



Protected areas
in Québec:

A Lifelong Heritage

Réserve de biodiversité des Drumlins-du-Lac-Clérac



CONSERVATION PLAN

Québec 

Notice

This conservation plan was updated in March 2022 solely for the purpose of adjusting the references to certain legislative provisions following the coming into force of the Act to amend the Natural Heritage Conservation Act and other provisions (2021, c. 1) and the Regulation respecting certain transitional measures necessary for the application of the Act to amend the Natural Heritage Conservation Act and other provisions (Order in Council 198-2022 of February 23, 2022).

Cover page photos: woodland caribou: Ministère des Forêts, de la Faune et des Parcs; other photos: André R. Bouchard and Marc-André Bouchard, Ministère de l'Environnement et de la Lutte contre les changements climatiques.

Reference to cite:

Gouvernement du Québec. 2022. Conservation Plan, Réserve de biodiversité des Drumlins-du-Lac-Clérac. Québec, Ministère de l'Environnement et de la Lutte contre les changements climatiques, Direction des aires protégées. 17 pages.

Contents

Introduction.....	1
1 The territory of Réserve de biodiversité des Drumlins-du-Lac-Clérac.....	1
1.1 Official toponym	1
1.2 Boundaries and location	1
1.3 Ecological portrait	2
1.3.1 Physical environment.....	2
1.3.2 Biological environment.....	3
1.3.3 Ecological representativeness	5
1.3.4 Ecological zones	6
1.3.5 Outstanding ecological elements.....	7
1.4 Land occupation and uses	7
1.4.1 Particular heritage elements	8
2 Conservation and management issues.....	8
2.1 Introduction	8
2.2 Protection of biodiversity.....	8
2.3 Knowledge acquisition and environmental monitoring	9
2.4 Conservation and management objectives.....	9
3 Zoning	10
4 Activity framework applicable to Réserve de biodiversité des Drumlins-du-Lac-Clérac.....	10
4.1 Activity framework established by the Natural Heritage Conservation Act.....	11
4.2 Activity framework established by the Regulation respecting the Réserve de biodiversité des Drumlins-du-Lac-Clérac	11
5 Activities governed by other laws.....	11
6 Management	12
6.1 Responsibilities of the Minister of the Environment and the Fight against Climate Change	12
6.2 Monitoring	13
6.3 Participation of stakeholders.....	13
Bibliographical references	14
Appendix 1 — Boundaries and location	15
Appendix 2 — Ecological zones.....	16
Appendix 3 — Occupation and uses	17

Introduction

By Order in Council No. 636-2005 of June 23, 2005, in accordance with the *Natural Heritage Conservation Act* (chapter C-61.01), the government authorized the Minister of Sustainable Development, Environment and Parks to create Réserve de biodiversité projetée des Drumlins-du-Lac-Clérac, and approved the boundaries and conservation plan proposed for it. The creation of this provisional protected area by the ministerial order of July 27, 2005 (2005, G.O. 2, 4072), came into force on September 7, 2005 for a duration of four years. This provisional protection status was extended twice, first until September 7, 2013 by order of the Minister of Sustainable Development, Environment and Parks on July 17, 2009 (2009, G.O. 2, 2233), and then until September 7, 2021 by order of the Minister of Sustainable Development, Environment, Wildlife and Parks on March 13, 2013 (2013, G.O. 2, 769).

On January 26, 2012 the Minister of Sustainable Development, Environment and Parks (MDDEP) mandated the Bureau d'audiences publiques sur l'environnement (BAPE) to hold public consultations on ten proposed protected areas in the Saguenay–Lac-Saint-Jean region, one of them being Réserve de biodiversité projetée des Drumlins-du-Lac-Clérac. This mandate was given to the BAPE in accordance with the *Natural Heritage Conservation Act*. The BAPE's mandate began on February 13, 2012 and concluded on July 20 of the same year. The consultation was held in March and April 2012 in Saguenay and Saint-Félicien. The BAPE's inquiry and public

hearing report (No. 287) was submitted to the Minister on July 20, 2012 (BAPE, 2012). In its report, the commission recommended giving permanent protection status to Réserve de biodiversité projetée des Drumlins-du-Lac-Clérac, with the enlargements jointly proposed during hearings by the MDDEP and the Ministère des Ressources naturelles. Additionally, to widen the corridor connecting the reserve to the neighbouring protected area (Réserve de biodiversité projetée Albanel-Témiscamie-Otish), the Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC) accepted some of the enlargement proposals made by forestry company Produits Forestiers Résolu during the public hearings of 2012.

1 The territory of Réserve de biodiversité des Drumlins-du-Lac-Clérac

1.1 Official toponym

The toponym “Réserve de biodiversité des Drumlins-du-Lac-Clérac” reflects the presence, near Lac Clérac, of a particular type of moraine¹ called *drumlins*. A drumlin is a rounded hill, semi ovoid or ellipsoidal in shape (like the back of a whale), formed under a moving glacier and oriented in the direction of ice flow (Robitaille and Allard, 2007).

1.2 Boundaries and location

The boundaries and location of Réserve de biodiversité des Drumlins-du-Lac-Clérac are shown on the map comprising Appendix 1.

¹ Moraine: topographic expression of accumulations of glacial sediments of sufficient size to create a relief.

The reserve is located about 200 km north of the municipality of Dolbeau-Mistassini and 125 km northeast of Chibougamau, between 50°26' and 50°44' north latitude and between 72°42' and 73°06' west longitude. It covers an area of 449 km² and is entirely within the administrative region of Saguenay–Lac-Saint-Jean. West of Lac Boudreault, a forest road is excluded from the reserve, dividing the protected area into two sections. The reserve intersects unorganized territories at the extreme north of the municipality of Rivière-Mistassini (Maria-Chapdelaine MRC). In the northeast, the reserve overlaps what is at present Réserve de biodiversité projetée Albanel-Témiscamie-Otish. When the latter is given permanent protection status, with a new name and adjusted boundaries, the boundaries of the reserve will run along two sectors of what will then be called Parc national Nibiischii.

Wherever possible, the boundaries of the reserve were defined on the basis of natural or anthropic elements that are easily identified on the ground, such as watercourses, lakes, forest roads and the edges of bogs. For sections along the banks of a water body (e.g. Lac Clérac in the southwest), the real boundary is the natural high-water mark. Where the boundary corresponds to a forest road, the right of way of the road is excluded from the protected area. The legal boundaries of the reserve are defined in the technical description and the survey map prepared by land surveyor Pierre Hains with the following minutes 11 631 (April 23, 2018) and filed in the surveying archives of the Surveyor General of Québec (Greffes de l'arpenteur général du Québec), Ministère de l'Énergie et des Ressources naturelles under document number 536702.

1.3 Ecological portrait

1.3.1 Physical environment

The biodiversity reserve is in the northern part of the Central Laurentian natural province (Li *et al.*, 2019). It is in Grenville geological province, but near the contact zone with Superior geological province, to the north, where the general elevation is much higher. Grenville geological province corresponds to the roots of a chain of mountains formed nearly a billion years ago, during the Grenville orogeny. Gneiss, anorthosite and granite dominate the rock foundation. The relief of the reserve and environs is one of the least rugged in the natural province, corresponding to the Lac Manouane Depression natural region. The general physiography of the latter is that of a macro cuesta, the frontslope of which is on the northwest edge (Grenville front). Its relief is dominated by often elongated hollows with thick glacial deposits, separated by small blocks of mounds or isolated hillocks, mostly with a drumlinoid shape and a north/south or northeast/southwest orientation.

Like the natural region, Réserve de biodiversité des Drumlins-du-Lac-Clérac presents a fairly even relief, formed essentially of hillocks (25 to 50 metres in height). The elevation generally ranges from 455 to 550 m, except for two low hills (100 to 200 metres in height) northeast of Lac Clérac, whose summits have an elevation of 600 metres.

The dominant surface deposits, of glacial and fluvioglacial origin, are often covered by organic deposits (bogs). Thousands of hectares of bogs dominate the landscape to the west and north of Lac Clérac, where there are also drumlins.

Near Rivière Nestaocano, at the western edge of the reserve, the dominant surface deposits are of fluvioglacial origin (proglacial and ice-marginal deposits), along with dunes stabilized by forest stands and one esker. There are also large areas of dead-ice moraine (especially near Lac Kaamichaapuhskau) and of Rogen or ribbed moraine near Lac Boudreault. Less than 30% of the soils of the reserve have good to moderate drainage.

In the last glaciation, the flow of the ice sheet profoundly marked the land. Thus, as with the drumlins, the other surface deposits along with the hydrographic network are generally oriented north/south or northeast/southwest, in the direction of glacial flow. Throughout the eastern half of the reserve, bands of fluvioglacial deposits, aligned northeast/southwest, alternate with bands of glacial deposits (ground moraine with no particular morphology [undifferentiated till]), with countless little areas of organic deposits scattered within them.

The reserve is essentially at the head of Rivière Nestaocano, a tributary of Rivière du Chef, which empties into Rivière Ashuapmushuan. To the northeast, the thinner section connecting the reserve to Réserve de biodiversité projetée Albanel-Témiscamie-Otish (the future Parc national Nibiischii) is at the head of the Rivière Mistassini watershed. The northeast and northwest boundary is very close to the height of land separating the great watersheds of the St. Lawrence and James Bay (via Rivière Rupert). As a result, the reserve's aquatic ecosystems, wetlands and near-shore environments have outstanding ecological

integrity. Water bodies are abundant, accounting for nearly 16% of the area of the reserve, though only lakes Clérac, Kaamichaapuhskau, Boudreault, Minie, Jules and Atshikash ("mink lake" in Innu) and Rivière Nestaocano have official toponyms.

According to Gerardin and McKenney (2001), the territory of the reserve is subject to a cold subarctic continental climate, subhumid with a medium growing season. Average temperatures are on the order of -9.4 to -6.0 °C. The average annual precipitation ranges from 800 mm to 1359 mm, while the average growing season is 150 to 179 days.

1.3.2 Biological environment

Vegetation: Though located in the heart of the spruce/moss bioclimatic domain, the reserve has very few productive wooded areas: in 57 % of the reserve there are no forests at all (Table 1), while nearly half of the areas that do have forest present poor drainage conditions. Black spruce stands (often of low density) predominate, along with dry barrens. Grey pine stands (also often of low density) are well represented, associated with fluvioglacial deposits and dead-ice moraine.

Table 1: Forest summary of the territory of Réserve de biodiversité des Drumlins-du-Lac-Clérac (MFFP, SIEF, 4th ten-year survey)

Type of cover		Area (ha)	Proportion (%)
Forest	Coniferous	22 642.3	50.4%
	Regenerating	1542.6	3.4%
	Alder stands	433	1.0%
	Wet barrens	8990.5	20.0%
Other	Dry barrens	4095.3	9.1%
	Water	7097.6	15.8%
	Island	48.1	0.1%
	Flooded	55.6	0.1%
Total		44 911	100.0%

The rare stands of balsam fir are confined to the slopes of the two low hills northeast of Lac Clérac. The bogs are immense, sometimes structured and very abundant to the west and north of Lac Clérac, while heathlands are common in the central part of the reserve. In 1996 a fire burned nearly 1000 hectares of forest along the western edge of the reserve. Old-growth forest (> 90 years) accounts for 61% of the forest cover, yet represents just 30% of the total area of the reserve, due to the abundance of non-forest environments (water, wetlands and barrens). A quarter of the wooded areas have poor drainage (levels 4, 5 and 6), and 92.8% are of low density (levels C and D). The reserve includes a territory designated as a “biological refuge” (#02551R146, see Appendix 3) under the Sustainable Forest Development Act. Created in 2008, the refuge has preserved old-growth forest since then.

No plant survey specific to the territory of the reserve has been done, but in 1990 observations were made at several ecological sampling points (Table 2), to the east of Lac Clérac and west of

Lac Boudreault. Besides the species listed in Table 2, the MELCC also identified early meadow-rue (*Thalictrum dioicum*), shrubby cinquefoil (*Potentilla fruticosa*) and narrowleaf gentian (*Gentiana linearis*) in an inventory conducted in 2008.

Wildlife: With regard to wildlife, no survey specific to the territory of the reserve has been done, but telemetric monitoring has confirmed that woodland caribou frequent almost all of the reserve, both in winter and during the rut and calving periods. The woodland caribou is considered a threatened species across Canada and vulnerable in Québec. The territory of the reserve is thus included in the area of application of the *Plan de rétablissement du caribou forestier (Rangifer tarandus caribou) au Québec — 2013-2023* (ÉRCFQ, 2013) (recovery strategy for woodland caribou, boreal population).

Table 2: Species identified at 6 ecological observation points surveyed for the ecological inventory program of the MFFP (1986-2000).

Tree species	Black spruce (<i>Picea mariana</i>), grey pine (<i>Pinus banksiana</i>), balsam fir (<i>Abies balsamea</i>)
Shrubs	Speckled alder (<i>Alnus incana subsp. rugosa</i>), serviceberry (<i>Amelanchier sp.</i>), willow (<i>Salix sp.</i>)
Small shrubs and understory herbaceous plants	Lowbush blueberry (<i>Vaccinium angustifolium</i>), velvet-leaf blueberry (<i>Vaccinium myrtilloides</i>), dwarf birch (<i>Betula glandulosa</i>), sedge (<i>Carex sp.</i>), leatherleaf (<i>Cassandra calyculata</i>), creeping snowberry (<i>Gaultheria hispidula</i>), bluebead lily (<i>Clintonia borealis</i>), threeleaf goldthread (<i>Coptis groenlandica</i>), sheep laurel (<i>Kalmia angustifolia</i>), swamp laurel (<i>Kalmia polifolia</i>), labrador tea (<i>Rhododendron groenlandicum</i>), stiff clubmoss (<i>Lycopodium annotinum</i>), Canada mayflower (<i>Maianthemum canadense</i>), cloudberry (<i>Rubus chamaemorus</i>)
Mosses, lichens and horsetails	Greater whipwort (<i>Bazzania trilobata</i>), green reindeer lichen (<i>Cladina mitis</i>), grey reindeer lichen (<i>Cladina rangiferina</i>), northern reindeer lichen (<i>Cladina stellaris</i>), fork moss (<i>Dicranum sp.</i>), horsetail (<i>Equisetum sp.</i>), glittering woodmoss (<i>Hylocomium splendens</i>), red-stemmed feathermoss (<i>Pleurozium Schreberi</i>), knights-plume moss (<i>Ptilium crista-castrensis</i>), haircap moss (<i>Polytricum sp.</i>), rusty bogmoss (<i>Sphagnum fuscum</i>), Girgensohn's bogmoss (<i>Sphagnum girgensohnii</i>), peat moss (<i>Sphagnum sp.</i>)

Two other vulnerable species, the red bat (*Lasiurus borealis*) and southern bog lemming (*Synaptomys cooperi*) have been sighted near the biodiversity reserve.

In terms of aquatic wildlife, Lac Clérac is home to lake whitefish (*Coregonus clupeaformis*), yellow perch (*Perca flavescens*), walleye (*Sander vitreus*) and sculpin (*Cottus sp.*). White sucker (*Catostomus commersonii*), northern pike (*Esox lucius*) and fallfish

(*Semotilus corporalis*) have also been found in the reserve.

1.3.3 Ecological representativeness

Réserve de biodiversité des Drumlins-du-Lac-Clérac is in the Lac Manouane Depression natural region, in the western part of the central Laurentian natural province. Elongated in shape, this natural region has a southwest/northeast orientation. It underlies the western part of the spruce/moss bioclimatic domain, extending all the way from the fir/white birch domain in the southwest (lakes Ashuapmushuan and Chigoubiche), almost to the taiga in the north, near Rivière Témiscamie-Est and the Monts Otish.

The reserve is in the physiographic complex of the Lac à l'Eau Froide mounds, which is at the confluence of three large watersheds: Rivière Témiscamie (which flows toward James Bay via Rivière Rupert), Rivière Ashuapmushuan and Rivière Mistassini, which both empty into the St. Lawrence (via Lac Saint-Jean and Rivière Saguenay). The territory of the reserve corresponds essentially to a depression, a topographic situation reflected by the ecosystems there. The proportion of aquatic environments (16%) is higher than the average for the natural region (11%), and much of the territory is poorly drained. Thus the reserve contains a good sample of aquatic ecosystems, including wetlands and near-shore environments, and a good sample of unproductive forest environments (low density or poor drainage). There is not much productive forest of the kind used by the forestry industry.

1.3.4 Ecological zones

Based primarily on the distribution of surface deposits, the reserve can be divided into four distinct ecological zones, from west to east, as shown in the map comprising Appendix 2.

Zone I: Rivière Nestaocano ecological zone (32.2 km²)

At the western edge of the reserve, the dominant surface deposits are of fluvioglacial origin (proglacial and ice-marginal deposits). The relief is almost completely flat, except for some dunes stabilized by stands of grey pine and black spruce, a few eskers, and a mound near Rivière Nestaocano. A number of water bodies meet in this zone, notably in the sector named Confluent Maatauwaaskuyau. In 1996 a fire swept across nearly 1000 hectares in this part of the reserve.

Zone II: Drumlins ecological zone (149.2 km²)

This ecological zone extends from Lac Clérac north and consists almost entirely of immense ombrotrophic bogs, often structured in pools or strings, along with stands of black spruce/sphagnum moss. Numerous drumlins emerge from these deposits, rising to barely a few metres above the surrounding fen. This type of moraine is elongated, aligned in parallel with the flow of the ice sheet, here with a north/south or slightly northeast/southwest orientation. The drumlins are generally covered with stands of black spruce over 100 years old. Dead-ice moraine is abundant in the southern part of this zone.

Zone III: Lac Kaamichaapuhskau ecological zone (188.5 km²)

This ecological zone covers the central part of the protected area. It is chiefly characterized by the presence of a great number of small, narrow bodies of water with a north/south or northeast/southwest orientation.

Lac Kaamichaapuhskau lies in the centre of this zone, in an area with little relief and abundant lakes, generally aligned north/south or northeast/southwest. The deposits are varied (glacial, fluvioglacial, dead-ice moraines and organic deposits), mostly with unproductive cover of the “dry barrens” type, the only trees being grey pine (for the most part) or black spruce.

In the southern part of this zone, a few low hills and mounds support forest ecosystems that could be called productive in terms of woody matter. In 1991 a small fire burned just over 100 hectares to the west of Lac Kaamichaapuhskau. West of this lake there are several eskers.

Zone IV: Connectivity corridor ecological zone (79.2 km²)

The easternmost portion of the biodiversity reserve connects up with Réserve de biodiversité projetée Albanel-Témiscamie-Otish (the future Parc national Nibiischii) and will allow wildlife to move safely between the two protected areas. Thick glacial deposits dominate in the southwest, while in the northeast the shores of Lac Boudreault are surrounded by organic and fluvioglacial deposits, along with Rogen and dead-ice moraine. Dry and wet barrens define the landscape, along with black spruce stands. A forest road traverses the zone, and logging was

done on about 2% of it (170 ha) between 2003 and 2015. Use of this road should be harmonized with the woodland caribou's life cycle.

1.3.5 Outstanding ecological elements

The exceptional ecological integrity of all the ecosystems present in the reserve is in itself an outstanding feature. In the boreal forest, most productive forest territory has been or will soon be subjected to logging. Réserve de biodiversité des Drumlins-du-Lac-Clérac protects forest ecosystems that have never been disturbed by industrial activities, and include sizeable areas of old-growth forest.

Forest development is gradually changing the landscapes of the boreal forest. Mature and over-mature forests will become increasingly rare as average forest age decreases. An important contribution of the biodiversity reserve will therefore be provide a quality habitat for species that thrive in mature and over-mature forests.

Apart from woodland caribou, according to the Centre de données sur le patrimoine naturel du Québec (2015) no plant or animal species that is threatened, vulnerable or likely to be so designated has been observed on the territory of the reserve. However, since no survey has been done of its plant and animal life, the absence of such species other than woodland caribou cannot be assumed.

1.4 Land occupation and uses

Réserve de biodiversité des Drumlins-du-Lac-Clérac is very remote and only accessible by forest road. West of Lac Boudreault, the forest road that cuts the reserve in two constitutes the

main access to the eastern part of the protected area. Other forest roads offer access to the west bank of Rivière Nestaocano and the south and east shore of Lac Clérac, without entering the reserve itself. Thus, practically all of the reserve can only be reached by air or water (mainly Lac Clérac and Rivière Nestaocano).

The activities carried out on the territory of the reserve are primarily those of the Pekuakamiulnuatsh and the Cree of Mistissini. They are shown on the map comprising Appendix 3.

The Ministère de l'Énergie et des Ressources naturelles (MERN) has granted a single resort lease on the territory, plus there is an automated weather station operated by Rio Tinto Alcan on the western shore of Lac Clérac (a lease for purposes of meteorological instrument). Additionally, Rivière Nestaocano is a recognized canoe-kayak route (FQCK, 2005).

The reserve is located entirely within the Nitassinan of the Innu of Mashteuiatsh First Nation, as demarcated in Schedule 4.1 of the *Agreement-in-Principle of General Nature between the First Nations of Mamuitun and Nutashkuan and the Government of Québec and the Government of Canada*. It is south of the territory covered by the James Bay and Northern Québec Agreement. Certain terms and conditions of the Agreement to resolve the Baril-Moses forestry dispute between the Cree Nation of Eeyou Istchee and the Government of Quebec apply on the territory of Réserve de biodiversité des Drumlins-du-Lac-Clérac. The same applies to the Entente concernant certains enjeux forestiers et fauniques entre la Première

Nation des Pekuakamiulnuatsh et le gouvernement du Québec (Agreement concerning certain forestry and wildlife issues between the Pekuakamiulnuatsh First Nation and the Government of Quebec²). More than 90% of the territory of Réserve de biodiversité des Drumlins-du-Lac-Clérac overlaps with the Mistassini beaver reserve, the remainder being included in the Roberval beaver reserve. Only Indians and Inuit may hunt or trap fur-bearing animals in these two beaver reserve.

1.4.1 Particular heritage elements

According to Pekuakamiulnuatsh Takuhikan, many documents refer to the occupation of this land by the Pekuakamiulnuatsh (Montagnais of Lac-St-Jean), including the 1980 study by the Conseil Atikamewk Montagnais conducted for the Comprehensive Land Claim Negotiations. This study revealed that in the 1930s they travelled as far as Lac Témiscamie. In the 1960s, Innuatsh families (i.e. Montagnais families) lived on the shores of Lac Clérac, as shown by the presence of gravesites as well as Innu and Cree toponyms. Names were given to places where people often went. They refer to water courses, camp sites, portages and other topographical elements like mountains, islands, rapids or the mouths of rivers. A large number of toponyms in a given area can be a sign of archeological potential (Lac Clérac, Lac Beauregard and Lac à l'Eau Froide).

2 Conservation and management issues

2.1 Introduction

Generally, a biodiversity reserve is dedicated to protection of the natural environment, nature discovery and recreation. For this reason, activities that could have a significant impact on ecosystems and biodiversity, particularly of an industrial nature, are prohibited. Less harmful activities, such as those involving recreation, wildlife, ecotourism or education, are permitted in this type of protected area. However, the management framework to which they are subject is conditioned by conservation issues specific to each biodiversity reserve. Based on the information presented in section 1, the conservation and other issues to be taken into account for Réserve de biodiversité des Drumlins-du-Lac-Clérac, and the orientations and objectives to which they give rise, are set out in the sections that follow.

2.2 Protection of biodiversity

The remoteness and inaccessibility of the territory of Réserve de biodiversité des Drumlins-du-Lac-Clérac are such that there is very little human footprint on its present-day ecosystems, which have a very high degree of ecological integrity.

ECOLOGICAL INTEGRITY

The condition of a protected area that is considered characteristic of its natural region and likely to persist, including abiotic [non-living] components and the composition and abundance of native species and biological communities, rates of change and supporting processes.

Adapted from the definition in the Canada National Parks Act (S.C. 2000, c. 32).

² Free translation

Additionally, since it is at the head of two watersheds, in an area where human activities are almost nil, the ecological integrity of the reserve's terrestrial, aquatic and wetland environments is also very high. The water quality of the lakes and rivers is particularly exceptional. The first conservation issue for the reserve will therefore be to maintain the ecological quality of its terrestrial, aquatic, wetland and near-shore environments.

The second conservation issue stems from the presence of woodland caribou, a species that is intolerant of human presence. The abundant bogs, dry barrens, conifer/lichen stands (often very old), with a few dense old-growth forests, offer all the habitat components needed by woodland caribou. To improve the status of the species by maintaining viable herd size and adequate recruitment, Québec's woodland caribou recovery team (ÉRCFQ) believes that it is essential to reduce the human footprint throughout the animal's range. The creation of the biodiversity reserve will contribute to that end insofar as the impact of human activities is reduced.

The third conservation issue concerns the objective of preserving a representative sample of the ecosystems of the Lac Manouane Depression natural region. The reserve contains a good sample of aquatic, wetland and near-shore environments. It also contains a few examples of productive woodlands, including the old balsam fir stands on the slopes of the two low hills northeast of Lac Clérac. All of these ecosystems have an exceptional level of ecological integrity.

The three conservation issues mentioned above converge toward a management approach that restricts human intervention as much as possible. Achieving that objective will be facilitated by the fact that the territory of the reserve is relatively inaccessible and little used.

2.3 Knowledge acquisition and environmental monitoring

Specific objective:

- ***Conduct plant and wildlife surveys and monitor the general evolution of ecosystems***

Very little is known about the flora and fauna of Réserve de biodiversité des Drumlins-du-Lac-Clérac. Accordingly, the MELCC intends to work with various partners to carry out specific surveys to learn more about the biodiversity of these natural environments. Among others, the MELCC will work with the Ministère des Forêts, de la Faune et des Parcs (MFFP) to monitor the woodland caribou herd that frequents the reserve, and to measure the reserve's contribution to maintaining viable herd size, maintaining adequate recruitment, and facilitating the circulation of caribou between Réserve de biodiversité des Drumlins-du-Lac-Clérac, Réserve de biodiversité projetée Albanel-Témiscamie-Otish, and the surrounding developed forest.

2.4 Conservation and management objectives

Réserve de biodiversité des Drumlins-du-Lac-Clérac is a "protected area" as defined in the *Natural Heritage Conservation Act*, and appears in the *Registre des aires protégées du Québec* constituted under the Act. Thus, it was primarily

created to ensure the protection and maintenance of the area's biological diversity, with the associated natural and cultural resources. In addition, protecting this territory increases the representativeness of the national and regional protected areas network, since it holds many ecological components of interest that are representative of the characteristic ecosystems of the Lac Manouane Depression natural region. For the government, the protection of these components and ecosystems, described in section 1.3, is a major objective. Accordingly, taking into account the issues explained in sections 2.1 and 2.2 of the present plan, the principal conservation and management objective for the reserve is: *Preserve the ecological integrity of the ecosystems present in the biodiversity reserve.*

To accomplish this, the MELCC will have to ensure that there continues to be only limited access to the territory, to avoid allowing usage to increase beyond the current level. This should also contribute to maintaining a quality habitat for the woodland caribou. However, by itself the reserve is not large enough to ensure the protection of the woodland caribou, which needs multiple interconnected protected areas ranging from 5000 to 13 000 km² (Schneider 2001, Wilkinson 2008). The enlargement of the initial project to connect it to the future Parc national Nibiischii (currently Réserve de biodiversité projetée Albanel-Témiscamie-Otish), should encourage circulation between the two protected areas, provided that the caribou are willing to cross the forest road that traverses the corridor. This will depend largely on how much the road is used during certain parts of the year. In light of the road avoidance behaviour described in

several studies (ÉRCFQ, 2013), the effectiveness of the corridor is far from certain. This makes it all the more important that forest planning be adapted to the presence of woodland caribou in and around the reserve. This will improve the long-term chances of maintaining the herds that frequent the area.

The principal objective stated earlier (to preserve the ecological integrity of the ecosystems of the reserve) will allow the continued pursuit of traditional activities by the Aboriginal communities that frequent the land, as well as activities by the two holders of existing land rights. However, these activities must be practised in accordance with the applicable laws and regulations as well as treaties or agreements signed between the government of Québec and the Aboriginal communities concerned.

To achieve the objectives set out above, the conservation and management of Réserve de biodiversité des Drumlins-du-Lac-Clérac will be guided by an activity framework whose several dimensions are set out in sections 4, 5 and 6 of this plan.

3 Zoning

Since the territory of Réserve de biodiversité des Drumlins-du-Lac-Clérac is very little used, the MELCC does not propose management zoning.

4 Activity framework applicable to Réserve de biodiversité des Drumlins-du-Lac-Clérac

The activity framework applicable to Réserve de biodiversité des Drumlins-du-Lac-Clérac follows from the provisions of the *Natural Heritage Conservation Act* and the Regulation respecting the Réserve de biodiversité des Drumlins-du-Lac-Clérac (chapter C-61.01, r. 71.3).

4.1 Activity framework established by the Natural Heritage Conservation Act

Activities carried out within the biodiversity reserve are primarily governed by the provisions of sections 46 and 49 of the *Natural Heritage Conservation Act*, as they read on 18 March 2021.

Under section 46, the principal activities prohibited in a territory with the status of biodiversity reserve are the following:

- mining and gas or oil extraction or exploration;
- forest management within the meaning of section 4 of the *Sustainable Forest Development Act* (chapter A-18.1);
- the development of hydraulic resources and any production of energy on a commercial or industrial basis.

Though fundamental to protecting the territory and its ecosystems, the above prohibitions do not cover all of the standards considered desirable to ensure the proper management of the reserve and the conservation of its natural environment. Section 46 of the *Natural Heritage Conservation Act*, as it reads on 18 March 2021, allows the Regulation to detail the legal framework applicable on the territory of a biodiversity reserve.

4.2 Activity framework established by the Regulation respecting the Réserve de biodiversité des Drumlins-du-Lac-Clérac

Accordingly, the provisions set out in Regulation respecting the Réserve de biodiversité des Drumlins-du-Lac-Clérac present additional

prohibitions beyond those already stipulated in the Act. Their purpose is to set conditions for the performance of certain permitted activities, thus ensuring better protection of the natural environment in accordance with the principles of conservation and other management objectives for the biodiversity reserve. Certain activities are therefore subject to prior authorization by the Minister.

The measures contained in Regulation specifically concern new interventions. They do not affect activities that are already being practised or facilities that are already present, so many existing uses are therefore preserved.

However, for activities subject to authorization, the provisions set out in Regulation do not identify which activities could be refused authorization, being considered incompatible with the vocation of the biodiversity reserve. Basic information about the compatibility or incompatibility of each type of activity is provided in the document *Activity Framework for Biodiversity Reserves and Aquatic Reserves*, which is available on the website of the MELCC at:

http://www.mdelcc.gouv.qc.ca/biodiversite/aires_protegees/regime-activites/regime-activite-reserve-bio-aqua-en.pdf.

For certain activities, Regulation also includes exemptions to the requirement for prior authorization.

5 Activities governed by other laws

Certain activities that could potentially be practised in the biodiversity reserve are also governed by other applicable legislative and regulatory provisions, and some require a permit or authorization or the payment of certain fees.

Certain activities could be prohibited or limited under other laws or regulations applicable on the territory of the reserve.

Within the biodiversity reserve, a particular legal framework may govern permitted activities under the following categories:

- **Protection of the environment:** measures set out in particular by the *Environment Quality Act* (chapter Q-2) and its regulations.
- **Archeological research and discoveries:** measures set out in particular by the *Cultural Heritage Act* (chapter P-9.002).
- **Exploitation and conservation of wildlife resources:** measures stipulated by the *Act respecting the conservation and development of wildlife* (chapter C-61.1) and its regulations, including provisions relating to threatened or vulnerable wildlife species, outfitters and beaver reserves; and measures in the applicable federal laws and regulations, including the legislation and regulations on fisheries.
- **Plant species designated as threatened or vulnerable:** measures prohibiting the harvesting of such species under the *Act respecting threatened or vulnerable species* (chapter E-12.01).
- **Access and property rights related to the domain of the State:** measures set out in particular by the *Act respecting the lands in the domain of the State* (chapter T-8.1) and the *Watercourses Act* (chapter R-13).
- **Issuance and oversight of forest development permits** (harvesting of firewood for domestic purposes, wildlife development, recreational development); and **delivery of authorizations** (forest roads): measures stipulated by the *Sustainable Forest Development Act* (chapter A-18.1).
- **Travel:** measures stipulated by the *Act respecting the lands in the domain of the State* and by the regulations on motor vehicle travel in fragile environments, under the *Environment Quality Act*.
- **Construction and development standards:** regulatory measures adopted by local and regional municipal authorities in accordance with the applicable laws.

6 Management

6.1 Responsibilities of the Minister of the Environment and the Fight against Climate Change

The Minister of the Environment and the Fight against Climate Change is responsible for the management of Réserve de biodiversité des Drumlins-du-Lac-Clérac. Among other things, the Minister sees to the application of the *Natural Heritage Conservation Act* (chapter C-61.01) and the Regulation respecting the Réserve de biodiversité des Drumlins-du-Lac-Clérac. In its management, the MELCC enjoys the collaboration and participation of other government representatives that have specific responsibilities in or adjacent to the territory. Since the territory is difficult to access and little used, the MELCC intends to take a minimal approach to management. Signage and surveillance will be very limited.

6.2 Monitoring

As mentioned in section 2, “Conservation and management issues”, measures will be taken toward monitoring the status of the natural environment, in collaboration with the various stakeholders. The MELCC particularly wishes, in collaboration with the Ministère des Forêts, de la Faune et des Parcs, to evaluate the contribution of the reserve to maintaining the woodland caribou herds that frequent the area. For example, the following parameters could be documented:

- Evolution of caribou numbers
- Level of recruitment by herds
- Circulation of woodland caribou between Réserve de biodiversité des Drumlins-du-Lac-Clérac, the future Parc national Nibiischii, and the surrounding developed forest

Botanical and wildlife surveys may also be conducted.

6.3 Participation of stakeholders

To fulfill its management responsibilities, the MELCC will seek the collaboration and participation of the principal actors concerned by the territory, including the MRC of Maria-Chapdelaine, the Aboriginal communities whose members frequent the area, the holders of land rights and the regional units of other government departments that have responsibilities in the biodiversity reserve.

Bibliographical references

ÉQUIPE DE RÉTABLISSEMENT DU CARIBOU FORESTIER DU QUÉBEC, 2013. *Plan de rétablissement du caribou forestier (Rangifer tarandus caribou) au Québec — 2013-2023*. Produit pour le compte du ministère du Développement durable, de l'Environnement, de la Faune et des Parcs du Québec, Faune Québec. 110 pages.

FÉDÉRATION QUÉBÉCOISE DU CANOT ET DU KAYAK, 2005. *Guide des parcours canotables du Québec*. 4^e éd. Éditions Broquet. 455 pages.

GERARDIN, V. et D. McKenney, 2001. *Une classification du Québec à partir de modèles de distribution spatiale de données climatiques mensuelles: vers une définition des bioclimats du Québec*, ministère de l'Environnement du Québec, Service de la cartographie écologique no 60, 40 pages. [En ligne] <http://www.mddelcc.gouv.qc.ca/changements/classification/model-clima.pdf>

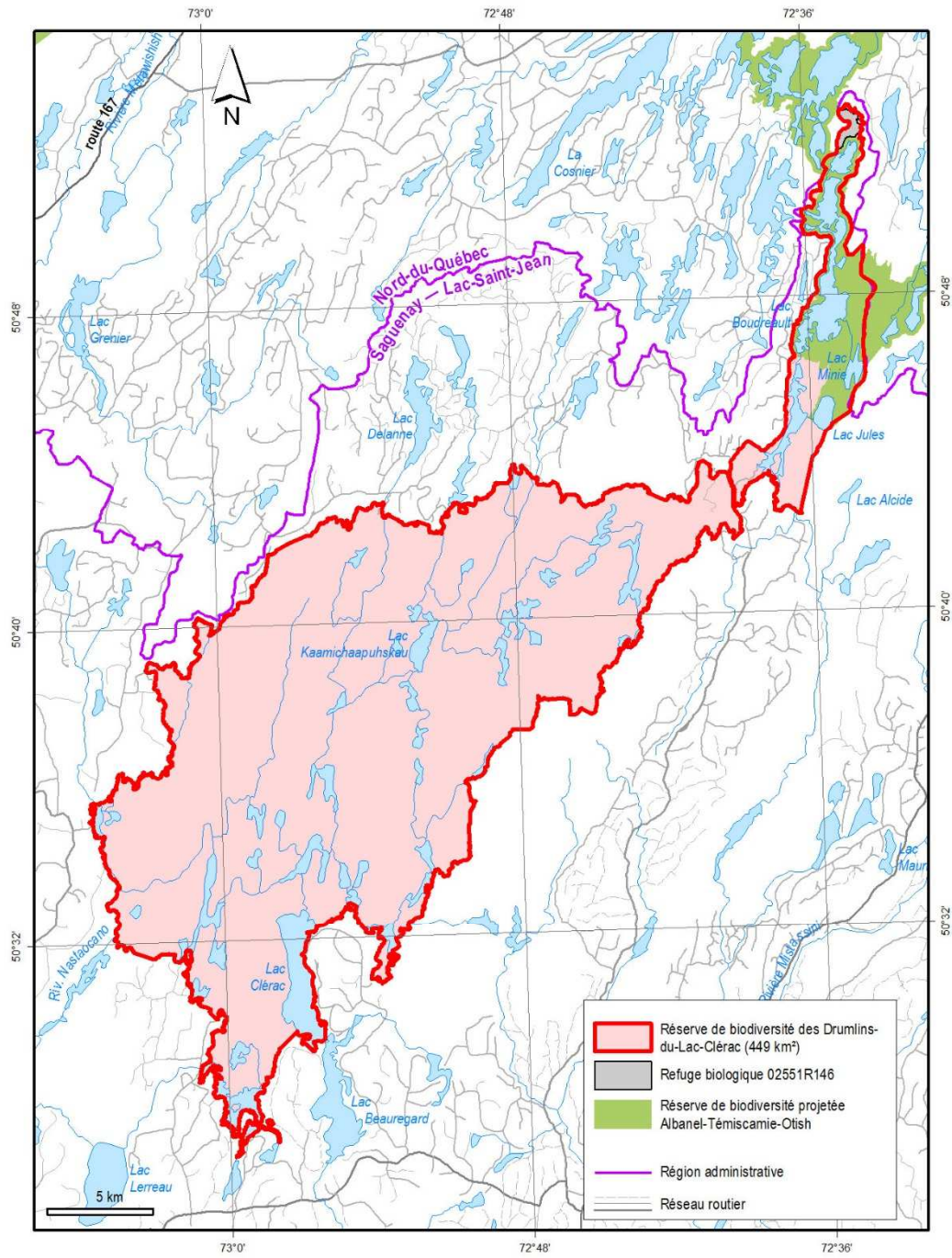
LI, T., J.-P. Ducruc, M.-J. Côté, D. Bellavance et F. Poisson, 2019. *Les provinces naturelles : première fenêtre sur l'écologie du Québec*. Québec, ministère de l'Environnement et de la Lutte contre les changements climatiques, Direction de la connaissance écologique, 24 pages.

ROBITAILLE, A. et M. Allard, 2007. *Guide pratique d'identification des dépôts de surface au Québec*; 2nd éd. Notions élémentaires de géomorphologie. Les Publications du Québec. 121 pages.

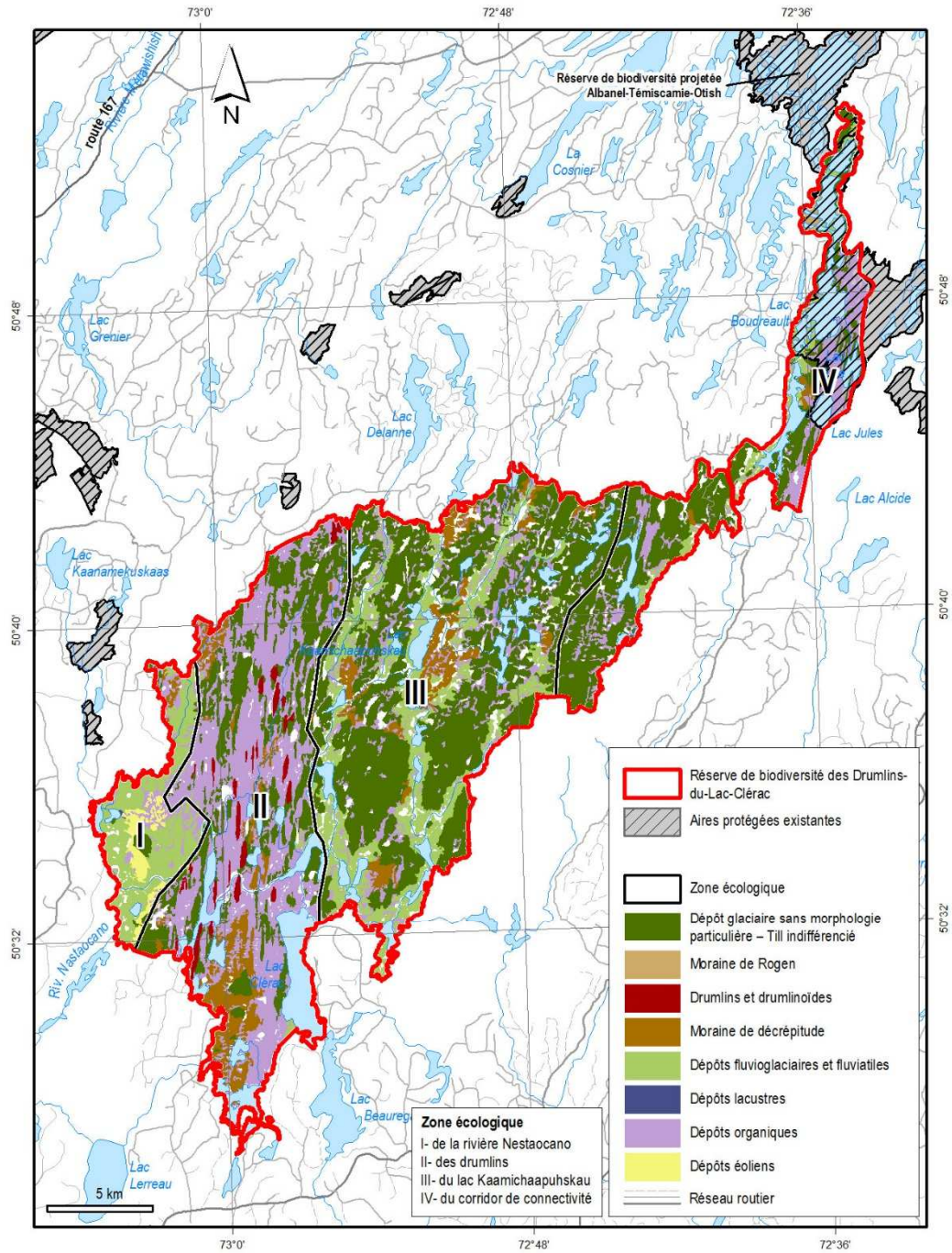
SCHNEIDER, R. R., 2001. *Establishing a protected area network in Canada's boreal forest: An assessment of research needs*. Alberta Centre for Boreal Studies Edmonton, AB.

WILKINSON, C. J. A., 2008. *An examination of recovery planning for forest-dwelling woodland caribou (Rangifer tarandus caribou) in Ontario, Canada*. Rangifer, volume 28, pages 13-32.

Appendix 1 - Boundaries and location



Appendix 2 — Ecological zones



Appendix 3 — Occupation and uses

