Photo 16. The Rivière Attic near its mouth in the Rivière Mégiscane (M.-A. Bouchard, MDDEP)

4.4 Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic

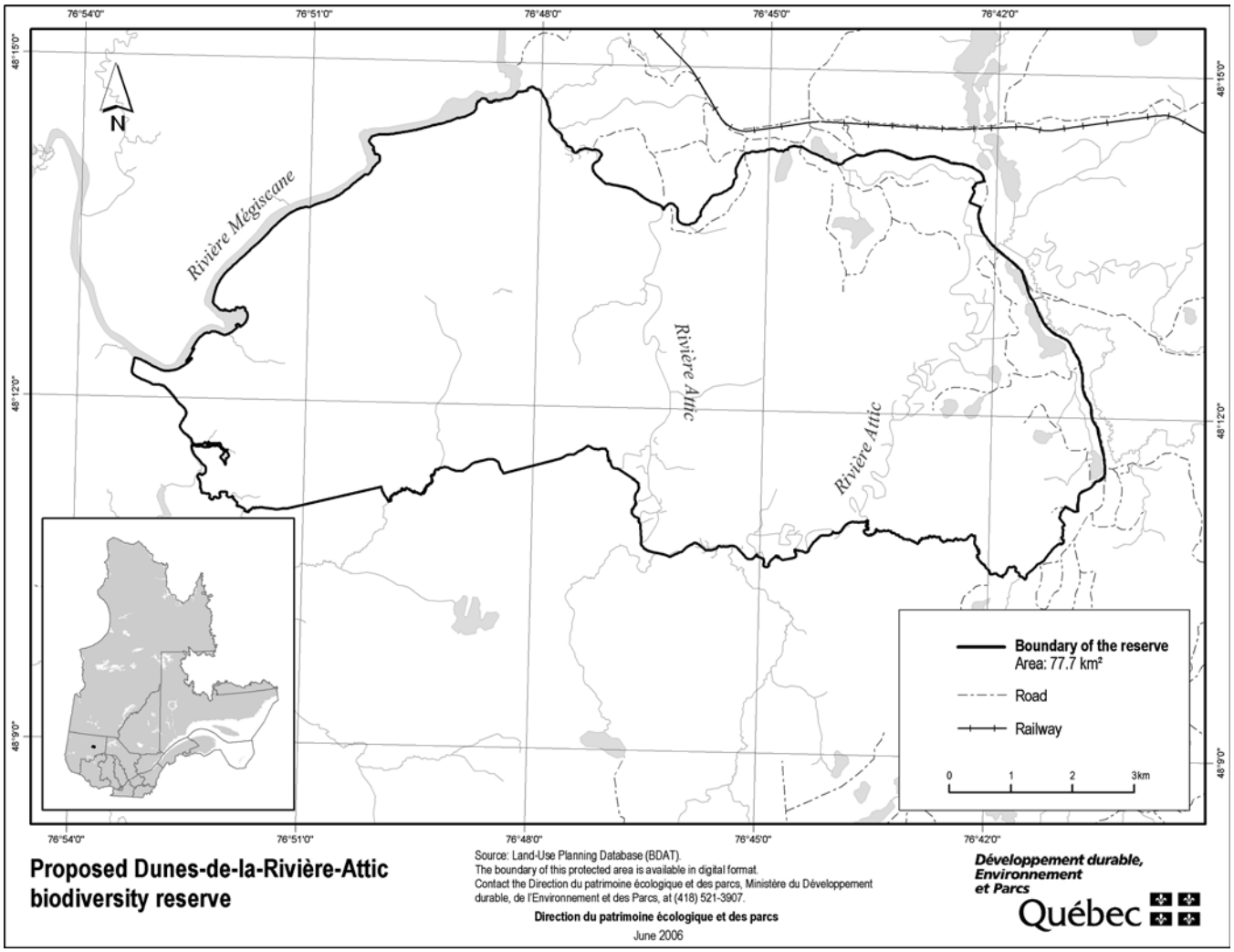
4.4.1 Location, boundaries and dimensions of the proposed reserve

The Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic is located in the territory of the Ville de Senneterre in the MRC de La Vallée-de-l'Or. It is roughly 35 km east of the Senneterre city core (approximately 55 km by road), i.e. between 48° 10′ and 48° 14′ north latitude and 76° 40′ and 76° 53′ west longitude. It occupies a geographic area of 77.1 km^2. It is bounded to the southwest by the Rivière Assup, to the northwest by the Rivière Mégiscane, to the north in part by the Rivière Attic, to the northeast by an unpaved drivable road, and to the southeast by the Ruisseau Kâhôbekônemekak.

4.4.2 Legal framework

The territory described below has the status of a proposed biodiversity reserve, pursuant to the *Natural Heritage Conservation Act*. The same Act governs its regime of activities and its conservation plan.

Figure 91. Geographical location and boundaries of the Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic, as presented in the summary conservation plan



4.4.3 Place name

The provisional place name is the Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic. The proposed place name for the granting of permanent protection status is the Réserve de biodiversité des Dunes-de-l'Attic. The expression "Rivière Attic" is an Algonquin name (*atikosipi*) that means "caribou" or "caribou river." The place name appears on a map dating from 1932. It is here that Grey Owl, the celebrated trapper and animal protector, and his spiritual companion Anahareo caught his two famous beavers in the winter of 1928.[15]

4.4.4 Ecology

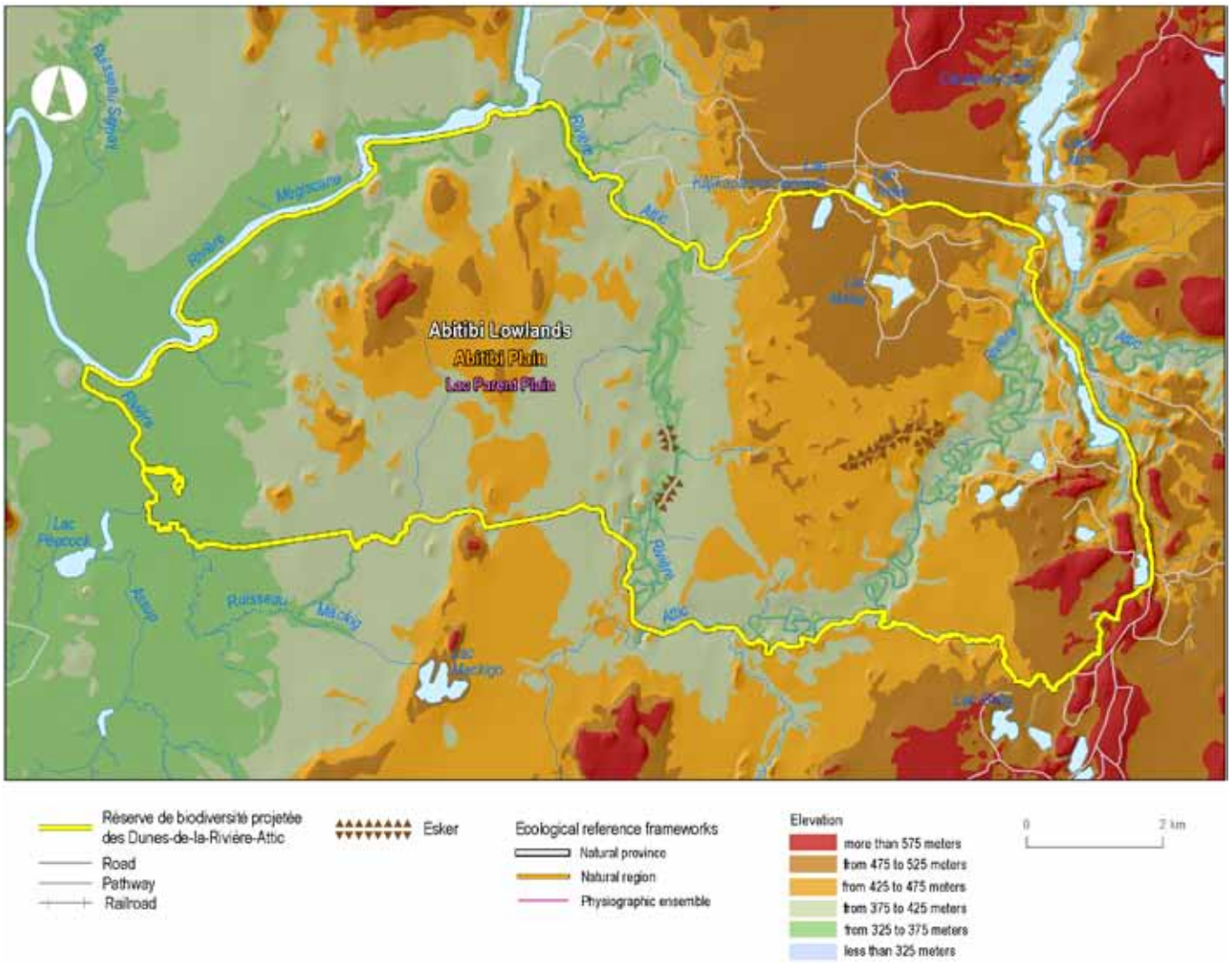
Physical environment

As noted in the "Climate" section, the region of the proposed biodiversity reserve has a subpolar, subhumid climate with a medium growing season. The territory is located in the Superior Geologic Province and its basement rock is almost entirely made up of granitic rock, Archean-age intrusive rock.

The topography varies from an altitude of 333 m to 384 m, with an average altitude of 355 m (Figure 92). The Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic is located in the Abitibi Plain natural region (Abitibi and James Bay Lowlands natural province), more precisely in the Lac Parent plain physiographic unit, which, as its name indicates, is a plain dotted with rare mounds of till.

[15] *Guide des parcours canotables du Québec*, tome II, 1999, page 180.

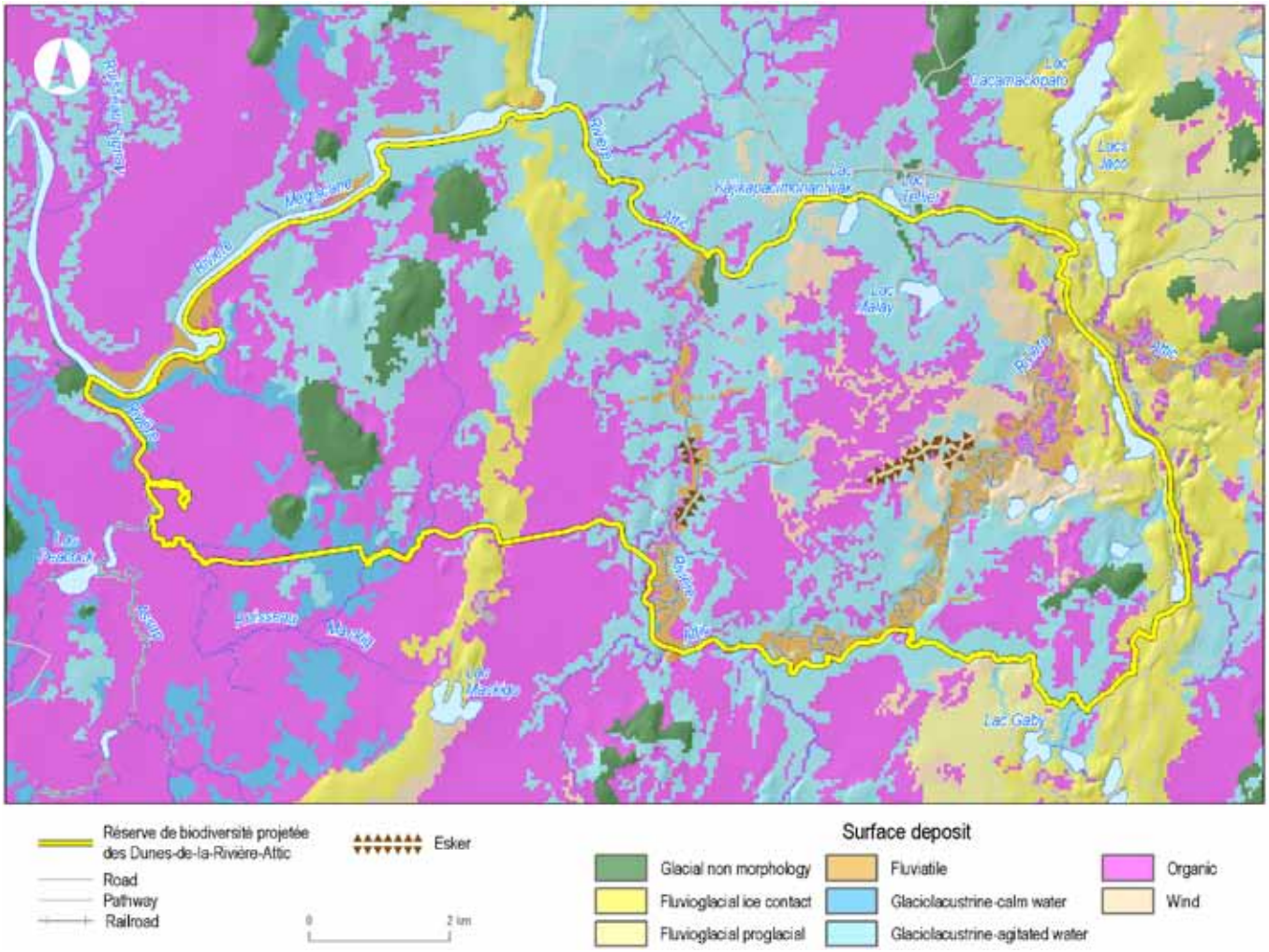
Figure 92. Topography of the Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic



The fairly flat territory has glaciolacustrine sand plains that slope slightly towards the Rivière Attic and are dotted with peat bogs. The Rivière Attic valley, which meanders across the reserve, receives current and subactual river alluvium deposits. A slightly raised plateau comprising stable dunes dotted with peat bogs is located in the northeastern portion (Figure 93). The dune ecosystems (Photo 17) are rare and are the main element of interest as regards the protection of the territory. Dunes of sandy glaciolacustrine deposits and big glaciofluvial systems are found here and there. Moreover, the dunes were formed by the finest windborne grains of sand from the surrounding deposits.

Photo 17. Aeolian dunes

Figure 93. Geomorphology of the Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic

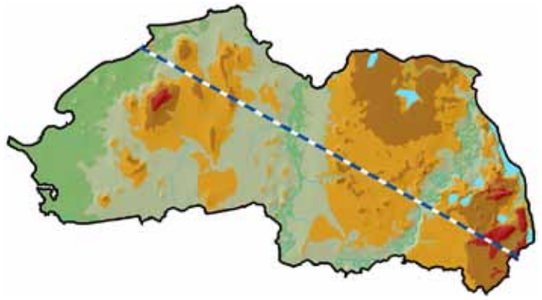


The depressions and very poorly drained areas are carpeted with organic deposits that form ombrotrophic peatlands covering large geographic areas of the proposed biodiversity reserve. The northeast boundary of the proposed reserve is the site of confluence of two big glaciofluvial valleys, one from the east, i.e. the Rivière Attic valley, and the other from the north, in which is located, in particular, Lac Cacamackipato. The convergence of the two glaciofluvial systems dating from the Quaternary Period explains the significant presence of sandy deposits (Photo 18). An esker running north to south crosses the protected area between the Rivière Attic and the Rivière Assup.

The Rivière Attic physiographic sere (Figure 94) illustrates the territory's physical features and their links with the environment's forest components.

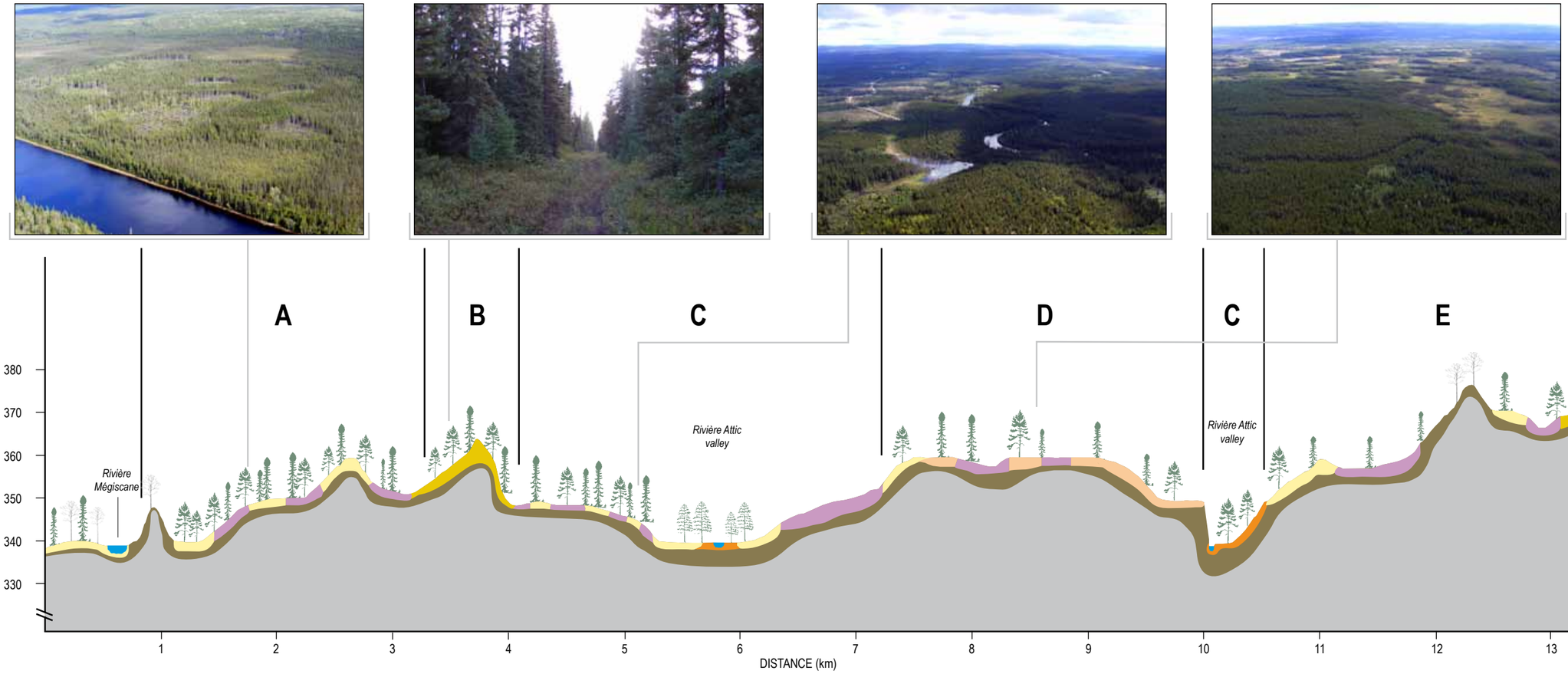
Photo 18. Jack pine forest on glaciofluvial sand

Figure 94.
Rivière Attic physiographic sere



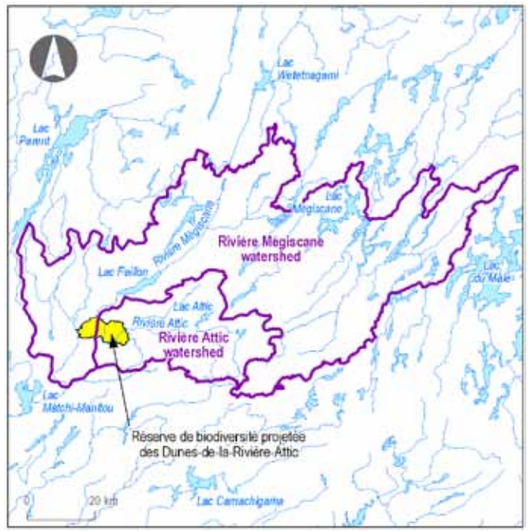
Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic

- Abitibi Lowlands natural province
- Abitibi Plain natural region
- Lac Parent Plain physiographic ensemble



A. Black spruce moss, ericacea or sphagnum
B. Grey pine on esker
C. Black spruce and grey pine
D. Grey pine on dunes and bog
E. Grey pine and black spruce

Figure 95. Drainage basins of the Rivière Attic and the Rivière Mégiscane



The eastern two-thirds of the river system in the territory of the proposed biodiversity reserve feeds into the Rivière Attic (Photo 19) and the western third flows directly into the Rivière Mégiscane. The entire territory lies within the Rivière Mégiscane drainage basin, which flows into the Rivière Bell, which in turn is part of the large drainage basin of the Rivière Nottaway, which empties into James Bay (Figure 95). Despite its name, the protected area only protects the downstream portion of the Rivière Attic to its mouth in the Rivière Mégiscane. What is more, it protects only 4.8% of the Rivière Attic drainage basin, with an area of 1057 km^2.

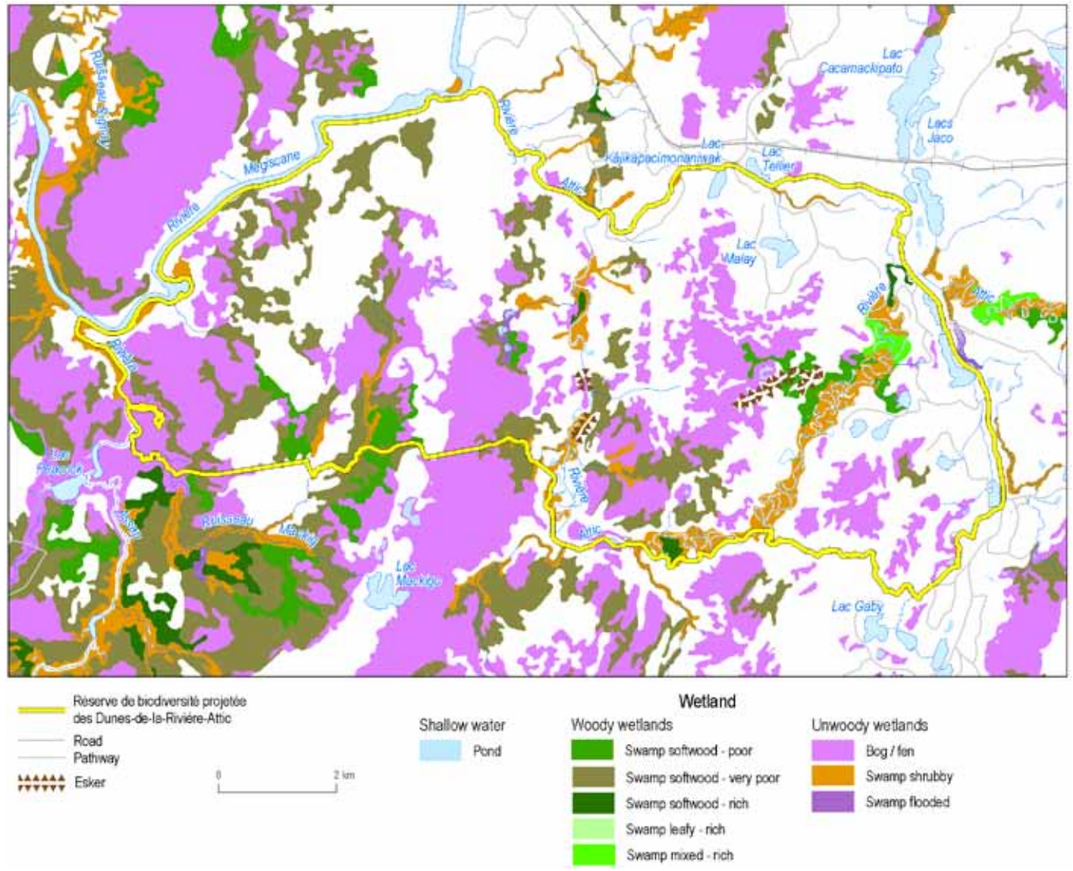
Apart from the Rivière Attic, the sparse river system essentially comprises several streams and intermittent watercourses. Several small lakes (79) are located in the territory, of which the two biggest ones are Lac Malay and Lac Kâjikapacimonaniwak, with an area of 17 hectares (0.17 km^2) and 0.8 hectare (0.008 km^2), respectively. Aquatic environments account for less than 2% of the area of the proposed biodiversity reserve.

Wetlands have a total area of nearly 33 km^2, equivalent to roughly 43% of the protected area. Most of the wetlands are made up of ombrotrophic peatlands (Photo 20) but there are also numerous softwood swamps and, in the sector of the meanders of the Rivière Attic, shrub swamps (Figure 96).

Photo 19. Meanders of the Rivière Attic

Photo 20. Ombrotrophic peatlands in the western portion

Figure 96. Wetlands – Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic



Unfold

Biological environment

Vegetation

The proposed biodiversity reserve is located in the balsam fir-white birch bioclimatic domain, where the potential vegetation mainly comprises black spruce-moss stands or black spruce-heath stands and black spruce-sphagnum moss stands and, to a lesser extent, balsam fir-black spruce stands (Figure 97).

However, in point of fact, the existing vegetation comprises jack pine stands and black spruce stands but also poplar stands in the harvested sectors. Forest fires may explain the presence of jack pine stands in environments favourable to black spruce (Figure 98). Forest cover accounts for 61% of the geographic size of the protected area.

Figure 97. Potential vegetation – Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic

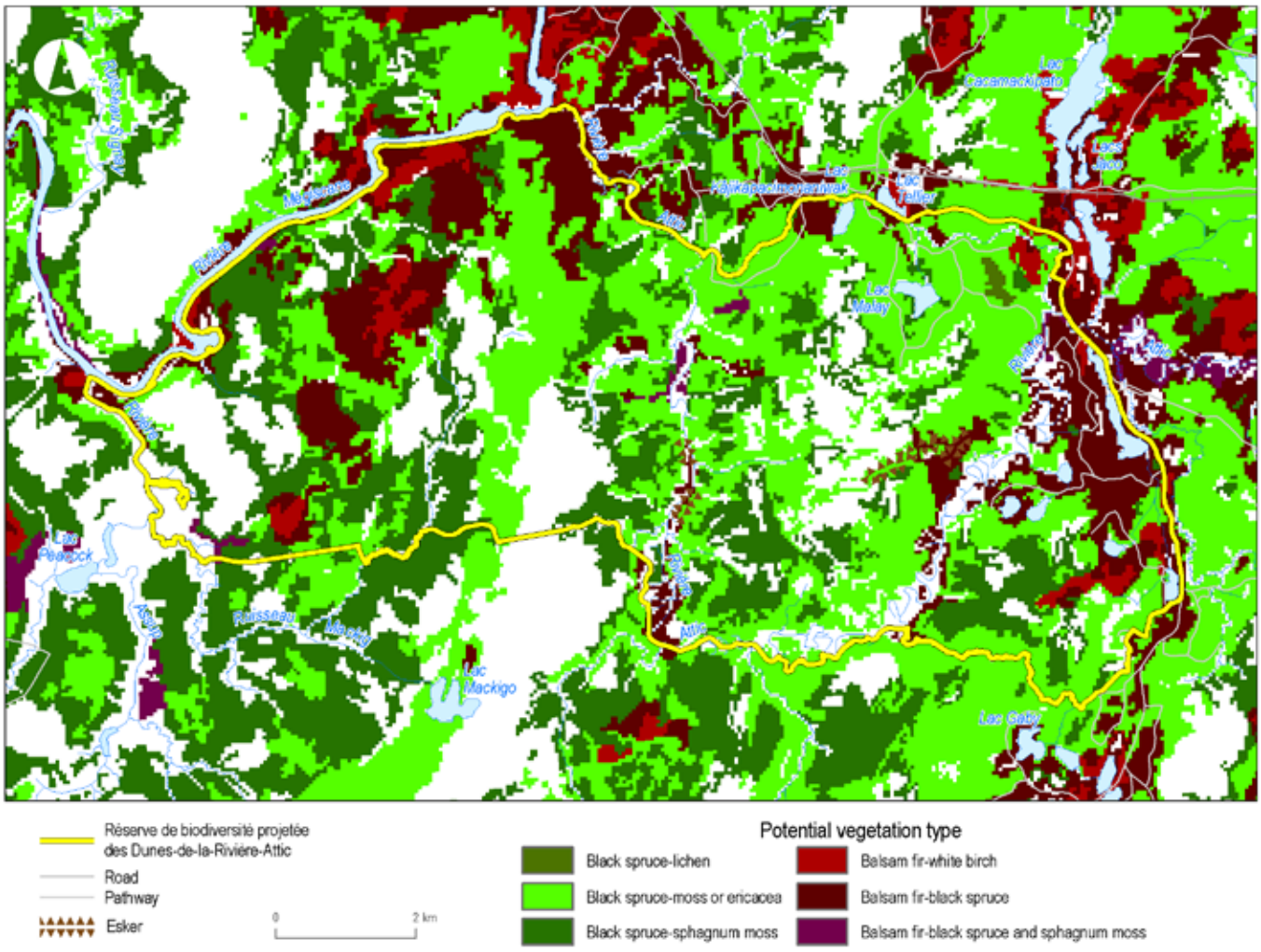
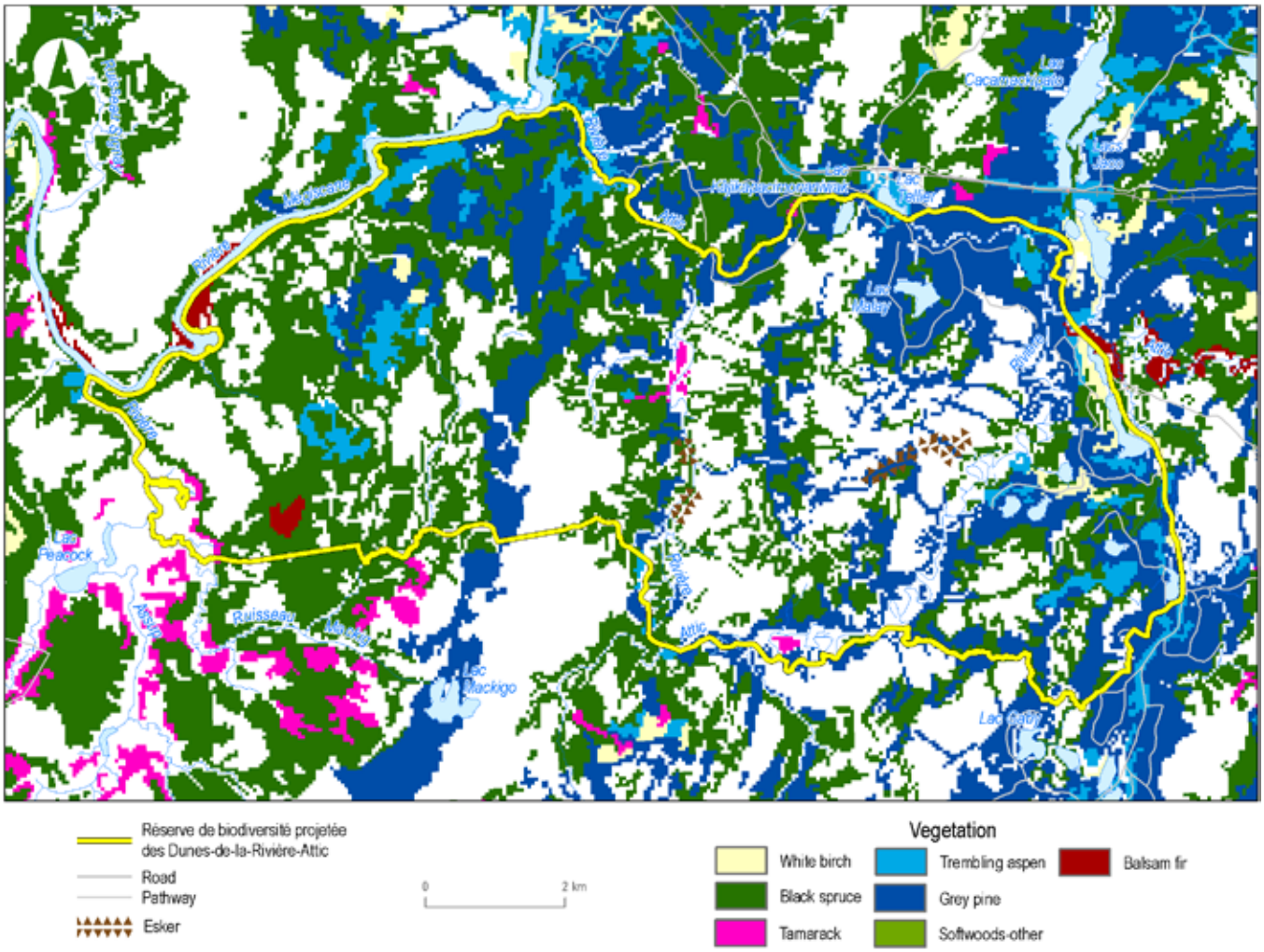
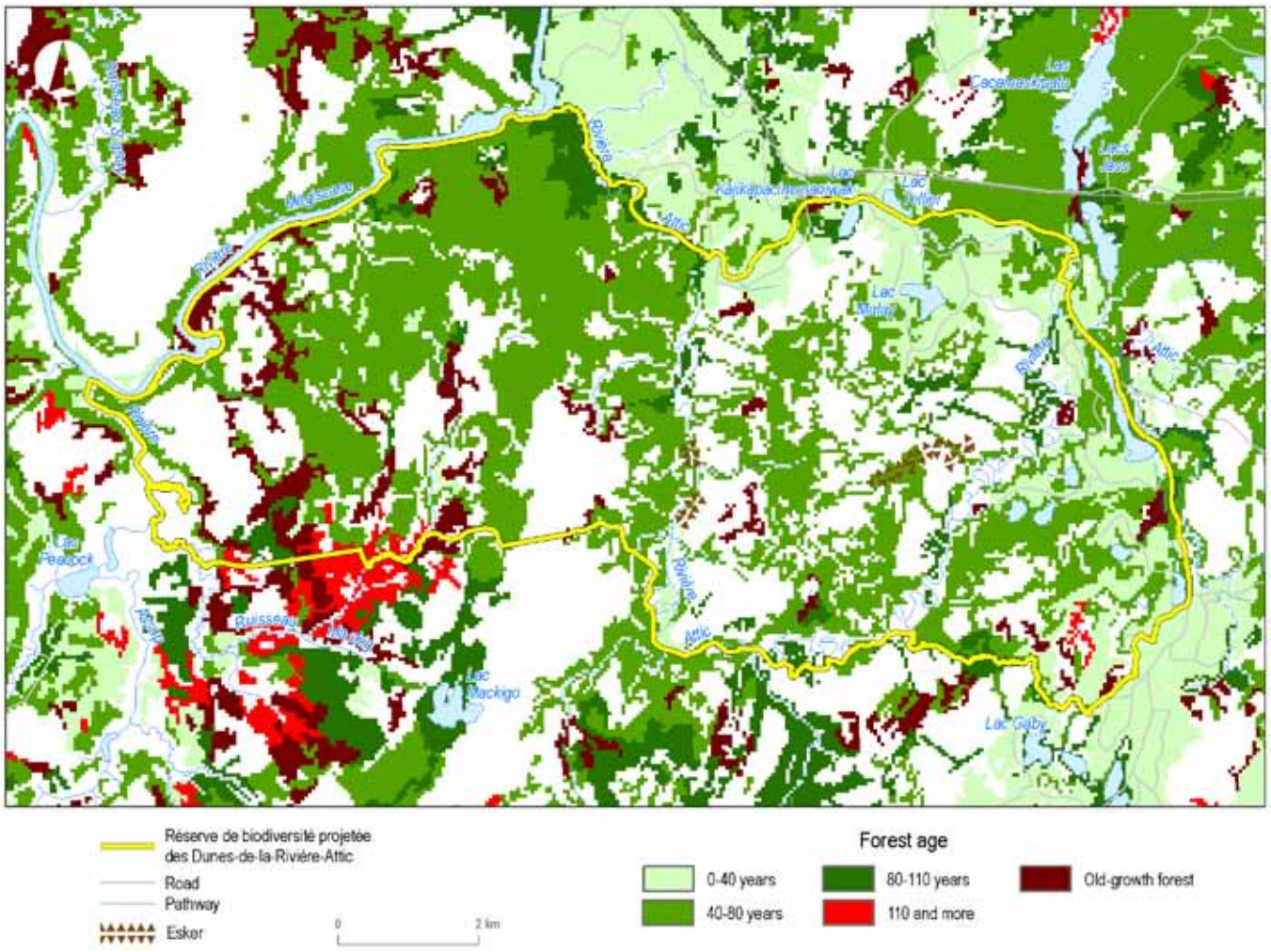


Figure 98. Vegetation – Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic



Plant cover on hydric sites is made up of forest stands of varying density of black spruce, equivalent to roughly 52% of the forest cover. Xeric sites, in particular sandy glaciolacustrine deposits, dunes and eskers, are mainly colonized by jack pine, found on roughly 39% of forest land. As for the age of the forest stands, 67% of the forest cover comprises middle-aged forests (between 40 and 80 years old) and forests under 40 years old account for 16% of the forest cover (Figure 99). Mature forest stands (80 years old or over) and old-growth forests account for 8% each of the forest cover. The few old forest stands are black spruce stands.

Figure 99. Age of forest stands – Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic



From the standpoint of forest productivity, the extent of the wetlands in the territory means that less than 70% of the territory is made up of productive forests (Figure 100). Accordingly, an appreciable proportion of environments are without forest cover because of logging carried out before the reserve was established.

The proposed biodiversity reserve is located in an ecological subregion in which average forest fires cover large areas (see Figure 44), i.e. over 500 km^2, under the forest fire regime. The proposed biodiversity reserve has an area of 77 km^2, which is too small to maintain over time all of the components of the ecosystem at different stages in its natural dynamic, in particular in a context in which it is located in an ecological subregion where the most frequent forest fires cover over 500 km^2. Forest fires in the decade preceding the establishment of the reserve affected just over 8.6 km^2. The fire in 2007 burned the southeastern portion of the reserve (Photo 21). Jack pine regenerated there rapidly and efficiently (Photo 22).

Figure 100. Productive forest – Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic

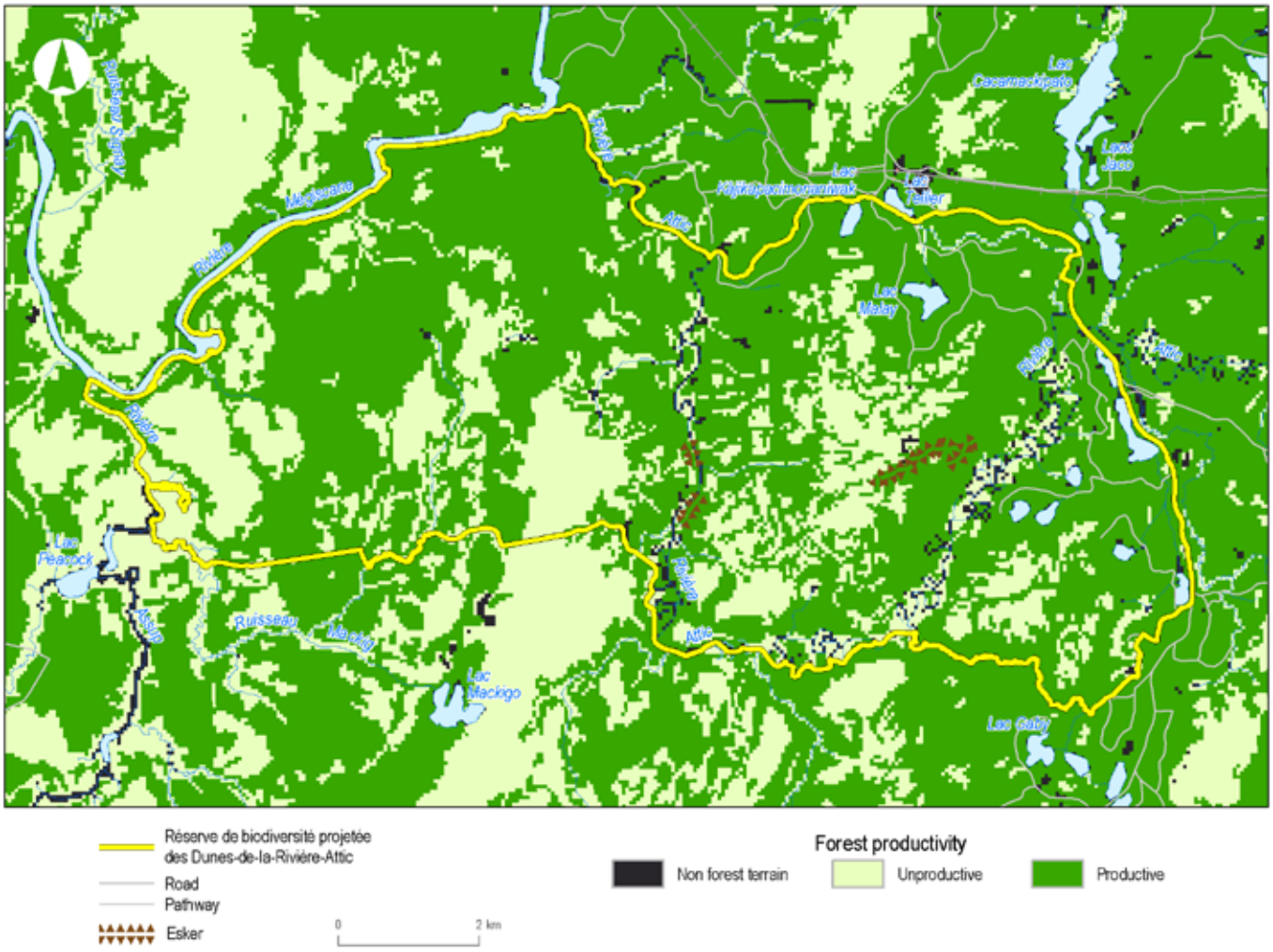


Photo 21. The area burned in 2007

Photo 22. Regeneration of jack pine after a fire

Wildlife

No occurrence has been mapped of rare, vulnerable or threatened species. Furthermore, given that lakes in the reserve are small, there are no specific data for fish species in the territory.

No specific inventories have been conducted in the territory as regards terrestrial species, but the ecosystems, depending on the human footprint and age of existing forests, are likely to host several species that are typical of the Abitibi-Témiscamingue region, as indicated in the section devoted to regional fauna. Fur-bearing animals in the territory include muskrat, mink, river otter, beaver, American marten, red fox, weasel, coyote, red squirrel, wolf, Canada lynx, striped skunk, black bear, marten, and racoon. The main big game species hunted are moose and black bear. The most common small game species are ruffed grouse, spruce grouse, snowshoe hare and migratory birds such as ducks, geese, American woodcock and Wilson's snipe.

According to information obtained from the SLOA, a great grey owl has already been observed in a logged area in the territory of the proposed biodiversity reserve.

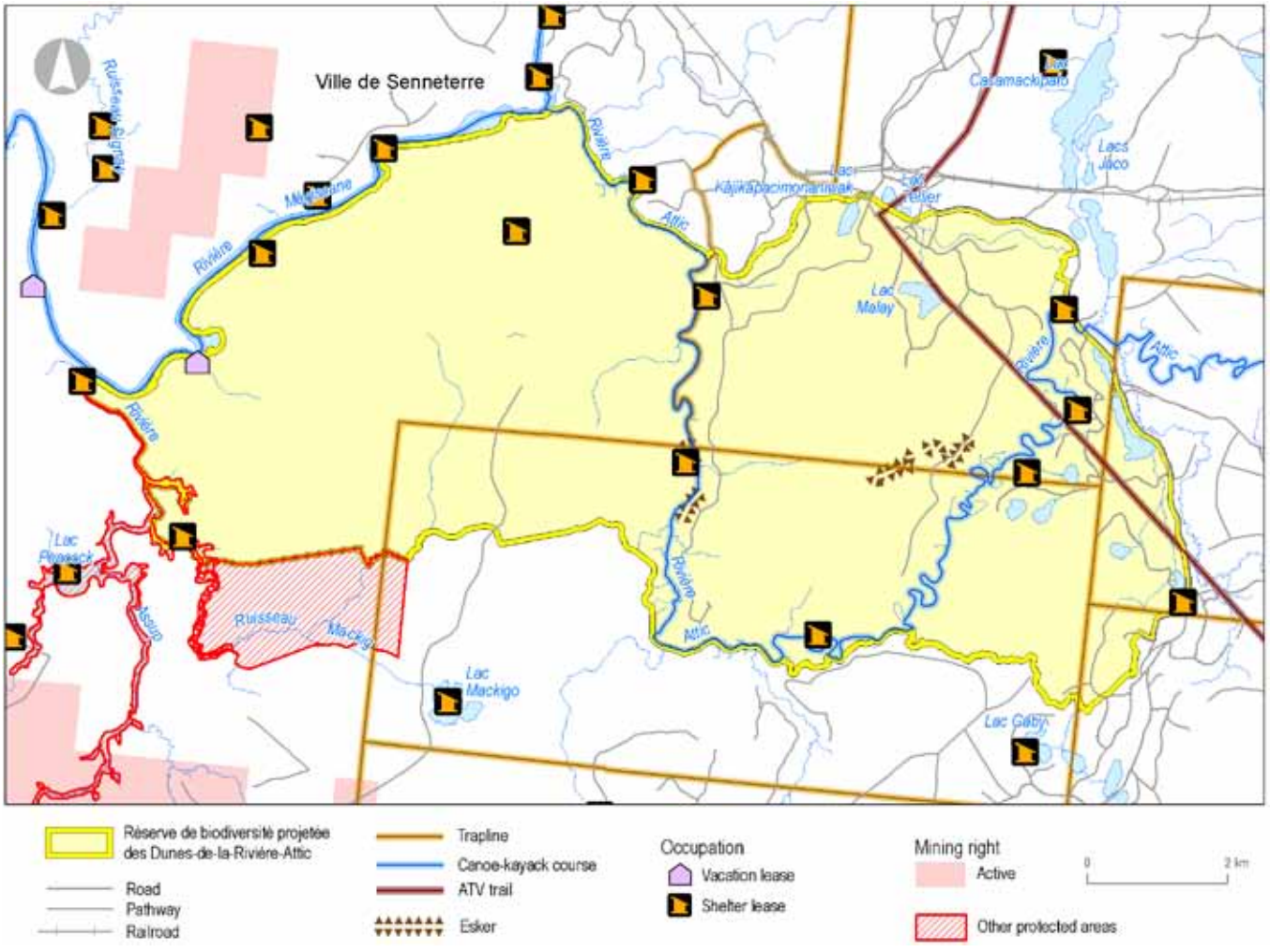
One water bird concentration area and one muskrat habitat located inside the reserve are already recognized as protected areas.

Social environment

Native groups appear to have used the territory in the past. According to Archéo-08 (Marc Côté, personal communication), the territory offers archaeological research potential because of the presence in the territory of the Rivière Mégiscane, an important former canoe route for travel from west to east and into which the Rivière Attic flows.

Trappers frequent the reserve, which lies entirely in FAMU 05 and straddles five systems of traplines (Figure 101). Beaver account for

Figure 101. Occupancy and use of the Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic



roughly 36% of catches. Moreover, the territory is suited to hunting and has 11 shelter leases. Between 2002 and 2006, sport hunting accounted for the harvesting of six black bears and two moose. Holiday resorts are rare. There is only one vacation lot lease, located near the Rivière Mégiscane.

The territory of the reserve has been classified under Category III pursuant to the JBNQA and the *Act respecting the land regime in the James Bay and New Québec territories*. The reserve is covered by the hunting, fishing and trapping regime applicable pursuant to section 24 of the JBNQA.

As for accessibility, forestry roads resulting from the most recent logging, in particular a forestry road running north then along the eastern boundary of the reserve, afford access to the territory. There are approximately 55 linear km of roads. The protected area is located in FMU 084-51.

A quad bike trail crosses the eastern part of the reserve and a snowmobile trail, while it has not been mapped, appears to cross the northwestern portion of the reserve and the Rivière Mégiscane. However, it is likely that users travel by motorized vehicle to different places in the territory in the summer or winter on logging roads.

4.4.5 Contributions of the protected area

Representativeness

From the standpoint of representativeness, the Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic seeks primarily to protect the aeolian dunes. Given its limited size, it is contributing little to the protection of common elements, but the protection of the dunes, a rare element, confers on it special importance. It is contributing to the protection of ecosystems in physiographic unit F0205, i.e. the Lac Parent plain, which, above all, comprises, silty-clay plains and boggy plains. Despite its small size, the reserve is protecting landforms and sandy glaciolacustrine, organic, glaciofluvial and glacial surface deposits, which are underrepresented in the network of protected areas in this natural region, which makes it a relevant protected area.

From a biological perspective, the reserve is protecting numerous environments corresponding to types of potential vegetation that are underrepresented in the network of protected areas in this natural region, i.e. black spruce-sphagnum moss stands, black spruce-lichen stands, black spruce-moss stands or black spruce-heath stands, balsam fir-white birch stands, balsam fir-black spruce stands and balsam fir-sphagnum moss stands. There are few old-growth forests in the reserve. Only 5% of the territory of the reserve is made up of old-growth forests. The forest stands are usually isolated, except in the southwestern portion where a certain concentration of old-growth stands is found (see Figure 12).

Moreover, the reserve stands out since it protects extensive, varied wetlands, including ombrotrophic peatlands and shrub swamps, which adds to the protected area's relevance.

Efficacy

Human beings have left evidence of their passage through or presence in the territory. The main human footprints stem from forest harvests and the attendant logging roads. Logging occurred, especially in the dunes sector, before the territory was protected (Photo 23). Accordingly, the level of naturality is very low on the dunes. The human footprint is rare west of the Rivière Attic and is quasi-absent in the western third of the reserve (west of the esker). The satellite image in Figure 102 clearly illustrates the human footprint. It also reveals the condition of the territory surrounding the reserve.

Photo 23. Dunes subject to logging

From the standpoint of configuration, as noted earlier, the proposed protected area (77.1 km^2) is not big enough to encompass all of the successional stages of forest ecosystems. The perimeter-area ratio is 0.7, barely two times the ideal ratio (a perfect circle) and is deemed to have an acceptable shape. Obviously, when a 3-km strip is subtracted from the boundaries (edge effect), no conservation core remains. While the perimeter-area ratio is fairly close to a perfect circle, the configuration could be improved. As for the major part of the southern portion of the reserve, it does not seem possible to expand it since the sector has high mineral potential (gold and copper-zinc-silver). Several mining rights are found there at present.

Figure 102. Satellite image of the Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic

From the standpoint of fragmentation, there are approximately 55 linear km of roads in a 77.1-km^2 area, equivalent to a ratio of 0.71 linear km of road per km^2 of area, which, according to Quigley *et al.* (2001), is a moderate road density (0.43 to 1.06 km/km^2). Logging carried out in the years that preceded the protection of the territory covered over 7.4 km^2, equivalent to roughly 10% of the territory of the reserve but to nearly 16% of the forest cover.

4.4.6 Conservation issues

The restoration of the dunes and the forest ecosystem are the main conservation issue in the territory. The question is to determine which initiatives should or should not be carried out to ensure the most appropriate restoration. Indeed, the jack pine growing on the dunes was harvested before the protected area was established. Once the territory was protected, no initiative was undertaken to regenerate the dunes. As a result, since 2007, the dunes have shown no sign of regeneration. To reproduce, jack pine needs fire, whose heat opens the cones and spreads the seeds. When a jack pine forest is harvested instead of being renewed by fire, it is necessary to replant the species or engage in controlled burning if jack pine is still growing in the vicinity. Accordingly, there is good reason to contemplate a solution adapted to the territory that will facilitate the reconstitution of this ecosystem.

While the protected area was not established in order to protect the Rivière Attic, the last downstream section of the river, until it empties into the Rivière Mégiscane, is protected. The boundaries of the reserve touch in places on the banks of the river, which does not afford it optimal protection. The management of the protected area must seek to properly protect these stretch of the river. The activities carried out near the river should take into account this conservation objective. The following section presents possible adjustments to the boundaries aimed, among other things, at attaining this objective.

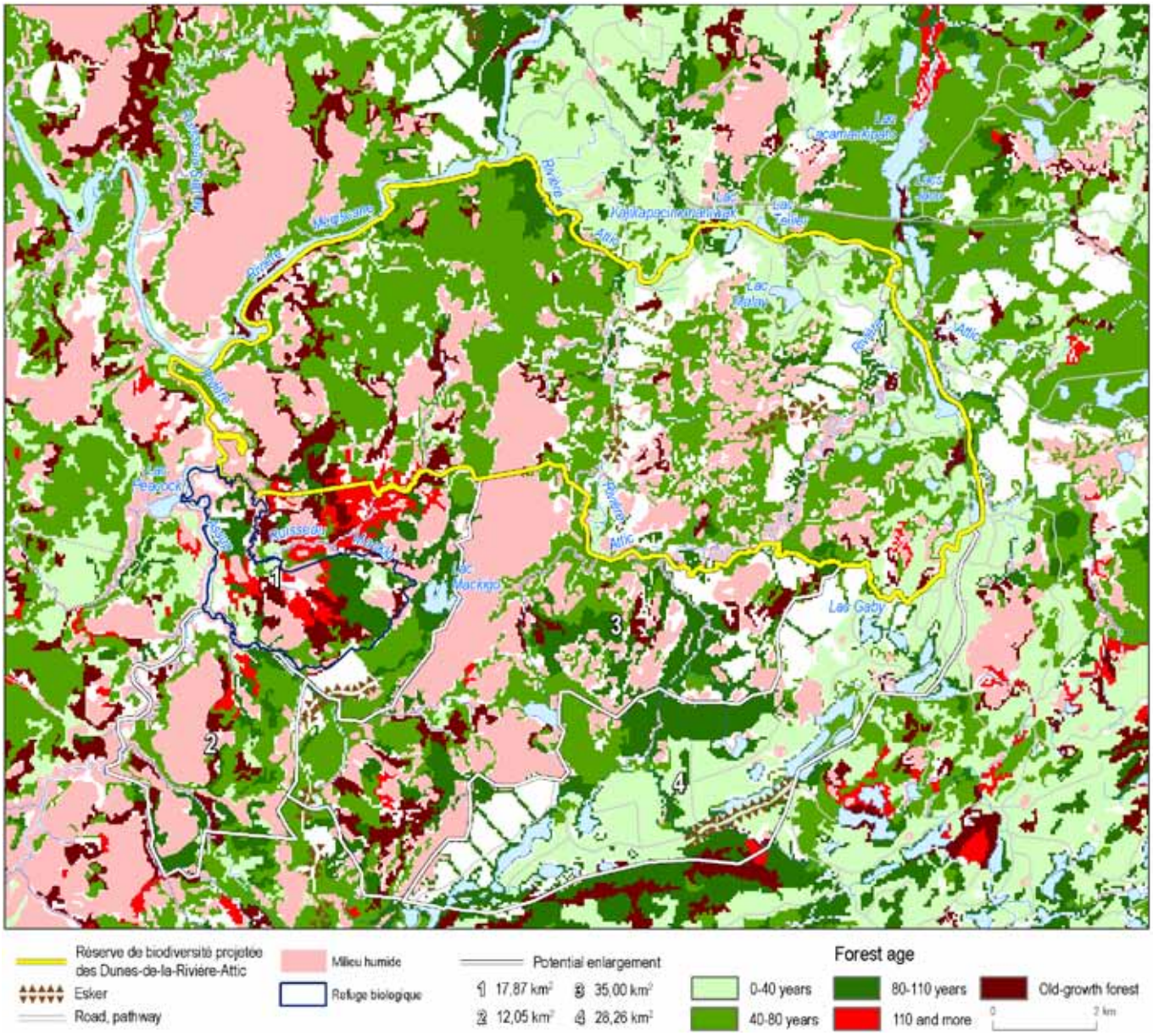
4.4.7 Potential expansions

Potential expansions were studied (Figure 103) in order to enhance the configuration of the protected area and add to it portions of lands where the forests are of greater interest, bearing in mind the MDDEP's original proposal. The expansions thus focused on peripheral lands located south of the current proposed reserve. It was decided that it was most important to add contiguous lands on the southwestern boundary because of the presence of an exceptional forest ecosystem and mature forest stands (first expansion in Figure 103).

The potential expansions studied would protect organic and silty, argillaceous environments. The areas are mainly occupied by old black spruce stands. Polygon No. 2 is already entirely covered by mining rights and polygons Nos. 3 and 4 are also partially covered by mining rights.

The MDDEP presented these potential expansions of ecological interest to the members of the Table GIRT MRC-VO during the workshops that preceded the public consultations. The reactions to the potential expansions are presented in detail in the companion document entitled "Summary of the preparatory workshops for the public consultation and meetings: Granting of permanent

Figure 103. Potential expansions of the Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic

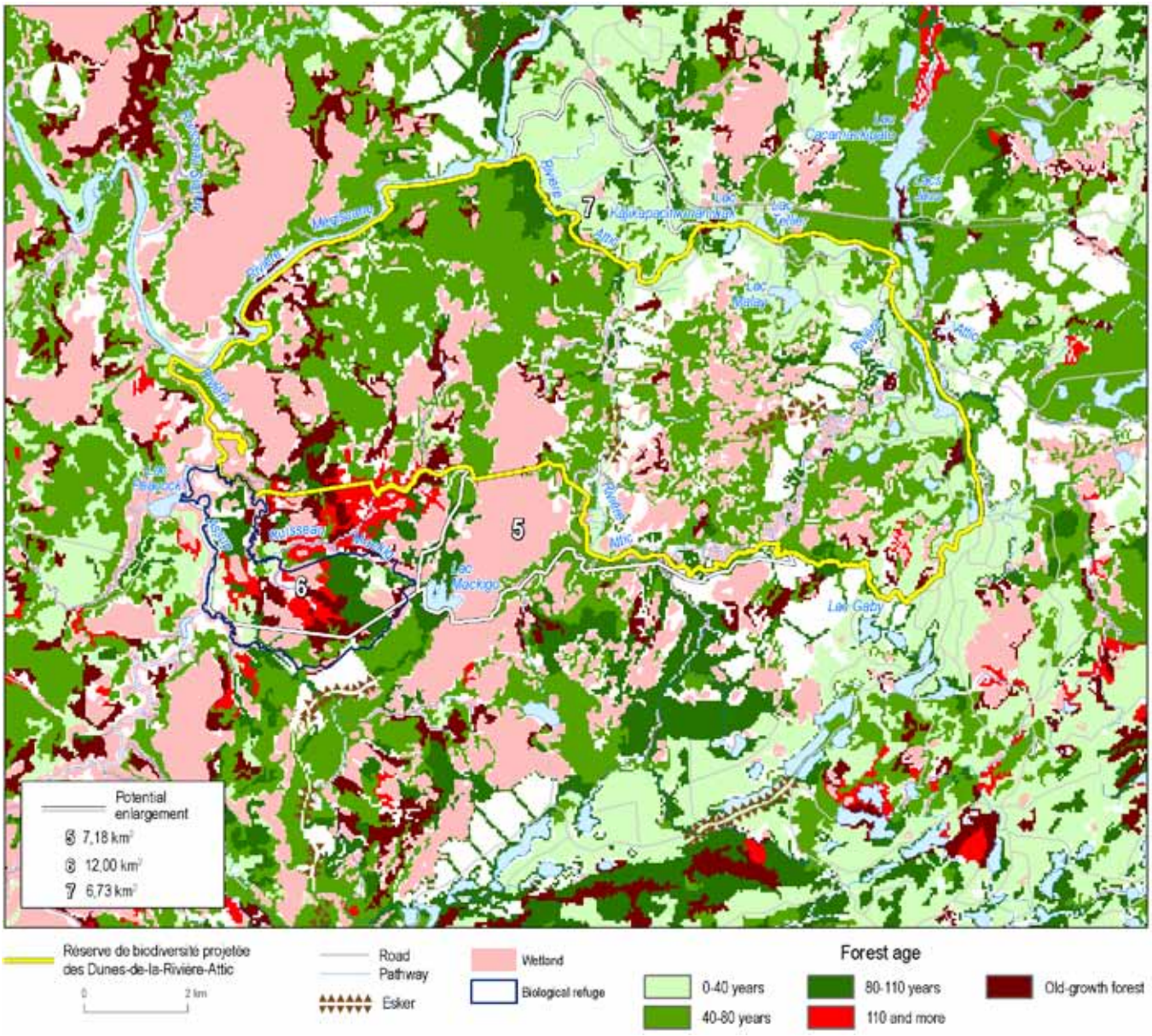


biodiversity reserve or aquatic reserve status to eight territories in the Abitibi-Témiscamingue region" submitted to the BAPE Commission within the framework of this consultation. In short, forest and municipal stakeholders are disinclined to accept the expansions for the proposed biodiversity reserves located in the territory of the Ville de Senneterre and in the Senneterre forest management units, for the same reasons as those expressed as regards the protected areas mentioned earlier. However, in the case of the proposed biodiversity reserve, there was less reluctance because of the small areas in question. The main constraint stems from mineral potential and mining rights.

The constraints to the adjustment of the boundaries mean that the MDDEP has revised the expansions to be evaluated in respect of this protected area. The revision also took into account the conservation objectives respecting more appropriate protection of the Rivière Attic. Figure 104 presents a revised scenario for the potential expansions. The figure shows the three polygons analyzed, with a total area of nearly 26 km^2. The biodiversity reserve would have a total area of 103 km^2 and the perimeter-area ratio would improve, from 0.69 to 0.55.

While there is mining potential in the southwestern portion of the reserve, the MDDEP revised the territory of analysis, i.e. polygons Nos. 5 and 6 in Figure 104 by attempting to reduce the overlapping of sectors of ecological interest and mineral potential. Polygons Nos. 5 and 6 in Figure 104 total 19 km^2 and almost all of polygon No. 6 includes an exceptional forest ecosystem and a biological

Figure 104. Revised expansions of the Réserve de biodiversité projetée des Dunes-de-la-Rivière-Attic



refuge. However, mining potential is present and future analyses must be conducted to ascertain whether the expansion scenario is possible since, at present, the exceptional forest ecosystem is recognized as a protected area but the biological refuge is not.

4.4.8 Management of the permanent reserve

Once the biodiversity reserve obtains permanent status, it will be managed in such a way as to ensure the attainment of conservation objectives. Accordingly, the MDDEP's decisions pertaining to management will prioritize conservation. As for regulations, when the biodiversity reserve obtains permanent status, it will have a conservation plan in which a regime of activities will regulate all activities or initiatives in the protected area. The regime of activities will draw inspiration, by and large, from the regime of activities in the conservation plan of the proposed reserve. However, in the case of permanent status, the new conservation plan could make provision, as the case may be, for specific features to better structure activities and initiatives in order to ensure better protection of the territory, ecosystems and biodiversity.

The conservation plan will stipulate that certain activities are allowed in the protected area, that others are strictly prohibited, and that a number of activities or initiatives whose compatibility with the protected area and its conservation objectives varies will be subject to authorization by the MDDEP. For more information, see the section entitled "The regime of activities explained" or the document entitled "Régime d'activités dans les réserves de biodiversité et les réserves aquatiques." When the MDDEP evaluates any request for authorization, it will attach particular importance to the protection of the aeolian dunes and the Rivière Attic.

As for the operational management that the MDDEP carries out in the territory of the permanent reserve, the department will ensure minimum management through the installation of basic signage and occasional surveillance of the protected area. However, a management committee comprising the stakeholders concerned could be established to participate in the drafting of an action plan that defines the management priorities pertaining to the protected area, then collaborate on the action plan's implementation.