



**Pôle d'excellence  
en récréotourisme**  
Outaouais

## **Recreational Trails Plan**

**Report presented to:  
the municipality of Kazabazua**

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# 1. Introduction

The Municipality of Kazabazua requested the services of PERO to develop a development plan for the creation of hiking/recreational trails on nearby private lands as well as on public lands, including near Lake Danford and in the Kazabazua Plain area. This document will equip the municipality in its decision-making process, in budgeting and in the search for funding for the implementation of a trail network.

As it stands, the document is designed with a view to planning over more than a year and route proposals are organized in a modular way. While most of the recommendations focus on snowshoeing trails in winter, some sections lend themselves to other types of use, such as mountain biking. Where this is the case, this will be mentioned in the text. In the event of the integration of different types of activities, however, it should be kept in mind that some practices are difficult to combine and will require use management.

It should also be noted that the trails have not been named at this time. In order to facilitate the understanding of the text, the different sections are designated according to four sectors (Private Sector, Cycle Route Sector, Kazabazua Plain Sector, Danford Lake Sector) and according to their geographical location (south loop, west crossing, etc.)

# 2. Context

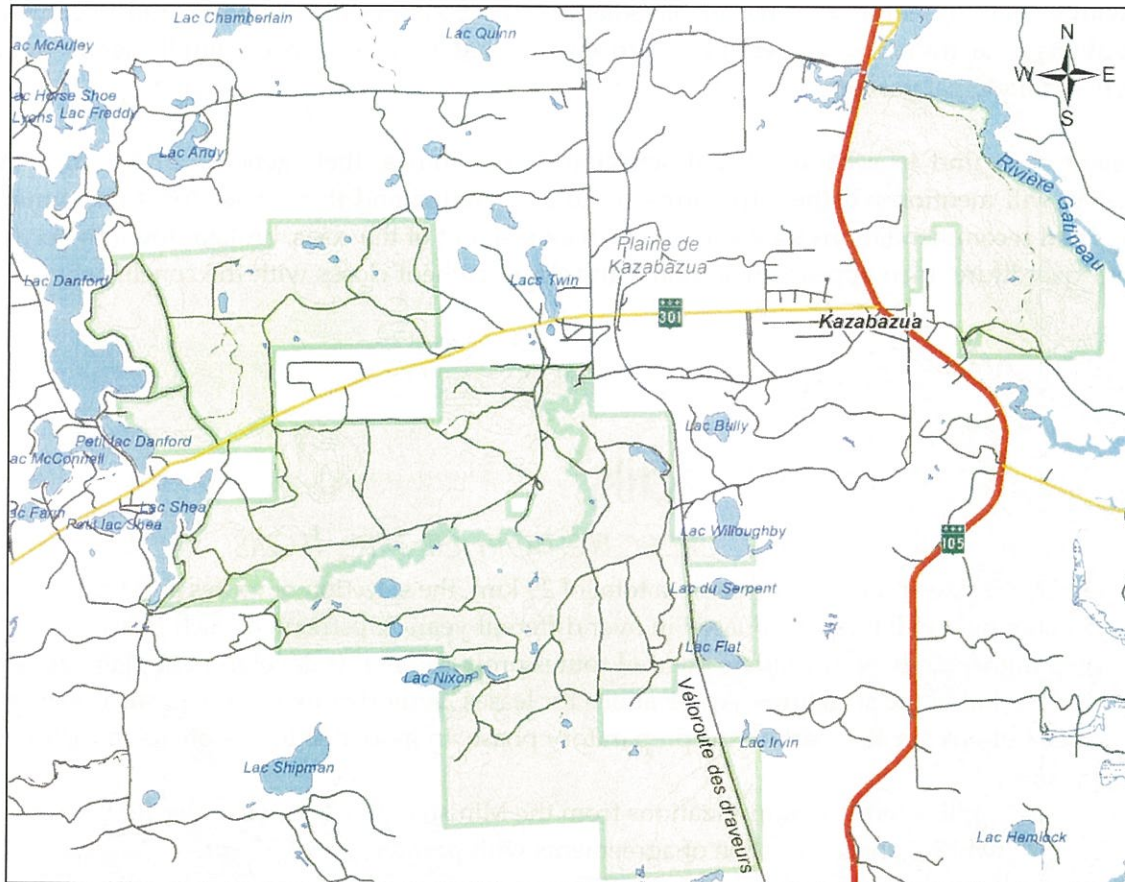
A study conducted by the Transat ESG UQAM Chair in Tourism (2017) showed that the outdoor activities sector is an important leisure hub in Quebec and contributed \$2.2 billion to the province's economy by generating more than 30,800 jobs in 2016. Far from running out of steam, the popularity of the outdoors is confirmed with more than 9 out of 10 practitioners who wish to discover a new activity. Note that 66% of respondents (adult Quebecers) have practiced at least one outdoor activity in the previous three years. Whether on trails, on the water, on the walls or even underground, Quebecers are resolutely avid outdoor enthusiasts. The study also reveals that Quebecers who practice the outdoors associate nature with well-being and 87% of them consider that it reduces stress. The beauty of the landscapes is decisive in the criteria. Among outdoor enthusiasts, hiking and snowshoeing are in 2nd and 3rd position of the most popular practices, after road biking and bike paths.

With a view to complementarity of the offer, the hiking trails of the Gatineau Valley are presented in Appendix 1. It may be interesting to keep in mind that, in addition to Quebec users, the population base of eastern Ontario could be interested in this network. Finally, it should be noted that all the proposed routes total 29 km of trails: Depending on the choices of the municipality, it is therefore possible to establish a small local network or, over the years, a larger network.



### 3. Methodology

This development plan is based on cartographic analysis and field observations of an area of approximately 2,500 hectares located between the Gatineau River and Lake Danford, on either side of the agglomeration of Kazabazua and divided into a block of private land and another on public lands (see map below).



Secteur analysé (zone apparaissant en vert)

The proposed routes were determined following observations made in the field and an in-depth analysis of data from different sources (aerial photographs, forest stands, logging histories, topography, hydrology, lidar, cadastre), in order to cover a maximum of attractions. Thus, preliminary routes are proposed and the required structures have been identified. It is important to note in this regard that the current philosophy in the field of outdoor is to limit as much as possible the presence of infrastructures such as stairs, sidewalks and walkways in favor of a judicious use of topography. The goal is to limit the expenses related to maintenance and replacements, inevitable with artificial structures, while respecting as much as possible the natural character of the site. It should also be noted that as much as possible, plots try to avoid clearcut areas or other open areas, which are of more limited interest to users.



As mentioned, the proposed routes are, at this stage, preliminary, and are to be refined during a validation stage in the field and with potential other stakeholders. Ideally, the final routes should remain within 50 to 100 m of the routes indicated in this document. When infrastructure is essential, the PERO is based on generic plans from the Government of Quebec's guide to construction in a natural environment as well as previous projects as a baseline to determine the quantities of materials needed and the required workforce.

Also with a view to simplifying the management of the potential trail network and maximizing its sustainability, the routes were determined to ensure that they remain on public lands or on the property of municipal partners.

The reader will find in section 4.1 a description of the routes, their general environment and, if applicable, will mention whether structures are to be installed and then in section 4.2 a summary of findings and recommendations for each route. An assessment of the costs, broken down by section and type of expenditure, then appears in section 5 and the document closes with the conclusions in section 6.

## 4. Proposed trails

### 4.1. *Planification and description of the trails*

Given the size of the entire system (a total of 29 km), the selection of routes and trail development will likely be phased in over different years. Upstream of each phase, a preparatory phase will validate the trail routes proposed in this development plan and confirm the location of the structures. Applications for leases, authorizations and various research and consultations are also part of this preparatory phase. In more detail, this phase consists of 3 steps:

- Applications for authorizations from the Ministère de l'Énergie et des Ressources Naturelles (MERN) and ratification of agreements with partner owners;
- If applicable, applications for certificates of authorization based on environmental or wildlife characteristics;
- Validation of the routes presented in the development plan, identification with GPS and identification of the final route of the trails;
- Sending exact routes to departments.

During the process of analyzing applications for authorizations by the MERN, research will be done to verify that no contraindications exist in relation to the current use of the territory (consultation of databases on threatened species, consultation of indigenous communities, consultation of planners of the Ministry of Forests, etc.). Once the audits are completed and the authorizations obtained, the MERN will then be responsible for publishing the route of the trails in the public land use plan.

Structurally, the hiking trails proposed as part of this development plan correspond to a hiking use, in accordance with Rando-Québec standards (walking surface about 1.2 m wide, lateral clearance area, routes located on accessible slopes, etc.). The sections proposed for bicycle use provide for development that complies with the design standards of Vélo-Québec's mountain bike trail development guide. All trails also have clearly visible signage including markings, trail names, points of interest indications, location maps and welcome signs.

The network as a whole is presented in 16 sections, divided into four sectors as follows:

- **Private sector** (close to municipal offices)
  - North loop;
  - South loop ;
- **Cycle Route Sector North portion;**
  - Central portion ;
  - South portion.
- **Kazabazua plain sector**
  - West crossing;
  - Central crossing;
  - East crossing;
  - Hill loop;
  - Connexion to the hill;
  - Access to the Kazabazua river (west)
  - Access to the Kazabazua river (east)
- **Danford Lake Sector**
  - Access to the small Danford lake;
  - North loop;
  - Central loop;
  - South loop ;

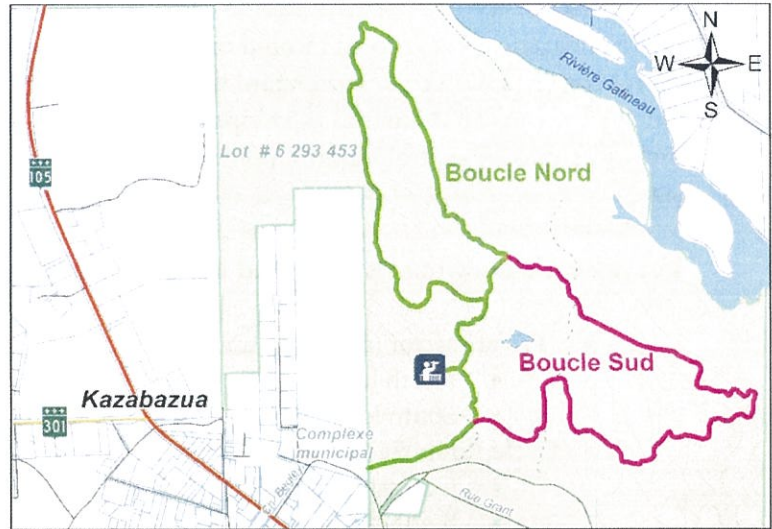
The network is organized according to one drop-off point per sector: This is the municipal complex for the private sector; the bicycle path for the cycle route sector; the hill east of Shea Lake for the Kazabazua Plain area and access to Little Danford Lake for the Danford Lake area. As mentioned above, this organization is based on a modular approach allowing each sector to be functional as soon as the first trails are implemented.



## ROUTE DESCRIPTION – PRIVATE SECTOR

Around the municipal complex is a vast private property of 340 hectares whose holder is interested in granting a right of way for the development of hiking trails.

The topography is characterized by a rocky mountain crossing the property diagonally, from southeast to northwest, so that one slope overlooks the agglomeration of Kazabazua and the other towards the Gatineau River. Another particularity, the portion of the property located right next to the municipal land has for its part a flat sandy relief typical of the plain of Kazabazua.



These varied topographical conditions are therefore reflected in existing forest stands, including a jack pine plantation in the sandy portion and a tolerant hardwood forest with an abundance of oak and maple trees accompanied by hemlock in the mountainous portion. The routes proposed here total 6.9 km and take advantage of this diversity of environments, with two loops starting on municipal land.

### The North loop

The first route, called the "north loop", is 4 km long and crosses, as its name suggests, the northern portion of the mountain from the gray pine plantation below. Visually it is a layout whose landscape is particularly interesting: The gray pine plantation at the beginning presents an open undergrowth and a soil covered with moss contributing to a cozy atmosphere. Shortly after the ascent is initiated in the mountainous portion, in a forest dominated by oak. The relief, although frequently steep, has enough flats and crevices to allow a winding layout on passable slopes. As the summit approaches, a site could be set up as a small stop. The presence of treetops prevents a completely unobstructed view towards the village, which can be guessed through the branches, but the scenery is nevertheless very attractive and justifies this small detour. Along the way, counterclockwise, users will observe a forest sometimes dominated by oak, sometimes dominated by hemlock, swaying in a topography dotted with rocks.



North loop : Grande diversité de topographie et de végétation



### The South loop

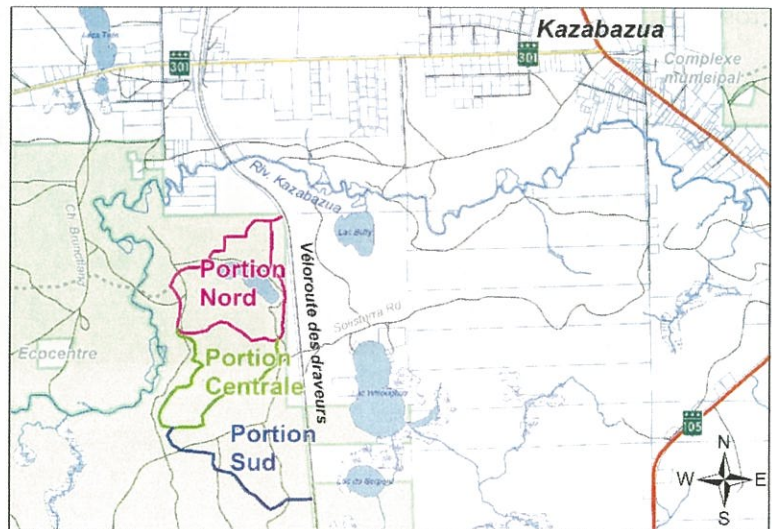
This second section runs through the southeastern portion of the mountain for 2.9 km. The topography is still conducive to sinuous layouts, although rock outcrops appear less frequent, in favor of boulders, stones and smaller mounds. This area appears to have been the subject of more frequent forestry interventions than in the northern portion and, although tree cover is abundant, there is some sporadic thinning and a greater presence of pioneer species such as poplar, fir and red maple. From a hydrological point of view, the area has a greater presence of wetlands that will have to be bypassed in order to maintain the trails in dry environment. Finally, it is pertinent to mention the presence of ATV trails that appear to be used for hunting..



South loop : Une topographie toujours variée peuplée d'une plus grande proportion d'arbres pionniers

### CYCLE ROUTE SECTOR

In places, the block of public land located in the plain of Kazabazua runs along the cycle route of the log drivers, where there are many red pine plantations established in the 70s. An exploration of the area shows a potential for appeal because of the particular landscape offered by the plantations approaching adulthood and the straight row arrangement of trees, giving a "cathedral forest" effect. As the proximity of the cycle route, the ease of making wider routes and the uniform topography of the area lend itself well to cycling, the recommendation for this sector is the implementation of mountain bike trails connecting to the cycle route to offer an exploration opportunity for cyclists in transit.





**North, central and south portion**

The map shows the proposals along three contiguous routes, with a northern portion of 3 km, a central portion of 2.1 km and a southern portion of 1.3 km, the sum of these three portions totaling 6.4 km. A fourth route choice (not shown on the map for clarity) is a direct connection between the two connections to the cycle route, making it a 3.3 km section (using only the east side of the top two loops and the southern portion). This additional route option is also evaluated in the costing section.



The three routes are similar from the point of view of the environment which consists essentially, as mentioned, of red pine plantations on flat and sandy ground, occasionally crossing natural deciduous stands.

The proposed use of mountain biking would result in the establishment of a trail that takes advantage of the spacing created during thinning cuts made about ten years ago, where part of the rows reaches a width of 4 m, a dimension conducive to cycling that requires wider trails than for hiking.

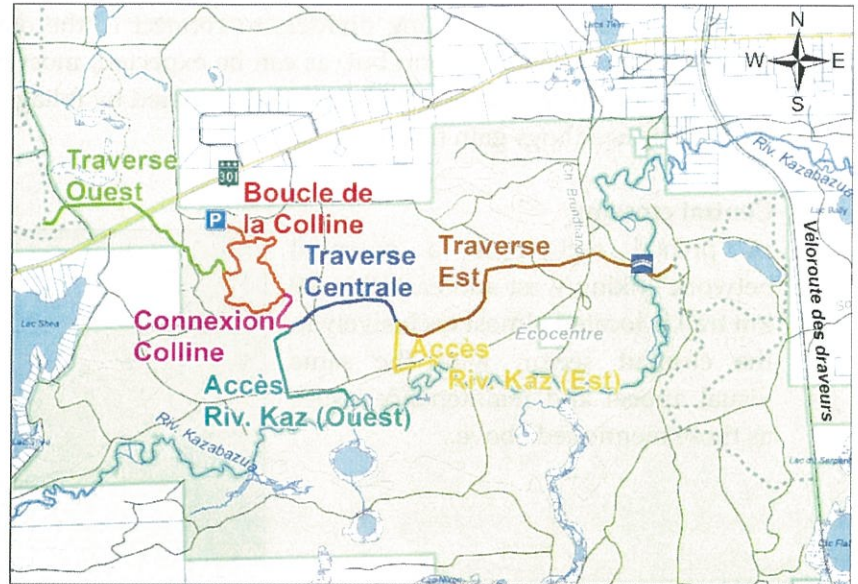






**KAZABAZUA PLAIN SECTOR**

Bordered by Highway 301, the Kazabazua River and Shea Lake, is an area almost entirely occupied by grey and red pine plantations found at various stages of growth and where significant logging has taken place. Indeed, contrary to what is observed in the cycle route sector, the harvesting work carried out here, in most of the planted areas, consisted of clear-cutting, with a few scattered rows left intact as cutting separators. The areas cut, which are recently exploited, have been the subject of work to reproduce and now consist of plantings at the seedling stage, less than one metre high.



With the exception of certain sections, the interest of the proposed trails for this sector lies mainly in the connecting role they could play in the event of the need to connect the cycle route to small Danford Lake and to various points on the Kazabazua River.

**East crossing**

This is the 2.2 km section that connects to the cycle route area by crossing a relatively easily accessible location of the Kazabazua River, presumably once used as a crossing point and to which, from Brundtland Road, an ATV trail leads. There is no trace of a bridge today, but the rocky banks and the narrowness of the riverbed are conducive to the eventual installation of a footbridge. In the context of this analysis, the construction of a 15 m pedestrian-bicycle bridge is proposed. The proposal for this structure consists of the installation of a galvanized metal structure designed with engineer's plan, with untreated cedar circulation surface.



Traverse est : Un point de la rivière Kazabazua est propice à l'installation d'une passerelle piétonnière



From the river heading west, the route first passes, for about 400 m, in a wooded area consisting of gray pine plantations. Thereafter, the rest of the route traverses the recently cut and replanted area by crossing the occasional cutting dividers to connect to the other trails further west. The topography remains very flat and uniform but, as can be expected, most of the landscape observed in the cutting areas is completely clear and will remain dominated by foliage and branches for another decade, while the planted seedlings gain height.

### Central crossing

A pivotal section in a potential network linking west and east, this 0.9 km trail is located almost exclusively in the clearcut sector, with the same visual appeal and maintenance issues as those mentioned above..



coupe à blanc

### Access to the Kazabazua River (west and east)

The two routes (the western access is 1 km and the access is 0.6 km) offer different routes to two access points to the Kazabazua River, identified by municipal collaborators as potentially interesting in the context of canoeing activities. The map on the previous page illustrates the particular shape of the two paths, whose hook-shaped routes are found to follow nearby cutting dividers. Of note, long stairs would be to be built at access points to the river because of the encashment of the riverbed.





### The hill (loop and connection)

About a kilometre east of Shea Lake is a secluded rocky hill contrasting with the flattened topography of the surrounding area. This peculiarity of relief and soil is also reflected in the forest composition, consisting here of oak, maple and poplar as opposed to the plantations of jack pines / red pines present in the rest of the plain. The result is an "island" of mature deciduous forest that overlooks nearby plantations and logging.

This rapid transition from the flat environment and generally discovered from the plain enhances the interest

of this area whose scenery could be characterized as an intermediate version of what is found in the mountainous area of the private land sector.

The terrain configuration and visual environment are conducive to the establishment of a 2.1 km loop, to which can be added a 0.4 km stretch as a connection to the plain to the southeast. It should also be noted that the central location of this area and the fact that the north of the hill is accessible from Route 301 by a secondary road would allow the improvement of the road over 350 m and the development of a parking lot as an access point to the network.

### West crossing

This 1.6 km stretch connects to the trails of the Danford Lake sector by crossing Route 301. Although, as in the case of the other two sleepers, it has to travel through areas of young plantations with little cover (in this case white pine plantations dating from 2010), almost half of the route was positioned in an adjacent young forest from a white pine plantation established in 1988. The topography, as in the rest of the plain sector, remains flattened except for the easternmost portion connecting to the loop of the hill.



La colline : Un îlot de forêt feuillue faisant contraste avec la plaine et les plantations des alentours

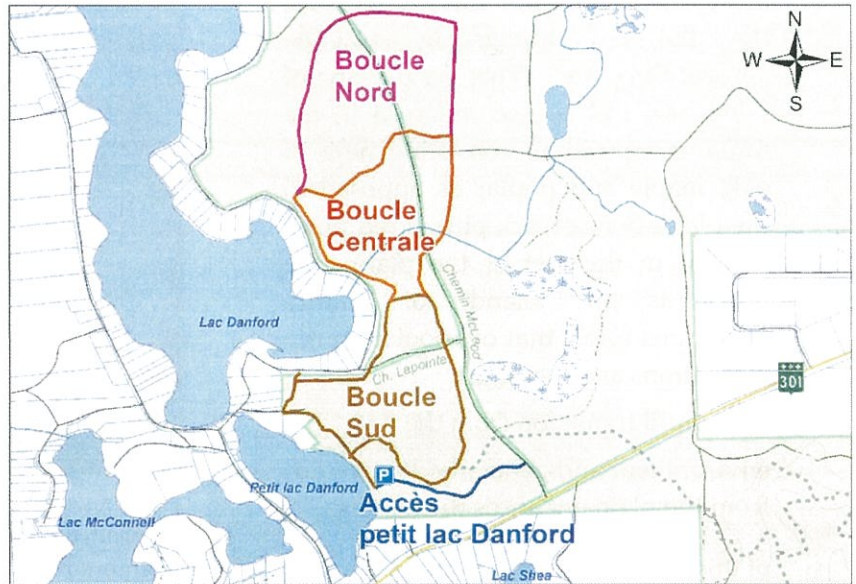


Traverse ouest : Un parcours partagé entre différents types de couverts



## DANFORD LAKE SECTOR

At the western end of the territory analyzed is the Danford Lake sector, characterized by the abundant resort present near the bodies of water. One side of the small Danford Lake is an exception, however, with nearly 400m of shoreline consisting of public land. As this narrow strip of land is destined never to be exploited, the municipality sees an opportunity to create public access and to establish, over time, a pole of attraction including recreational trails through the surrounding area.



The sector being essentially an extension of the Kazabazua plain, there is the same preponderance of flattened relief and sandy soil, forest stands being distinguished here by a greater diversity of ages present: Recent felling is more sporadic and plantations are older (the youngest date from at least a dozen years ago and several were established in the 70s and 80s). Notably, buffer zones of mature forest were left intact on the periphery of the resort area. Proposals in this area include the development of a section of motor road connecting McLeod Road to the water, an adjoining parking lot, pedestrian access to Little Danford Lake, and three loops of walking trails arranged contiguously to offer different lengths of hikes.

### Access to the small Danford lake

The eastern part of this route, from McLeod Road, currently consists of a wide 0.5 km truck trail and a 0.2 km stretch located in the middle of the forest. The geographical location, the flat relief (at least before arriving on the edge of the small Danford Lake) and the sandy soil seem conducive to the improvement of the trail to make it a passable road, which could extend to the lake where a parking lot of about twenty places, with dry toilet, would be designed to accommodate user heading to the lake or hiking trails. With regard to access to water, as in the case of access to the Kazabazua River, the proposal here is made in the context of non-motorized use, so it consists of the installation of a 6 m staircase.



Aspect du sentier en place vu depuis le chemin McLeod



### South loop

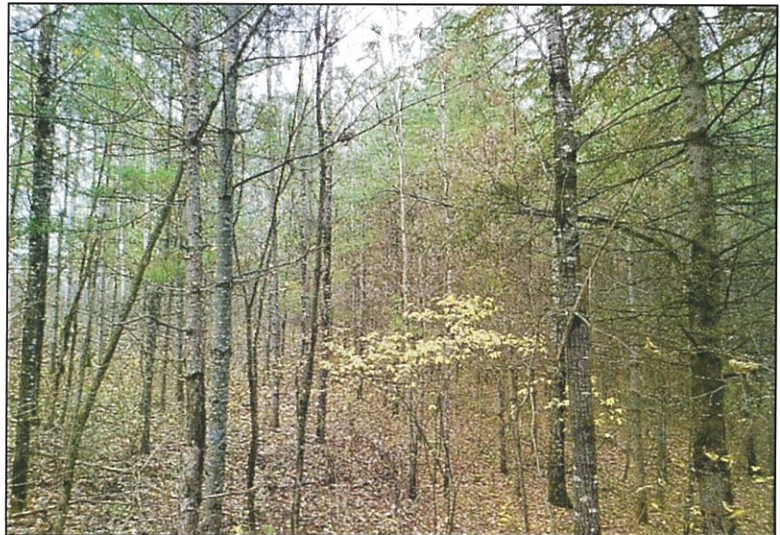
It is a 2.7 km route located between MacLeod Road and the two lakes (Danford Lake and Little Danford Lake), connected to the parking lot site and connecting with the plain sector. On the side of the bodies of water, to the west, the presence of an ATV trail facilitates the development of the route on nearly a quarter of the loop (about 700 m), the rest of the route forming a loop along MacLeod, Lapointe and Lac-Danford Road East..

The western portion of the route takes advantage of the mature strip of forest adjacent to the lakes and resort area. This part passes through a mature forest of maple, poplar and white pine, while the eastern part, along MacLeod Road, is located in a younger stand of poplars and white pines, from a plantation established in 1988. As pre-commercial thinning has already taken place in this stand in 2010, other forestry interventions are not expected for about ten years.

As part of the development of this sector as a pole of attraction, this loop is one of the first routes to be put in place, which would offer users the possibility of a short hike of about forty minutes from the parking site.



South loop : Sentier de VTT déjà en place dans la portion Ouest



Aspect caractéristique de la forêt dans la portion est, issue d'une plantation de pin blanc datant de 1988



### Central loop

This loop adds 2 km of trails and provides access to older plantations further north, offering users the opportunity to extend their hikes and cross, in the eastern part of the trace, a portion of the red pine plantations dating back to 1970. The northern part of the loop is in a young stand of white pine from a 1992 plantation and the western part, which runs along the resort area, is in a strip of natural mature forest of red and white pine. It should be noted that a 75 m portion of the route crosses a wetland that cannot be circumvented or boardwalks will be required.





### North loop

The northern loop extends the network by an additional 1.6 km and continues its journey through the 1970 red pine plantation, whose arrangement in straight rows appears more distinctly, reminiscent of the scenery of the plantations of the cycle route sector and the cutting separators of the Kazabazua plain. The western portion crosses a young coniferous forest composed of different species of pine trees whose origin dates back to a 1992 plantation consisting of slightly younger trees.



Plantations à des stades divers se trouvant sur l'itinéraire de la North loop



## 4.2. Analysis and recommendations

In order to better locate all the trails, a summary map is provided at the end of this section. As for the characterization and analysis exercise, it makes it possible to retain the following observations:

### Secteur en terrain privé

- Near the village, the northern loop area presents one of the most beautiful scenery of the network;
- Strategically favorable location due to the proximity to the municipal complex, the primary school and the urban agglomeration.
- The area where the South Loop is located is crisscrossed with mountain bike trails and appears to be used for hunting. In the event of the implementation of the southern route, a management of uses is to be expected;
- The sustainability of trails on private land is a major issue. The ratification of sustainable agreements for rights of way should be prioritized if public programs participate in the financing of implementation projects;

### Cycle Route Sector

- An agreement is to be expected with the MRCVG in the event of a connection to the cycle route;
- This portion of public land is managed in a manner supported by the government and the forest industry, ensuring that harvesting activities are recurrent. Partial cuts were made a decade ago in this particular sector, suggesting that the next cuts will not take place for another ten years. That being said, the Ministry of Forestry is likely to express, when applying for a permit, reservations about the establishment of trails in the centre of plantations intended for harvesting. Should these routes be chosen, prior political support at the provincial level is recommended;
- Although the establishment of structures does not seem necessary for trails in this area, the costs of building bicycle trails remain higher than on walking trails due to their increased width (traffic area of 2.5 m instead of 1.2 m) and additional work required such as surface stripping and installation of adapted signage.

### Kazabazua plain sector

- The potential attraction of trails in this sector varies, particularly because of the routes crossing the clear-cut areas, whose landscape is currently of limited interest.
- Due to the high light exposure of clearcut areas, it is to be expected that trails (mainly portions of the west, central and eastern ties) will require more frequent maintenance, at least for about ten years. Thereafter, as the newly planted trees grow tall, the amount of grasses and brush will gradually decrease.
- Both accesses to the river can use cutting separators to avoid being located in open areas.
- The Kazabazua River, at the two access points south of the central crossing, is encased at the bottom of steep slopes, it will be necessary to take into account this context in the implementation possible access to water. For the purposes of this exercise, the installation of long stairs was evaluated.
- As in the cycle route sector, this portion of the territory is developed on a sustained basis. However, recent clear-cutting means that the next logging will not take place for about thirty years. That being said, the same issue of reluctance on the part of the Ministry of Forestry is to be expected in the context of a possible application for authorization;



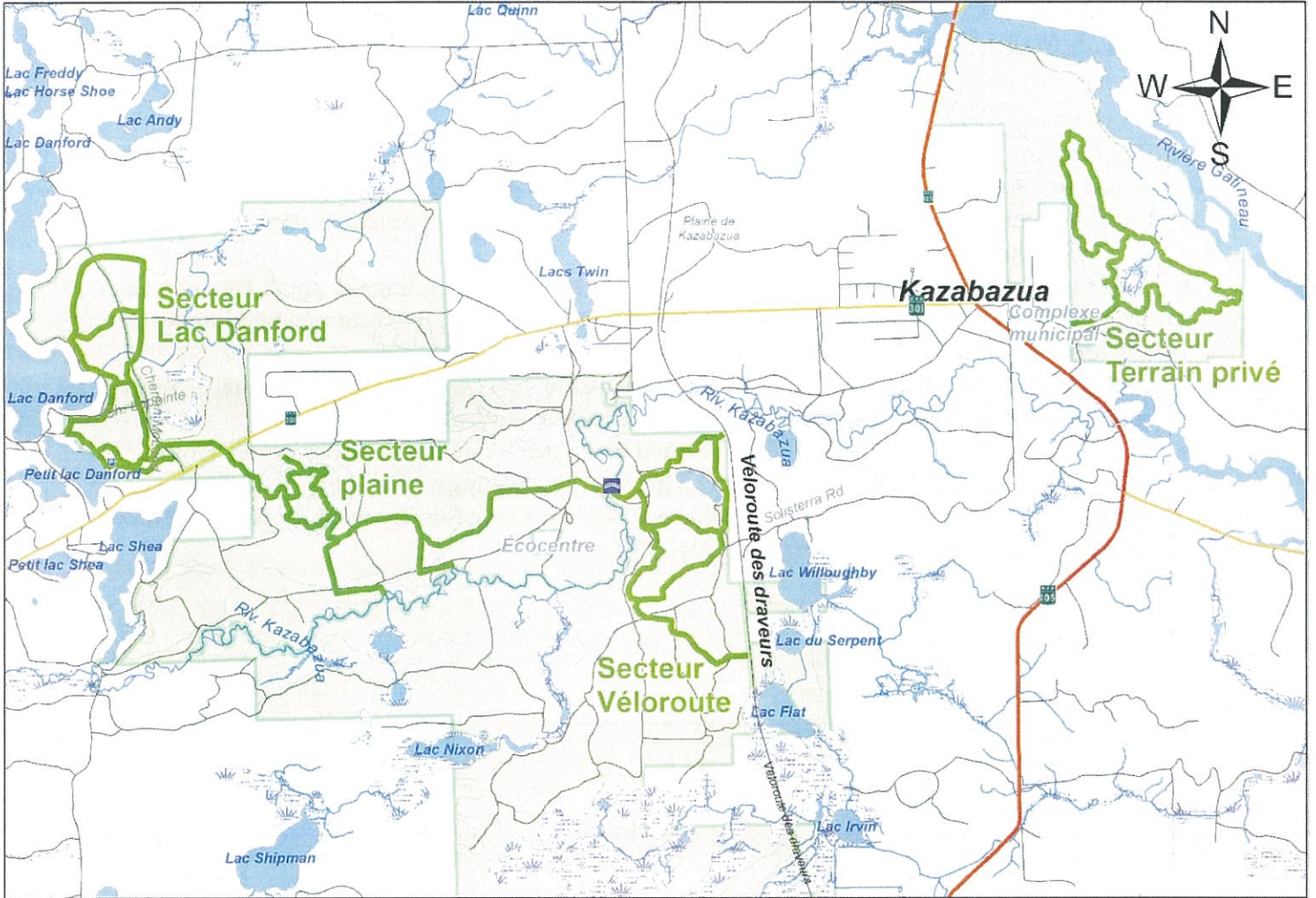
- The hillside area, because of its central position, is an ideal access point in the event of the establishment of a network of trails in the plain. In this eventuality, the development of a parking lot of about fifteen spaces with dry toilet as well as the improvement of approximately 350 m of secondary road are possible between the hill and Route 301. For the purposes of anticipated traffic to the parking lot, the cost assessment is carried out for a gravel road surface 6 m wide to allow a passing of vehicles at low speed.

#### **Danford Lake sector**

- The development of a section of road proposed as access to Little Danford Lake consists, like the access to the loop of the hill, of a secondary road with a gravelled road surface 6 meters wide. However, the work for this section of road takes for granted the implementation of a complete layout (ditches, culverts, etc ...);
- In contrast to the topography in the rest of the area, the surroundings of small Danford Lake have significant slopes. Due to the configuration of these slopes, it is recommended to position the possible parking lot north of the future access road;
- In the central loop, an impossible to bypass wetland makes it necessary to install 75-metre wooden sidewalks. The sidewalks here proposed have a width of 0.5 m.
- The buffer zone near the dwellings has ensured that a strip of mature forest is spared. However, for the rest of the territory, the same issue with regard to logging and the potential reluctance of the Ministry of Forestry remains. It should be noted that recent forestry work suggests that few interventions will take place in the next 10 to 15 years.



## Global map of proposed routes





## 5. Costs evaluation

The evaluation presented here includes all the stages of development of the network as well as the implementation of the necessary structures. All according to the standards of Rando-Québec and vélo-Québec and having been the subject of the various necessary authorizations (provincial government, MRC, municipality and private owners involved).

Costs are presented in the form of tables broken down by item of expenditure and by section. All the proposals can be summarized as follows:

### **Private sector:**

- 4.0 km of walking trails (North loop);
- 2.9 km of walking trails (South loop);
- Summary development (without platform) of a rest and observation area (North loop)

### **Cycle Route Sector:**

- 3.0 km of mountain bike trail (north portion);
- 2.1 km of mountain bike trail (central portion);
- 1.3 km of mountain bike trail (southern portion);
- OPTIONAL ROUTE: Direct connection of 3.3 km crossing the three portions.

### **Kazabazua Plain Sector:**

- 2.2 km of walking trails (East Crossing);
- 0.9 km of hiking trails (Central Crossing);
- 0,6 km of hiking trails (Access is to the Kazabazua River);
- 1.0 km of hiking trails (West access to the Kazabazua River);
- 2.1 km of hiking trails (Hill loop);
- 0.4 km of walking trails (connection to the loop);
- 1.6 km of hiking trails (West Crossing)
- 15m x 1.2m metal structure pedestrian bridge, Kazabazua River (East Crossing);
- Wooden staircase on 15 linear meters (Access is to the Kazabazua River)
- Wooden staircase on 20 linear meters (West access to the Kazabazua River)
- Improvement / gravelling of path on 350 m (loop of the hill)
- Development of a 15-space parking lot (hill loop)
- Installation of a dry toilet in the parking lot;

## Plan d'aménagement de sentiers récréatifs



### Danford Lake Area:

- 2.7 km of hiking trails (South loop);
- 2.0 km of walking trails (Central loop);
- 1.6 km of hiking trails (North loop);
- Improvement / gravelling of road on 700 m (Access to small Danford Lake);
- Wooden staircase on 6 linear meters (Access to small Danford Lake);
- Development of a 20-space parking lot (Access to Little Danford Lake);
- Installation of a dry toilet in the parking lot;
- Installation of 75 m of boardwalks (Central loop)

Pre-tax costs, presented by sector and broken down by item of expenditure, are therefore as follows:

### Projet sentiers Kazabazua

Ventilation des coûts - tronçons pédestres

Poste	TOTAL 22 km \$	Tronçons (selon plan d'aménagement)											
		Privé		Plaine						Lac Danford			
		Boucle Nord 4,0	Boucle Sud 2,9	Trav. Ouest 1,6	Trav. Centre 0,9	Trav. Est 2,2	Boucle colline 2,1	Conex. Colline 0,4	Acc. Riv. Est 0,6	Acc. Riv. Ouest 1,0	Boucle sud 2,7	B. Centrale 2	Boucle nord 1,6
Chargé de projet	4 000,00 \$	727,27 \$	527,27 \$	290,91 \$	163,64 \$	400,00 \$	381,82 \$	72,73 \$	109,09 \$	181,82 \$	490,91 \$	363,64 \$	290,91 \$
Salaires Ouvriers	80 848,00 \$	14 699,64 \$	10 657,24 \$	5 879,85 \$	3 307,42 \$	8 084,80 \$	7 717,31 \$	1 469,96 \$	2 204,95 \$	3 674,91 \$	9 922,25 \$	7 349,82 \$	5 879,85 \$
Avantages Sociaux	21 212,00 \$	3 856,73 \$	2 796,13 \$	1 542,69 \$	867,76 \$	2 121,20 \$	2 024,78 \$	385,67 \$	578,51 \$	964,18 \$	2 603,29 \$	1 928,36 \$	1 542,69 \$
Frais de déplacement - Transport	14 000,00 \$	2 545,45 \$	1 845,45 \$	1 018,18 \$	572,73 \$	1 400,00 \$	1 336,36 \$	254,55 \$	381,82 \$	636,36 \$	1 718,18 \$	1 272,73 \$	1 018,18 \$
Matériel et fournitures	4 000,00 \$	727,27 \$	527,27 \$	290,91 \$	163,64 \$	400,00 \$	381,82 \$	72,73 \$	109,09 \$	181,82 \$	490,91 \$	363,64 \$	290,91 \$
Infrastructures	Passerelle piétonnière (15m x 1,2m)	35 000,00 \$				35 000,00 \$							
	Escalier 15m	7 500,00 \$							7 500,00 \$				
	Escalier 20m	10 000,00 \$								10 000,00 \$			
	Trottoirs de bois 75m x 0,5m	6 500,00 \$										6 500,00 \$	
Signalisation - Graphisme	3 000,00 \$	545,45 \$	395,45 \$	218,18 \$	122,73 \$	300,00 \$	286,36 \$	54,55 \$	81,82 \$	136,36 \$	368,18 \$	272,73 \$	218,18 \$
Signalisation - Impression	16 000,00 \$	2 909,09 \$	2 109,09 \$	1 163,64 \$	654,55 \$	1 600,00 \$	1 527,27 \$	290,91 \$	436,36 \$	727,27 \$	1 963,64 \$	1 454,55 \$	1 163,64 \$
Allocations Équipement	21 353,00 \$	3 882,36 \$	2 814,71 \$	1 552,95 \$	871,53 \$	2 135,30 \$	2 038,24 \$	388,24 \$	582,35 \$	970,59 \$	2 620,60 \$	1 941,18 \$	1 552,95 \$
Frais de gestion	16 441,30 \$	2 989,33 \$	2 167,26 \$	1 195,73 \$	672,60 \$	1 644,13 \$	1 569,40 \$	298,93 \$	448,40 \$	747,33 \$	2 017,80 \$	1 494,66 \$	1 195,73 \$
	<b>239 854,30 \$</b>	<b>32 882,60 \$</b>	<b>23 839,89 \$</b>	<b>13 153,04 \$</b>	<b>7 398,59 \$</b>	<b>53 085,43 \$</b>	<b>51 263,37 \$</b>	<b>3 288,26 \$</b>	<b>12 432,39 \$</b>	<b>18 220,65 \$</b>	<b>22 195,76 \$</b>	<b>22 941,30 \$</b>	<b>13 153,04 \$</b>

### Projet sentiers Kazabazua

Ventilation des coûts - tronçons sentiers de vélo

Poste	TOTAL 6,4 km \$	Secteur véloroute			Option connexion directe (option distincte) 3,3
		Portion nord 3	P. Centrale 2,1	Portion sud 1,3	
Chargé de projet	1 200,00 \$	562,50 \$	393,75 \$	243,75 \$	618,75 \$
Salaires Ouvriers	45 000,00 \$	21 093,75 \$	14 765,63 \$	9 140,63 \$	23 203,13 \$
Avantages Sociaux	11 550,00 \$	5 414,06 \$	3 789,84 \$	2 346,09 \$	5 955,47 \$
Frais de déplacement - Transport	5 000,00 \$	2 343,75 \$	1 640,63 \$	1 015,63 \$	2 578,13 \$
Matériel et fournitures	2 500,00 \$	1 171,88 \$	820,31 \$	507,81 \$	1 289,06 \$
Infrastructures					\$
Signalisation - Graphisme	1 500,00 \$	703,13 \$	492,19 \$	304,69 \$	773,44 \$
Signalisation - Impression	7 500,00 \$	3 515,63 \$	2 460,94 \$	1 523,44 \$	3 867,19 \$
Allocations Équipement	12 000,00 \$	5 625,00 \$	3 937,50 \$	2 437,50 \$	6 187,50 \$
Frais de gestion	8 625,00 \$	4 042,97 \$	2 830,08 \$	1 751,95 \$	4 447,27 \$
	<b>94 875,00 \$</b>	<b>44 472,66 \$</b>	<b>31 130,86 \$</b>	<b>19 271,48 \$</b>	<b>48 919,92 \$</b>



## Projet sentiers Kazabazua

Ventilation des coûts - tronçons carrossables

Poste	TOTAL 1,05 km	Secteur	
		Plaine	Lac Danford
	\$	0,35	0,7
Chargé de projet	480,00 \$	240,00 \$	240,00 \$
Salaires Ouvriers	- \$	- \$	- \$
Avantages Sociaux	120,00 \$	60,00 \$	60,00 \$
Frais de déplacement - Transport	126,00 \$	63,00 \$	63,00 \$
Matériel et fournitures	- \$	- \$	- \$
Infrastructures	Réfection de chemin (350m)	21 000,00 \$	21 000,00 \$
	Amélioration / construction (700m)	52 000,00 \$	52 000,00 \$
	Stationnement 15 places	23 000,00 \$	23 000,00 \$
	Stationnement 20 places	28 000,00 \$	28 000,00 \$
	Escalier 6m	3 000,00 \$	3 000,00 \$
	Toilette sèche	7 000,00 \$	3 500,00 \$
Signalisation - Graphisme	600,00 \$	300,00 \$	300,00 \$
Signalisation - Impression	1 900,00 \$	950,00 \$	950,00 \$
Allocations Équipement	- \$	- \$	- \$
Frais de gestion	1 322,60 \$	511,30 \$	811,30 \$
	138 548,60 \$	49 624,30 \$	88 924,30 \$

## 6. Conclusion

The cost estimates (before taxes), appearing in the previous tables according to the type of development (pedestrian sections, bicycles or motorable paths), can therefore be summarized as follows:

- All pedestrian sections ( 22 km ) : 239 854,30 \$
- All bike sections ( 6,4 km ) : 94 875,00 \$
- Bike section optional (instead of 6,4 km of the 3 sections) : 48 919,92 \$
- All sections suitable for motor vehicles (1,05 km) : 138 548,60 \$

All the proposals evaluated under this development plan represent investments totalling \$473,277.60. As already mentioned, the routes were planned so that they could be completed independently and allow the municipality to set its priorities.

Important note, the amounts evaluated are for the implementation of the network. In order to ensure its sustainability and to ensure the maintenance of the quality of the trails, it must be kept in mind that annual maintenance work will also be necessary. Depending on the degree of involvement of the municipality, the amount to be invested in maintenance may vary. For example, the PERO offers a trail maintenance program including 3 passages per year that was detailed at \$ 701.00 / km for the 2022 season. Basic maintenance done internally by the municipality is always possible, at which time it will be necessary to allow enough person-days to carry out the work. It should also be kept in mind that structural repairs are not included in the trail maintenance program.

In closing, it should be noted that permits obtained from the MERN on public lands must be renewed after a period of ten years, in the amount of \$130.00. This renewal is important because it makes it possible to maintain trails in the public land use plan, thus ensuring protection from forestry interventions.



# Annex 1 – General map of networks

