



Protected areas
in Québec:

A Lifelong Heritage

Réserve de biodiversité Kakinwawigak



CONSERVATION PLAN

Québec 

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Introduction

In 2004, the Gouvernement du Québec moved to protect an area of land located to the east of Lac des Quinze.

The territory was officially accorded the legal provisional status of proposed biodiversity reserve in July 2004, under section 27 of the *Natural Heritage Conservation Act* (chapter C-61.01). The proposed reserve was given the temporary name of Réserve de biodiversité projetée du Lac des Quinze.

On February 22, 2007 the Minister of Sustainable Development, Environment and Parks (MDDEP) mandated the Bureau d'audiences publiques sur l'environnement (BAPE) to hold a public consultation on the proposed protected areas of Lac Opasatica, Lac des Quinze, Forêt Piché-Lemoine and Réservoir Decelles. This mandate was entrusted to the BAPE pursuant to section 39 of the *Natural Heritage Conservation Act*, which provides for a public consultation process before a proposal is made to the Government on permanent protection status for land set aside as a proposed protected area. The BAPE's mandate started on March 8, 2007 and concluded on August 8 of the same year. The consultation was held in April and May 2007 in Val-d'Or, Rouyn-Noranda, Angliers, Lac-Simon and Winneway. The BAPE's inquiry and public hearing report (No. 244) was submitted to the Minister of the MDDEP on August 8, 2007 (BAPE, 2007). In its report, the commission recommended giving permanent protection status to Réserve de biodiversité projetée du Lac des Quinze, which is now Réserve de biodiversité Kakinwawigak.

By giving permanent protected status to Réserve de biodiversité Kakinwawigak, the Gouvernement du Québec ensures the definitive protection of the following: representative samples of the biological diversity of the Abitibi lowlands natural province; more specifically, of representative ecosystems in the Lac Témiscamingue lowlands natural region; and more precisely still, of the Lac Roger plain physiographic complex (MDDELCC, 2014a). The new reserve joins a network of representative and exceptional protected areas by which the various types of ecosystems across Québec are protected.

This reserve was chosen particularly for its complex of mounds covered with stands of yellow birch and mature maple. The area is also of note for the diversity of its plant communities, including yellow birch, white birch, eastern white cedar, sugar maple, balsam fir, trembling aspen, jack pine, tamarack, black spruce and white pine.

1. The territory of Réserve de biodiversité Kakinwawigak

1.1 Official toponym

Réserve de biodiversité Kakinwawigak: the name refers to the former presence of the Long Point First Nation, which inhabited the southern point of what is now the biodiversity reserve, and whose name corresponds to the point of land that extends into Lac des Quinze. The term "*kakinwawigak*" means "*long point*" in Algonquin.

1.2 Geographical location, boundaries and dimensions

The location and boundaries of Réserve de biodiversité Kakinwawigak are illustrated in Appendix 1.

Location: Réserve de biodiversité Kakinwawigak is located in Abitibi-Témiscamingue region, in the MRC de Témiscamingue, between 47°30'25" and 47°43'15" north latitude and between 78°54'9" and 79°11'00" west longitude. It extends over three municipalities: Angliers, Rémigny and Moffet. The reserve is about 35 km northwest of Ville-Marie and about 25 km from the village of Winneway, where the Long Point First Nation has settled. It is accessible by highways 101 and 391, and by following Chemin de la Baie-du-Tigre to Rémigny. The reserve is also served by a network of forest roads that can be accessed through its northern portion.

Area and boundaries: The initial area of the proposed reserve, when it was set aside as such in 2004, was 159 km². Following the public hearings, different expansion proposals were presented to the MELCC. In its analysis report (No. 244), the BAPE recommended evaluating the possibility of expanding the proposed reserve to include the areas of interest presented, before granting permanent protection status (BAPE, 2007).

The final boundaries 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 watercourses and water bodies, the real boundary is the natural high-water mark. For the section along the shores of Lac des Quinze, which is a hydroelectric reservoir, the boundary corresponds to the level of 263.94 metres. Six islands in Lac des Quinze that are mostly above that level are also part of the biodiversity reserve.

The northern part of the reserve is crossed in an east-west direction by a 120 kV electrical transmission line, circuit 1339 Rapides des îles / Rapides-7. This transmission line and its right of way, which averages about 37 metres across, are excluded from the biodiversity reserve. The excluded land corresponds to an easement granted to société Hydro-Québec, as recorded in the Registre du domaine de l'État.

After the above modifications, Réserve de biodiversité Kakinwawigak now covers an area of 243.1 km². 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 11327 (October 23, 2017) and filed in the surveying archives of the Surveyor General of Québec (Greffé de l'arpenteur général du Québec), Ministère de l'Énergie et des Ressources naturelles, under document number 536697.

1.3 Ecological portrait

Réserve de biodiversité Kakinwawigak is part of the Abitibi lowlands natural province. It protects representative ecosystems in the Lac Témiscamingue lowlands natural region (MDDELCC, 2014a) and belongs to the Lac Roger plain physiographic complex, which is characterized by the elements described below. Those of the greatest ecological interest are mapped in Appendix 2.

1.3.1 Representative elements

Geology: The biodiversity reserve is in Superior geological province, where the foundation rock is Archean (over 2.5 billion years old). The

substratum is primarily intrusive igneous rock, i.e. granitoids, with granite in the northern part. At the eastern end, near lakes Beaudry and Gérin-Lajoie, the bedrock is metamorphosed metasedimentary rock in the form of paragneiss.

Geomorphology: When the Laurentide ice sheet melted, around 8500 years ago, it covered the bedrock with a thick layer of poorly drained glaciolacustrine sediments (silt and clay). Erosion by the waves of glacial lake Barlow-Ojibway stripped the silt from the tops of the highest mounds (Veillette, 2000).

Today the landscape is a plain punctuated with mounds and residual hillocks, gently sloping to the north.

Apart from outcrops here and there, the bedrock is covered by glaciolacustrine deposits or occasionally a thin layer of till. The relief is shallow, with an elevation of 218 to 373 metres (average 284 metres).

Two eskers cross the reserve along a northeast-southwest heading. One is on the point of land where Lac à Donat is located. The other passes to the east and south of Lac du Vieux-Leblanc, continuing to the southern tip of the reserve.

Réserve de biodiversité Kakinwawigak is composed of three distinct ecological units, in terms of landforms and surface deposits.

With an area of 110 km², the largest ecological unit occupies the entire western part of the reserve, and consists of glaciolacustrine silty clay lowlands scattered with hillocks and knolls of thin till, with rocky outcrops. One of the eskers is

found here, its sand and gravel deposits adding diversity. Hollows are filled with organic deposits in the form of peat bogs.

The second ecological unit, located in the southern part of the reserve, is more heterogeneous and covers 55 km². Its two parts are on either side of Petite Rivière Roger. The relief and topography are varied, with mounds of thin till and rocky outcrops, an esker with deposits of sand and gravel, and glaciolacustrine lowlands composed of sand and gravel in some places, clay and silt in others. A few hollows are filled with organic deposits in the form of bogs.

The last ecological unit, of 77 km², occupies the northern part of the reserve and consists of a complex of till mounds, with rocky outcrops and bogs in the valley bottoms. Though more homogeneous, its forest cover makes it the main element of interest in the reserve.

Hydrography: The biodiversity reserve is in the watershed of Rivière des Outaouais, which skirts the reserve where it becomes Lac des Quinze. The several sub-watersheds in the reserve empty directly into Lac des Quinze (Rivière des Outaouais).

There are five named lakes in Réserve de biodiversité Kakinwawigak. By order of decreasing size, they are: Lac Gérin-Lajoie (1.54 km²), Lac des Guêpes (1.34 km²), Lac du Vieux-Leblanc (0.31 km²), Lac Roger (0.17 km²) and Lac à Donat (0.09 km²). The total area of these lakes and the 350 or so other water bodies and watercourses in the reserve comes to about 4.9 km², or 2% of the reserve's territory.

Climate: The territory of the reserve is subject to a mild continental subarctic climate, subhumid with a long growing season. Average temperatures range from 1.9°C to 4.5°C. The average annual precipitation ranges from 800 mm to 1359 mm, and the average growing season is from 180 to 209 days.

The reserve is in the balsam fir-yellow birch bioclimatic domain, which extends in a band from west to central Québec between 47° and 48° north latitude. Mesic sites are occupied by mixed stands of yellow birch and conifers, including balsam fir, white spruce and eastern white cedar. Sugar maples are at the northern limit of their range. Forest fires and epidemics of spruce budworm are the two main factors of forest dynamics here. The abundance of yellow birch and pines diminishes from west to east, resulting in two subdomains. The reserve is in the western one, where stands of yellow birch-balsam fir are omnipresent on mesic sites.

Forests: Forest occupies about 215 km² of the reserve, representing some 88% of the territory. The forest cover consists of 70% mixed forests. Coniferous stands account for 25% of the forest cover, while deciduous stands are only 5%. The principal elements are stands of black spruce and balsam fir. These primarily occupy the ecological unit of silty clay lowlands, sharing the territory (depending on the degree of disturbance) with stands of white birch and poplar. Yellow birch stands are also abundant, particularly on the complex of till mounds in the northern part, and on the mounds and hillocks of the southern part. The yellow birch stands in both areas share the territory with stands of sugar maple.

The topographic and geomorphological diversity of Réserve de biodiversité Kakinawwigak has given rise to forest diversity. Thus, besides the forest stands common to the ecosystems mentioned above, there are other stands such as white or red pine on steep slopes and sandy habitats, cedar on rock walls and rocky outcrops where the soil is thin or absent, jack pine on sandy soils, and tamarack in very poorly drained places and around bogs.

The forest cover is characterized by a balanced distribution of age classes among forest stands. Young regenerating stands, mostly due to logging, account for 36% of the forest cover, while those of medium age (40-80 years) represent about 20%. Mature and old forests are in the majority, accounting for nearly 40% of the forest cover. The ecological unit covering the centre and west of the reserve, the silty clay lowlands, primarily contains young and medium-age stands. The ecological unit in the south, and the complex of till mounds to the north, are mostly covered by mature and old forest.

At this latitude and in terms of climate and the physical components of the ecosystem (topography, surface deposits), the territory is particularly well suited to the development of yellow birch-balsam fir stands. However, some parts of the silty clay lowlands are favourable to balsam fir-black spruce stands and balsam fir-black spruce-sphagnum moss stands. The characteristics of other sectors are ideal for the development of black spruce-moss or black spruce-heath stands, or to black spruce-sphagnum moss stands. Some of the riparian environments offer conditions suited to the

presence of balsam fir-eastern white cedar, while the tops of certain mounds are more suited to birch-fir-sugar maple stands and maple-yellow birch stands.

Flora: No comprehensive plant inventory has been done on the territory of Réserve de biodiversité Kakinawigak. However, Baldwin (1958) and Rousseau (1974) studied the vascular flora of the clay belt of northeastern Ontario and northwestern Québec, where the reserve is located. Primarily characterized by boreal vegetation, the clay belt covers most of Abitibi and northern Témiscamingue. The few inventories conducted after Baldwin's study, indicate that the region is home to about 1000 vascular species, 125 species of lichen, 30 species of liverwort, and 159 species of moss. However, no inventory has been done of the region's mushrooms and algae.

Fauna: No inventory has been done for wildlife in the reserve. However, species mentioned in the literature as being characteristic of balsam fir-yellow birch forests include the following: snowshoe hare, black bear, red squirrel, Canadian beaver, muskrat, American porcupine, red fox, patched fox, American marten, weasel, fisher, American mink, coyote, wolf, river otter, Canadian lynx, moose, white-tailed deer, and seven species of bat, three of which are endangered. According to the literature, some fifty species of mammals could inhabit western Abitibi-Témiscamingue, and thus the territory of Réserve de biodiversité Kakinawigak.

The few lakes, rivers and brooks in the reserve are generally small, and have not been surveyed for fish species.

With regard to birds, the Ministère des Forêts, de la Faune et des Parcs has identified over 150 species in the area, most of which are likely to be found in the biodiversity reserve.

Among the herpetofauna (which include snakes, turtles, amphibians and salamanders), 22 species have been observed in Abitibi-Témiscamingue. Some could inhabit the lakes and watercourses of Réserve de biodiversité Kakinawigak (MRNF, 2007).

1.3.2 Outstanding elements

According to the Centre de données sur le patrimoine naturel du Québec (2014a), no plant species that is threatened or vulnerable or likely to be so designated has been observed in the reserve. They could however be present. On the other hand, numerous plant species that are threatened, vulnerable or likely to be so designated have been found near Lac Témiscamingue. Some of them could therefore be present in the biodiversity reserve.

Again according to the CDPNQ (2014a), a number of wildlife species that are threatened, vulnerable or likely to be so designated, such as the chimney swift, sedge wren, bald eagle, silver-haired bat, eastern red bat, hoary bat and rock vole, have been observed just outside the reserve. Most of them could frequent the reserve to feed or reproduce.

The presence of sugar maple stands is of particular interest, since they are among the most northern in Québec. Additionally, woodland areas with old forests and mature deciduous forests are the major feature of this reserve. A more comprehensive inventory could enrich our limited knowledge of the vegetation, while potentially revealing other outstanding elements.

Also found in Réserve de biodiversité Kakinwawigak are two areas that have all the characteristics of biological refuges. One surrounds Lac Roger, while the other is to the northwest of Lac Gérin-Lajoie. Also, according to the CDPNQ (2014b), several areas near the biodiversity reserve enjoy a degree of protection. These include the aquatic bird staging areas of Lac des Quinze, Baie Barrière, Baie du Tigre and Ruisseau Mc Farland; the heronry of Lac des Quinze, with 42 active nests across from Pointe du Fish Creek; the muskrat habitats of Rivière des Quinze (Baie Sèche area) and of Lac des Quinze (Baie du Tigre area); and lastly, a biological refuge on the shores of Lac Beaumesnil, north of the reserve.

Also found in the southeastern part of the reserve is the old village of the Long Point First Nation. It was once the site of a Hudson's Bay Company trading post and an Oblate mission founded in 1884. There is still an Algonquin cemetery there, with the remains of a small chapel built in 1891 (MRC de Témiscamingue, 2006).

It is also interesting to note that there is an area of archeological potential at the southern tip of the reserve, on the shores of Lac des Quinze. The presence of archeological sites in the reserve has

yet to be confirmed. The archeological potential of the area could be significant, since the biodiversity reserve includes the site of the old village of Long Point First Nation.

1.4 Land occupation and uses

The principal occupations and uses exercised in Réserve de biodiversité Kakinwawigak are shown in Appendix 3.

There are 72 registered land rights on the territory of the reserve, including six resort leases, one lease for accommodation purposes held by an outfitter with non-exclusive rights, and 65 leases for temporary shelters (hunting shelters).

The biodiversity reserve straddles eleven traplines in fur-bearing animal management unit 08. A single trapping camp has been built on the southern point of the reserve, opposite Squelette and Du Foyer islands. According to the MRNF (2006), catches recorded in 2002-2005 included weasel, American beaver, coyote, red squirrel, river otter, Canadian lynx, American marten, fisher, muskrat, raccoon, patched fox, red fox and American mink. The same source states that trapping pressure on these species was average at the time.

The entire territory of the reserve is in hunting zone 13, where sports hunting is practised. The annual harvest data for large game only concerns moose and black bear. The MFFP has examined hunting pressure on the territory of the reserve from 2011 to 2014. Over this period, the harvest was 83 moose (1.27 moose per 10 km²) and 12 black bears. This indicates an annual average of 21 moose and 3 black bears, and a density of 0.86 moose and 0.12 black bear per 10 km².

Compared to the average for hunting zone 13 (0.5 moose and 0.19 black bear per 10 km²), the hunting pressure on moose in the reserve is considered well above average, while the pressure on black bear is lower than average (MFFP, 2015).

In 2006 the Ministère des Ressources naturelles et de la Faune had little data about sport fishing pressure on the territory of the reserve, but considered it to be low (MRNF, 2006).

The MRNF had no data in 2006 about the species and quantities taken by the Algonquin communities of Timiskaming and Long Point, nor on their activities and places for wildlife harvesting (MRNF, 2006).

It should also be mentioned that a canoe route on Lac des Quinze follows the southern and southwestern boundaries of the reserve. The route allows for temporary wilderness camping along the shore in this part of the reserve.

The area is noteworthy for having few buildings and very few trails or forest roads. Parts of the reserve cannot even be accessed by land. There are plans to upgrade the roads shown in Appendix 3.

2. Conservation and development of Réserve de biodiversité Kakinwawigak

This section presents conservation and development guidelines, together with objectives specific to Réserve de biodiversité Kakinwawigak.

2.1 Protection of biodiversity

To maintain the viability of ecological processes, management of the reserve should give priority to protecting the ecosystems present and the species that depend on them. This includes allowing ecosystems that have been disturbed by logging, especially on silty clay lowlands, to recover their dynamics and natural characteristics.

Since the existing occupations and uses are few in number, and compatible with the reserve's protection objectives, they will be maintained. Activities should be managed to ensure that they have as little impact as possible, and no long-term impact on biodiversity.

Specific objectives:

- ***Promote the resilience of disturbed forest ecosystems***

The areas that were logged over the ten to fifteen years prior to the creation of the reserve are concentrated in the silty clay lowlands and at the foot of till mounds in the northern part. Other areas have also been logged, but more in the past. However, regeneration is underway in those areas, where there are already young to medium-age stands, especially black spruce and shade-intolerant hardwoods.

The disturbed forest ecosystems should thus be able to recover their natural characteristics. The absence of any form of logging will facilitate that resilience. These environments have good productivity and will be able to re-establish themselves over the next few decades, with no

need for active management measures such as planting and restoration.

- ***Ensure the protection of mature and old forests***

The forest ecosystems on till mounds and hillocks, whether in the north, south or west, have been little disturbed and are mostly composed of mature to old forests. Stands of so-called noble hardwoods, such as yellow birch-sugar maple and maple-yellow birch, are of particular interest. It is rare to find such forest ecosystems preserved at this latitude. Any further fragmentation of the forest cover must therefore be avoided, except for unobtrusive development (such as hiking trails) to facilitate enjoyment of these natural environments.

2.2 Knowledge acquisition and environmental monitoring

Knowledge acquisition, besides being crucial to the achievement of objectives specific to natural heritage protection, will make it possible to monitor the natural environment. The knowledge acquired could also be used in developing activities for nature discovery, education and public awareness. It will facilitate the analysis of development projects, and ensure that management partners have a common understanding of the issues.

Ecological knowledge, especially about the support capacity of natural environments, and about the impact of recreational and tourist activities on ecosystems, must also be developed. This will be done to properly assess the wealth of the reserve's resources, to obtain representative data, and to develop the tools

needed for good management, to ensure that the biodiversity specific to the reserve is conserved.

Specific objective:

- ***Perform targeted inventories and subsequent monitoring***

The MELCC will target certain needs related to knowledge building on biodiversity. For example, a plant inventory must be done. A list of fish species in the lakes, and of the reserve's terrestrial wildlife, could be created with the help of regional partners in the wildlife field. More knowledge is needed about the various species (flora and fauna) associated with the ecosystems of old noble hardwood forests, such as the stands of sugar maple at the northern limit of their range. Other inventories or scientific research, whether on existing or anticipated ecological problems, could be conducted later.

2.3 Integrated and participative management

The characteristics of the reserve and its adjacent areas, in particular the presence of Lac des Quinze, a well used waterway giving access to the reserve, make imperative the adoption of a management approach based on stakeholder participation. This will facilitate the harmonious management of recreational activities while protecting the natural heritage.

Specific objective:

- ***Establish participative and collaborative management***

Although Réserve de biodiversité Kakinwawigak is little used and almost unoccupied, the MELCC should engage the participation of users and the holders of land rights (outfitter with non-exclusive

rights, cottagers, hunters and trappers), the municipalities of Rémigny, Angliers and Moffet, and the regional county municipality of Témiscamingue, in managing the reserve. The Long Point First Nation will be an important partner in managing the reserve, since the latter contains the remnants of their past occupation and its members continue to practise activities there.

The MELCC will encourage the creation of a conservation committee where stakeholders can discuss protection issues and the measures to take in response. An action plan will be prepared by the MELCC in collaboration with management partners. Among other things, the plan will determine actions to be taken, the means advocated, actors chosen to perform those actions, performance horizons, and a mechanism for evaluating results.

3. Zoning

Réserve de biodiversité Kakinawwigak is partly bordered by a hydroelectric reservoir, Lac des Quinze. Management of the territory will need to reflect the reserve's accessibility from that waterway. Based on the ecosystems present, the current state of the natural environment, the reserve's protection and management objectives, and to a lesser extent considerations of land use and occupation, the reserve has been divided into three zones, even though it is relatively homogeneous. All three have a protection level and the same activity framework. However, protection measures and development possibilities will reflect the specific features of each zone. All three have specific elements of ecological interest, or that must be preserved, such as old hardwood forests, remnants of Aboriginal occupation, or a variety of wetlands.

A map of the zones is provided in Appendix 4. This zoning, and the particular characteristics of each zone, will be taken into account in the MELCC's management of the reserve and when evaluating authorization requests for activities and improvements.

The three zones are:

- Zone I: Silty clay lowlands
- Zone II: Southern point
- Zone III: Massif of noble hardwoods

Zone I: Silty clay lowlands

This zone is a plain of glaciolacustrine origin whose fine deposits of clay and silt accumulated at the bottom of Lac Barlow-Ojibway during the last deglaciation. Zone I covers around 110 km², or about 45% of the territory of the reserve.

Zone I can be considered a "natural" zone, despite the fact that its disturbance level and human footprint are somewhat greater than in the other two zones. With its flat topography and fine deposits, the area is productive from a forestry point of view, and easy to log. Such environments are favourable to stands of conifers like balsam fir and black spruce. Naturally present in the reserve, these species were logged in the last decade of the 20th century, and traces of that activity remain. The zone also features a mosaic of wetlands, some quite large, limiting the amount of timber that could be harvested. In sum, the zone is relatively undisturbed and rich in wetlands and forest diversity (in terms of both age and species).

Human presence has been scattered and periodic. While there is limited overland access, the zone is easily entered via Lac des Quinze.

There are 41 buildings, mostly hunting camps, but the occupation rate is relatively low, at one building per 2.7 km². Additionally, there are about 136 linear km of forest roads and trails. The zone's fragmentation index is 1.24 linear km per km², which is high according to Quigley *et al.* (2001).

The conservation objective for Zone I is to maintain its ecological integrity and improve or restore the natural character of its ecosystems, especially where logging has been done. Active management measures such as planting or restoration will not be needed. As for the trails and forest roads, they will have to be studied to identify which ones are essential for access to buildings and which ones could be renaturalized.

Zone II: Southern point

Covering 55 km², this zone represents about 23% of the biodiversity reserve. The landscape is different from that of Zone I, with a tiered elevation presenting knolls, then hillocks, then mounds of till. The maximum vertical drop (i.e. of the tallest mounds) is about 100 metres. The low relief consists of glaciolacustrine deposits of clay and silt, occasionally sands and gravels. An esker rises above the lowlands here. The mounds and hillocks of thin till, with rocky outcrops here and there, are the dominating feature. The higher portion is largely covered by old forests, including stands of yellow birch, maple, white pine and cedar. The zone's diverse environments have produced a diversity of forest ecosystems, so there are also stands of balsam fir, black spruce and jack pine.

Unlike the others, Zone II is nearly devoid of trails and forest roads. In this respect it can be considered a "natural" zone. There are just

13 linear km of trails and forest roads. The fragmentation index is 0.24 linear km per km², which is low (Quigley *et al.*, 2001). Land occupation consists of 13 hunting camps and 2 cottages, or one building per 3.7 km².

The objective for this zone is to conserve its natural and relatively unfragmented character, and to allow its woodland landscapes to continue evolving naturally.

Zone II contains the Longue-Pointe site, a former Algonquin village that is of historical and cultural interest. It is important to note that the village site is at Baie Paulson, not the place identified as "Longue-Pointe" on the topographic maps (see map in Appendix 1). According to the literature, in 1884 the village had a Hudson's Bay Company trading post and an Oblate mission (MRC de Témiscamingue, 2006). The site now contains an Amerindian cemetery and the remains of a small chapel built in 1891. The Algonquins of Longue-Pointe were moved to Lac Simard in 1950.

In view of the site's cultural and historical interest, it must be preserved, and if appropriate, developed in collaboration with the Long Point First Nation and in harmony with their values.

Zone III: Massif of noble hardwood forests

This zone of 77 km² represents about 32% of the biodiversity reserve. It is characterized by a relief of till mounds (deposits of glacial origin), wetlands in the valley bottoms, and rocky outcrops. This zone is the domain of the yellow birch. The summits and slopes are relatively undisturbed, covered with mature stands and old hardwood forests, primarily yellow birch-balsam fir, as well as yellow birch-sugar maple and maple-yellow birch. Disturbance from logging in the past is

found more on the plateaus and low areas, where there are now stands of white birch and conifers (black spruce and balsam fir stands). There is a fairly well developed network of forest roads.

Being the main access to the reserve and an area where there has been logging activity, Zone III has a high fragmentation index (Quigley *et al.* 2001). It has about 117 linear km of forest roads and trails, giving a fragmentation index of 1.5 linear km per km². There are 15 hunting camps and one cottage, for a total of 16 buildings. The occupation rate is just one building per 4.8 km², which is very low.

The main conservation objective for Zone III is to maintain the characteristics of its mature and old forests and to promote the resilience of stands that were logged in the years prior to the reserve's creation. No new development will be allowed, except of the kind that would enhance the reserve's educational and ecotourism dimensions (e.g. hiking trails, shelters, interpretive panels). However, upgrading will be done on certain forest roads, as shown in Appendix 4.

As with the other two zones, Zone III corresponds to a "natural" zone. As such, it will be managed in a similar fashion with respect to development, fragmentation and promoting the resilience of ecosystems.

4. Activity framework applicable to Réserve de biodiversité Kakinwawigak

The purpose of the reserve is to protect natural environments and their components. For this reason, activities that could have a significant impact on ecosystems and biodiversity, especially of an industrial nature, are prohibited.

Less harmful activities and occupations, such as those involving recreation, wildlife, ecotourism or education, are however permitted in this type of protected area.

In sum, the biodiversity reserve should be considered as a territory dedicated to protecting the natural environment, to nature discovery and to recreation.

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 the *Natural Heritage Conservation Act* (chapter C-61.01).

Under the Act, the activities prohibited in an area with the status of biodiversity reserve are primarily the following:

- mining and gas or oil extraction;
- forest management within the meaning of section 4 of the *Sustainable Forest Development Act* (chapter A-18.1);
- the exploitation 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. The *Natural Heritage Conservation Act* 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 Kakinwawigak

The provisions contained in Regulation respecting the Réserve de biodiversité Kakinwawigak set out additional prohibitions beyond those already stipulated in the *Natural Heritage Conservation Act* (chapter C-61.01). They also provide a framework for certain permitted activities, to ensure the protection of the natural environment in accordance with the principles of conservation and other management objectives of the reserve. Certain activities are therefore subject to prior authorization by the Minister.

The measures presented in Regulation concern new interventions in particular, and generally do not affect activities that are already being practised or facilities that are already present. Many existing uses are thus preserved.

In listing the activities requiring authorization, Regulation does not identify which ones would be considered incompatible with the vocation of the reserve and could therefore be refused authorization. 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 available on the website of the MELCC at

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

Note that certain activities are exempted from the requirement to obtain authorization. These exemptions are also presented in Regulation.

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.

In the territory of Réserve de biodiversité Kakinwawigak, a particular legal framework may govern permitted activities under the following categories:

- **Protection of the environment:** measures stipulated by the *Environment Quality Act* (chapter Q-2) and its regulations;
- **Archeological research and discoveries:** measures stipulated 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 related 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 stipulated by the *Act respecting the lands in the domain of the State* (chapter T-8.1) and by 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 Environment and the Fight against Climate Change

The Minister of Environment and the Fight against Climate Change is responsible for the management of the reserve. 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 Kakinwawigak. In managing the reserve, the MELCC enjoys the collaboration and participation of other government representatives

that have specific responsibilities in or adjacent to the territory.

6.2 Monitoring

As mentioned in section 2, “Conservation and development of Réserve de biodiversité Kakinwawigak”, measures will be taken toward monitoring the status of the natural environment, in collaboration with the following local and regional partners: municipal stakeholders, partners in the areas of environment, recreation and education, and residents, cottagers, hunters, fishers, trappers, etc.

6.3 Participation of stakeholders

As mentioned in section 2, “Conservation and development of Réserve de biodiversité Kakinwawigak”, the MELCC will seek the collaboration and participation of stakeholders in managing the reserve. Its intention is to draw up an action plan to guide management in protecting and enhancing the territory and its resources. The MELCC will prepare the plan in collaboration with the regional actors concerned. A participation and consultation mechanism for local stakeholders will be worked out by the MELCC on the basis of local and regional territorial realities.

Management of the biodiversity reserve will respect the following conservation principles:

- maintain natural ecosystem dynamics;
- restore or facilitate the restoration of damaged ecosystems;
- respect the support capacity of ecosystems;

- maintain non-industrial harvesting activities, without encouraging their development;
- gather and disseminate knowledge about the natural and cultural heritage;
- participate in the management of adjacent areas to ensure harmonization with the conservation objectives pursued within the biodiversity reserve.

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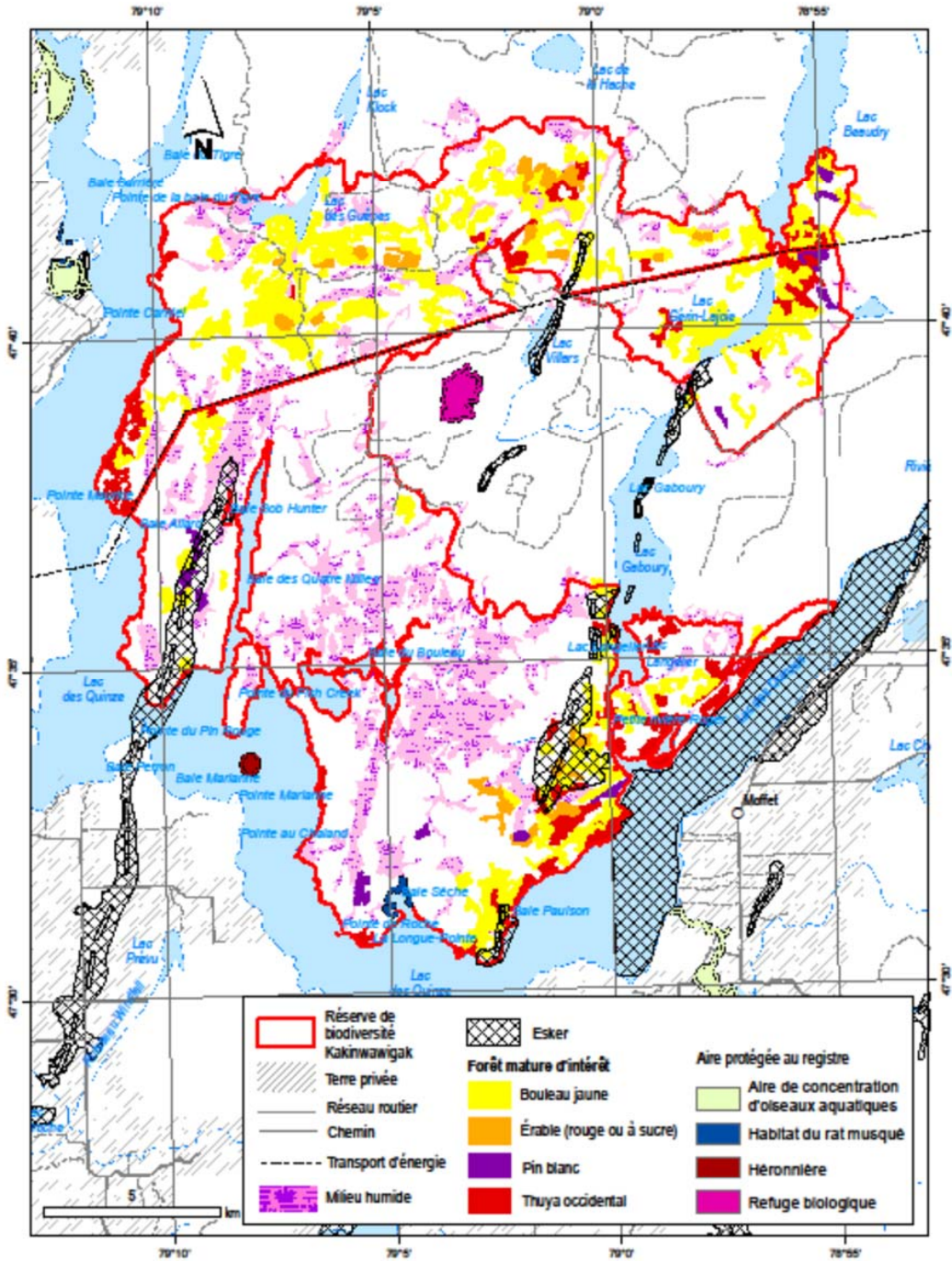
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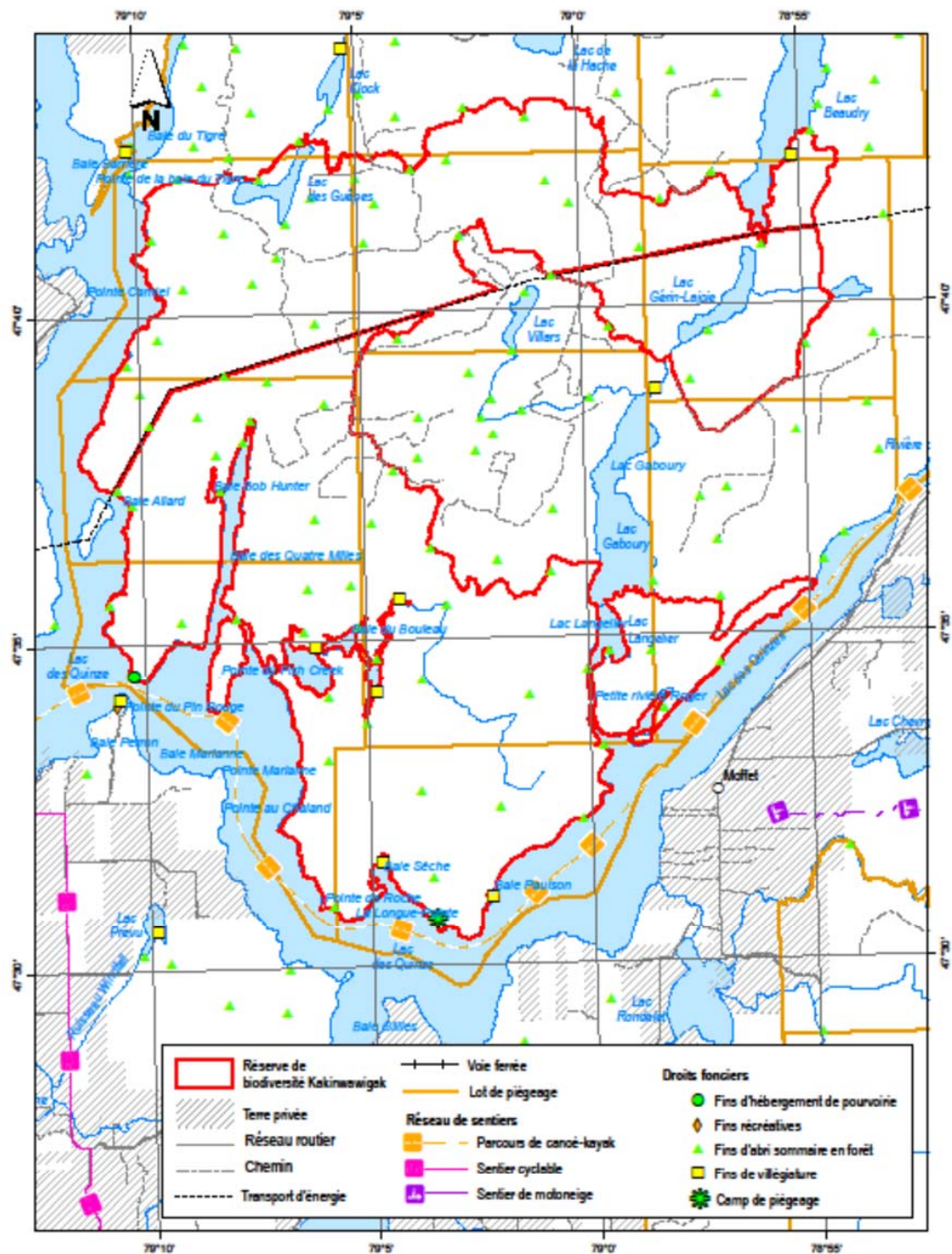
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Appendix 2 — Réserve de biodiversité Kakinawigak: Elements of ecological interest



Appendix 3 — Réserve de biodiversité Kakinawiaqak: Land occupation and uses



Appendix 4 — Réserve de biodiversité Kakinawigak: Zoning

