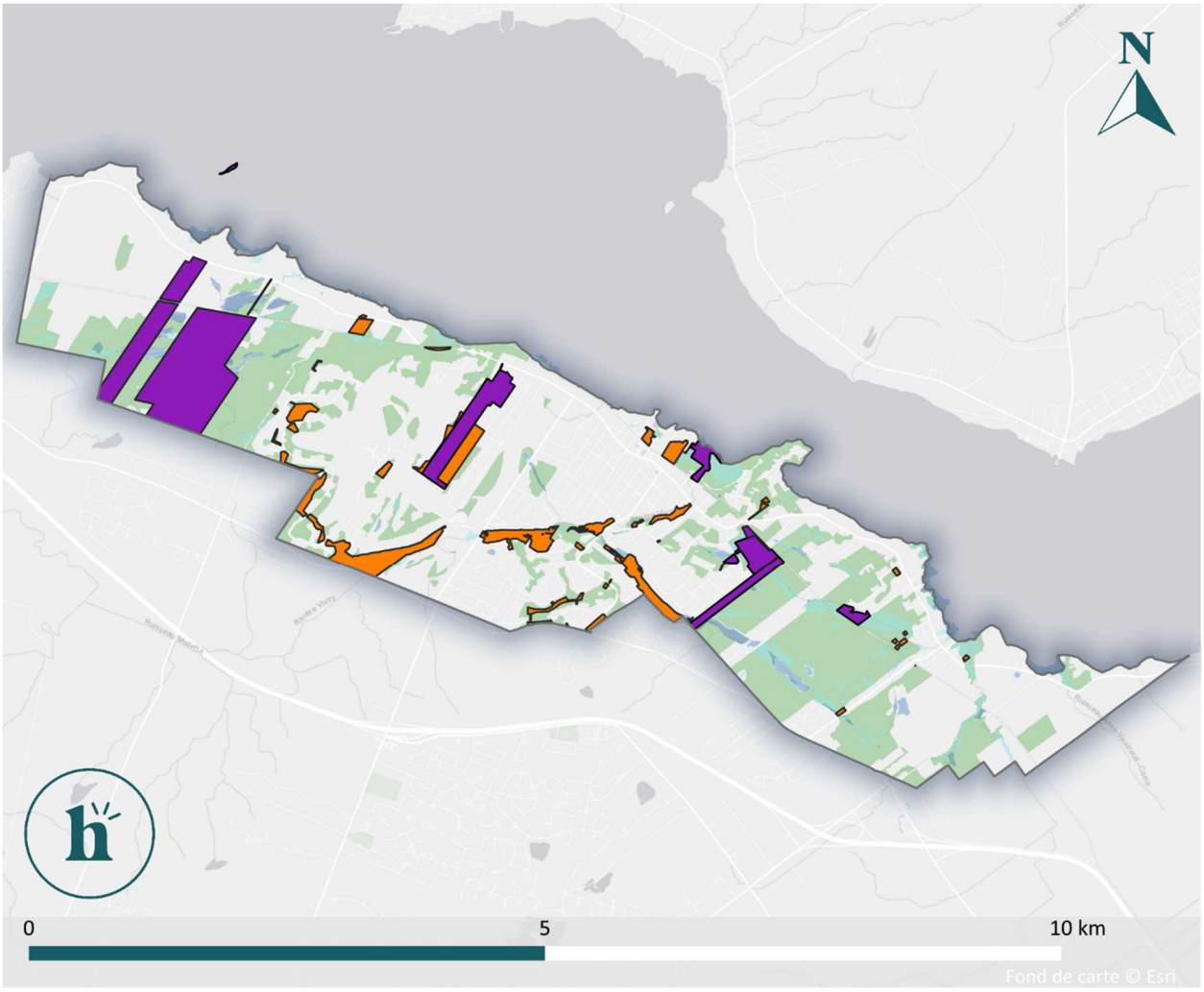


**Figure 9.** Map of natural areas owned by the Town of Hudson (orange) and natural areas with conservation status (purple).

In addition to protected natural areas or those under municipal control, the territory has several natural areas that are subject to RCI-2022-96. RCI-2022-96 is an interim control bylaw of the CMM concerning natural areas (**Figure 10**). It establishes rules for the protection and enhancement of forest and wetlands of metropolitan interest, as well as the habitat of the western chorus frog (for the latter, no habitat has been identified in Hudson). The bylaw stipulates, among other things, that it is prohibited to build or carry out any of the works listed in the targeted areas. These areas are represented in green on the CMM map below. These identified areas meet objective 3.1 of the PMAD currently under review.

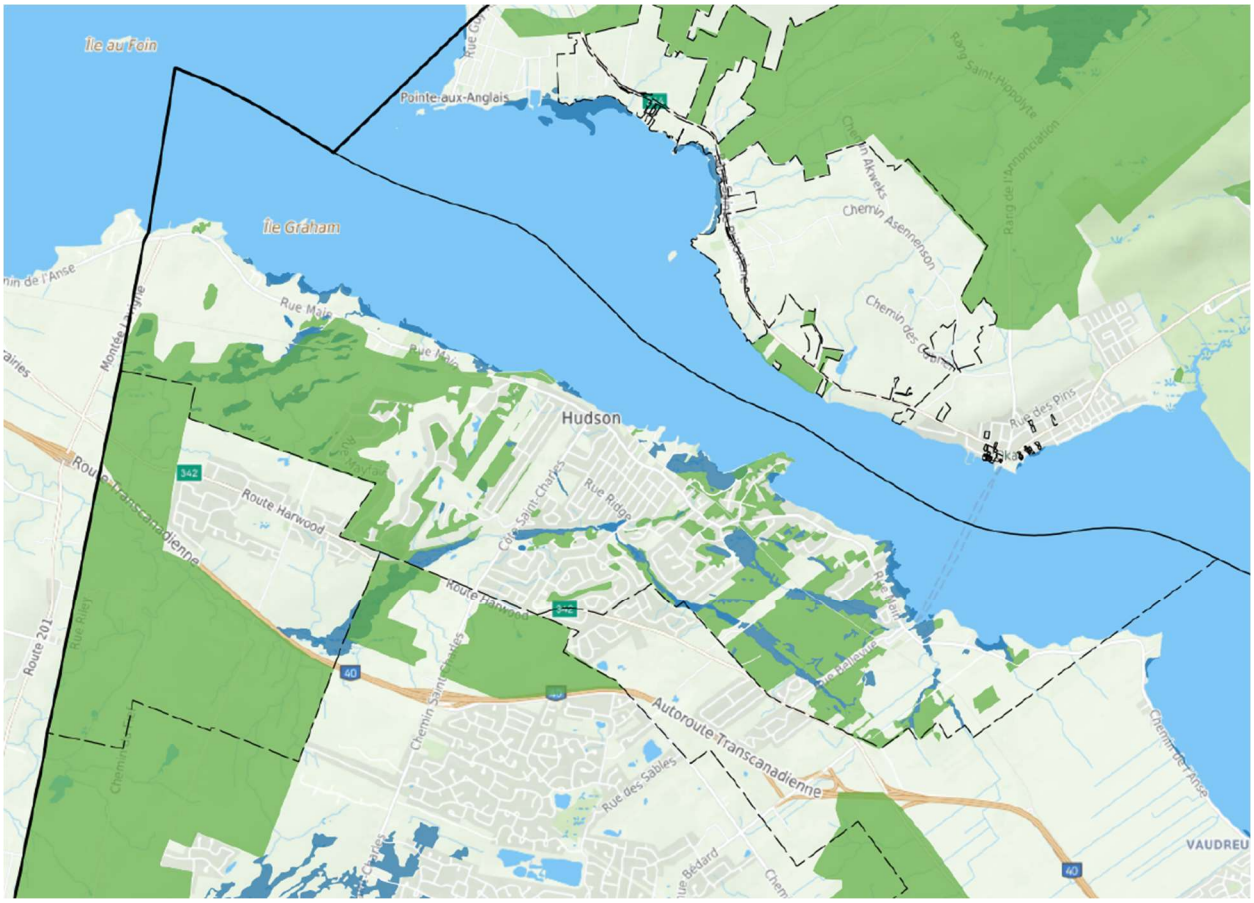


**Figure 10.** Map of areas subject to RCI-2022-96 identified in the Town of Hudson[5]. Forest areas are identified in green and wetlands in blue.

## 1.2 Disturbances of natural areas between 2019–2024

Determining the health of a territory's natural areas is essential to any conservation plan, as their health influences their ecological function and their ability to provide ecosystem services and to support biodiversity.

[5] Figure 10 is taken from the CMM's interactive map. https://sigma.cmm.qc.ca/application/run/798

The update of the field inventory of natural areas carried out in the summer of 2024 provided an opportunity to identify and track new disturbances on the landscape since the 2019 inventory carried out for the 2020 conservation plan, particularly in wetlands. Using satellite imagery and in consultation with the municipality, 41 of the 128 sites visited in 2019 were flagged as having potentially experienced a new disturbance and were revisited in 2024 to assess the degree of impact. The primary type of disturbance at each visited site was recorded and scored on a 5-point scale from "*Little to no impact on ecological integrity*" to "*Significant impact on ecological integrity*" and their ranking compared with scores from 2019. As only a portion of all sites inventoried in 2019 were revisited, the comparison of disturbance levels between time periods represents only a sample of the potential changes undergone by the territory's natural areas.

**Figures 11 and 12** show the changes in levels of disturbance—both anthropogenic and natural—in the territory's wetlands and forests, comparing data from 2019 and 2024. Areas appearing in red indicate that the level of disturbance intensity increased (*e.g.,* from "*Little or no impact on ecological integrity*" to *"Significant impact on ecological integrity"*). Areas where the intensity of disturbance has decreased are shown in green. Natural areas that have experienced less disturbance have changed by a maximum of two levels, while for natural areas having experienced more disturbance, the level of disturbance has increased by up to three levels. The disturbances noted are insects or diseases, including the emerald ash borer, the presence of beaver dams or windthrow, and anthropogenic disturbances such as construction or the creation of trails/paths.

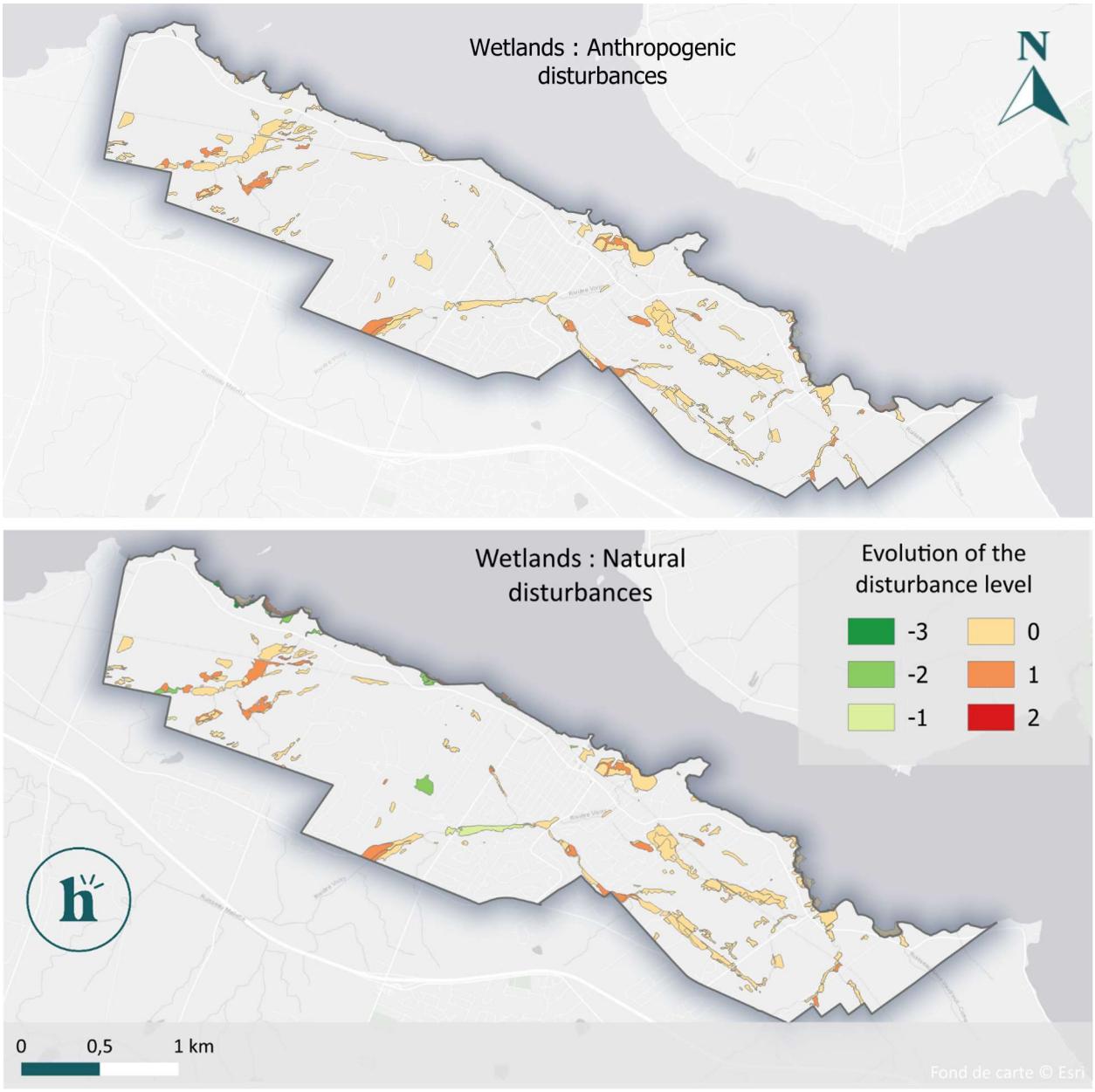


**Figure 11.** Mapping of the level of disturbance in wetlands between 2019 and 2024.

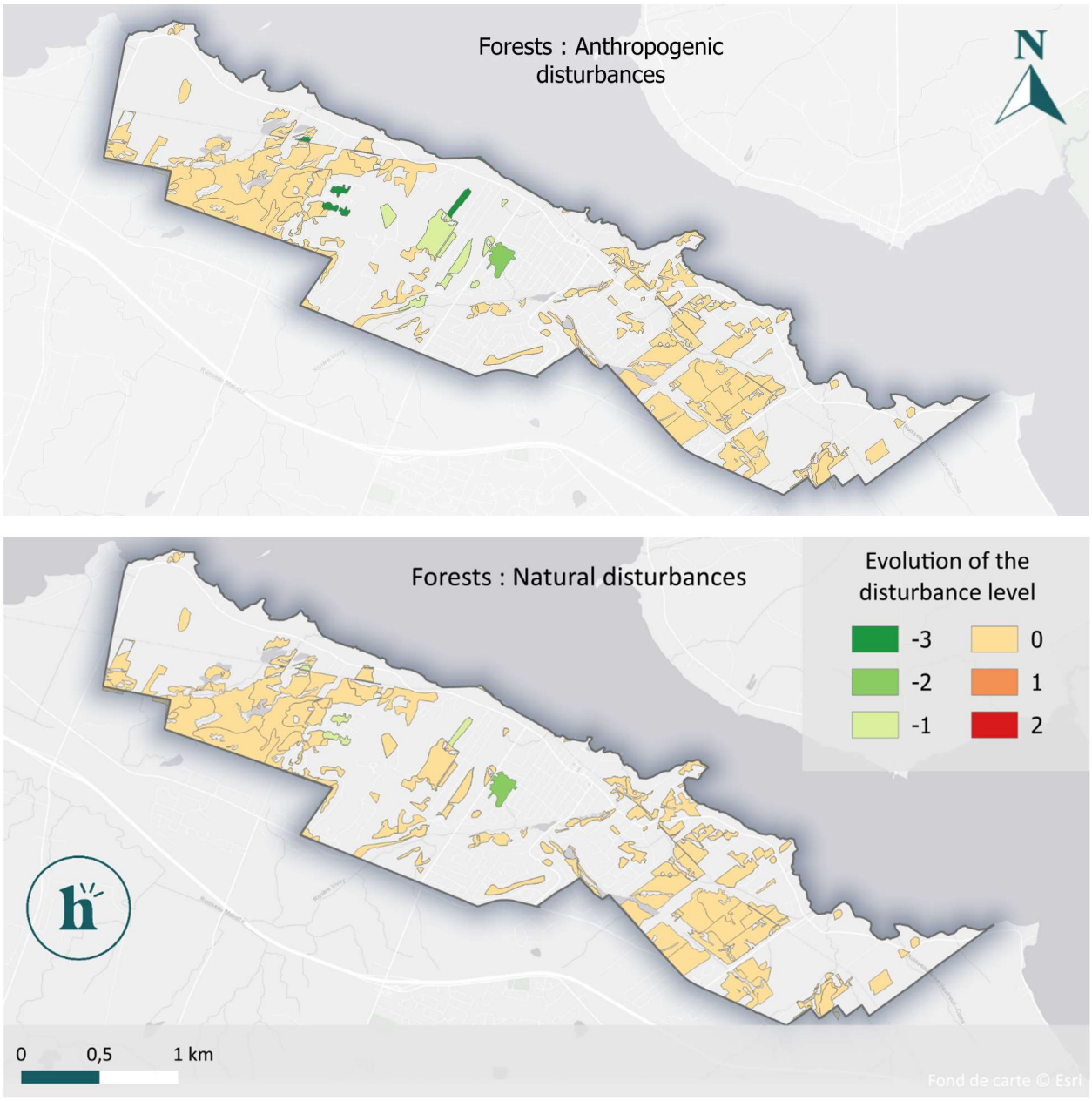


**Figure 12.** Mapping the level of disturbance in forest areas between 2019 and 2024.

The legend indicates the evolution of the intensity of natural disturbances. The main cause of new disturbances, whether in natural forest or wetland areas, is the emergence of the emerald ash borer, a threat that was not noted in the 2019 inventory but was probably already present in the landscape. Rather rare in the 2019 inventory, beech bark disease shows a resurgence in the 2024 inventory. The change in land use towards urban and agricultural uses is the most significant cause of anthropogenic disturbances.

### 1.3 Biodiversity

The Town of Hudson is home to a rich biodiversity, with more than 12 species of mammals, 230 species of birds, 165 species of insects, 47 different fungi, 22 reptiles and amphibian species, and 248 plant

species[6] having been observed across the territory. Given their important role as indicator species, the distribution of all bird, reptile and amphibian species observed across the territory were mapped by Habitat (Figure 13). Bird occurrences are collected from the Global Biodiversity Information Facility (GBIF) database. Herpetofauna occurrences are based on the AARQ (Atlas des amphibiens et reptiles du Québec)[7] data. This data was obtained in the summer of 2024 and only observations since 2010 to the present were retained.

We also identified occurrences of threatened, vulnerable, or species likely to be designated as such in the territory, hereafter referred to as Species at Risk (SAR). This data was obtained from the AARQ and the Quebec Natural Heritage Data Centre (Centre de données sur le patrimoine naturel du Québec, CDPNQ) in the fall of 2024[8]. This data portal lists occurrences of species with status under the Quebec Act Respecting Endangered or Vulnerable Species. A total of nine species with SAR provincial status were obtained from this source, including four wildlife species and five plant species (Tables 2 and 3). Only observations of SAR dating from 1999 to 2024 were taken into account for the description of the territory.

The CDPNQ database lists only species with threatened status in Quebec. To take into account species designated as at risk in Canada but not in Quebec, we also took into account species with status from two other sources: the Species at Risk Act (SARA) or according to the status defined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Observations of species listed in SARA and COSEWIC were included in the 2021 study of natural areas in Sandy Beach, conducted by TerraHumana, which identified a total of 29 SAR species in part of the Town of Hudson territory; and SAR occurrence data for the Clarke-Sydenham Reserve and Creek 53, shared by the Nature Conservancy of Canada.

The tables below (Tables 2 and 3) list all SAR species that have been recorded across Hudson, according to their designation status. It is important to note that, regardless of their designation, a wide variety of species at risk (a total of 31 animal and plant species) are found in the Hudson area and that their protection is essential.

[6] These figures are based on observations made between 1990 and 2025 and recorded in GBIF. These data also indicate the presence of nine species of arachnids, two bivalves, one gastropod, and three testudines observed in the Hudson area. GBIF.org (May 1, 2025) GBIF Occurrence Downloadhttps://doi.org/10.15468/dl.aw4qpz

[7] AARQ. 2024. Atlas of Amphibians and Reptiles of Quebec: database active since 1988, maintained by volunteers and wildlife professionals. St. Lawrence Valley Natural History Society.

[8] Quebec Natural Heritage Data Centre (CDNPQ). August 2024. Extracts from the data system for the Hudson area. Ministry of the Environment, Climate Change, Wildlife and Parks (MELCCFP), Quebec.

**Table 2.** List of Species at Risk animal species found in Hudson, indicating their status and data source[9].

| SCIENTIFIC NAME | COMMON NAME | STATUS LEMV (Provincial) | STATUS SARA (Federal) | COSEWIC STATUS | SOURCE |
|---|---|---|---|---|---|
| *Graptemys geographica* | Common Map Turtle | Vulnerable | Special concern | Special concern | CDPNQ (2024), CNC |
| *Chrysemys picta* | Painted Turtle | | | Special concern | AARQ (2024), CNC |
| *Cistothorus platensis* | Sedge Wren | Susceptible | | Not at Risk | CDPNQ (2024) |
| *Ixobrychus exilis* | Least Bittern | Vulnerable | Threatened | Special concern | CDPNQ (2024) |
| *Moxostoma carinatum* | River Redhorse | Vulnerable | Special concern | Special concern | CDPNQ (2024) |
| *Danaus plexippus* | Monarch Butterfly | | Special concern | Endangered | Rapport TerraHumana (2021), CNC |
| *Dolichonyx oryzivorus* | Bobolink | Vulnerable | Threatened | Special concern | CNC |
| *Chelydra serpentina* | Snapping Turtle | | Special concern | Special concern | Rapport TerraHumana (2021), CNC |
| *Chaetura pelagica* | Chimney Swift | Threatened | Threatened | Threatened | Rapport TerraHumana (2021) |
| *Contopus cooperi* | Olive-sided Flycatcher | Vulnerable | Special concern | Special concern | Rapport TerraHumana (2021) |
| *Contopus virens* | Eastern Wood-Pewee | | Special concern | Special concern | CNC |
| *Haliaeetus leucocepahlus* | Bald Eagle | Vulnerable | | | Rapport TerraHumana (2021) |
| *Hylocichla mustelina* | Wood Thrush | | Threatened | Threatened | Rapport TerraHumana (2021) |
| *Lasionycteris noctivagans* | Silver-haired Bat | Susceptible | | | Rapport TerraHumana (2021) |
| *Lasiurus borealis* | Red Bat | Vulnerable | | | Rapport TerraHumana (2021) |
| *Myotis lucifugus* | Little Brown Myotis | Threatened | Endangered | Endangered | Rapport TerraHumana (2021) |
| *Perimyotis subflavus* | Tri-colored Bat | Threatened | Endangered | Endangered | Rapport TerraHumana (2021) |

[9] Sources:https://www.quebec.ca/agriculture-environnement-et-ressources-naturelles/faune/gestion-faune-habitats-fauniques/especes-fauniques-menacees-vulnerables/liste; https://www.canada.ca/fr/environnement-changement-climatique/services/registre-public-especes-peril.html

**Table 3.** List of Species at Risk plant species found in Hudson, indicating their status and data source[10].

| SCIENTIFIC NAME | COMMON NAME | STATUS LEMV (Provincial) | STATUS SARA (Federal) | STATUS COSEWIC | SOURCE |
|---|---|---|---|---|---|
| *Juglans cinerea* | Butternut | Susceptible | Endangered | Endangered | CDPNQ (2024), CNN |
| *Ulmus thomasii* | Rock Elm | Threatened | | | CDPNQ (2024) |
| *Sisyrinchium angustifolium* | Narrow-leaved Blue-eyed grass | Susceptible | | | CDPNQ (2024) |
| *Quercus bicolor* | Swamp White Oak | Susceptible | | | CDPNQ (2024) |
| *Carya ovata var. ovata* | Shagbark Hickory | Susceptible | | | CDPNQ (2024) |
| *Adiantum pedatum* | Northern Maidenhair Fern | Vulnerable to harvesting | | | TerraHumana (2021),NCC |
| *Asarum canadense* | Wild Ginger | Vulnerable to harvesting | | | TerraHumana (2021), NCC |
| *Cardamine diphylla* | Two-leaved Toothwort | Vulnerable to harvesting | | | TerraHumana (2021) |
| *Fraxinus nigra* | Black Ash | | | Threatened | TerraHumana (2021) |
| *Matteuccia struthiopteris* | Ostrich Fern | Vulnerable to harvesting | | | TerraHumana (2021), NCC |
| *Persicaria arifolia* | Halberd-leaf Tearthumb | Susceptible | | | NCC |
| *Sanguinaria canadensis* | Bloodroot | Vulnerable to harvesting | | | NCC |
| *Trillium grandiflorum* | Large-flowered Trillium | Vulnerable to harvesting | | | TerraHumana (2021), NCC |
| *Uvularia grandiflora* | Large-flowered Bellwort | Vulnerable to harvesting | | | TerraHumana (2021), NCC |

[10] Sources: https://www.quebec.ca/agriculture-environnement-et-ressources-naturelles/flore/especes-floristiques-menacees-ou-vulnerables/liste-especes; https://www.canada.ca/fr/environnement-changement-climatique/services/registre-public-especes-peril.html

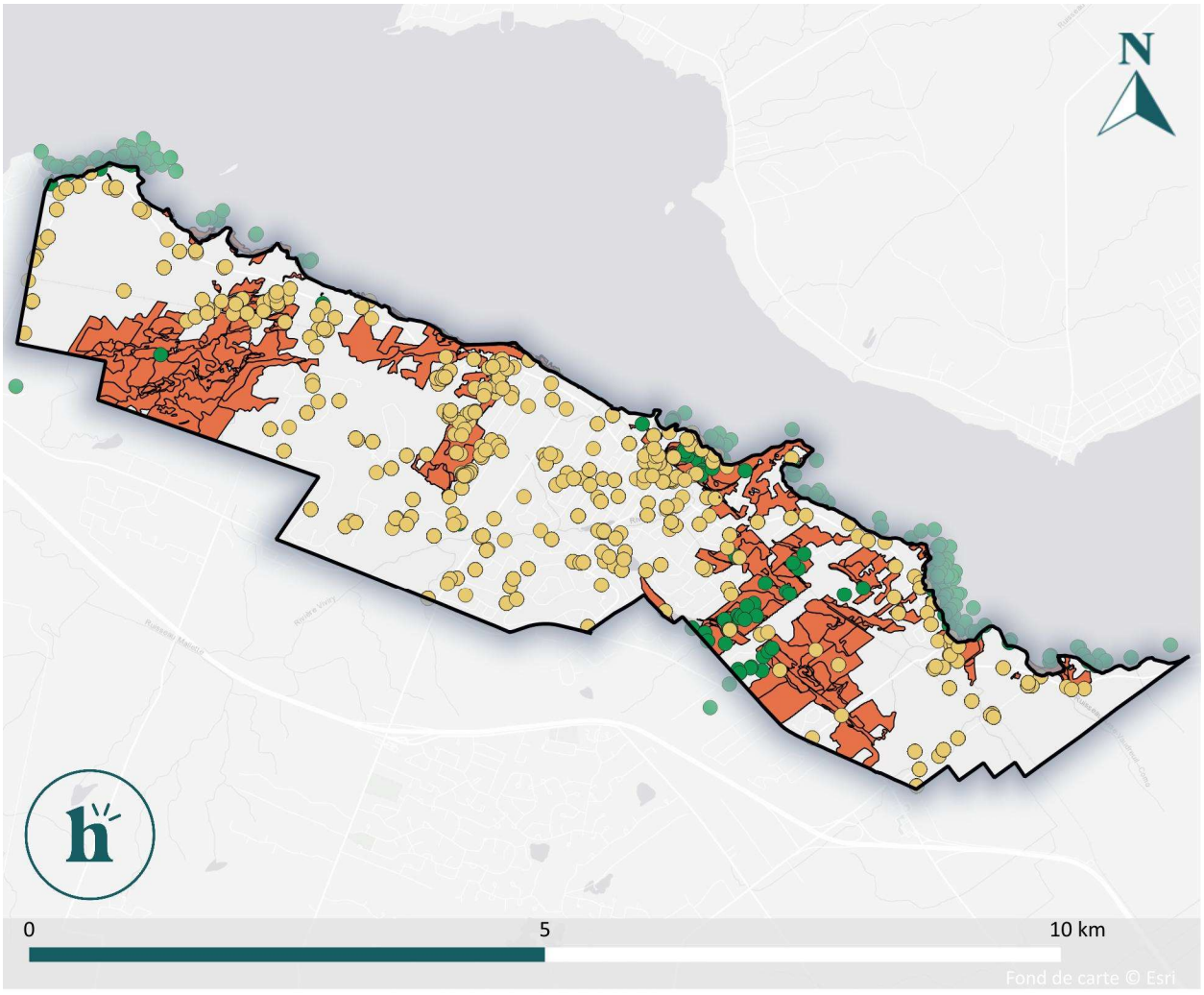


**Figure 13.** Mapping of bird occurrences (yellow dots), herpetofauna (green dots) and natural habitats with Species at Risk (SAR) observations (orange).

**Figure 13** shows the distribution of several observed at risk species of wildlife and flora in the Town of Hudson. The orange polygons represent natural areas where endangered, vulnerable, or potentially endangered or vulnerable animal and plant species have been inventoried (based on occurrence data obtained from the CDPNQ and NCC). Two main areas appear to provide habitat for these species: the Alstonvale Escarpment (particularly the Creek 53 Conservation Trust and the Clarke-Sydenham Reserve) and the Como plain and Hudson Hillsides (including the Sandy Beach and Parsons Point wetlands).

The points shown in **Figure 13** indicate bird occurrences (yellow) and amphibian and reptile occurrences (green). Birds are a highly represented wildlife group throughout the Hudson area, with clustered observations especially near key points of interest (e.g., Le Nichoir, Sandy Beach, and the Clarke-

Sydenham Reserve in the town centre). In contrast, clusters of herpetofauna are observed along the western and eastern banks and along the wetlands of the Hudson slopes and Como plain.

With regards to invasive alien species (IAS), data from the NCC provide a visualization of IAS plant species present in a portion of the territory, namely the Creek 53 Conservation Trust and the Clarke-Sydenham Nature Reserve. The IAS plant species listed are: Phragmites australis, Purple loosestrife, Buckthorn and Cathartic Buckthorn, Barberry, Common Pondweed, Ground Elder, Wilson's Honeysuckle, Oriental Bittersweet, Common Comfrey, Periwinkle, Garlic Mustard, Valerian, Wild Parsnip, and Lily of the Valley. This list updates the diversity of IAS present in the territory, in addition to the IAS listed in the 2021Eco2Urb report, which already included Buckthorn, Tartary Honeysuckle, Thunberg's Barberry, Purple loosestrife, Phragmites, Celandine, Common Garlic and Japanese Knotweed.

**Key points:**

Hudson's territory consists largely of natural, forested, and wetland areas.

- Hudson's natural areas are part of a regional green corridor.
- They make up 41.2% of the territory.
- These natural areas are of metropolitan interest identified by the CMM.
- Only 10.4% of natural areas belong to the city.
- 17% of natural areas have conservation status.
- The territory's wetlands have undergone natural and anthropogenic disturbances since the 2019 inventory.
- The territory has a high level of biodiversity, particularly in terms of birds and SAR.
- The presence of IAS is a challenge for the health of natural areas and the biodiversity they contain.

# 2 – PLANNING FRAMEWORK

The Natural Areas Conservation Plan for the Town of Hudson is based on global conservation objectives, national and provincial legal frameworks, government guidelines, and key provincial conservation planning documents (PRMHH, SADR, UP). It also considers local realities in terms of planning and conservation.

The planning framework presented below identifies concrete links with existing policies and programs at various levels. The planning framework also incorporates the most recent developments, such as new government guidelines on land use planning (OGAT) and recent legislative changes (e.g., section 245 of the LAU on disguised expropriation).

The Conservation Plan's associated Action Plan is based on these specific targets and guidelines so that the Town of Hudson can align efforts to achieve them.

## 2.1 Global conservation objectives

The Town of Hudson's conservation plan is rooted in recognized global conservation goals, such as the **Kunming-Montreal Global Biodiversity Framework** (GBF, signed at COP 15th of the Convention on Biological Diversity)[11]. The GBF includes 23 targets, several of which directly concern cities. In addition, the Quebec government has adopted the GBF's ambitions and contextualized them to the province's issues and priorities in its **Nature Plan 2030**. In both frameworks, the targets aim to integrate biodiversity into urban planning, protect and restore urban ecosystems, improve access to blue and green spaces, and promote sustainable practices in urban areas. The main targets of the two frameworks that concern cities are as follows:

- Target 1 of the Nature Plan 2030:

- Slow biodiversity loss through participatory planning and integrated, biodiversity-friendly development across Quebec, with a view to mitigating climate change and improving access to nature.

- GBF Target 2 / Nature Plan 2030 Target 2: Ecosystem restoration

- Restoration of degraded ecosystems: These targets call for the restoration of at least 30% of degraded ecosystems by 2030, including in urban areas. This includes rehabilitating natural spaces within cities, such as parks, urban wetlands, and waterways, to improve their resilience and capability to provide essential ecosystem services.

- GBF Target 3 / Nature Plan 2030 Target 3: Protected areas

- Protection of 30% of natural areas: By 2030, at least 30% of land and marine areas must be protected. Cities are encouraged to contribute to this goal by designating and protecting urban natural areas, such as parks, urban nature reserves, and ecological corridors, which play a crucial role in urban biodiversity.

- GBF Target 4 / Nature Plan 2030 Target 4: Protection of species with protected status

[11] https://www.cbd.int/doc/c/0bde/b7c0/00c058bbfd77574515f170bd/cop-15-l-25-fr.pdf?fbclid=IwAR2yuXEgdgiMVYPVcKE8EEhQMkFLzI5EqsXZ_Q1Xp_ww2c5ornwF6WwYT8E

- These targets aim to protect endangered or vulnerable species in Quebec and elsewhere and to advance their recovery by developing and maintaining an overview of the status of SAR. To achieve this, collaboration with Indigenous communities, the scientific community, and the general public is expected.

- GBF Target 6 / Nature Plan 2030 Target 5: Invasive alien species

- Management of invasive alien species: These targets aim to take measures to prevent and reduce the impact of invasive alien species, which threaten local biodiversity. Cities are critical partners to achieve this target, and actions may include the implementation of management programs for these species in urban parks and other natural areas.

- GBF Target 7: Pollution reduction

- Reduction of pollutants: This target aims to reduce pollution, including excess nutrients, hazardous pesticides, and plastic waste in the environment. Cities are encouraged to adopt policies to manage and reduce these sources of pollution, which directly affect urban natural areas and the health of local ecosystems.

- GBF Target 9 / Nature Plan 2030 Target 8: Sustainable management of nature

- Strengthen sustainable management and responsible practices for the use of exploited species and natural areas to ensure the sustainability of wildlife populations, conserve the integrity of ecosystems, and improve access to nature.

- GBF Target 10 / Nature Plan 2030 Target 6: Sustainable agriculture and urban planning

- Integrating biodiversity into urban planning: Cities must integrate sustainable practices into urban land planning and management, including urban agriculture. This includes preserving agricultural land on the urban periphery, promoting sustainable urban agriculture, and urban planning that takes natural ecosystems into account.

- GBF Target 12: Green and blue spaces in urban areas

- Equitable access to green spaces: This target aims to ensure that green and blue spaces (water areas) are accessible to all citizens. Cities must ensure that urban populations, including marginalized communities, have equal access to parks, gardens, urban forests, and other natural spaces for their well-being and for the conservation of biodiversity.

## 2.2 Legal regulatory frameworks

The conservation of natural areas is subject to various regulatory frameworks and linked to plans, policies, and strategies already in place at the provincial and national levels.

At the federal level, there are two important laws (which mainly concern wildlife species) which were considered in the development of the Conservation Plan:

**1. Species at Risk Act (SARA)**

- Designates species of special concern, endangered or threatened species at the national level and ensures the protection of their habitat through voluntary initiatives and stewardship measures[12].

- 13 animal and plant species designated by the SARA are found in the Hudson territory (**Tables 2 and 3**).

**2. Migratory Birds Convention Act**

- Protects approximately 450 species of native migratory birds, as well as their nests and eggs.

At the provincial level, the laws that were considered in the development of the conservation plan:

- Environment Quality Act (LQE);
- Act respecting conservation and development of wildlife (LCMVF);
- Act respecting land use planning and development (LAU);
- Natural Heritage Protection Act (LCPN);
- Act respecting Endangered or Vulnerable Species (LEMV);

In addition, the Quebec government recently adopted the Act respecting the conservation of wetlands and water areas (LCMHH or Act 132) and the Act affirming the collective nature of water resources and promoting better governance of water and related areas (Water Act). In order to curb the loss of wetlands and water areas in Quebec and achieve net gains in this area, the principle of no net loss is at the heart of the Act. In addition, RCMs are now required to produce a Regional Wetlands and Water Environment Plan (PRMHH). This strategic discussion document aims to integrate the conservation of wetlands and water areas into land use planning by promoting sustainable and structuring development[13]. This conservation plan also takes into account the PRMHH developed by the Vaudreuil-Soulanges RCM.

### 2.3 Government Guidelines

The OGAT (*Orientation gouvernmentales en aménagement du territoire*) constitutes “the government's land use planning objectives.” The Vaudreuil-Soulanges RCM is part of Group A, which includes RCMs that are part of a metropolitan community. The OGATs determine expectations for the RCM and, as such, have an indirect influence on the Town of Hudson. The new OGATs have been in effect since December 1, 2024[14].

**Guideline 2** of the OGATs aims to “Ensure the conservation of ecosystems and focus on sustainable and integrated water resource management.”

The objectives arising from this guideline that apply most directly to the Town of Hudson are as follows:

**2.1** Conserve natural areas of interest (identify them and establish appropriate means of conservation).

[12] Environment Canada, 2007

[13] Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs [MELCCFP], n.d.

[14] https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/affaires-municipales/publications/amenagement_territoire/orientations_gouvernementales/BRO_ogat_groupesABC.pdf

**2.2** Contribute to ecosystem resilience (promote ecological connectivity and limit forest cover fragmentation).

**2.3** Ensure the perennity and protection of water resources through integrated management (identify drinking water withdrawal sites, monitor master plans, and preserve water resources).

### 2.4 Key regional conservation planning documents

At the regional level, several documents set out conservation objectives, such as the Greater Montreal Land Use and Development Plan (PMAD), the revised Regional Land Use and Development Plan (SADR), and the Regional Wetlands and Water Plan (PRMHH).

The PMAD, proposed by the CMM, is currently being revised. The PMAD is a consultation tool for land use planning for the 82 municipalities in the CMM territory and "proposes a concerted vision to create attractive and dynamic urban areas, developed according to the principles of sustainable development." The final version of the PMAD is expected to be adopted in the summer of 2025, but a preliminary version is available for consultation. At the 15th Conference of the Parties (COP15) to the United Nations Convention on Biological Diversity held in Montreal in 2022, the CMM committed to protecting 30% of its territory by 2030.

The current PMAD identifies large areas of interest, namely "metropolitan woodlands and forest corridors" and "areas of regional interest." These areas must be taken into account in the Vaudreuil-Soulanges RCM's Land Use and Development Plan (SADR) and Hudson's Urban Plan (UP).

The current PMAD also introduced the vision of a Green and Blue Belt for Greater Montreal, which proposes "an integrated and comprehensive approach for a structured network of natural areas developed for recreational and tourism purposes." This large-scale project is associated with a funding program to help achieve this vision. The CMM is also asking the RMCs and agglomerations to protect their forest cover.

| **PMAD in effect** | **PMAD under review** |
|---|---|
| **3.1** Protect 17% of the Greater Montreal area | **3.1** Identify areas that will enable the CMM to meet its commitments to the conservation of natural areas |
| **3.2** Protect riverbanks, coastlines, and floodplains | **3.2** Support activities in certain areas with effective conservation measures |
| | **3.3** Increase the Greater Montreal tree canopy to reach a target of 35% by 2046 |
| **3.3** Protect landscapes of metropolitan interest | **3.4** Protect and enhance landscapes of metropolitan interest |
| **3.5** Enhance the natural environment, built environment, and landscapes in an integrated | **3.5** Protect and enhance the built heritage of metropolitan interest |

| | |
|---|---|
| and comprehensive manner for recreational and tourism purposes | |

Based on the criteria of Objective 3.1 of the PMAD, the Town of Hudson is required to produce a wetland conservation plan within the urban perimeter. It did so in 2008 with an inventory and characterization of wetlands, in 2017 with an initial conservation plan for the town's urban core, and then, in 2020, in the Eco2Urb report listing all the town's natural areas, with the exception of urban forest cover.

The CMM has established several vital indicators for Greater Montreal, some of which make it possible to monitor progress toward the PMAD's objectives. The indicators relating to the environment and natural areas are: the proportion of the territory benefiting from conservation measures; the proportion of the territory covered by canopy; the share of households with good pedestrian access to parks and green spaces; and the annual quantity of residual materials disposed of from the residential sector[15].

The **third generation SADR** for Vaudreuil-Soulanges came into effect on February 2, 2023. The SADR "provides a framework for the actions of public bodies and urban planning regulations of the various local municipalities within its territory, in accordance with government land use planning guidelines and those contained in the Montréal Metropolitan Community's Land Use and Development Plan (PMAD)." Among the seven main elements of the SADR vision, the 4th element deals with the protection of the region's natural environment, particularly through the protection of forests and rural landscapes, the maintenance of water quality, and the sustainable use of natural resources.

The SADR identifies several environmental issues that the RCM wants to address. It has already taken action, for example, on the issues of tree felling and forest cover, which are addressed in the new plan.

The objectives in the SADR relating to the protection of the environment and natural areas are:

1.1 Implement best practices for the management of water, wetland, and riparian areas, taking into account their environmental value and the context of intervention.

1.2 Ensure the preservation of trees and woodlands.

1.3 Recognize the environmental value of protected areas and natural sites.

These objectives will be achieved through various identified actions involving the government, the RCM, and municipalities.

The SADR specifies that municipalities within the CMM territory must:

1. In their urban plans, identify, map, and characterize wetlands of 0.3 hectares or more;

2. Develop a conservation plan for wetlands of 0.3 hectares or more. […] In addition, these municipalities are encouraged to extend the scope of the plan to natural areas.

These objectives can be achieved by conducting an inventory of wetlands and woodlands of interest.

[15] https://indicateurs-vitaux.cmm.qc.ca/environnement-et-milieux-naturels/

In addition, the objectives of the PRMHH, as set out by the MELCCFP, include

- Achieving no net loss;
- And taking climate change into account.

These are relevant objectives for the Hudson's conservation plan.

At the municipal level, the **Town of Hudson's Urban Plan (UP)** sets out more specific guidelines and strategies for biodiversity conservation. Environmental management, as part of the UP, is divided into the following guidelines and strategies:

**Guidelines:**

**1)** Preserve the natural elements of the territory, particularly forests, lakes, waterways, and wetlands;

**2)** Prohibit any new quarries or sand pits within the city limits;

**3)** Protect the natural environment to ensure the best conditions for the survival of flora and fauna and the maintenance of natural landscapes;

**4)** Contribute to the metropolitan objective of increasing the area of protected areas in the Montreal region to 17%;

**5)** Protect forest cover within woodlands, metropolitan forest corridors and established and developing areas, in accordance with established conservation priorities (section 2.1 therein);

**6)** When preservation is made difficult by current or planned land use, integrate the protection and enhancement of natural areas of interest into the planning and development of new areas;

**7)** Preserve the ecological integrity of forests.

**Strategies:**

**1)** Require in the regulations on permits and certificates that a permit or certificate be obtained for any construction, work or development carried out on the shoreline or littoral areas

**2)** Incorporate provisions into zoning regulations to protect shorelines, lakes and watercourses, and wetlands, and to ensure the conservation, quality, and biological diversity of these areas, including the protection of wildlife habitats;

**3)** Make municipal tree cutting regulations more enforceable;

**4)** Designate the Clark-Sydenham property and wetlands for conservation purposes. An inventory commissioned by the Town will identify and characterize these wetlands;

**5)** Include provisions in the zoning by-law to prohibit any new quarries or sand pits on the territory;

**6)** Adopt a Wetlands and Natural Areas Conservation Plan;

**7)** Incorporate into the zoning by-law forest cover protection standards for metropolitan woodlands and forest corridors;

**8)** Develop a wetland conservation plan based on the MELCC's Guide to Developing a Wetland Conservation Plan;

**9)** Amend zoning regulations to take into account the conservation priorities of identified natural areas (Figures 2 and 3 therein) that may be subject to development, in particular by improving or revising the map appended to the regulations to better illustrate the natural areas and the standards that will apply to them;

**10)** Incorporate wetland protection provisions into the zoning by-law aimed at:

- Limiting interventions within wetlands, particularly with regards to filling, excavation, and tree cutting;
- Promoting the enhancement of wetlands by allowing light development actions and limit interventions on the edges of wetlands in order to promote an extended buffer zone between buildings and wetlands;
- Severely restricting tree cutting within these areas;
- Protecting trees during construction work and other authorized interventions.
- Requiring a minimum number of trees to be planted when constructing a main building.
- Promoting the reforestation of areas, the replacement of felled trees, and the maintenance of trees.
- Promoting the greening of mineralized areas, particularly in areas affected by heat islands.

**11)** Amend the subdivision by-law to regulate cadastral operations in identified natural areas (Figures 2 and 3 therein) that may be subject to development;

**12)** Include the Viviry River biodiversity corridor and other sensitive natural areas in the site planning and architectural integration regulations and subject these areas to objectives and criteria designed to better integrate cadastral operations, new construction, expansions, and land development projects into their natural environment.

**13)** Prohibit the planting of invasive alien species within the municipality (example: Japanese knotweed, etc.).

**14)** Define, through zoning by-laws and using municipal environmental powers, the concept of "remarkable trees" and establish additional protection mechanisms for selected specimens.

**15)** Adapt the permit and certificate regulations to require specific and tailored information on the environmental characteristics of lots for which permit applications are required.

In addition, **Bylaw 767.1-2024**, adopted by the Hudson Town Council in January 2024, imposes protective and restrictive measures for the protection of natural landscape features. These measures entail the following obligations:

**Tree protection:**

· Increased restrictions on tree cutting;

· New restrictions on the cutting of identified heritage trees;

**Protection of wetlands and water bodies:**

· Prohibition of wetland in-fill for residential purposes;

· For vacant lots: Increase in the riparian protection strip from 10 to 15 metres.

Other regional documents may be considered for the definition and implementation of the Town of Hudson's Natural Areas Conservation Plan.

The tree and woodland policy (PAB) of the Vaudreuil-Soulanges RCM, adopted in 2008, contains several pieces of information and protection guidelines that must be considered by the Town of Hudson, particularly with regard to forest management.

The RCM's Agricultural Zone Development Plan (PDZA)[16], which aims to promote agricultural development in the region, includes the Town of Hudson. Actions 8 and 18 of the PDZA action plan may be considered in the context of this plan.

Finally, the Vaudreuil-Soulanges watershed water management plan [17] sets out clear conservation objectives for wetlands and waterbodies in particular. Those presented in section 7.1.4 should be taken into consideration.

It should also be noted that the Conservation Plan is associated with and directly linked to other plans and policies implemented on the territory of Hudson :

- Drinking Water Source Protection Plan
- Groundwater Recharge Area Protection Plan
- Parks and Green Space Master Plan

[16] MRC de Vaudreuil-Soulanges, 2014
[17] 2021 action plan update by the Vaudreuil-Soulanges watershed council (COBAVER-VS)

## 2.4 Summary of the planning framework for the territory

| REGULATION, PLAN, OR FRAMEWORK | CONSTRAINTS, OBLIGATIONS, OPPORTUNITIES |
|---|---|
| GBF | Targets 2, 3, 4, 6, 7, 9, 10, 12. |
| Nature Plan 2030 | Axis 1 - Take action to protect and restore biodiversity to ensure ecosystem resilience (targets 1, 2, 3, 4, 5). |
| | Axis 2 - Encourage sustainable practices that promote biodiversity and improve access to nature (targets 6 and 8). |
| Species at Risk Act (SARA) | Thirteen animal and plant species designated by SARA are found in the Hudson territory. |
| Migratory Birds Convention Act | Protects approximately 450 species of native migratory birds, as well as their nests and eggs. |
| OGAT | Conserve natural areas of interest. |
| | Contribute to ecosystem resilience. |
| | Ensure the sustainability and protection of water resources through integrated management. |
| Revised PMAD | Identify areas that will enable the CMM to meet its commitments regarding the conservation of natural areas. |
| | Regulate activities in certain areas with effective conservation measures. |
| | Increase the Greater Montreal tree canopy to reach a target of 35% by 2046. |
| | Protect and enhance landscapes of metropolitan interest. |
| PRMHH & SADR | In terms of urban planning, identify, map, and characterize wetlands of 0.3 hectares or more. |
| | Develop a conservation plan for wetlands of 0.3 hectares or more. […] In addition, municipalities with such wetlands are encouraged to extend the scope of the plan to natural areas. |
| Town of Hudson Urban Plan | Orientation: Preserve the natural areas of the territory, particularly forests, lakes, waterways, and wetlands. |
| | Orientation: Prohibit any new quarries or sand pits within the city limits. |
| | Orientation: Protect the natural environment to ensure the best conditions for the survival of flora and fauna and the preservation of natural landscapes. |

| REGULATION, PLAN, OR FRAMEWORK | CONSTRAINTS, OBLIGATIONS, OPPORTUNITIES |
|---|---|
| | Orientation: Contribute to the metropolitan objective of increasing the area of protected areas in the Montreal region to 17%. |
| | Orientation: Protect forest cover within woodlands, metropolitan forest corridors, and established and developing areas, according to established conservation priorities (section 2.1). |
| | Orientation: When preservation is difficult due to current or planned land use, integrate the protection and enhancement of natural areas of interest into the planning and development of new areas. |
| | Orientation: Preserving the ecological integrity of forests. |
| | Strategy: Require in the regulations on permits and certificates that a permit or certificate be obtained for any construction, structure, or work carried out on the shoreline or littoral area. |
| | Strategy: Incorporate provisions into zoning regulations to protect shorelines, lake and riverfronts, and wetlands, and to ensure the conservation, quality, and biological diversity of these areas, including the protection of wildlife habitats. |
| | Strategy: Make municipal regulations on tree cutting more enforceable. |
| | Strategy: Designate the Clark-Sydenham property and wetlands for conservation purposes. An inventory commissioned by the Town will identify and characterize these wetlands. |
| | Strategy: Include provisions in zoning regulations to prohibit any new quarries or sand pits on the territory. |
| | Strategy: Adopt a Wetlands and Natural Habitat Conservation Plan. |
| | Strategy: Incorporate forest cover protection standards into zoning regulations for metropolitan forests and forest corridors. |
| | Strategy: Develop a wetland conservation plan based on the MELCC's Guide to Developing a Wetland Conservation Plan. |
| | Strategy: Amend zoning regulations to reflect conservation priorities for identified natural areas (Figures 2 and 3 therein) that may be subject to development, in particular by improving or revising the map appended to the regulations to better illustrate natural areas and the standards that will apply to them. |

| REGULATION, PLAN, OR FRAMEWORK | CONSTRAINTS, OBLIGATIONS, OPPORTUNITIES |
|---|---|
| | Strategy: Incorporate wetland protection provisions into zoning regulations aimed at: limiting interventions within wetlands, particularly with regard to filling, excavation, and tree cutting; promoting the enhancement of wetlands through light development and limit interventions along the edges of wetlands in order to promote an extended buffer zone between buildings and wetlands; severely restricting tree cutting within these areas; protecting trees during construction work and other authorized interventions; requiring a minimum number of trees to be planted when constructing a main building; promoting the reforestation of areas, the replacement of felled trees and the maintenance of trees; promoting the greening of mineralized areas, particularly heat islands. |
| | Strategy: Amend the subdivision regulations to govern cadastral operations in identified natural areas (Figures 2 and 3 therein) that are likely to be developed. |
| | Strategy: Identify, in the zoning and architectural integration plans, the Viviry River biodiversity corridor and other sensitive natural areas, and subject these areas to objectives and criteria designed to better integrate cadastral operations, new construction, expansions, and land development projects into their natural environment. |
| | Strategy: Prohibit the planting of IAS within the municipality (examples: Giant Hogweed, Phragmites, Buckthorn, etc.). |
| | Strategy: Define, through zoning regulations and using municipal environmental powers, the concept of a “remarkable tree” and establish additional protection mechanisms for selected specimens. |
| | Strategy: Adapt the regulations on permits and certificates to require specific and tailored information regarding the environmental characteristics of lots for which permit applications are required. |

## 2.5 Local realities of planning and conservation of natural areas

In order to take into account local realities in terms of planning and conservation of natural areas, a consultation with environmental organizations and local stakeholders in the Town of Hudson was organized in October 2024. Conducted online, the purpose of this meeting was to identify their concerns and expectations and their vision for the conservation and enhancement of natural areas. The environmental organizations noted various drivers and constraints to conservation.

### 2.5.1 Conservation challenges

Several obstacles to conservation in the area were cited, including:

- The cost of conservation measures;
- The presence of invasive alien species (IAS);
- Pressure from urban development;
- Limited public engagement due to communication and education issues, as well as a lack of awareness;
- Lack of financial resources;
- Intense agricultural activity in the area;
- Maintenance of strict conservation areas (no public access).

### 2.5.2 Levers for conservation

Local stakeholders also identified numerous conservation levers, which can be grouped into broad themes around education, collaboration, regulation, and natural areas management. Possible actions were proposed for each theme.

- **Education and public awareness**: Implement activities such as awareness campaigns, skills development, nature walks, workshops, nature celebration days, educational programs with schools, collaboration with Indigenous communities, information sessions, workshops (led, for example, by biology interns); support for educational non-profit organizations (NPOs).
- **Collaboration between local organizations, as well as between the town, organizations, and the population**: Reduce bureaucracy for local organizations that preserve natural areas; pair agricultural landowners with ecological/organic apprentice farmers; work in concert with available farm biodiversity programs and grants; mobilize volunteers for conservation actions (restoration, invasive alien species eradication, tree planting, trail maintenance); create citizen-based scientific biodiversity monitoring programs.
- **Update zoning designations:** Define conservation sub-designations, which could be defined by the Town based on criteria such as woodland integrity, presence of SAR, sensitive habitats (wetlands, riparian areas), or site accessibility; Establish different types of municipal zoning designations for natural areas included in the Conservation Plan, each corresponding to a specific level of protection and use, e.g., regulated conservation area, conservation park for educational or low-impact recreational use, wooded island in an urban or peri-urban area, ecological corridors in areas to be planned.
- **Natural environment management and development:** Town support for citizen initiatives (e.g., purchase of land threatened by development); More sign postage (maps, better marked trails) in natural areas for the public; Collect more data on natural systems (water and land); Development of the green and blue belt with the CMM; Purchase of natural areas by the Town;

Audubon Cooperative Sanctuary Program (ACSP) for golf courses[18]; provide maps to identify access points to natural areas for local residents (recreational, conservation, preservation); seek external funding to purchase natural areas for conservation; protect wetlands; protect the population from climate hazards (floods).

### 2.5.3 Local realities

The participants also discussed their experiences and reflections with regards to conservation efforts and activities in their respective territories. The following points were raised:

- **Organic farming and conservation:** Organic farming coexists perfectly with conservation efforts and can even play a central role in protecting land from urban development.
- **Integration of forest and Indigenous education:** The approach combining the principles of forest schools and Indigenous education emphasizes holistic, respectful, and nature-based learning. This method values traditional ecological knowledge (TEK), contributing to sustainable management and biodiversity preservation.
- **Playful and intergenerational learning:** Programs focused on children's education require preserved but accessible natural spaces. It is important to design safe areas for play and exploration while minimizing impacts on fragile ecosystems.
- **Balance between conservation and recreation:** The growing demand for recreational spaces must be balanced with conservation objectives. Sustainable infrastructure, such as low-impact trails or designated areas for environmental education, is needed to prevent habitat degradation.
- **Resilience to climate change:** Conservation strategies must include measures to adapt to climate change and restore biodiversity.
- **Housing plans and flood management:** New housing projects should not increase flood risks. Land-use planning should incorporate hydrological analyses to preserve groundwater and limit construction-related hazards.
- **Protection of Sandy Beach:** The entire Sandy Beach delta should be protected from development, not just part of it.
- **Light pollution and fireworks:** Laws against light pollution and regulations on fireworks are not enforced, affecting fireflies, migratory birds, and other wildlife.
- **Invasive species:** Invasive buckthorn is not being removed from existing green spaces, threatening their ecological integrity.

[18] https://www.auduboninternational.org/audubon-cooperative-sanctuary-program

- **Trail infrastructure:** Some trails are in good condition, but others are deteriorating or missing. A system of comprehensive infrastructure that is accessible to people with reduced mobility and children is needed.
- **Golf and pesticides:** Golf course owners must be more transparent in their environmental reports, particularly regarding pesticide use and compliance with municipal regulations.
- **Pesticide laws:** Multiple exemptions weaken municipal anti-pesticide laws, despite efforts to strengthen regulations.
- **Hudson in the region:** Hudson, along with Rigaud and Saint-Lazare, represents a significant portion of the forest cover in the Vaudreuil-Soulanges RCM. The Town of Hudson, in particular, should be recognized as an asset to the region and valued for its natural areas (woodlands, wetlands, trails). As such, it should be exempt from the building density and ratio requirements imposed by the RCM and the CMM.

#### 2.5.4 Examples of successful conservation practices

Consulting with local stakeholders also provided an opportunity to list examples of successful conservation efforts thanks to community involvement and collaboration between different parties. There are already several examples in the Town of Hudson, such as the Creek 53 Conservation Trust, the Clarke-Sydenham Nature Reserve, and Le Nichoir, all three of which are conservation areas created through land donations by citizens. Hudson Forest Play is an example of a conservation organization that is involved in educating the public in the area, while Hudson HeartBeet Community Farm demonstrates the application of ecological practices in agriculture.

The Creek 53 Conservation Trust is a particularly important and remarkable example of local conservation action. The trust is a registered charity that brings together landowners, trustees, auxiliaries, and like-minded organizations to accomplish its conservation mission. The trustees manage the land and perpetual conservation easements for the benefit of the general public. The trust's role is to protect the Hudson Escarpment and the Creek 53 watershed, whose wetlands, forests, and grasslands that are home to a wide variety of flora and fauna. The trust's example should be a source of inspiration and shared with landowners who may be interested in conserving their land.

Beyond Hudson’s boundaries, examples of exemplary conservation projects included the Gault Reserve for its balance between conservation and education; Vaudreuil-sur-le-Lac for the purchase of natural areas through a citizen initiative; and Île-aux-Tourtes for its collaborative project involving the government, conservation organizations, and the public.

#### 2.5.5 Other actors to consider

The consultation with local stakeholders did not include consultation with the Kanesatake Indigenous community on the shore of the Lake of Two Mountains across the Ottawa River from Hudson. However, as the Conservation Plan aims to restore connectivity between natural areas at both the local and regional levels, it would be important to plan joint consultation and reflection activities to engage with Indigenous

actors in conception and implementation of the Conservation Plan. With a view to collaboration among all stakeholders in the region, several actions proposed in the Conservation Action Plan highlight the importance of implementation involving the Kanesatake community.

**Key points:**

The Hudson Town Natural Areas Conservation Plan is at the heart of recommendations at the supraregional level.


The conservation plan must take into account a number of obstacles (funding, invasive alien species, urban development pressure, public awareness, agricultural activities, and the balance between conservation and recreation) and conservation levers (education, collaboration, regulation, and management of natural areas), and be implemented in collaboration with all stakeholders in the area.

## 3 – ASSESSMENT OF THE STATE OF HUDSON'S NATURAL AREAS

To ensure that the Conservation Plan is based on an accurate picture of the state of natural areas in the territory, several analyses carried out in 2019 were updated with data from inventories carried out in 2024 and updated public data[19]. The results of the analyses are summarized in this section.

For the purposes of the analyses, forest wetlands were considered to be forest areas. The analyses were carried out using data from the IEQM for forest areas, supplemented by data from the inventory carried out in the summer of 2024. In addition, the forest areas included in the analyses do not include shrubland nor scrubland (these land use classes are not included in the IEQM).

### 3.1 Bird observation hotspots

Based on existing species observations, it is possible to model the expected distribution of species across a landscape and estimate the expected number of species (i.e. species richness) in different parts of the landscape. Expected species richness is an important indicator for evaluating and tracking the state of biodiversity in a study area. It helps to identify sites that are thought to host a large number, i.e. hotspots, which can be monitored over time. It thus provides information on conservation areas that should be prioritized.

We used data on bird observations in the area from the GBIF public database to map hotspots across the Town of Hudson. Only observations made since 2010 were retained, totaling more than 17,000 observations. This data was used to generate a land use distribution matrix for each species with more than five observations, modeling the most likely distribution of each species in the area surrounding the observations. The resulting layers were normalized and pooled to illustrate bird hot spots (**Figure 14**). This method relies on observations collected on the GBIF citizen science platform, thus when interpreting the results, it is important to recognize biases favouring a greater number of observations from areas that are more easily accessible or known to bird observers.

[19] MINISTRY OF NATURAL RESOURCES AND FORESTRY. Original ecoforestry map and current inventory results, [Data set], in Données Québec, 2017, updated on January 28, 2025. [https://www.donneesquebec.ca/recherche/dataset/resultats-d-inventaire-et-carte-ecoforestiere], (accessed on April 23, 2025).

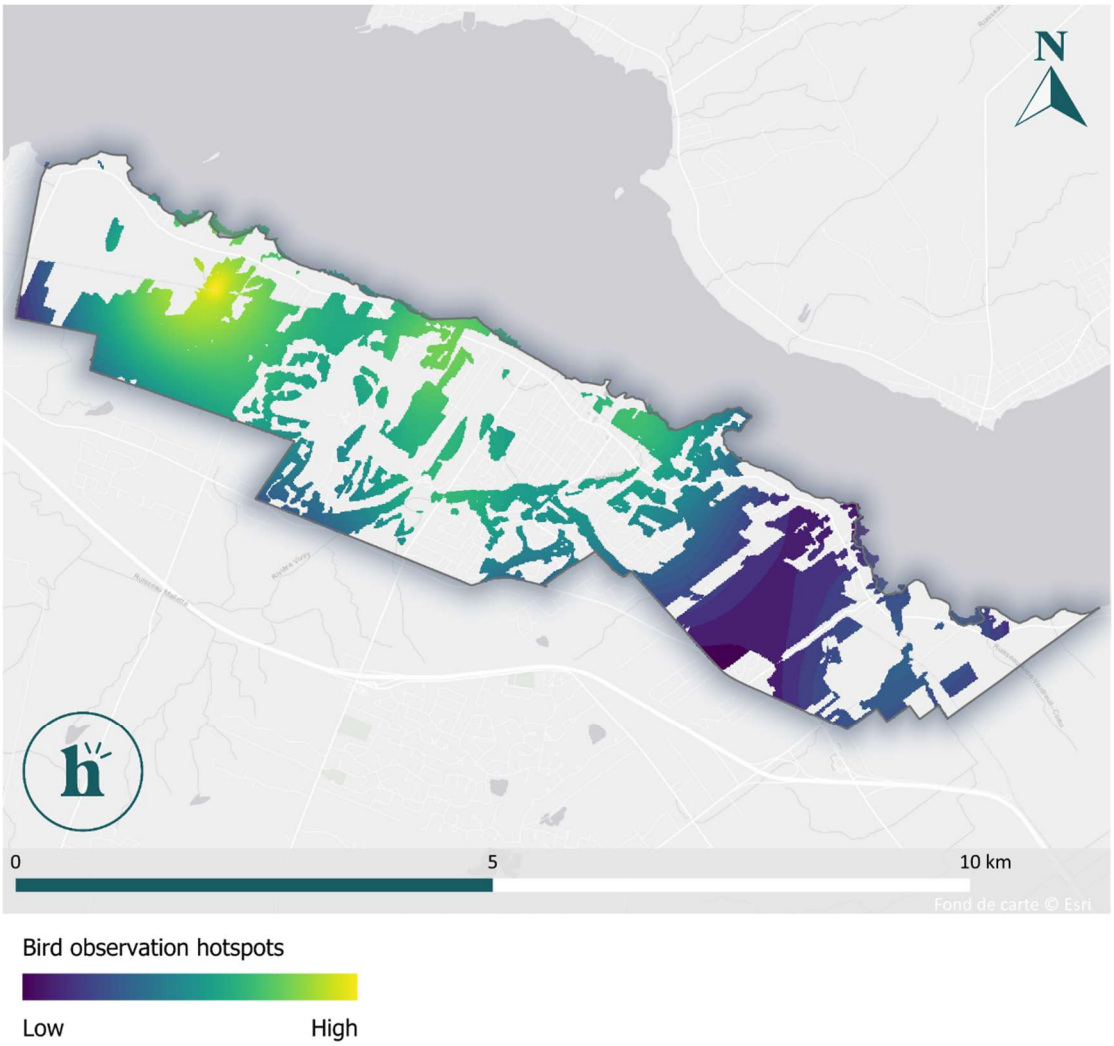


**Figure 14.** Mapping of bird observation hotspots.

There is only one hotspot that stands out with a high concentration of bird species observations, concentrated north of the Creek 53 Conservation Trust with a diffuse gradient extending to the Viviry River valley. This gradient suggests that, although there is a significant concentration of species at this point, birdlife is relatively homogeneous and abundant throughout the natural areas. It appears that bird presence is lowest and/or least observed in the Como plain.

### 3.2 Herpetofauna hotspots

The same analysis was performed on amphibian occurrence data to identify hotspots of herpetofauna observation and presence in the territory. Herpetofauna occurrences were obtained from the AARQ (Atlas des amphibiens et reptiles du Québec) in the summer of 2024—only observations dating back to 2010 were retained, for a total of 598 observations. This analysis is also sensitive to observation efforts and has the same biases as the avifauna hotspot analysis.

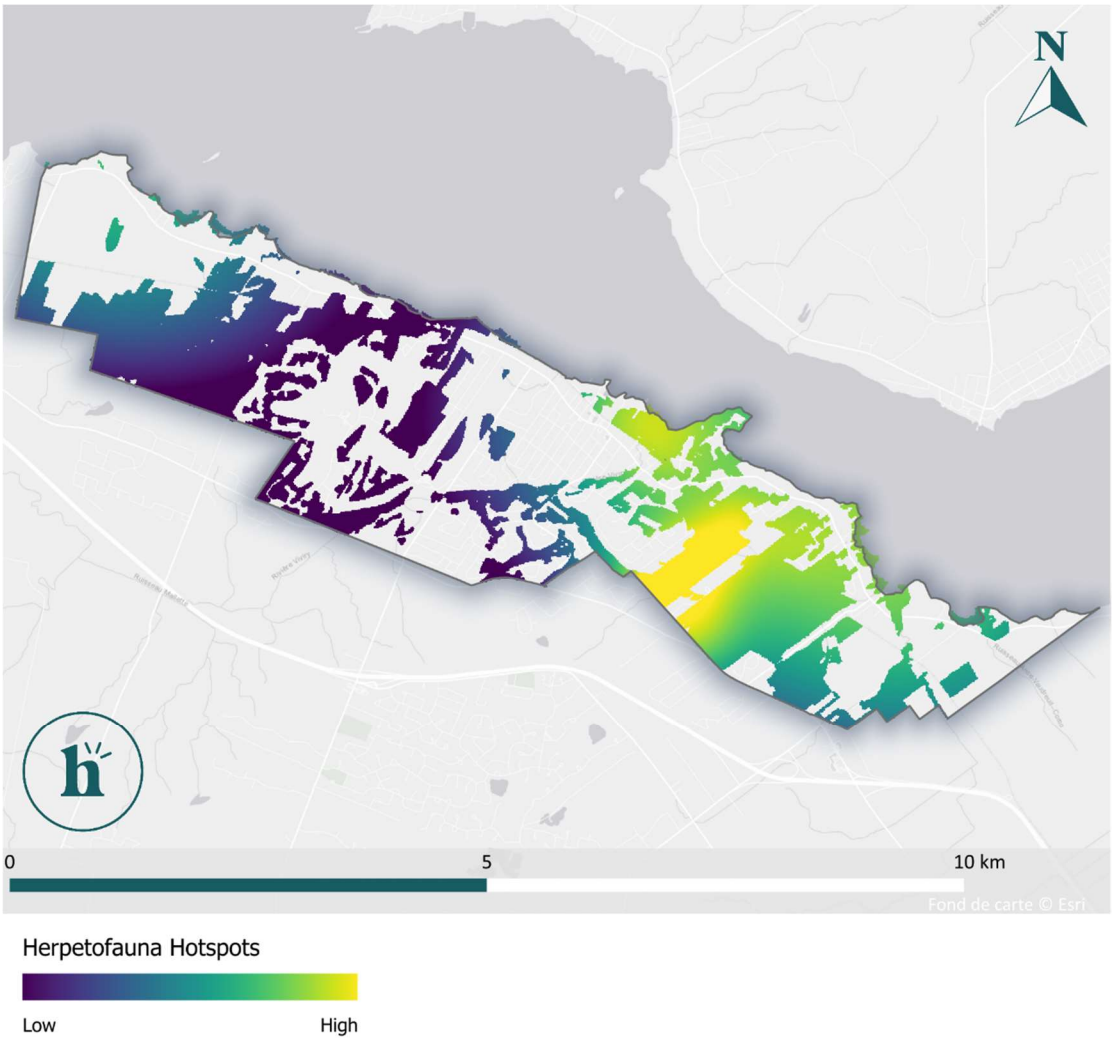


**Figure 15.** Mapping of herpetofauna observation hotspots.

**Figure 15** shows the location of hotspots of herpetofauna in the Town of Hudson. Unlike the results for birds, the distribution of herpetofauna observations is concentrated over a larger area east of the city centre. The Choisy Plain (northwest of the territory) has a hot spot along the riverbanks, but it is the Como plain and the Hudson slopes that stand out as areas with a high potential concentration of herpetofauna.

### 3.3 Regional connectivity

The connectivity of natural areas refers to the ability of wildlife species to move within their range. High connectivity indicates that natural areas are close to each other or separated by limited barriers in the landscape, allowing species to move according to their needs. Among the various components of a regional ecological network are large habitat areas (also referred to as core natural areas) which are the most influential and vital areas for biodiversity. These are important areas to protect and connect to support local species populations. Next are corridors, or spatially defined linear features made of smaller, less optimal, sometimes structurally fragmented, habitat area that enable species to move between core areas. Finally, smaller high quality habitat patches can act as Japanese stepping stones that can provide

stop over points for species traversing inhospitable landscape between core natural areas. As such, urban and agricultural areas often represent inhospitable areas for most species. They fragment into smaller patches and constitute the main barriers to their movement (**Figure 16**).

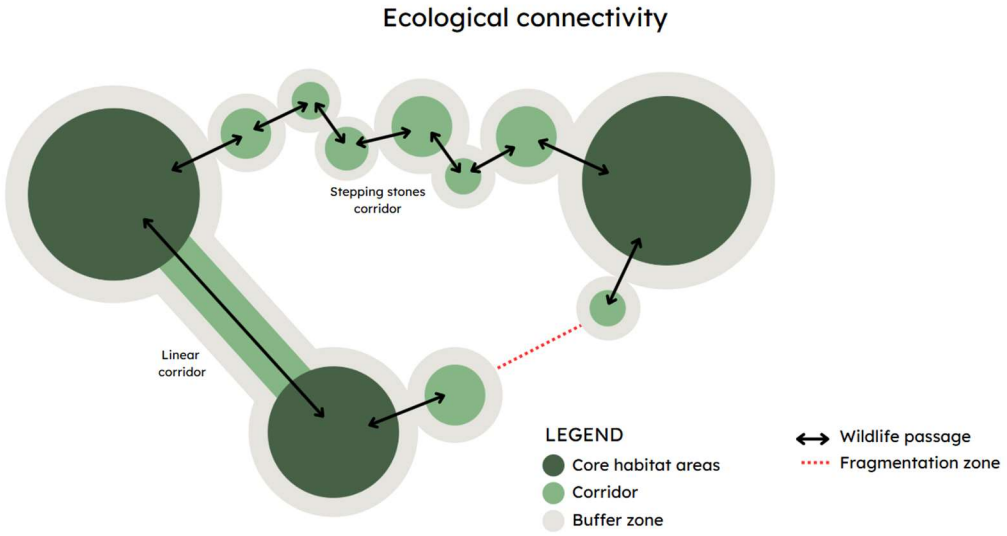


**Figure 16.** Representation of ecological connectivity.

At the regional level, the Town of Hudson is located in a green corridor connecting Rigaud, Saint-Lazare, and Oka on the other side of the Ottawa River. This connection can be seen in **Figure 1**, which illustrates the importance of natural areas in Hudson for maintaining regional connectivity.

### 3.4 Analysis of local connectivity of Hudson's natural areas

To assess local connectivity in the study area, Habitat employed the approach developed by Albert et al. (2017)[20] and Rayfield et al. (2019)[21]. The local connectivity modelling identifies networks and corridors of habitat patches that meet the connectivity needs of several animal species. The chosen species are the black bear (*Ursus americanus*), the red-backed salamander (*Plethodon cinereus*), the northern short-tailed shrew (*Blarina brevicauda*), the American marten (*Martes americana*), and the wood frog (*Rana sylvaticus).* This grouping of reference species represents the habitat requirements and movement capacity of a wide range of forest or forest-wetland dependent species. These species were selected to reflect the biological community of the St. Lawrence Lowlands and are not necessarily found in Hudson.

Two indices, with complementary approaches to understanding the dispersal dynamics of animal species in a fragmented landscape, were used to assess landscape connectivity: betweenness centrality and current flow. Betweenness centrality provides an understanding of the relative position and importance

[20] Albert, C. H., Rayfield, B., Dumitru, M., & Gonzalez, A. (2017). Applying network theory to prioritize multispecies habitat networks that are robust to climate and land-use change. Conservation Biology, 31(6), 1383–1396. https://doi.org/10.1111/cobi.12943

[21] Rayfield, B., Laroque, G., Daniel, C., & Gonzalez, A. (2019). Prioritization for the conservation of natural areas in the St. Lawrence Lowlands based on their importance for ecological connectivity. *Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC)*, 36.

of a habitat patch in the habitat network. Current flow identifies the most likely route for an animal to cross the landscape by following paths that offer the least cost or resistance to movement. The approach used calculates these values and maps for each of the five reference species. These are then combined to provide a portrait of the relative importance of the natural areas for maintaining connectivity. The methodology used takes into account anthropogenic and natural disturbances noted during the inventory, so that a disturbed natural area is not considered as an optimal habitat for a species.

The results of current flow and betweenness centrality for each of the five reference wildlife species are presented in the appendix (**Appendix 2**)**.**

Using prioritization software, the current flow and betweenness centrality indices were combined to rank Hudson's natural areas according to their conservation value for maintaining a connected habitat network (**Figure 17**). Overall local connectivity values appear lower than in 2020—this is due in part to the use of a more advanced version of the prioritization software[22].

Across the Hudson territory, animal movement is mainly limited by urban and agricultural areas, and species habitats are more connected along waterways and wetlands. This result is predictable given that the reference species considered in the analysis prefer forest and wetland habitats.

[22] Moilanen, A., Lehtinen, P., Kohonen, I., Jalkanen, J., Virtanen, E. A., & Kujala, H. (2022). Novel methods for spatial prioritization with applications in conservation, land use planning and ecological impact avoidance. *Methods in Ecology and Evolution*, *13*(5), 1062–1072. https://doi.org/10.1111/2041-210X.13819

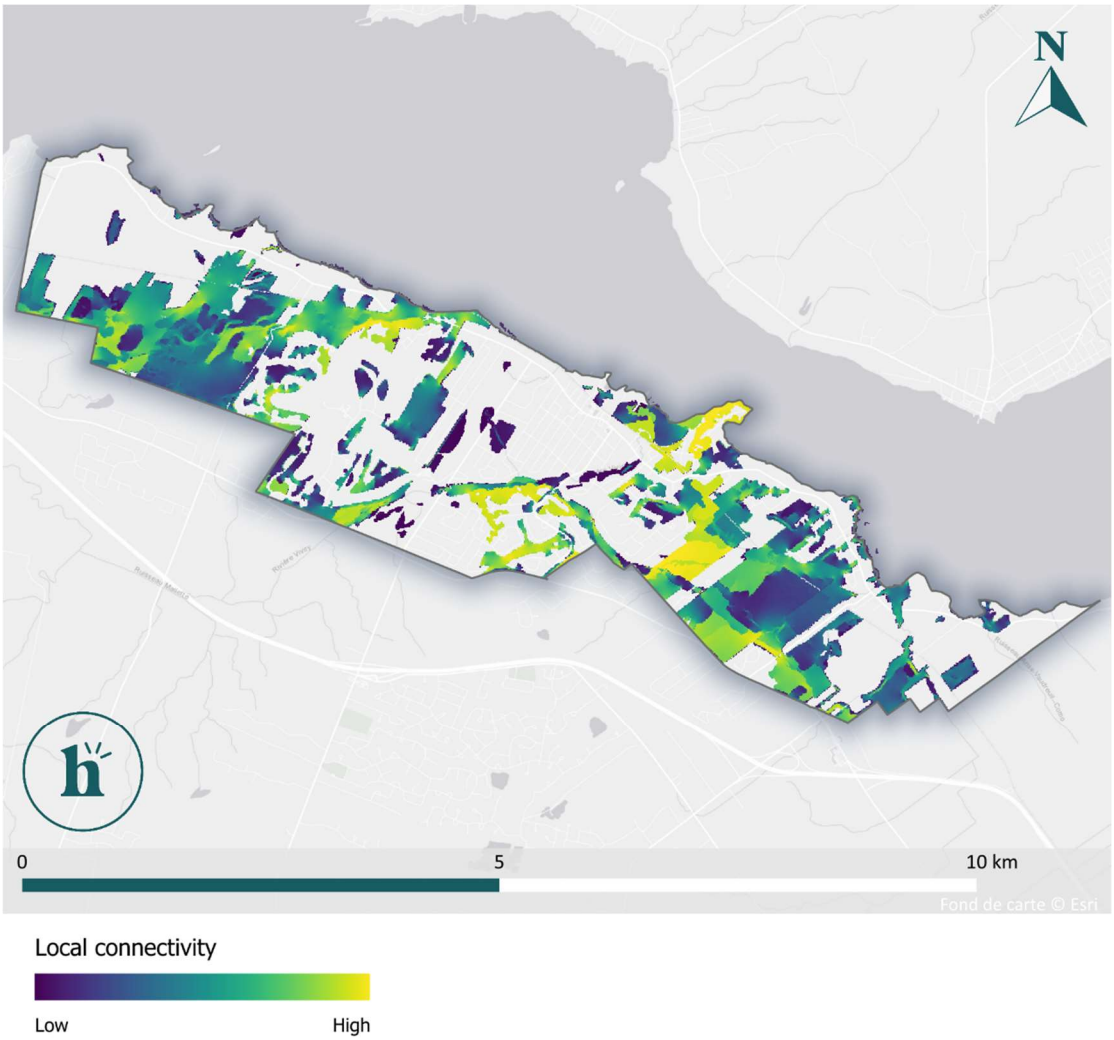


**Figure 17.** Map of connectivity across the territory of Hudson.

The interpretation of **Figure 17** highlights several important elements, mainly when looking at the existing corridors and landscape breaks between the Ottawa River and the boundaries of Hudson's territory. In terms of connectivity, the Town's waterways appear to form a well-connected network. However, there is an important degree of fragmentation across the landscape Three corridors can be identified among the areas with high current flow: the Fiefs River (Alstonvale escarpment), the Viviry watercourse to Sandy Beach and Parsons Point (the Viviry River valley and part of the Como plain), and the Black Creek watercourse (Hudson slopes).

## 3.5 Functional diversity analysis of forest areas

Functional diversity[23] characterizes the resilience of a community, i.e., its' ability to resist or return following a multitude of known and unknown threats. Community with a wider diversity of function traits, that is biological characteristics which influence a species ecological function, vulnerabilities, and provision of ecosystem services, will be less affected by extreme events. For trees, these biological characteristics include, for example, wood density, which is a good indicator of drought tolerance, or seed size, which provides information on dispersal capacity.

Grouping species into functional groups with similar functional traits makes it possible to calculate the functional diversity index and to spatialize these values, across a territory. According to a classification of native and naturalized species found in the temperate forests of northeastern North America, there are five major functional groups composed of nine subgroups (**Figure 18**).

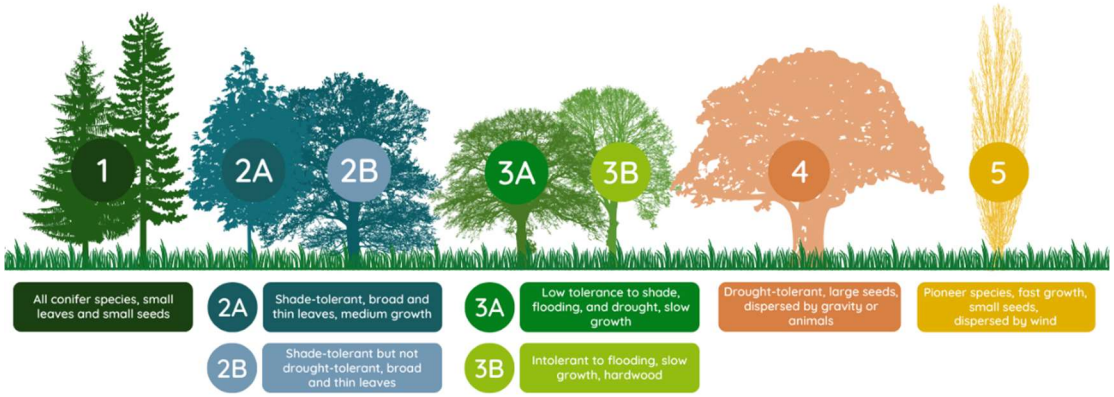


**Figure 18.** Functional groups of native tree species found in the forest areas of the Town of Hudson[24].

The functional diversity index is categorized into categories for easy of interpretation (i.e., the low class represents values below the 25th percentile, the medium class represents values between the 25th and 75th percentiles, and the high class represents values above the 75th percentile). Quantiles are calculated separately by forest type (hardwood, mixed, and softwood), as the expected levels of absolute diversity vary by forest type (e.g., by definition, mixed forests have higher diversity than hardwood or softwood forests).This approach provides a general overview of the resilience of forests in the territory of Hudson, but must be interpreted at the local context because the index is relative (classes values can differ in other territories).

[23] Paquette, A., Sousa-Silva, R., Maure, F., Cameron, E., Belluau, M., & Messier, C. (2021). Praise for diversity: A functional approach to reduce risks in urban forests. *Urban Forestry & Urban Greening*, *62*, 127157.
[24] Source: Habitat 2022

The distribution of forest stands according to their functional diversity index is shown in **Figure 19**, where:

- Low diversity corresponds to forest stands that rank below the 25th percentile;
- Moderate diversity corresponds to forest stands that rank above or at the 25th percentile and below the 75th percentile; and
- High diversity corresponds to forest stands that rank above or at the 75th percentile.

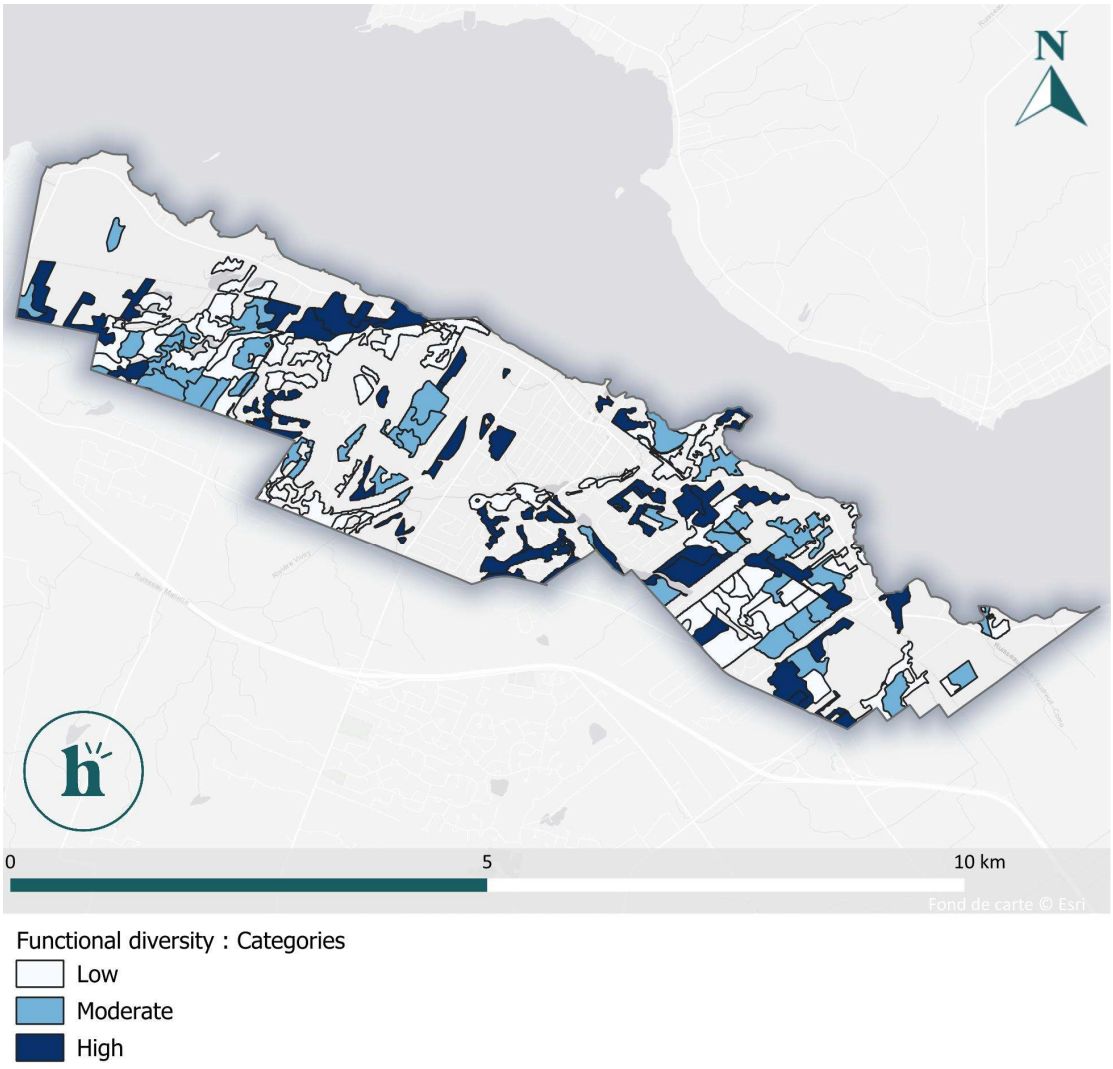


**Figure 19.** Mapping the functional diversity of forest areas.

**Figure 19** shows that functional diversity is fairly heterogeneous across the forested areas of the Town of Hudson. Some forest stands have high functional diversity, while others have very low diversity, despite being located close to one another. Groups of forest stands with low functional diversity, such as those in the Como plain on the western edge of the territory or in the Alstonvale escarpment, are areas where monitoring and diversification efforts may be necessary to strengthen resilience and ensure the health of these forest areas.

The proportion of the different functional groups present in the forested areas of the territory is shown in Table 4. Functional group 2B, which includes large-leaved, shade-tolerant (but not drought-tolerant) hardwood species (e.g., red maple, sugar maple, dogwoods, hornbeams, ash species), is the most common

in the Town of Hudson's forested areas (almost half of all forest areas), followed by functional group 1, which represents conifer species (spruce, juniper, pine, thuja, fir species)[25]. Far behind in terms of importance are functional groups 2A (shade-tolerant deciduous species with medium growth, e.g., box elder, silver maple, hackberry, beech, and linden species) and 5 (pioneer species, e.g., alder, birch, poplar, and willow), each representing almost 10% of forest areas.

**Table 4.** Representation of functional groups in forest areas across the territory.

| FUNCTIONNAL GROUP | PROPORTION (%) |
|---|---|
| **1** | 28 |
| **2A** | 9 |
| **2B** | 45 |
| **3A** | 2 |
| **3B** | 5 |
| **4** | 3 |
| **5** | 8 |

Forested areas are largely represented by only two functional groups and, therefore, are highly vulnerable to threats (including drought) affecting these two groups in particular.

## 3.6 Vulnerability analysis of forest areas

### 3.6.1 Vulnerability to climate threats

The concept of forest vulnerability to extreme climate events is part of a broader perspective of resilience and adaptation to global change. Climate event such as drought or ice storms can directly affect forests, but they can also make trees more vulnerable to insect infestations and disease. For example, drought increases the rate of defoliation by insects (Netherer et al., 2015 and Sangüesa-Barreda et al., 2015 in Aquilué et al., 2020)[26].

Climate vulnerability analysis identifies the extreme climate events to which forests are most vulnerable. The analysis assesses the susceptibility of forest stands to five types of extreme climate events that are likely to affect the study area (**Table 5**). To carry out the analysis, a sensitivity index is assigned to each

[25] Although coniferous forests account for only 1.2% of the territory, the functional diversity analysis also includes conifers present in the understory and in mixed forests, which explains this result.

[26] Aquilué, N., Filotas, É., Craven, D., Fortin, M., Brotons, L., & Messier, C. (2020). Evaluating forest resilience to global threats using functional response traits and network properties. *Ecological Applications*, *30*(5), e02095. https://doi.org/10.1002/eap.2095

tree species, according to values established by Matthews et al. (2011)[27] – using forest inventory data, from the IEQM. This index is then used to determine what percentage of the basal area of forest areas is likely to be affected by each threat.

**Table 5.** Descriptions of abiotic threats selected for vulnerability analysis, according to Matthews et al. (2011).

| CLIMATIC THREAT | DESCRIPTION |
|---|---|
| **Temperature gradients** | Extreme temperature variations, which may be high or low, could exceed the physiological tolerances of certain species. |
| **Floods** | Temporary submersion of root systems (waterlogging) for a period of varying length, which may be caused by heavy rainfall over a long period. Prolonged submersion of roots in water limits the exchange of oxygen and carbon dioxide through the roots, which can cause the roots to drown and die. |
| **Droughts** | A prolonged period of low rainfall leading to water scarcity. Water scarcity can limit evapotranspiration and the movement of water from the roots to the leaves, which can lead to desiccation and leaf loss in order to minimize transpiration and, in extreme cases, to the death of individuals. |
| **Strong winds** | Air movements of varying strength which can cause windthrow. |
| **Freezing rain** | A layer of ice formed as a result of precipitation where water freezes when it comes into contact with a solid surface, if the temperature of the latter is below 0°C. The weight of ice that forms on branches can break them, making trees vulnerable to infection. |

**Table 6** summarizes the results of the vulnerability analysis of forest across the territory for these five climate threats, which are considered the most concerning for the study area. The values presented in the "vulnerability level" column of the table correspond to the cumulative tree basal area for which the potential impacts are low, intermediate, or high across all forest stands. In a forest landscape with low vulnerability, 25% or less of the basal area is composed of tree species vulnerable to the threat. In a forest landscape with high vulnerability, 75% or more of the basal area is composed of tree species vulnerable to the threat. The results indicate that droughts are the most threatening to forested areas based on total basal area at risk across the territory. However, the frequency of droughts in the study area should be taken into account when interpreting this result.

[27] Matthews, S. N., Iverson, L. R., Prasad, A. M., Peters, M. P., & Rodewald, P. G. (2011). Modifying climate change habitat models using tree species-specific assessments of model uncertainty and life history factors. *Forest Ecology and Management*, *262*(8), 1460–1472. https://doi.org/10.1016/j.foreco.2011.06.047

**Table 6.** Summary of the areas of forest most vulnerable to each of the five climate threats.

| CLIMATIC THREAT | % OF TOTAL FOREST AREA | VULNERABILITY LEVEL |
|---|---|---|
| **Temperature gradients** | 13.0 | Low |
| **Floods** | 13.6 | Low |
| **Droughts** | 68.0 | Moderate |
| **Strong winds** | 22.5 | Low |
| **Freezing rain** | 15.5 | Low |

**Figure 20** shows the vulnerability of forest areas in the Town of Hudson according to a gradient ranging from Low to High for the five climate hazards assessed. In a forest stand with low vulnerability, 25% or less of the basal area is composed of tree species vulnerable to the threat. In a forest stand with high vulnerability, 75% or more of the basal area is composed of tree species vulnerable to the threat. **Figure 20** provides additional information to **Table 6** above as it shows the spatial distribution of forest stands and highlights those stands with moderate vulnerability.

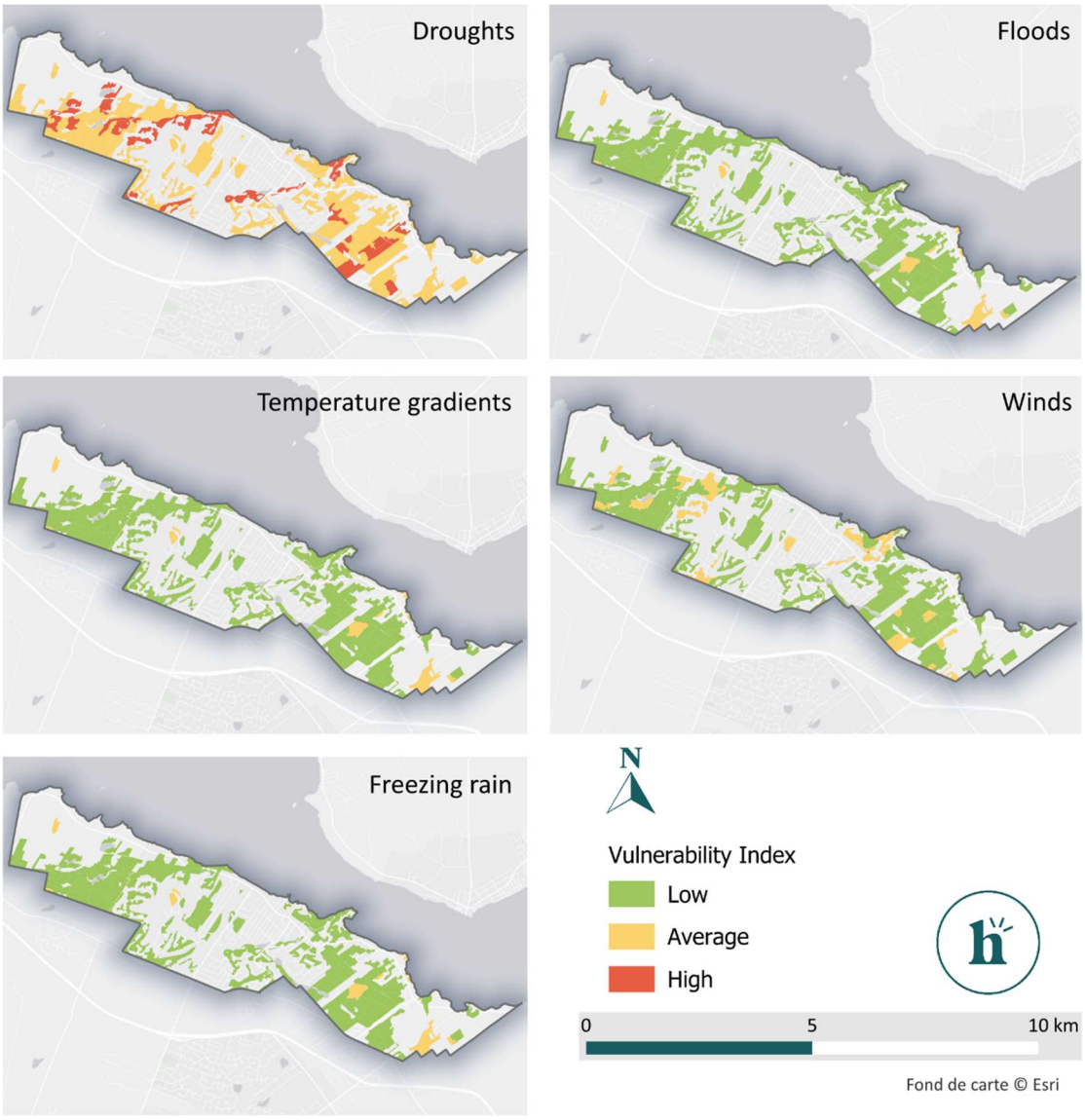


**Figure 20.** Map of the vulnerability of forest areas to climate threats.

The forest areas in the Town of Hudson show relatively high resilience to most of the climate threats assessed.

According to the analysis results, forested areas are most vulnerable to drought (**Figure 20**). Forest bordering watercourses appear to have the highest vulnerability values for this threat and are therefore well positioned in the event of a drought.

For other climate threats, a few areas stand out as having moderate vulnerability values, for example certain areas of the Como plain (Parsons Point) and the Hudson River slopes, but they are vulnerable to no more than two hazards in each area.

### 3.6.2 Vulnerability to biotic threats

The concept of forest vulnerability to biotic threats complements that of climate threats.

Biotic vulnerability analysis makes it possible to identify, among the tree species surveyed, those that are most vulnerable to selected insect or pathogens. This analysis is based on the biotic threats of greatest concern for the territory, namely species that are already present or likely to migrate to the territory soon. However, other biotic threats can be studied using the same protocol. The vulnerability of forest stands in the study area is analyse for sixteen threats:

- Gypsy moth complex, or flighted spongy moth (*Lymantria dispar asiatica, Lymantria dispar japonica, Lymantria umbrosa, Lymantria postalba and Lymantria albescens*) *
- Balsam poplar adelgid *(Adelges piceae)*
- Beech bark disease *(Cryptococcus fagisuga + Neonectria coccinea var. faginata)*
- Walnut canker *(Ophiognomonia clavigignenti-juglandacearum)*
- Dutch elm disease *(Ophiostoma ulmi)*
- Emerald ash borer *(Agrilus planipennis)*
- European spongy moth *(Lymantria dispar dispar)*
- Wood-boring wasp *(Sirex noctilio) **
- Hemlock woolly adelgid *(Adelges tsugae) **
- Red oak ink disease *(Phytophthora ramorum) **
- *Phytophthora* dieback (*Phytopthora cinnamomic*) *
- *Polyphagous* shot-hole borer (*Euwallacea sp. + Fusarium euwallacea*) *
- Asian longhorned beetle (*Anoplophora glabripennis*) *
- Oak wilt desease *(Bretziella fagacearum) **
- Winter moth (*Operophtera brumata*) *
- Spruce budworm (*Choristoneura fumiferana)*

Biotic threats not yet established in Quebec are indicated by an asterisk (*).

As with the climate vulnerability index, the biotic vulnerability index is determined based on evaluation in the literature. A binary index is assigned to tree species according to Brandt *et al.* (2017)[28]. This index is then used to determine what percentage of the basal area of forest stand that could be affected by the threat.

**Table 7** summarizes the results of the vulnerability analysis of forests across the territory for the biotic threats considered most concerning for the study area. The values presented in the table correspond to the cumulative area of forest for which the potential impacts are significant and could affect 75% or more of their basal area. The results indicate that insects from the flighted spongy moth complex pose the greatest threat in terms of impact on the territory. Although monitored, species from this complex are not established in the region.

[28] Brandt, L. A., Derby Lewis, A., Scott, L., Darling, L., Fahey, R. T., Iverson, L., Nowak, D. J., Bodine, A. R., Bell, A., Still, S., Butler, P. R., Dierich, A., Handler, S. D., Janowiak, M. K., Matthews, S. N., Miesbauer, J. W., Peters, M., Prasad, A., Shannon, P. D., … Swanston, C. W. (2017). *Chicago Wilderness region urban forest vulnerability assessment and synthesis* (p. 155). Urban Forestry Climate Change Response Framework Chicago Wilderness Pilot Project. https://doi.org/10.2737/NRS-GTR-168

**Table 7.** Summary of forest areas most vulnerable to each biotic threat. Threats observed in Hudson are shown in bold.

| BIOTIC THREAT | % OF TOTAL FOREST AREA | VULNERABILITY LEVEL |
|---|---|---|
| Flighted spongy moth | 97.5 | High |
| Balsam poplar adelgid | 4 | Low |
| **Beech bark disease** | **2.6** | **Low** |
| **Walnut canker** | **Less than 1** | **Low** |
| **Dutch elm disease** | **1** | **Low** |
| **Emerald ash borer** | **7.9** | **Low** |
| European spongy moth | 14.9 | Low |
| Wood-boring wasp | 5.5 | Low |
| Hemlock woolly adelgid | 12 | Low |
| Red oak ink disease | 2.5 | Low |
| *Phytophthora* dieback | <1 | Low |
| *Polyphagous* shot-hole borer | 44.5 | Moderate |
| Asian longhorned beetle | 65.9 | Moderate |
| Oak wilt disease | 56.8 | Moderate |
| Winter moth | 45.8 | Moderate |
| Spruce budworm | 4.8 | Low |

**Figure 21** shows the vulnerability of each forest stand on a scale from Low to High for the five threats with the highest values in **Table 7**, namely the flighted spongy moth complex, the *Polyphagous* borer, the Asian longhorn beetle, oak wilt, and the late spruce budworm.

In addition, the outbreaks, hosts, and impacts of each insect are presented in **Table 8**. The late spruce budworm is not yet established in Quebec, but is present on Prince Edward Island, in New Brunswick, and in Nova Scotia; it therefore represents a potential threat. Species of the flighted spongy moth complex are not yet established in North America, but cases of introduction have already been detected and eradicated.

**Table 8.** List and description of biotic threats from the vulnerability analysis.

| BIOTIC THREAT | DESCRIPTION |
|---|---|
| **Flighted spongy moth** (*Lymantria dispar asiatica, etc.*) | **Symptoms:** Defoliating insects that feed on the leaves of host species.<br>**Hosts:** More than 600 species of deciduous and coniferous trees, including oak, birch, poplar, and maple.<br>**Impacts:** More threatening than the European spongy moth, they disperse over greater distances and to more host species. Repeated defoliation or defoliation combined with other stress factors can lead to death. |
| **Balsam poplar adelgid** *(Adelges piceae)* | **Symptoms:** Defoliation.<br>**Hosts:** Balsam fir.<br>**Impacts:** Defoliation of trees, which can cause death 4 to 15 years after the infestation begins. |
| **Beech bark disease** *(Cryptococcus fagisuga + Neonectria coccinea var. faginata)* | **Symptoms:** The insect *Cryptococcus fagisuga* Lindinger attacks beech trees (*Fagus*), creating wounds that can become infected by the fungus *Neonectria coccinea* var. *faginata*.<br>**Hosts:** Large-leaved beech.<br>**Impacts:** Leads to i) a decrease in structural diversity through the regeneration of the stand caused by the death of mature beech trees, ii) a decrease in specific diversity caused by the removal of beech trees, which prevents the regeneration of other species, and iii) a decrease in food sources for species such as black bears and striped chipmunks, which feed on the fruit. High mortality. |
| **Walnut canker** *(Ophiognomonia clavigignenti-juglandacearum)* | **Symptoms:** Tree decline.<br>**Hosts:** The butternut tree is the preferred host of the disease, which can also infect black walnut and hybrid walnut plantations, including those derived from the Japanese walnut, *Juglans ailantifolia* Carrière (= J. x *bixbyi*), and the common walnut, *Juglans regia* L.<br>**Impacts:** Once infection has taken hold, it is impossible to control. |
| **Dutch elm disease** *(Ophiostoma ulmi)* | **Hosts:** All species of elm trees in North America.<br>**Impacts:** Blocks the tree's ability to transport water, causing it to die. |
| **Emerald ash borer** *(Agrilus planipennis)* | **Symptoms:** Causes the death of almost all infested ash trees.<br>**Hosts:** All North American ash species.<br>**Impacts:** The emerald ash borer attacks both healthy and weakened ash trees. Damage is not very visible during the first few years of infestation. Trees that have been infested for two or three years have sparse foliage and numerous adventitious shoots appear on the trunk. The larval galleries dug into the cambium cause the bark to split and peel off in places. The emerald ash borer attacks all ash trees with a diameter greater than 2.5 cm and takes three to five years to kill them. |

| BIOTIC THREAT | DESCRIPTION |
|---|---|
| **European spongy moth** *(Lymantria dispar dispar)* | **Symptoms:** Defoliation.<br>**Hosts:** Many hosts, including oak, trembling aspen, willow, and birch trees.<br>**Impacts:** Defoliation of trees, sometimes killing the hosts. |
| **Wood-boring wasp** *(Sirex noctilio)* | **Symptoms:** Causes leaves to wilt and turn yellow.<br>**Hosts:** Conifers of the genera *Pinus, Picea, Abies* and *Larix*.<br>**Impacts:** Attacks living trees. In the southern hemisphere, this wasp is responsible for the death of 80% of pine trees in infested areas. |
| **Hemlock woolly adelgid** *(Adelges tsugae)* | **Symptoms:** Defoliation.<br>**Hosts:** Canadian hemlock.<br>**Impacts:** Defoliation of trees, which can cause death 4 to 15 years after the infestation begins. |
| **Red oak ink disease** *(Phytophthora ramorum)* | **Symptoms:** Burns on shoots, necrosis, and spots on leaf surfaces.<br>**Hosts:** The pathogen has been detected in more than 120 plant species belonging to some 75 genera and 40 families.<br>**Impacts:** Symptoms of the disease vary greatly depending on the host species, but they are obvious on oak trees. Oozing cankers usually appear at the base of the tree. Crown dieback is characterized by yellowing and premature leaf drop in summer. Symptoms of *P. ramorum* infection on other tree and shrub species include shoot blight, necrosis, and spots on the leaf surface. |
| ***Phytophthora* dieback** *(Phytophtora cinnamomic)* | **Hosts:** Several hosts, including American chestnut and oak trees.<br>**Impacts:** High mortality in vulnerable trees. |
| **Polyphagous shot-hole borer** *(Euwallacea sp. + Fusarium euwallacea)* | **Hosts:** Over 200 species attacked by the insect, and over 100 species affected by its symbiotic fungus. Affected species include maple and oak.<br>**Impacts:** High mortality among vulnerable hosts. |
| **Asian longhorned beetle** *(Anoplophora glabripennis)* | **Symptoms:** Insect that attacks the wood and bark of infested trees, affecting the sap transport mechanism (RNC 2015).<br>**Hosts:** Several tree species, including maple, birch, poplar, and other hardwoods.<br>**Impacts:** Causes the death of affected trees. Could cause major damage to maple stands and hardwood stands. |
| **Oak wilt disease** *(Bretziella fagacearum)* | **Symptoms:** Wilting of the tree.<br>**Hosts:** All oak species and varieties. |

| BIOTIC THREAT | DESCRIPTION |
|---|---|
| | **Impacts:** Causes wilting of the tree, followed by death. Spread is rapid; entire stands can be infected in a short period of time. |
| **Winter moth** (*Operophtera brumata*) | **Symptoms:** Defoliating insect that lays its eggs on the trunk, in lichen or in cracks in the bark. Small holes in the leaves or the presence of green caterpillars.<br>**Hosts:** Several deciduous trees, particularly oak and apple trees.<br>**Impacts:** Defoliation of trees. After four consecutive years of defoliation, trees may die. |
| **Spruce budworm** *(Choristoneura fumiferana)* | **Symptoms:** The caterpillars of the gypsy moth completely devour new shoots.<br>**Hosts:** Fir and white spruce are the preferred hosts of the gypsy moth. To a lesser extent, red spruce, Norway spruce, and black spruce are also hosts. During epidemics, it also attacks hemlock and various species of pine and larch.<br>**Impacts:** The caterpillars of the gypsy moth completely devour new shoots and even part of the foliage from previous years when populations are high. A density level of approximately one caterpillar per three shoots is sufficient to destroy 70% of the annual foliage on fir trees. Tree vigor declines significantly when shoots are completely devoured for several consecutive years. Their chances of survival are low if the trees have lost more than 75% of their foliage. |

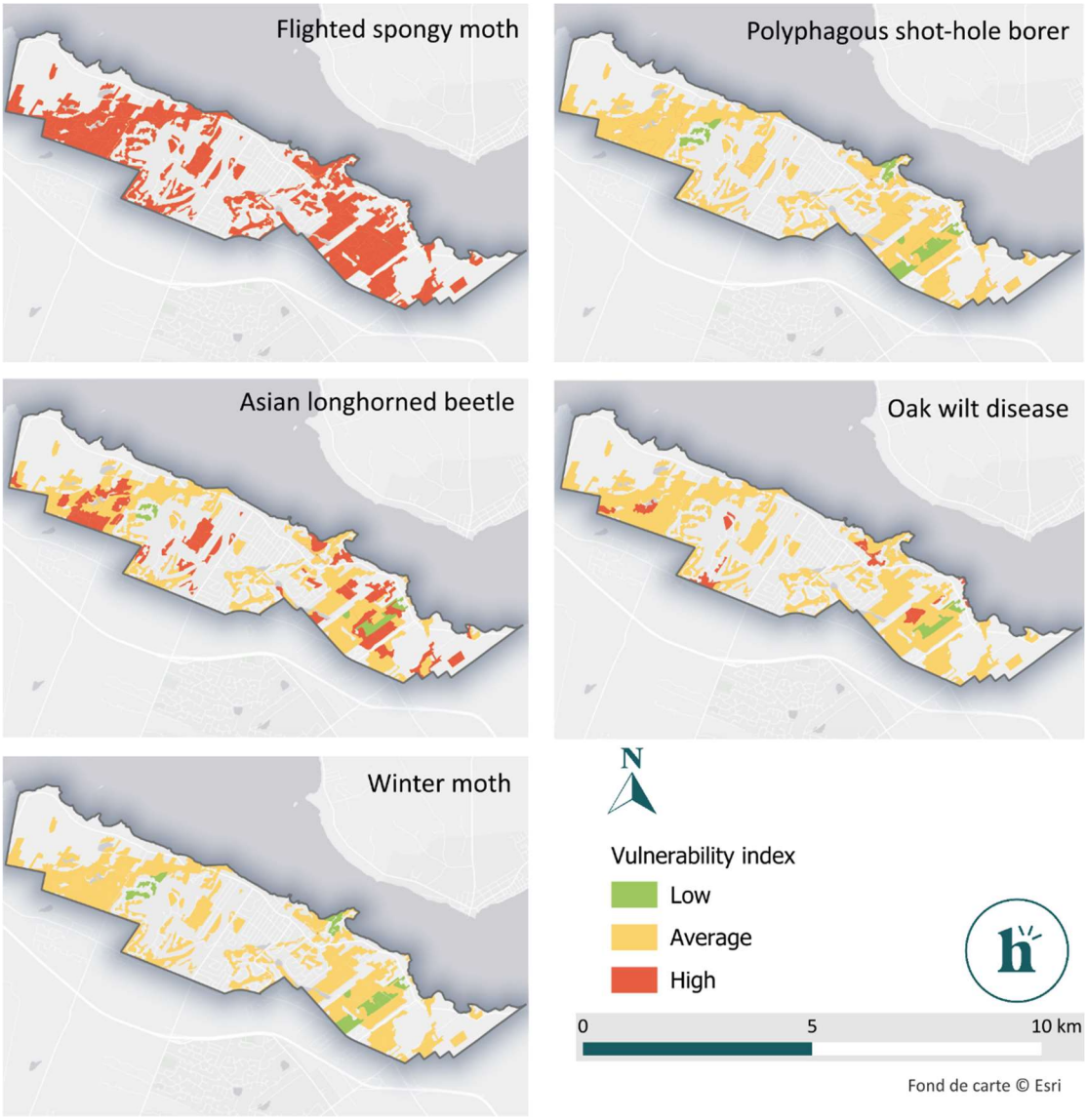


**Figure 21.** Map of the vulnerability of forest areas to biotic threats.

Forest areas have moderate to high vulnerability values for most of the five biotic threats tested, indicating that forest areas are not very resilient to these insects and diseases. The entire territory is particularly vulnerable to species of the flighted spongy moth complex. Some areas also stand out as vulnerable to the Asian longhorn beetle.

The forest areas most resilient to the biotic threats assessed are those located in Sandy Beach, certain areas of Falcon Golf, and certain areas of the Como plain. However, all these areas are highly vulnerable to the threat of the flighted spongy moth complex, which causes defoliation of trees but rarely leads to direct mortality.

**Key points:**

Updating certain analyses already carried out in 2020 has facilitated a diagnosis of the health of Hudson's natural areas. This assessment concluded :

- An important bird hotspot is located in the Choisy plain /Alstonvale escarpment area, and there is a high concentration of herpetofauna sightings in the eastern part of the municipality.
- Natural areas have high ecological connectivity throughout the territory, particularly along watercourses and wetlands.
- On average, forest areas have moderate functional diversity, however a strong representation of only two functional groups across its stands, which makes the territory less resilient.
- Forest areas are highly vulnerable to drought and biotic pressures (particularly flighted spongy moth complex, and the Asian longhorn beetle).
- Forest areas along watercourses are particularly sensitive to climate hazards, especially drought.

# 4- PARTICIPATORY PUBLIC CONSULTATION AND CITIZEN AWARENESS

To gather and incorporate the concerns of Hudson residents into the conservation plan, three public consultation activities were proposed throughout the planning process.

A full report on the consultation activities is included in the appendix to the conservation plan.

*Note: A consultation with environmental organizations and local stakeholders in the Town of Hudson was held in October 2024 to take into account local realities in terms of planning and conservation of natural areas. This meeting provided an opportunity to consider the concerns and expectations of organizations and local stakeholders along with their vision for the conservation and enhancement of natural areas, as well as the levers and constraints for conservation in the area. This consultation is not presented in the consultation report as it was part of the discussions on the planning framework; the points raised are therefore presented in section 2.5 of this report.*

## 4.1 Survey on the value of natural areas

An online survey on the importance of natural areas was developed in collaboration with the Town of Hudson and opened to Hudson residents in October 2024.

The survey results highlighted the importance of natural areas to the population, as well as their willingness to pay for a conservation program and to prioritize conservation or restoration projects that are most important to citizens.

A total of 560 people responded to the survey, representing 10% of the town's population.

The survey results were reviewed and compiled to guide discussions on the action plan, particularly regarding the areas to prioritize for conservation actions and the community's willingness to participate in these efforts.

The main results of the survey were presented during the information evening and workshops.

## 4.2 Information evening and workshops

An information evening on the conservation plan was held for the public in November 2024. The presentation summarized and explained the latest findings, the updated biodiversity and territorial analyses, and the main results of the survey on the importance of the town's natural areas.

Following this presentation, two workshops were offered to participants to solicit and incorporate their ideas and values into the conservation plan. The first workshop invited participants to reflect on the development of conservation priorities by identifying the three natural areas most in need of conservation on a map. During the second workshop, attendees shared their ideas and suggestions on available solutions for the conservation of natural areas in the Town of Hudson.

Approximately 100 people registered to participate in this two-hour evening event, held at the Stephen F. Shaar Community Centre.

The results of the first workshop highlighted the areas that the community considered most important for conservation actions. A prioritization map was created based on the workshop results (**Figure 23**, section 5.2).

The results of the second workshop were also compiled, identifying key themes for conservation actions to be targeted. These results informed the development of the Action Plan for the town's Natural Area

Conservation Plan, as well as the vision and strategic directions on which the plan is based. The Action Plan proposes several actions that were suggested by citizens.

### 4.3 Public consultation evening

Finally, a public consultation was organized in collaboration with the Town of Hudson to present the results of the workshops and preliminary versions of the conservation plan and action plan, giving participants the opportunity to submit their comments on the outcome of the workshops. In addition, a second survey was open for two weeks following the public consultation to gauge public opinion on the elements presented and to provide an opportunity to suggest additional content.

The public consultation was held on March 11, 2025, at the Stephen F. Shaar Community Centre and was open to the public in person and online. Approximately 100 people registered, with about 40 people in attendance.

The comments gathered during the public consultation and in the follow-up survey were taken into account to improve the proposed Conservation Plan.

**Key points:**

Three public consultation activities were carried out in the development of Hudson's Natural Areas Conservation Plan and Action Plan to take into account the concerns and ideas of the citizenry.

- The survey identified the benefits offered by the most important natural areas for the population, gauged the willingness to participate in conservation efforts, and identified conservation projects that were of particular concern to citizens.
- The evening workshop identified priority natural areas for conservation and listed available solutions for the Action Plan.
- The consultation evening aimed to present the preliminary version of the Conservation Plan and gather comments from the public to improve it.

# 5 – CLASSIFICATION OF NATURAL AREAS

The results of the analyses carried out, combined with the votes cast by the public during the information evening and workshops, were used to classify the natural areas in order of conservation priorities. This classification was carried out using a multi-criteria prioritization analysis.

## 5.1 Multi-criteria prioritization – ecological value

A multi-criteria analysis was conducted to identify priority natural areas for conservation using the landscape prioritization and planning software Zonation. This free software is used, among other things, to target areas that are essential for supporting biodiversity while maintaining connectivity between high-quality habitat patches. The inputs to the software are georeferenced criteria that are then analyzed to produce a map of natural areas where each pixel is ranked from 0 to 1 according to its importance for conservation.

The multi-criteria analysis is based on six criteria:

- Connectivity of natural areas;
- Functional diversity of forest areas;
- Biotic vulnerability of forest habitats;
- Abiotic vulnerability of forest habitats;
- Bird hotspots;
- Herpetofauna hotspots.

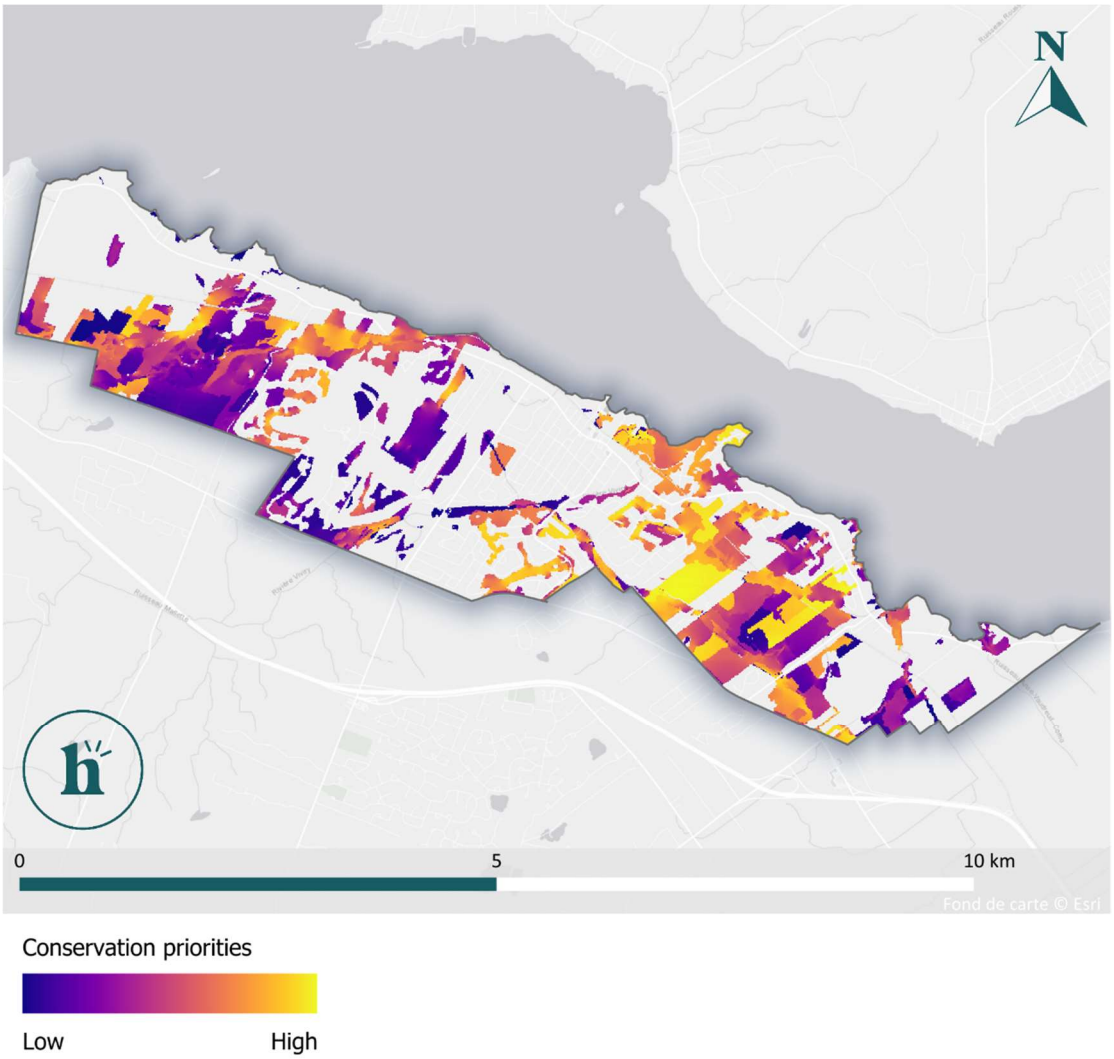


**Figure 22.** Map of conservation priorities based on multi-criteria prioritization analysis.

According to the prioritization gradient presented in **Figure 22**, certain natural areas in Hudson stand out as high priorities for conservation based on the ecological criteria considered. These include natural areas bordering the Fiefs River in the Alstonvale escarpment, east of the Como plain (Sandy Beach and Parsons Point), as well as several natural areas in the western Como plain and on the Hudson slopes.

The natural areas that stand out as the lowest priority are certain natural areas within the Creek 53 Conservation Trust (west of the upper Alstonvale plateau), the Clarke-Sydenham Reserve, and certain small areas of the Como plain and Hudson Hillsides, particularly south of the Como golf course.

## 5.2 Prioritization - citizen perspective

The prioritization votes cast by the population during workshop 1 of the information and workshop evening were compiled to produce the map below (**Figure 23**).

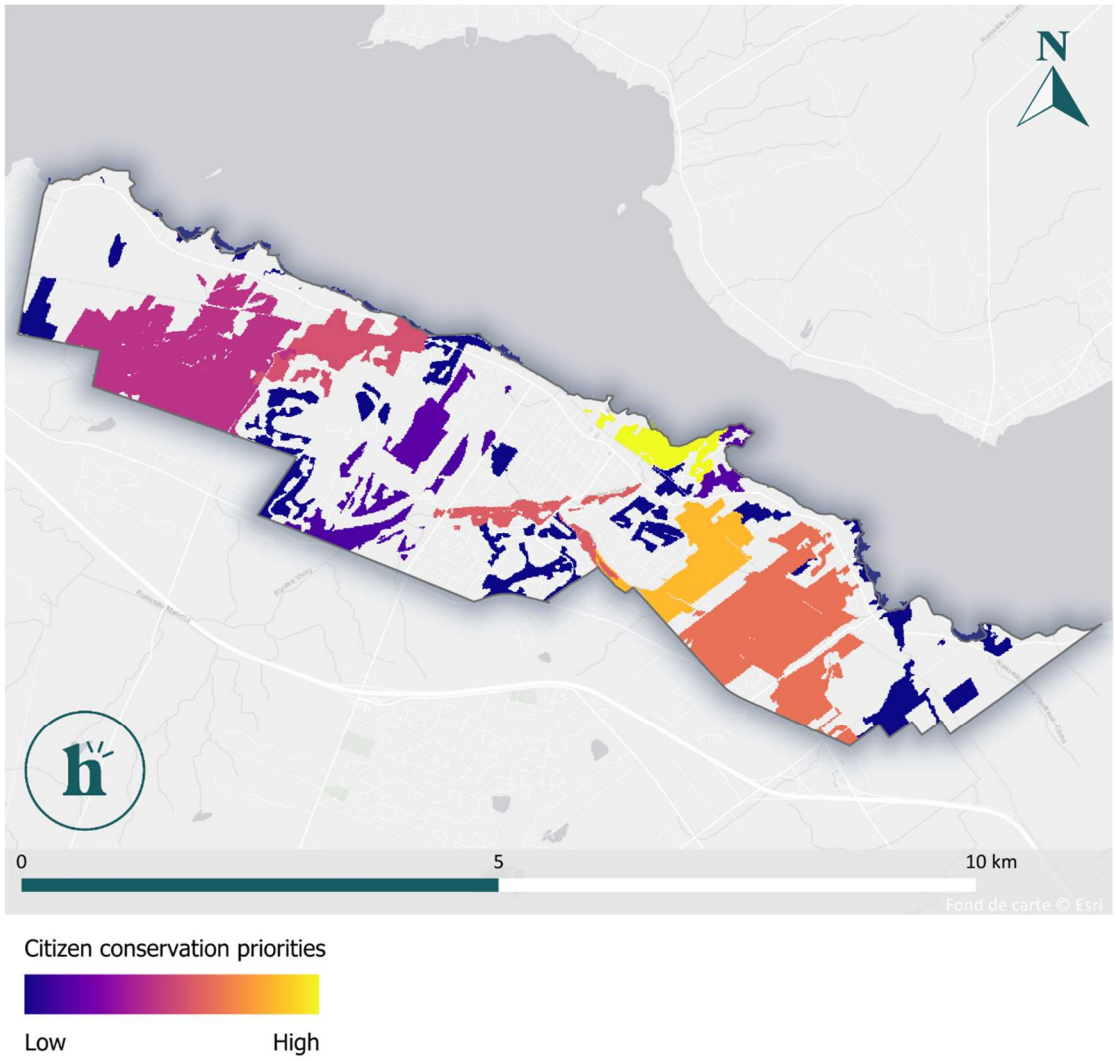


**Figure 23.** Map of citizen conservation priorities.

The natural areas with the highest priority according to the public vote are Sandy Beach and Jack Layton Park, as well as the Davidson Park area.

The East Alstonvale Forest area, the Viviry watercourse (including the Taylor Bradbury Trail and Pine Lake), and the Como Forest and Golf Course area also stand out as moderate priority areas.

The Creek 53 Conservation Trust area does not stand out as a high priority, as this environment is protected by measures put in place by the trust. Priority was focused on those areas for which there are no or few conservation measures at present. However, the trust was highlighted during the evening as an example to follow for the conservation of all natural areas in the Hudson area.

### 5.3 Multi-criteria prioritization - combined

The map resulting from the citizen votes was added as input to the multi-criteria prioritization analysis, and given weight similar to other included criteria. The result is shown in **Figure 24** below.

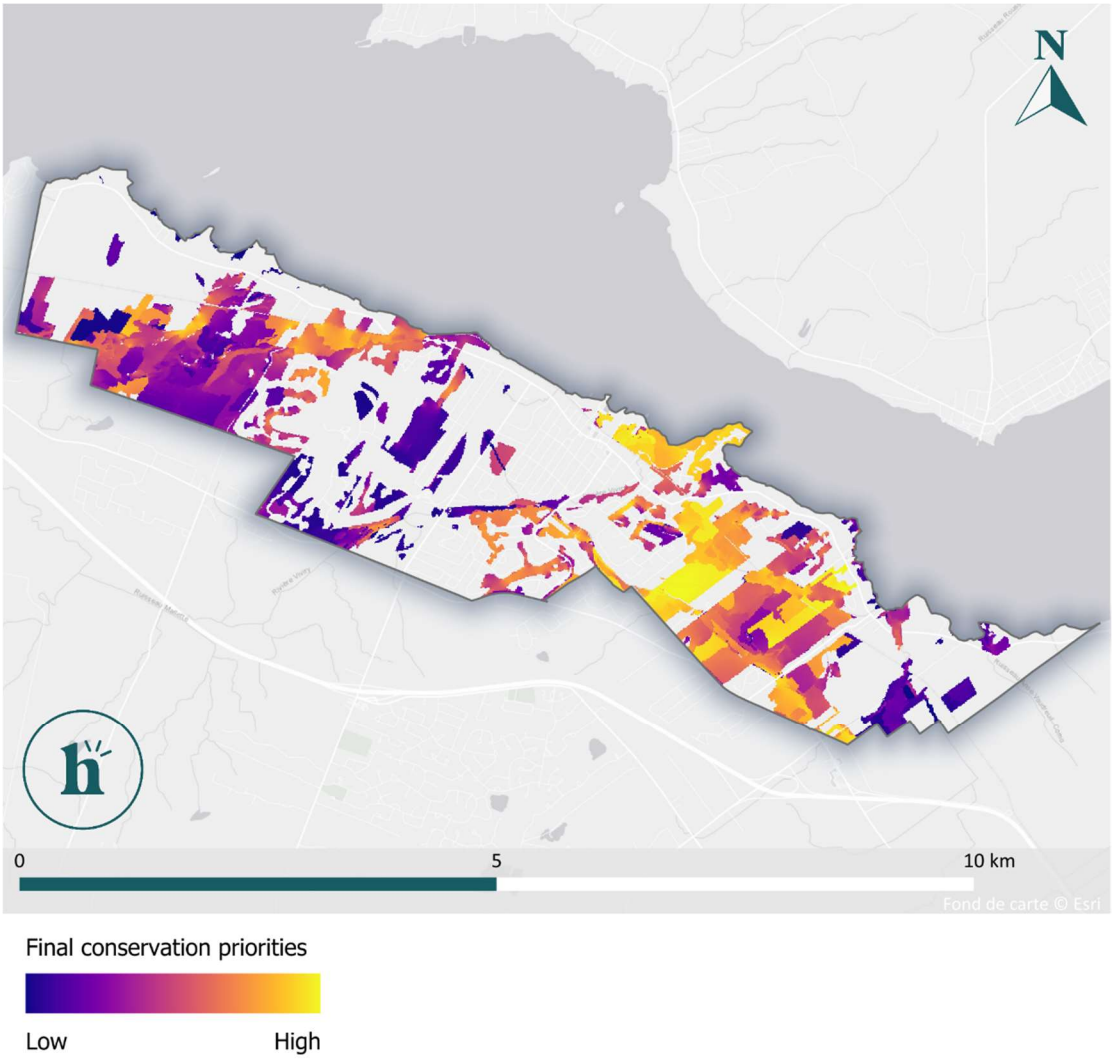


**Figure 24.** Map of conservation priorities from multi-criteria prioritization incorporating citizen votes.

After adding the prioritization map based on citizen votes to the multi-criteria prioritization analysis, the final map shows some differences from the first prioritization (Figure 22). Certain sectors stand out with higher prioritization values, thus defining key areas: the natural areas east of the Alstonvale escarpment, the Viviry River valley, and a large part of the natural areas of the Como plain (Sandy Beach and Parsons Point) and the Hudson slopes.

These areas represent three ecological corridors that follow the main waterways across the Town of Hudson: the Fiefs River, the Viviry River, and Black Creek.

The multi-criteria analysis is a useful tool for visualizing priority areas considering various criteria. However, it should be noted that the Action Plan presented in the second part of this document is also

based on additional criteria (including the planning framework and the presence of SAR, which could not be taken into account in the prioritization), in order to also take into account areas that are important for biodiversity but would not be highlighted by this analysis, such as the Creek 53 Conservation Trust.

**Key points:**

The pooling of natural area prioritization analyses highlights three ecological corridors of interest, all recognized for their structuring role in regional connectivity.

- The Viviry River, which runs through the centre of town and joins Sandy Beach.
- Black Creek, located in the Como sector.
- The Fiefs River, at the Alstonvale escarpment.

# 6 - COMPARISON OF RESULTS FOR 2019–2024

Following the update of certain analyses carried out in the 2020 report, it is important to highlight the possible differences that emerge from this update.

## 6.1 Area of natural areas

In 2019, natural areas accounted for 37% (825 ha) of the Town of Hudson's territory, with 24% wetlands (195 ha) and 76% forest (629 ha). These figures were based on data from the 4th IEQM.

According to data in the 5th IEQM, the area of natural areas has increased slightly to 40.5% of the territory. The proportion of wetlands and natural forest areas is roughly the same, but their total area has changed to 878.2 ha. This difference is due to an increase in the area of forests (increased to 796.6 ha), while the wetlands have decreased (81.6 ha). However, it should be noted that, compared to 2019, forest wetlands were considered as forest ecosystems, which explains the difference in proportion between these two types of ecosystems.

The increase in the area of forest habitats is explained by the updating of the boundaries of these habitats, carried out using data from the 2024 inventory.

## 6.2 Inventory and biodiversity

Several inventories were carried out in the summer of 2024, repeating the process for some of the inventoried sites in 2019. The sites chosen were those where disturbance had been observed through satellite image analysis, or to monitor the evolution of a disturbance noted in 2019. Thus, **Figure 25** shows that some inventory points carried out in 2024 are not in natural areas, as these were lost due to certain anthropogenic disturbances (urban development).

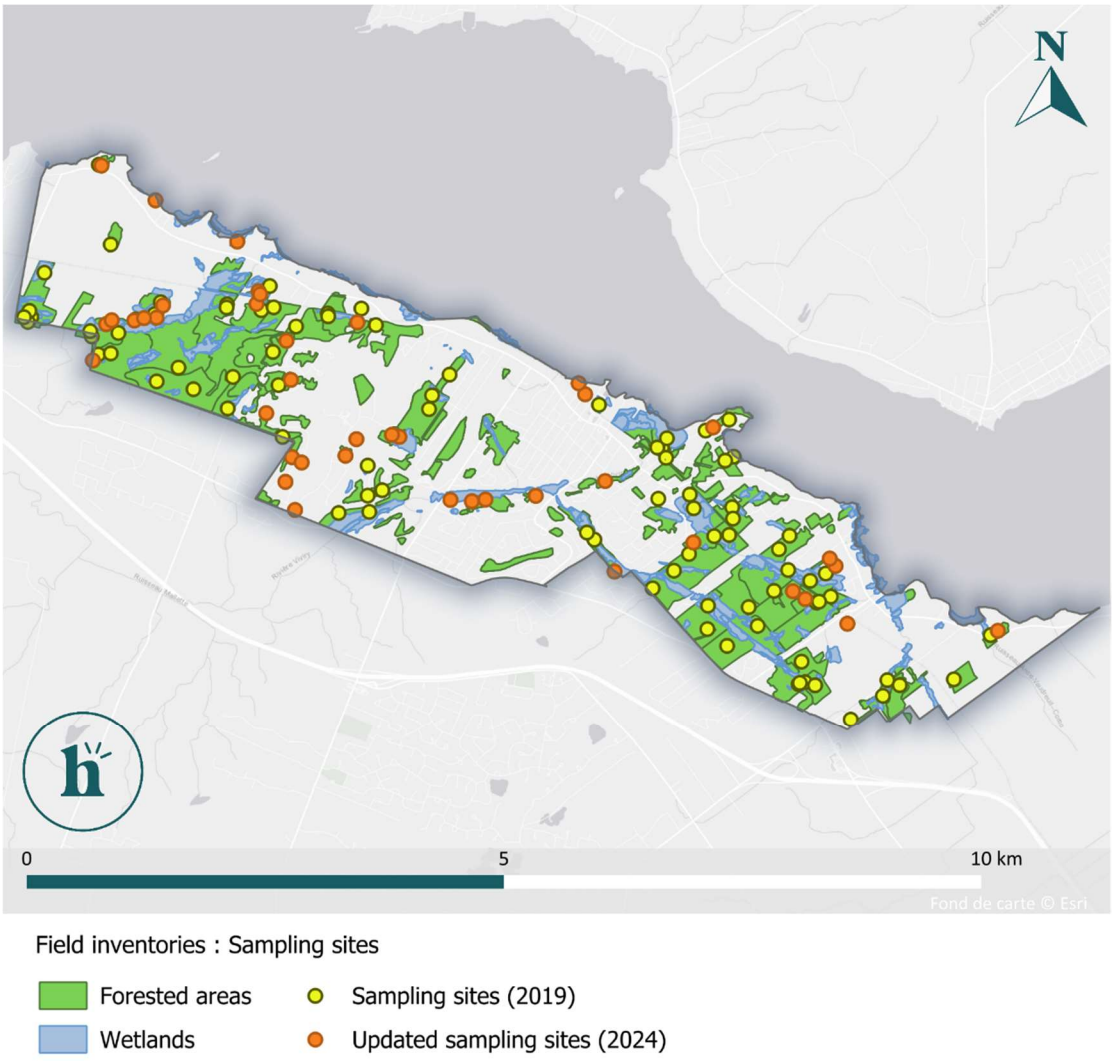


**Figure 25.** Breakdown of inventoried sites in 2019 and 2014.

In terms of SAR species, the 2020 report identified three plant species with status in the Hudson territory and only one endangered wildlife species. These data were taken from the CDPNQ (with LEMV status). This increased to four wildlife species and five plant species in 2024.

This report also takes into account SARA and COSEWIC-listed species in the biodiversity profile of the territory and considers other data sources to provide a more complete picture. The total number of SAR species has therefore increased to 31 animal and plant species with a SAR status.

The location of species with SAR status has also changed since the publication of the 2020 report, where they were indicated as present only along the Ottawa River shoreline and in the Como Forest and natural areas connected to Davidson Park. According to current data, species with SAR status are also found at Parsons Point and Sandy Beach, as well as at the Clarke-Sydenham Reserve and in the natural areas surrounding the Alstonvale escarpment.

### 6.3 Bird and herpetofauna hotspots

Hotspot of bird observation changed slightly between 2019 and 2024. The map included in the 2020 report shows three hotspots, at the Fiefs River, north of the Clarke-Sydenham Reserve, and at Sandy Beach. The 2024 results show bird hotspots in the same locations, but the radius is much larger, demonstrating a larger gradient of high bird presence connecting these three sites.

In terms of herpetofauna, the two maps are very similar, with only the epicentre of the hotspot in the Como sector being, located further south in 2024 (along Black Creek) than in 2019 (near the banks of the Ottawa River).

### 6.4 Local connectivity

The analysis of local connectivity shows little difference between 2019 and 2024, both in terms of current flow connectivity by species and overall connectivity.

In 2019 and 2024, black bears had the highest current flow connectivity values across the territory's natural areas. We also note that connectivity is strong for the American marten across most of the territory in the 2024 results. In general, connectivity is similar for the five species, with a slight decrease in the Como plain. Conversely, connectivity is slightly higher across the Viviry corridor. The natural areas of Parsons Point, Sandy Beach, the Fiefs River, and Black Creek maintain high connectivity values across the landscape.

For overall connectivity, the results are relatively similar between the 2024 analysis and those in the 2020 report. Some natural areas on the Alstonvale escarpment currently appear to have low connectivity, whereas they had higher values in the 2019 analysis. Natural areas with high connectivity values remain largely the same, however, the area surrounding Black Creek shows higher connectivity in 2024. The differences are explained by the prioritization software used, a new version of which has been available since 2019.

### 6.5 Functional diversity

The maps resulting from the functional diversity analysis of forest habitats in Hudson's natural areas do not show many differences between 2019 and 2024 in terms of areas of High and Low values. However, a direct comparison in the proportion of each functional group is not possible as the functional groups have been updated since 2019.

### 6.6 Vulnerability to biotic and abiotic threats

Forest in Hudson appear to be generally more vulnerable to biotic threats than in 2019. The proportion of vulnerable forest has increased for most of the threats analyzed, although the level of vulnerability remains low for most threats. It has risen to intermediate values for the Asian longhorn beetle, sudden oak death, and the flighted spongy moth. The most notable difference is the vulnerability to species of the spongy moth complex, which has increased from Low to High for all forest areas. These changes can be explained by the update of the IEQM data between 2019 and 2024 (5th inventory versus 4th inventory used in 2024) which captures evolution in forest stand composition and structure.

In terms of climate threats, only tolerance to flooding and drought were analyzed in 2019. According to the results of the analysis updated in 2024, forest areas are still relatively tolerant to flooding and moderately tolerant to drought.

### 6.7 Workshop results (conservation priorities)

As in 2019, Hudson residents were invited to rank the natural areas within the municipal territory according to conservation priority. Although the prioritization method differs between the two reports, it is possible to evaluate the differences based on the maps obtained. It is noticeable that the key areas targeted for conservation by the population are largely the same. However, the natural areas north of the Clarke-Sydenham Reserve have a low priority score in 2024, unlike in 2019 when the score was high. As well, the natural areas of Sandy Beach stand out with higher values than in 2019.

### 6.8 Final conservation priorities

The map showing the final conservation priorities (incorporating the results of the analyses and the public vote) shows significant differences between 2019 and 2024.

The eastern slope of Alstonvale, i.e., the natural areas bordering the Fiefs River, has higher values than in 2019. Several natural areas in the Como sector and near Davidson Park also have higher values.

Conversely, the Clarke-Sydenham Reserve now has low values, as do the natural areas bordering the western part of the Viviry River.

**Key points:**

The update of the territory profile and certain analyses presented in the 2020 report shows some minor changes in the results.

- The area of forest areas has increased slightly, according to the updated delimitation during the summer 2024 field inventory.
- This report highlights a greater number of SAR species, as more sources were consulted.
- The natural areas with high connectivity values remain similar.
- The vulnerability results for forest habitats show differences that are explained by an improved methodological approach.
- Several natural habitats in the eastern and western sections of the territory are now considered priorities for conservation.

## 7 – SUMMARY OF THE STATUS AND CHALLENGES BY TYPE OF NATURAL AND SEMI-NATURAL AREA

The portrait of the territory, the definition of the planning framework, and the various analyses presented above have made it possible to characterize and highlight the issues affecting the various natural and semi-natural areas present in Hudson's territory. The table below summarizes these points for natural and agricultural areas.

| **WETLANDS (including forested wetlands)** | |
|---|---|
| Description | Land use: Accounts for 14.4% of the territory.<br>Geographical location: Wetlands are distributed across the territory along four main waterways and along the banks of the Ottawa River.<br>Different types of wetlands are present: waterways, swamps, marshes, peat bogs.<br>Biodiversity: Significant biodiversity (many species of wildlife and plants), including SAR and IAS species |
| Status | Wetlands of metropolitan interest, protected by RCI-2022.<br>Wetlands and water bodies protected by Law 132 and the PRMHH.<br>Prohibition on wetland in-filling and required expansion of the riparian strip to 15 metres for vacant land (RCI 767-2024 and 768-2024). |
| Issues | Benefits: Wetlands are very important for filtering surface water and groundwater (urban development plan).<br>Analysis: The natural areas are highly connected. Forest areas are characterized by moderate functional diversity, sensitivity to drought, and sensitivity to biotic threats.<br>Constraints: Susceptibility to development. |

| **FORESTS (including wasteland and scrubland)** | |
|---|---|
| Description | Land use: Accounts for 26.8% of the territory.<br>Geographical location: Throughout the territory, with a concentration along the Alstonvale escarpment and the upper Hudson Heights plateau, as well as in the Como plain and on the slopes of the Hudson River.<br>Different types of forests present: mixed, deciduous, and coniferous.<br>Biodiversity: Presence of SAR species, particularly in mixed forests. Presence of IAS species.<br>Several SAR species are open habitat species and therefore present in fallow lands. |
| Status | Forest areas of metropolitan interest, protected by RCI-2022.<br>Protection guidelines defined by the RCMs tree and woodland policy (PAB).<br>The Clarke-Sydenham Reserve and the Driscoll-Naylor Sanctuary are protected by |

| FORESTS<br>(including wasteland and scrubland) | |
|---|---|
| | their status as “voluntary conservation areas.”<br>The Creek 53 Conservation Trust ensures the protection of private lands under its management. |
| Issues | Analysis: Mixed forests are characterized by high connectivity, moderate functional diversity, high sensitivity to drought, and some sensitivity to biotic threats.<br>Deciduous forests have moderate connectivity, variable functional diversity, moderate sensitivity to drought, and sensitivity to biotic threats.<br>Coniferous forests are characterized by low to moderate connectivity, low functional diversity, high sensitivity to drought, moderate sensitivity to wind, and sensitivity to biotic threats.<br>Scrublands and shrublands are characterized by low connectivity, moderate sensitivity to drought and wind, and sensitivity to biotic threats. |

| AGRICULTURAL AREAS | |
|---|---|
| Description | Land use: Accounts for 17.3% of the territory.<br>Geographical location: Agricultural areas are located at both ends of the territory, in the Choisy plain and in the east of the Como plain.<br>Biodiversity: Provincially designated SAR present (provincial or regional) threatened by agricultural activities (early mowing and agriculture intensification), and present in fallow land. |
| Statuts | The permanent agricultural zone was established in 1990 by the *Act respecting the protection and development of the agricultural area.*<br>These zones could be targeted to realize actions 8 and 18 of the RCM Vaudreuil-Soulanges PDZA action plan. |
| Issues | There are potential landslide zones in both the east and west.<br>Analyses: N/A |

Pooling these issues highlights the areas that the Natural Area Conservation Plan's Action Plan needs to address (**Figure 26**). The conservation actions proposed in the action plan are designed to address these issues.

### 7.1 Importance of hydrology

Following the identification of priority conservation areas through prioritization analysis, and other elements highlighted in the Conservation Plan, three biodiversity corridors were identified as particularly strategic: the Viviry corridor, the Black Creek corridor, and the western wooded area (Western Forest) (**Figure 26**). Their selection is based on specific criteria, such as their biological richness, their contribution

to ecological connectivity, their level of disturbance, and their vulnerability to pressures within the territory. A central element connects them: the presence of a key watercourse.

The hydrology is, in a sense, the ecological backbone of the Hudson area. The Ottawa River, with its wide banks, and a dense network of secondary waterways—including the Viviry River, which runs through the city from south to north—not only shape the landscape, but also support biodiversity, hydrological regulation, and species movement. For a town the size of Hudson, having such a hydrological network is an exceptional ecological asset that must be valued as the foundation of a coherent conservation plan.

## APPENDIX 1 - DOCUMENTATION CONSULTED

The various documents consulted in drawing up the Conservation Plan and its Action Plan are presented below.

Study reports and plans for the Town of Hudson:

- TechnoRem Inc. report (2005), Chapter 4 on geology and hydrology
- Pine Lake - Hydrogeological study AMEC (2014)
- Study conducted by McGill University and COBAVER-VS for the Viviry Corridor project (2016)
- Pine Lake Dam Scenarios (2016)
- Akifer Hydrogeological Report (17269-101 Rapport puits P-4) (2018)
- Case study of ecosystem management in the Town of Hudson (2021)
- Report "Ecological characterization of an area of interest in Hudson" by TerraHumana for Nature Hudson (2021)
- Town of Hudson Tree Policy Proposal (not in force) (2022)
- Drinking Water Source Protection Plan (forthcoming)
- Groundwater Recharge zone Protection Plan (forthcoming)
- Master Pan for Parks and Green spaces (forthcoming)

Regulatory documents (governmental and regional):

- Kunming to Montreal Global Biodiversity Framework
- Government of Quebec's OGAT
- PDZA of the RCM Vaudreuil-Soulanges
- Hudson’s Urban Plan
- The Quebec Government's 2030 Nature Plan
- PMAD (under revision, not in force) of the MRC Vaudreuil-Soulanges
- Tree and woodland policy of the RCM Vaudreuil-Soulanges
- PRMHH of the Vaudreuil-Soulanges RCM
- SADR of the Vaudreuil-Soulanges RCM

## APPENDIX 2 - INPUTS TO LOCAL CONNECTIVITY FOR THE 5 REFERENCE SPECIES

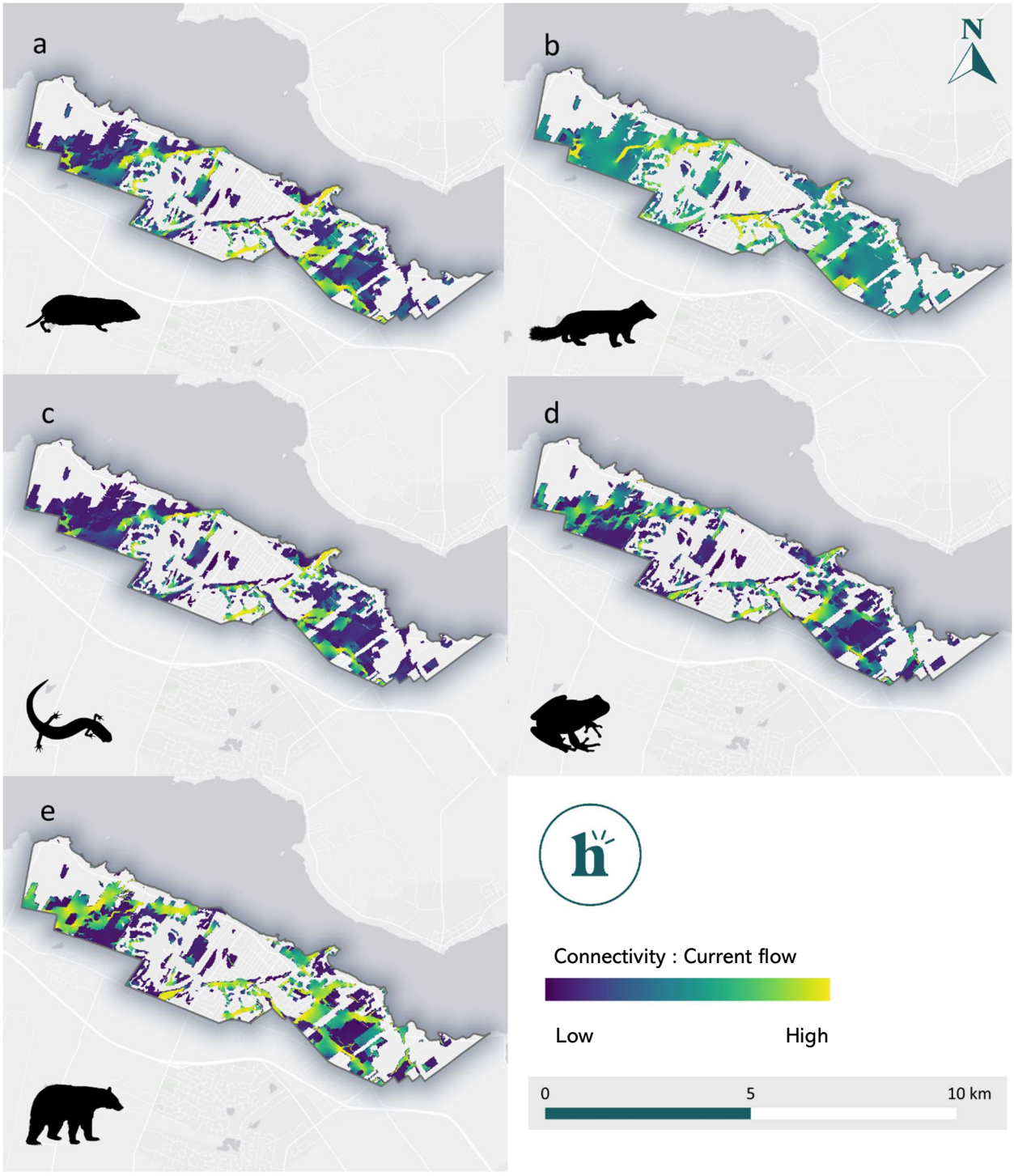


**Figure 26**. Connectivity: current flows for each reference wildlife species.

**Figure 27** shows the current flow for each reference species: northern short-tailed shrew (a), American marten (b), red-backed salamander (c), wood frog (d), and black bear (e).

For all five species, current flow is highest in the Fiefs River, some environments bordering the Viviry River, and around the Black Creek stream. A few natural areas in the Como plain area stand out with high connectivity values.

For the northern short-tailed shrew, American marten, red-backed salamander and wood frog, the natural areas of Pointe Parsons have a high connectivity value, while for the black bear, the natural areas of Sandy Beach also show high values. Finally, connectivity is highest for the American marten across the entire territory. Black bear connectivity is also high across much of the territory, as it is a generalist species that tolerates anthropogenic disturbance well and has a great capacity for movement.

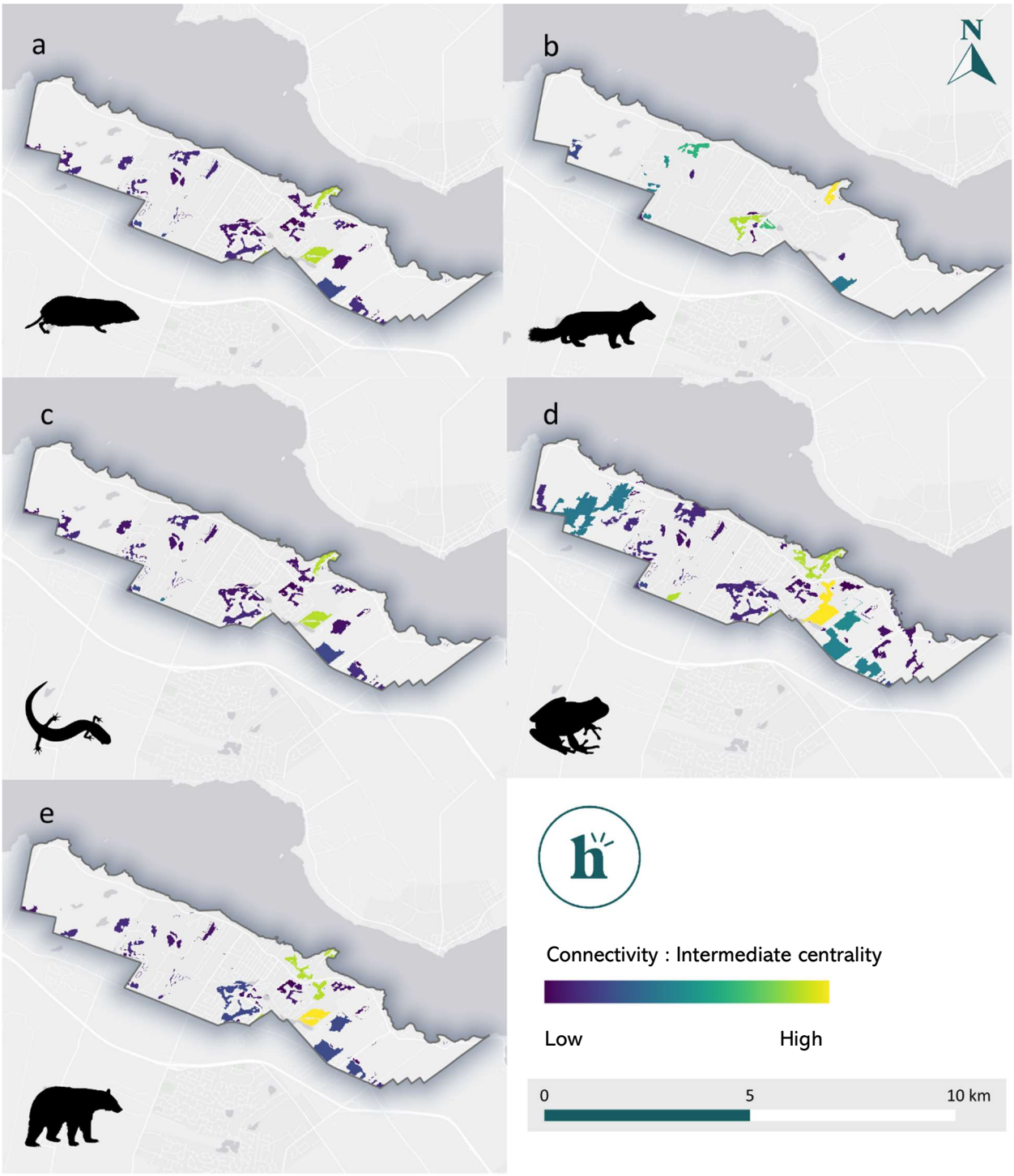


**Figure 27 . Connectivity: centrality for each reference wildlife species.**

**Figure 28** shows the centrality for each reference species: northern short-tailed shrew (a), American marten (b), red-backed salamander (c), wood frog (d), and black bear (e).

For all five species, centrality is highest in the natural areas of Sandy Beach and Pointe Parsons, as well as in the Como sector, close to Taylor Bradbury Park.

Wood frog connectivity is strongest across the entire territory. In contrast, few natural areas stand out for the centrality of the American marten.

# APPENDIX 3 - CONSULTATION REPORT

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