

Jacquet River Gorge Protected Natural Area

Strategic Plan 2017-2027

DRAFT

Overview

Protected Natural Areas (PNAs) are a precious heritage for the people of New Brunswick. They are nature reserves that are protected under the *Protected Natural Areas Act* to first and foremost protect the Province’s biodiversity, while allowing for low impact recreation, education, and scientific activities. The establishment of PNAs allows for a representative portion of the Province’s natural landscape to be left with little or no human disturbance. The first PNAs were designated in 2003, and to date, there is close to 274,000 hectares of the Province’s terrestrial biome that is protected under the *Act*.

The New Brunswick Department of Energy and Resource Development (ERD) is responsible for protecting and managing PNAs. Strategic Plans for the PNAs are meant to provide clear directives in the management of these sites in order to achieve the overarching Strategic Goals. This **draft** 2017-2027 Strategic Plan has been prepared considering the input obtained between 2005 and 2009 from the former Jacquet River Gorge PNA Local Advisory Committee.

In order to finalize this document, ERD will seek input from local First Nation communities, stakeholders, and residents.

This **draft** 2017-2027 Strategic Plan contains the Objectives, Strategies, and Priority Actions to address the most significant internal Threats to the biodiversity of the Jacquet River Gorge PNA. The plan is presented in 4 sections plus bibliography, useful links, and appendices:

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Section 1 - Background

Protected Areas

Protected areas can be known by many names: protected natural areas, nature reserves, wilderness areas, national parks, ecological reserves, conservation zones, etc. Protected areas, where ecosystems, their processes, and their natural habitats are effectively protected and managed, are a fundamental component of biodiversity conservation. The International Union for Conservation of Nature (IUCN, 2016), the world's oldest and largest global environmental organisation, defines a protected area as:

"A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values."

The importance of Protected Areas for New Brunswick

New Brunswick has a long history of intensive natural resource use and settlement. In fact, it was the abundant natural resources and related opportunities that sustained Aboriginal peoples and subsequently attracted European colonists to this land some 400 years ago. Today, most of the provincial public lands are administered by the New Brunswick Department of Energy and Resource Development (ERD) for the economic, social and environmental benefit of the residents of New Brunswick. The competing interests for natural resources and the other values provided by the land heightens the need for a provincial network of protected land to conserve the Province's biodiversity. Protected areas such as protected natural areas, national and provincial parks and national wildlife areas, each with their own mandate and level of protection, ensure that a representative portion of the Province's natural landscape is left with little or no human disturbance and that selected sites that are significant for biodiversity are conserved. The conservation of provincial biodiversity is ever more important in the face of climate change.

New Brunswick's Protected Natural Areas

In 2003, increasing concern for the loss of natural habitats and biodiversity led the Government of New Brunswick to enact legislation to designate provincial and private lands as Protected Natural Areas (PNAs). A PNA is an area of land or water that is legally designated under the *Protected Natural Areas Act for the conservation of the province's biological diversity*. The *Act* aims to protect, and manage lands that contain one or more of the following biodiversity elements:

- ecosystems and natural landscapes that are representative of the Province,
- unique or unusual assemblages of fauna or flora,
- native fauna or flora that is rare or endangered,
- ecologically sensitive fauna, flora or habitat,
- unique or rare examples of botanical, zoological, pedological or geological phenomena, and
- altered ecosystems that offer research opportunities to study their recovery from disturbance.

Thirty PNAs were designated when the legislation was first enacted. These consisted of twenty conservation areas or ecological reserves that were reclassified as PNAs and 10 new sites. Five years later, 31 additional PNAs were designated, including one on private lands. Year 2014 saw the designation of an additional 114,500

hectares on Crown lands and 1000 hectares on private lands. The Province's land base consists of over 7.2 million hectares and close to 274,000 hectares is now protected as PNA.

Although PNAs were established to first and foremost protect the Province's biological diversity, New Brunswickers can continue to enjoy the unique rewards of nature through low impact recreational activities, non-commercial food gathering, and the use of designated roads. Such activities include, but are not limited to, hiking, skiing, snowshoeing, canoeing, wilderness tenting, hunting, trapping, fishing, and the use of all-terrain vehicle and snowmobiles on designated roads intended for those purposes. These sites also offer opportunities for scientific research and education with a permit from the Minister. Development, and industrial, commercial and agricultural uses are prohibited in PNAs.

Classification of Protected Natural Areas

The Province of New Brunswick uses two classes to distinguish the degree of protection attributed to its PNA. These classes are designated by legislation:

- Class I Protected Natural Areas. These sites are relatively small in size and few in numbers. These PNAs require complete protection as they contain ecologically sensitive features that could be damaged with human activity. All activities are prohibited in these areas, except by permit for educational and scientific purposes.
- Class II Protected Natural Areas. These sites protect ecosystems that are representative of the New Brunswick landscape or that are ecologically important or rare. Certain recreational uses having minimal environmental impact and traditional food gathering activities are allowed in these areas.

Strategic planning for Protected Natural Areas

The purpose of PNAs is to protect the Province's biodiversity and its relationship with the environment, while providing opportunities for low impact recreation, education, and scientific activities. Strategic planning is a key process in managing PNAs to fulfil their purpose. Three Strategic Goals encompass what ERD wishes to achieve over the coming years to eliminate, manage and mitigate the risks to the biodiversity of New Brunswick's PNAs:

- Goal 1: Minimize human induced impacts, while respecting Aboriginal and treaty rights, and allowing for low impact recreational activities,
- Goal 2: Maintain and restore natural habitats, and
- Goal 3: Minimize impacts related to potentially large scale disturbances.

Strategic Plans

The Strategic Plans are developed by ERD to provide guidance in achieving the Strategic Goals. As a first step in developing a plan, an "environmental scan" is conducted to identify the Strengths and Threats for a PNA or group of PNAs. Strengths and Threats are factors that have either a positive or negative influence on achieving the Strategic Goals. Strengths are circumstances that support the protection of a site. Threats are circumstances, activities or factors that could potentially diminish the ecological integrity of a site. Strengths and Threats may be internal or external. A complete list of potential internal Threats that were considered for all PNAs can be found in Appendix A. Once the most significant internal Threats are identified, Objectives, Strategies, and Priority Actions to address them are developed.

Where applicable, the work and information compiled by the former Local Advisory Committees (LACs) between 2005 and 2009 is considered in the development of the Strategic Plans. These documents do not include lower priority conservation issues or issues related to environmental monitoring or research, unless these are necessary to reach an Objective. Generally, each Strategic Plan includes:

- A general description and the applicable key biodiversity elements for a PNA or group of PNAs,
- The priority conservation issues that pose the most significant Threats to the biodiversity of the site(s),
- The Objectives, Strategies, and Priority Actions that ERD will implement directly, or facilitate with partners, to address the priority conservation issues, while respecting existing commitments, including Aboriginal and treaty rights and sites of significance to First Nation people, and
- A site plan or multiple site plans including the proposed designated roads and other features.

Although these plans are being developed for ERD's guidance, they also provide direction for various interest groups where they may be involved in the same activities. The plans will undergo a complete review every ten years or sooner if required.

In Summary, a Strategic Plan has a hierarchical structure with each level strengthening the success of the one above:



Section 2 – The Jacquet River Gorge Protected Natural Area

General Description

The Jacquet River Gorge PNA encompasses 26,000 hectares of Crown lands located in north eastern New Brunswick (Figure 1). It was designated in 2003 as a Class II PNA to protect a landscape representative of the Northern Uplands Ecoregion. The PNA straddles the boundary of Restigouche and Gloucester counties, and is bordered to the north by the Village of Belledune and to the west by the Jacquet River, which cuts deeply into the hilly plateau, forming a deep gorge.

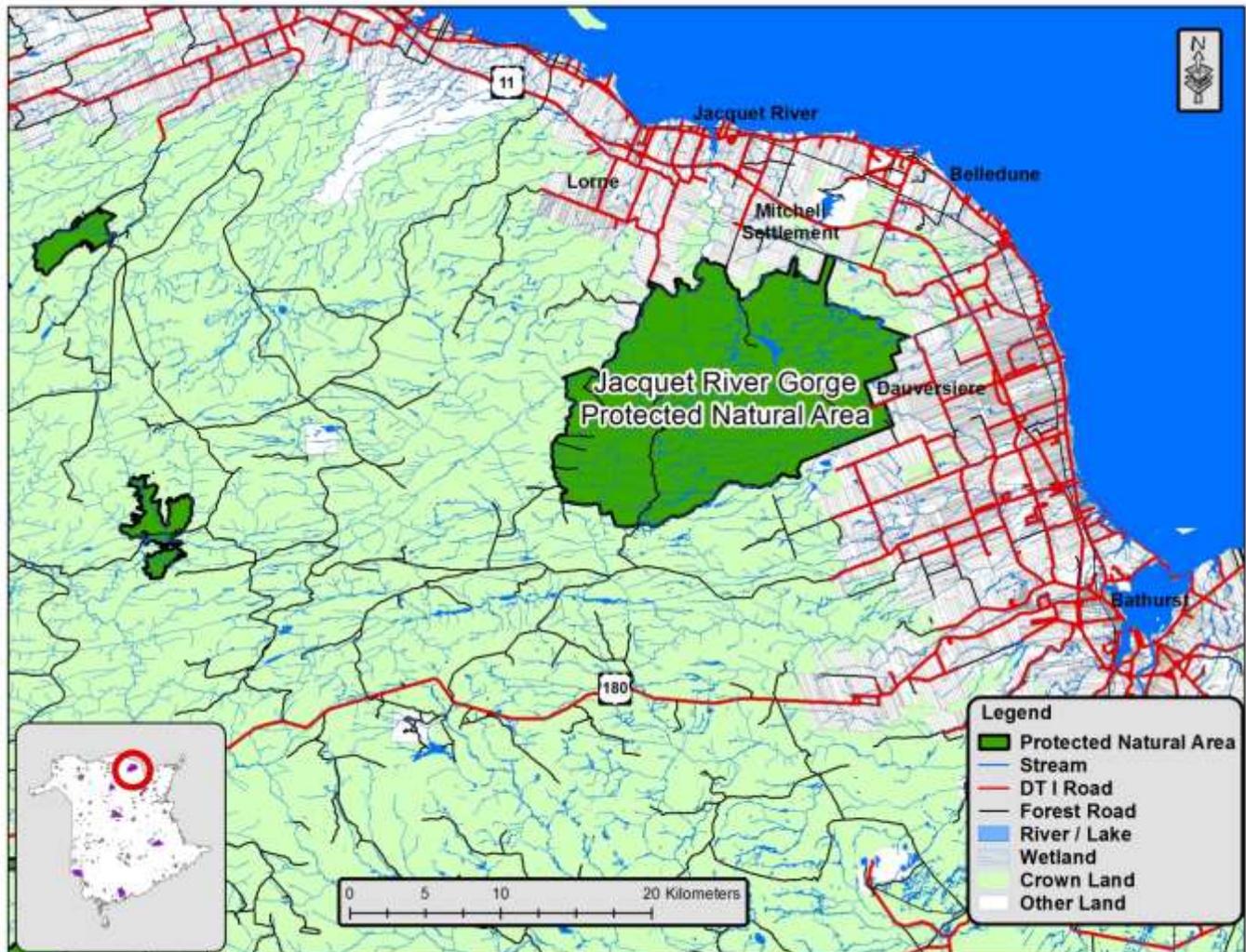


Figure 1: The Jacquet River Gorge PNA and surroundings.

With the diversity of habitats and forest age classes, wildlife within the site is typical of species found in the Acadian Forest and its associated watercourses and wetlands (Table 1). The PNA is also home to a number of plants and animals of conservation concerns (Appendix B - Internal Strength). Fossils of marine invertebrate and invertebrate trace fossils have also been found.

Being rich in history, past settlements and activities, the Jacquet River Gorge PNA is still broadly used and appreciated by local people today for recreational activities. One popular attraction is Antinouri Lake which is the second largest lake in Restigouche County. Another interesting feature is the Ducks Unlimited Canada (DUC) pond at Taylor Meadow, which draws hunters in the fall.

Table 1: Habitat summary for the Jacquet River Gorge PNA.

Habitats	Habitat Sub-types	Area (ha.)
Forest	Coniferous (Sapling to Overmature)	9,592
	Mixed wood (Sapling to Overmature)	11,973
	Deciduous (Sapling to Overmature)	2,422
	Regenerating (≈ less than 15 years old)	636
Freshwater Wetland	Forested*	1,180
	Shrub	912
	Bog	38
	Fen	60
	Freshwater Marsh	21
	Aquatic Bed	3
Freshwater	Lake and Pond	131.8
	Watercourse **	49.6
Other Inland Ecological Features	Upland Island (non-wetland)	0.9
	Grassland	15.5
	Upland Shrub	1.7
	Talus slope ***	—
Anthropogenic Features	Road, boat launch, beaver baffle, quarry, camp lots, dam and fishways***	—

* The forested wetland area is based on the depth to water table (≤ 10 cm). The area identified as forested wetlands overlaps with the forest stand areas.

** The area for watercourses is underestimated as some are too narrow to interpret an area.

*** These features are known to occur in the PNA, but area coverage (hectares) has not been determined.

Key Biodiversity Elements

The Jacquet River Gorge PNA has all six of the biodiversity elements targeted for protection under the *PNA Act*:

- ecosystems and natural landscapes that are representative of the Province,
- unique or unusual assemblages of fauna or flora,
- native fauna or flora that is rare or endangered,
- ecologically sensitive fauna, flora or habitat,
- unique or rare examples of botanical, zoological, pedological or geological phenomena, and
- altered ecosystems that offer research opportunities to study their recovery from disturbance.

Strengths and Threats Analysis

The factors that strengthen or threaten the ability to maintain the biodiversity of the Jacquet River Gorge PNA are summarised in Table 2. These are separated according to whether their potential occurrence is within the PNA or exterior to the PNA. The Strengths and Threats analysis led to the identification of the most crucial internal Threats, which provided the basis for Objectives, Strategies, and Priority Actions to reach the overarching Strategic Goals. Generally, this Strategic Plan does not address the external influences. A complete description of all Strengths and Threats can be found in Appendix B.

Table 2: Strengths and Threats for the Jacquet River Gorge PNA.

	Strengths	Threats
Internal	<ul style="list-style-type: none"> . Vegetation diversity . Good knowledge of biodiversity . High quality fish habitat . Species of conservation concern . Areas of ecological significance occur in the PNA . Large size 	<ul style="list-style-type: none"> . Network of existing roads . Motor vehicle use . Off-road use of all-terrain and four-by-four vehicles . High recreational use of focal points; particularly at Antinouri Lake . Siltation from the boat ramp . Poaching . Lack of public awareness . Forest fires and fire suppression activities . Fish stocking of Antinouri Lake . Invasive alien species . Spraying for insects and disease . Boundary lines growing in . Dams and fishways . Camp lots*
External	<ul style="list-style-type: none"> . Fish protection barrier . Numerous interest groups . First Nations . Surrounding areas with environmental designations 	<ul style="list-style-type: none"> . Pollutants . Acid rain and snow . Motor vehicle use . Invasive alien species, insects and disease, and forest fires . Climate change . Natural resource extraction and/or exploration

* Not a priority for this Plan as there are only 3 camp lots in the PNA.

Significant Internal Threats

A total of thirteen internal Threats that are deemed to pose the most significant risk to the biodiversity of the PNA were identified and are detailed below:

- 1) Network of existing roads. There is a fairly extensive network of old roads, which are used to reach remote areas, with local interest for continued use of these roads, mostly for hunting, trapping, and fishing purposes. Continued use of unmaintained roads could exacerbate the environmental degradation caused by

road deterioration and allow continued access to remote areas, thus maintaining the human influence on a larger area. Furthermore, it slows down the naturalisation of these roads, prolonging the impacts of habitat loss on the road's footprint, habitat fragmentation, and edge effect. Old culverts will eventually deteriorate and erode causing siltation in rivers and ponds. Siltation of the cool, clear rivers of the PNA may impact the spawning ground of salmon, trout and other fish species. Degraded ponds and wetlands would also impact water dependant species.

- 2) Motor vehicle use. The use of motorised wheeled-vehicles may result in increased siltation of watercourses, rutting of soil, change in drainage patterns, introduction of invasive alien species in the PNA, impacted air quality, sound impacts, and increased pollution (e.g. oil and fuel spills). Snowmobiles may cause less damage to the ground than wheeled-vehicles, given a sufficient amount of snow cover, but other risks and Threats still persist. These include degraded air quality, as well as potential oil and fuel spills and sound impacts. The required maintenance of snowmobile trails would also result in brush being cut back, allowing continued access during the summer months. The impacts to air quality, from snowmobiles and all-terrain vehicles, are much greater when using vehicles with 2-stroke engines.
- 3) Off-road use of all-terrain and four-by-four vehicles. As all-terrain vehicles and four-by-four vehicles are capable of handling rugged terrain, the human urge to explore and reach new grounds, to bypass impassable roads, or to challenge oneself by driving on wet, muddy ground often results in destructive off-road activity. Irresponsible vehicle use during snow-free conditions may cause erosion and rutting of the forest soil or wetland substrate which may change drainage patterns, damage habitats, generate silt runoff affecting watercourses and fish habitat, and create new roads in the PNA. The disruption of drainage patterns may affect the hydrology of watercourses and associated habitat. Wetlands are particularly vulnerable. In one wetland, off-roading has created deep ruts and erosion of the wetland substrate. Vernal pools, which are small, biologically diverse ephemeral ponds, may be highly degraded or destroyed by off-road vehicle use. These ponds are important breeding grounds for frogs, salamanders and various invertebrates.
- 4) High recreational use of focal points; particularly at Antinouri Lake. Excessive use of recreational areas may result in trampling and destruction of vegetation. This is mainly a concern at Taylor Meadow during hunting season, at a well-known salmon fishing location called Kettle Hole, and in the forest and lakeshore surrounding Antinouri Lake. Antinouri Lake is the most frequented area of the PNA. The lake and surrounding ecosystems are therefore subject to potential degradation stemming from recreational pressure. The main clearing is a popular gathering, picnic and camping site for nearby communities, and is a favourite hangout and party ground. Roads parallel the western shoreline, leading to additional clearings ideal for setting up camp. Trailer camping is a common occurrence, despite the presence of signs indicating that the activity is prohibited. Litter has been a recurring problem at the clearing and in the lake. Use of the surrounding woods as a bathroom facility further deteriorates the site's integrity and creates a potential risk of sewage seeping into the lake. Sewage is an added concern with illegal trailer camping. The use of motor boats on the lake and vehicles near the lake represents a risk of fuel and oil spills.
- 5) Siltation from the boat launch. The boat launch at Antinouri Lake was upgraded in 2010 and 2011. To prevent siltation of the Lake, regular maintenance may be needed to control runoff, which could degrade the aquatic habitat for brook trout, numerous dragonfly species, waterfowl and other aquatic species.

- 6) Poaching. Poaching of fish, wildlife, timber, and other forest products may occur and could affect biodiversity.
- 7) Lack of Public Awareness. People's actions have the greatest ability to disrupt biological diversity. In fact, most of the identified Threats are associated with human activities. Today, there is a greater awareness of the importance of biological diversity and there are improved efforts to protect the environment. Yet there are still many people that don't realize the impact of their actions. Even when activities are conducted responsibly, the pursuit of recreation in a PNA implies that there will be some impact on natural processes.
- 8) Forest fires and fire suppression activity. Fire can be an important component of some NB forest ecosystems. Fire may originate from natural causes as well as human-causes. To protect resources outside of the PNA, it is ERD's policy to suppress forest fires regardless of their origin. This activity is permitted under the *PNA Act*.
- 9) Fish stocking of Antinouri Lake. Antinouri Lake has been stocked with Brook trout for over 30 years to sustain a recreational fishery in the lake. Artificial enhancement for recreational purposes, and heavy fishing pressure, result in an artificial ecosystem. Some of the risks from fish stocking include competition for resources, predation on indigenous species, introduction of parasites, hybridisation, transmission of disease (bacterial and viral), impairment of natural reproduction of resident brook trout, and displacement of resident brook trout. Most of these risks are mitigated by only stocking fish that are native to New Brunswick, are of wild strain, are genetically appropriate for the receiving waters, and are certified disease free.
- 10) Invasive alien species. Invasive alien species may cause serious and irreversible damage to biological diversity. They may negatively alter a habitat thus displacing native species; they may predate on or compete with native species thereby directly or indirectly impacting on populations; they may interbreed with native species which often results in a population decline of the native species; they may introduce disease and parasites to which native species are often very susceptible. Invasive alien species are often introduced unintentionally through human activity.
- 11) Spraying for insects and disease. Some insect and disease outbreaks bring about long established natural cycles in New Brunswick forest ecosystems. Others are part of a natural range expansion or are exotic. Insect and disease suppression is the responsibility of ERD and is permitted in the PNA. This may be required, if there is a threat to the forest resources exterior to the PNA. While such management helps protect commercial tree species, the activity may impede or otherwise affect natural processes.
- 12) Boundary lines growing in. Visible boundary lines are essential to make users aware when they have entered the PNA and to ensure compliance of the Regulations. As boundary lines grow in, it may be more difficult for people who use the area to notice them.
- 13) Dams and fishways. The DUC impoundment at Taylor Meadow. Changes in the water levels can have a negative impact on organisms dependent on certain conditions at critical times in their life cycle. Fishways can fail due to inadequate flow, blockage by debris, or other factors.

Section 3 – Objectives, Strategies, and Priority Actions

Thirteen internal Threats have been identified as posing the most significant risk to the biodiversity of the Jacquet River Gorge PNA and therefore creating a barrier in achieving the three overarching Strategic Goals. Objectives, Strategies, and Priority Actions identified to eliminate, manage or mitigate these Threats are presented on the following pages. Specific timeframes are not set for any of the Priority Actions. Nonetheless, it is ERD’s intent to execute these actions in a timely fashion.

Goal 1: Minimize human induced impacts, while respecting Aboriginal and treaty rights, and allowing for low impact recreational activities	
Objective 1.1: Designate a road system Targeted Internal Threats: 1, 2 & 3	
Strategies	Priority Actions
<p>1.1.1 Legally designate the roads that address minimum legitimate access needs; designate as either access or recreational</p>	<p>1.1.1.1 <u>ERD</u> - Finalise the road network initiated by the former Local Advisory Committee (LAC), subject to provisions of the <i>PNA Act</i> and Policy PPB 006-2006 (Designation and management of Access Roads and Recreational Roads in Class II PNAs on Crown Lands), and consult with the former LAC and the public. Following public input, the road plan will be adapted as appropriate and proposed for designation in regulation. For recreational roads, ERD will ensure signage is erected at the road entrance to inform users of the designated usage.</p> <p>1.1.1.2 <u>Road lessee(s) and licensee(s)</u> - The NB Federation of Snowmobile Clubs and the NB Federation of All-terrain Vehicles have interest in the use of some recreational roads in the PNA. These may be leased or otherwise allocated to these groups and designated accordingly (<i>PNA Act</i> 20(f), 20(g)). The lessee or licensee of these roads may be requested to erect signage at the beginning of their leased or licensed roads to inform users of the designated usage.</p>
<p>1.1.2 Maintain designated roads to safe and environmentally sound standards when and where necessary</p>	<p>1.1.2.1 <u>ERD and DPS</u> - ERD does not guarantee access or regularly maintain forest roads on Crown lands. However, ERD may maintain the Antinouri Lake Road, from Mitchell Settlement to Antinouri Lake, including the boat launch, as needed (<i>PNA Act</i> 17(1)). Maintenance includes manual cleaning of the beaver baffler at the Antinouri Lake outlet. ERD may enter into agreements (ex. licence of occupation) with groups or individuals who wish to maintain these roads (<i>PNA Act</i> 20(e), 21(b)). ERD and DPS staff will monitor road conditions during their regular patrols. The maintenance standards of each access road will vary and need not necessarily be to a truck or car standard.</p>

Goal 1: Minimize human induced impacts, while respecting Aboriginal and treaty rights, and allowing for low impact recreational activities

Objective 1.1: Designate a road system Targeted Internal Threats: 1, 2 & 3

Strategies	Priority Actions
<p>1.1.2 Maintain designated roads to safe and environmentally sound standards when and where necessary</p>	<p>1.1.2.2 <u>Road lessee(s) and licensee(s)</u> - Maintenance of leased or licensed roads is the responsibility of the authorised user and must meet safe and environmentally sound standards, as per their agreement (<i>PNA Act 20</i>). Other maintenance activities such as grooming trails, placement of signs, seasonal closures, etc. may be allowed or required under the terms and conditions of their agreements. The NB Federation of All-terrain Vehicles has a license of occupation for an ATV trail in the southeast of the PNA and is responsible for its maintenance. The New Brunswick Federation of Snowmobile Clubs is responsible for the maintenance of provincial snowmobile trail # 24 on the west side of the PNA. Approximately 9 kilometres of the trail are in the PNA. The rest is on the northern boundary road, exterior to the PNA.</p> <p>1.1.2.3 <u>Camp lot lessee and interest groups</u> - Hickey Road leading to Taylor Meadow will be maintained, as required, by DUC to access and maintain the impoundment at Taylor Meadow. Camp lot lessees may maintain the designated access road to their lot (Policy PPB 006-2006). Access roads to camp lots will be undesignated in the event the camp lot is undesignated. The maintenance standards of each road will vary and need not necessarily be to a truck or car standard. A category 2 recreational road (walking, bicycling, skiing, snowshoeing, and dog sledding) will be maintained on an existing path in the woods by local interest groups. Maintenance may require the cutting back of branches to allow clear passage. Any maintenance work on PNA roads will require formal authorisation from ERD, unless it is already addressed in an existing agreement.</p>
<p>1.1.3 Abandon or decommission all undesignated roads and the designated roads that cannot be maintained and have degraded below safe and environmentally sound standards.</p>	<p>1.1.3.1 <u>ERD and DPS</u> - Roads not designated will be decommissioned or abandoned as per ERD Policy PPB 006-2006. Where designated roads are not maintained and cause environmental or safety hazards, the Minister may close the road until such time as the designation is rescinded (<i>PNA Act 18(1)</i>). Where warranted, decommissioning will consist of the placement of road closure signage at the entry point of the road. Where necessary, it may also involve the placement of barricades. During their regular patrols, ERD and DPS staff will monitor undesignated roads for non-compliance.</p> <p>1.1.3.2 <u>PNA users and interest groups</u> - Refrain from using undesignated roads and inform other users of the closed access.</p>

Goal 1: Minimize human induced impacts, while respecting Aboriginal and treaty rights, and allowing for low impact recreational activities	
Objective 1.2: Minimise the impact of recreational activity, especially at Antinouri Lake <u>Targeted Internal Threats: 1, 2, 4, 5 & 7</u>	
Strategies	Priority Actions
1.2.1 Access to Antinouri Lake will be limited to the existing road leading to the boat launch, to contain silt runoff into Antinouri Lake and reduce impacts to the surrounding habitats	<p>1.2.1.1 <u>ERD and DPS</u> - Designate the existing road and boat launch to the lake. During their regular patrols, ERD and DPS staff will monitor the boat launch, beaver baffler, as well as the barricade which blocks other accesses to the lake.</p> <p>1.2.1.2 <u>ERD and DPS</u> - Designate a category 4 recreational road on the Quarry Road, to provide access to the historical gravel pit on the north shore of Antinouri Lake.</p> <p>1.2.1.3 <u>ERD and DPS</u> - During their regular patrols, ERD and DPS staff will monitor activities at the lake for compliance with the regulations.</p> <p>1.2.1.4 <u>ERD</u> - PNA Section staff will communicate with potential stewards to discuss stewardship opportunities.</p> <p>1.2.1.5 <u>Local Stewards</u> - Interested groups may wish to become stewards of the PNA. Stewardship activities may include monitoring the activities at the lake and informing ERD or DPS staff of illegal activities.</p>
1.2.2 Eliminate the incidence of trailer camping	<p>1.2.2.1 <u>ERD and DPS</u> - During their regular patrols, ERD and DPS staff will monitor activities at Antinouri Lake to ensure compliance with the <i>PNA Act</i>, which prohibits trailer camping (<i>PNA Act 12(a)(x)</i>).</p> <p>1.2.2.2 <u>Local Stewards</u> - Stewardship activities may include promoting the soft use of the PNA and informing DPS of infractions.</p>
1.2.3 Reduce the incidence of littering	<p>1.2.3.1 <u>ERD and DPS</u> - During their regular patrols, ERD and DPS staff will monitor activities at Antinouri Lake to address the high incidence of littering.</p> <p>1.2.3.2 <u>Local Stewards</u> - An attempt should be made to engage local residents in solutions, to foster feelings of ownership. Stewards may also monitor the lake and inform the ERD or DPS of infractions.</p>

Goal 1: Minimize human induced impacts, while respecting Aboriginal and treaty rights, and allowing for low impact recreational activities	
Objective 1.3: Monitor, raise public awareness and promote education and research <u>Targeted Internal Threats: 1, 2, 3, 4, 6, 7, 12 & 13</u>	
Strategies	Priority Actions
1.3.1 Address issues brought forward by the SAC, PAC, First Nations, PNA users, and interest groups	1.3.1.1 <u>ERD</u> – The Scientific Advisory Committee (SAC), Provincial Advisory Committee (PAC), First Nations, PNA users, and interest groups may inform ERD on diverse aspects of the PNA such as non-compliance, monitoring and research priorities , and environmental or safety issues. ERD will address these issues accordingly.
1.3.2 Implement a stewardship and public awareness program	<p>1.3.2.1 <u>ERD</u> - In an effort to minimise impacts of use and therefore decrease or prevent negative environmental disturbance and protect biological diversity, ERD will increase awareness of the PNA legislation, as well as allowed and prohibited activities. This will be done as follows:</p> <ul style="list-style-type: none"> • Improve information available on the website and maintain fact sheets; • Communicate with other potential stewards to discuss stewardship and education opportunities; • Increase public awareness regarding permitted activities within the PNAs, specifically those related to hunting and trapping, through the Hunter and Trapper Education Program, and the Hunt and Trap book; • School program (i.e. classroom presentations). <p>1.3.2.2 <u>Local Stewards and interest groups</u> - Various local groups may volunteer to help raise awareness of the issues surrounding the PNA, promote best management practices, and raise the social intolerance for illegal activities. Groups may include ATV and snowmobile clubs, naturalist clubs, environmental groups, local schools, and parent’s committee. These groups are encouraged to work with ERD on the messages to be delivered.</p>
1.3.3 Monitor for negative environmental impacts, and activities which are not permitted within the PNA	<p>1.3.3.1 <u>ERD and DPS</u> - To reduce the incidence of illegal activities, ERD will maintain Crown-Freehold boundary lines for PNAs that have been surveyed, on an ‘as needed basis’ to minimise the risk of inadvertent unauthorised activity due to the PNA boundary lines growing in and becoming indiscernible. ERD and DPS staff will assess boundary lines during their regular patrols, where practical (ex. Where roads cross boundary).</p> <p>1.3.3.2 <u>Local Stewards, PNA users and interest groups</u> - Monitor abandoned roads and trails for siltation or other negative environmental impacts, and possible safety hazards. Also, be vigilant for illegal activities such as mineral exploration, dumpsites, trailer camping, forest harvesting, poaching, unauthorised disturbance of archaeological finds, unauthorised road and trail use, unauthorised boating, and construction of new roads or trails. Notify ERD or DPS of any illegal activities.</p>

Goal 1: Minimize human induced impacts, while respecting Aboriginal and treaty rights, and allowing for low impact recreational activities	
Objective 1.3: Monitor, raise public awareness and promote education and research <u>Targeted Internal Threats: 1, 2, 3, 4, 6, 7, 12 & 13</u>	
Strategies	Priority Actions
1.3.4 Cooperate with (DUC) to ensure that dam and fishway infrastructure is functioning as intended	<p>1.3.4.1 <u>DUC</u> - Ensure that dam and fishway at Taylor Meadow are monitored and maintained to design standards and inform ERD of any potential or current environmental impacts.</p> <p>1.3.4.2 <u>ERD</u> - Inform DUC of any environmental or safety concerns it becomes aware of. When an issue arises, ERD may provide advice to DUC on how best to proceed.</p> <p>1.3.4.3 <u>PNA users and interest groups</u> - Be mindful when around that area and inform ERD of known negative environmental impacts or safety concerns.</p>

Goal 2: Maintain and restore natural habitats	
Objective 2.1: Rehabilitate undesignated roads <u>Targeted Internal Threats: 1 & 2</u>	
Strategies	Priority Actions
2.1.1 Where feasible, remove culverts and bridges and restore banks on undesignated roads	<p>2.1.1.1 <u>ERD and DPS</u> - In an effort to prevent or decrease negative environmental disturbance, ERD will rehabilitate undesignated roads where feasible (<i>PNA Act 14</i>). This will involve such things as the removal of culverts and bridges, and restoring banks. Priority will be placed on those causing the greatest negative environmental impact (i.e. washouts near wetlands, watercourses), those with safety issues, those that are impeding the movement of fish, and those for which access may be imminently cut off, as identified by ERD and DPS staff during their regular patrols.</p> <p>2.1.1.2 <u>PNA users and interest groups</u> - Any interest group or individual capable and willing to rehabilitate undesignated roads and trails must first receive an authorisation from ERD.</p>
Objective 2.2: Maintain or restore native fauna and flora <u>Targeted Internal Threats: 9</u>	
Strategies	Priority Actions
2.2.1 Maintain or restore the natural fish population of Antinouri Lake	2.2.1.1 <u>ERD</u> –Antinouri Lake will be assessed to determine if the appropriate fish species are present and the numbers, age, and size classes are optimal. Appropriate actions may be taken to restore populations if required.

Goal 3: Minimize impacts related to potentially large scale disturbances

Objective 3.1: Prevent introduction or spread of invasive alien species

Targeted Internal Threats: 7 & 10

Strategies	Priority Actions
<p>3.1.1 Develop various plans or programs aimed at preventing the introduction or spread of invasive alien species</p>	<p>3.1.1.1 <u>ERD</u> - ERD may support interest groups in determining the most likely invasive alien species to invade a PNA and the development of a plan to address them. This could include implementing and maintaining programs aimed at raising awareness and eradication. It could also include the development of protocols for people who access sites where a potential invasive alien species exists; particularly terrestrial plant species, as there are no current guidelines for eliminating the likelihood of unknowingly transporting these species. Where possible, ERD staff could be involved in posting signs at various access points where an invasive alien species has been located. If an invasive alien species is introduced in the PNA, intervention may be considered (<i>PNA Act 14</i>).</p> <p>3.1.1.2 <u>Invasive alien species interest group</u> - Identify other vectors by which invasive alien species may be introduced or spread. Determine the most likely species to invade the PNA and develop plans to address them. Implement and maintain an awareness and eradication program.</p>
<p>3.1.2 Communicate with others about invasive alien species and monitor the occurrence of these species as needed</p>	<p>3.1.2.1 <u>ERD</u> - Communicate with bordering Provinces and the state of Maine on potential invasive alien species and monitor as warranted.</p> <p>3.1.2.2 <u>PNA users and interest groups</u> - Be knowledgeable about the detrimental effects of invasive alien species, and inform ERD of known sites. Inform ERD or DPS of any illegal activities (e.g. Illegal introduction of fish, etc.).</p>
<p>3.1.3 Apply the methodologies useful in preventing the introduction or spread of aquatic invasive alien species</p>	<p>3.1.3.1 <u>ERD</u> - In an effort to prevent the introduction of aquatic invasive alien species when working in the field, ERD staff will restrict the use of any equipment and personal gear to a single waterbody whenever possible. When moving from one waterbody to another is necessary, the Check, Clean and Dry method will be used. In regards to firefighting, if feasible, aircraft should also be cleaned and dried before going from one waterbody to another. The water should be sourced from the nearest waterbody unless it is a known introduced invasive alien species site, in which case waterbodies located further away would be more appropriate. In the event that a fire occurs just outside the PNA, and there is an option between a PNA water body and a non-PNA water body, water should be sourced from the non-PNA water body.</p> <p>3.1.3.2 <u>PNA users and interest groups</u> - Apply the Check, Clean and Dry method when using any equipment on a waterbody.</p>

Goal 3: Minimize impacts related to potentially large scale disturbances

Objective 3.2: Insect and disease control

Targeted Internal Threat: 11

Strategies	Priority Actions
<p>3.2.1 Intervene or prevent an insect or disease infestation in a Protected Natural Area to prevent devastating effects</p>	<p>3.2.1.1 <u>ERD</u> - Insect and disease infestations may be controlled by ERD (<i>PNA Act 14(c)</i>). When possible, biological or less toxic control agents will be used. If a control agent is likely to pose a threat to a species of conservation concern, or to another conservation target, alternate options could be sought. PNAs will be included in ERD’s standard forest pest monitoring activities. This will enable the Department to make decisions at an early stage of infestation if there should be an intervention. The following are some circumstances that could warrant an intervention:</p> <ul style="list-style-type: none"> • The infestation threatens a conservation target integral to the PNA, and • The infestation poses a significant threat to natural resources outside of the PNA.

Objective 3.3: Minimise impacts related to fire suppression

Targeted Internal Threat: 8

Strategies	Priority Actions
<p>3.3.1 Detect and respond to forest fires in the PNA</p>	<p>3.3.1.1 <u>ERD</u> - Forest fires will be monitored and managed in the PNA as those on non-PNA lands (<i>PNA Act 14(c)</i>). ERD may consider implementing controlled fires, for fire dependant species within the PNA (<i>PNA Act 14(b)</i>).</p> <p>3.3.1.2 <u>Interest group</u> - To aid in ERD’s response to fires, identify key areas in the PNA where fire could result in the irrecoverable loss of biodiversity, and those areas where fire is necessary or compatible with the ecosystem type.</p> <p>3.3.1.3 <u>PNA users and interest groups</u> – Inform ERD or DPS immediately of known fires.</p>
<p>3.3.2 Rehabilitate habitats negatively impacted by fire suppression efforts</p>	<p>3.3.2.1 <u>ERD</u> - Following forest fires where heavy equipment has been used to suppress the fire, ERD will rehabilitate the habitats that have been negatively impacted by the fire suppression efforts, as is the common practice outside of PNAs (<i>PNA Act 14(b)</i>).</p>

Section 4 - Site Plan

Proposed Site Plan

As public access and low impact recreational activities are allowed in the Jacquet River Gorge PNA, a Site Plan is proposed to reduce related negative impacts on biodiversity (Figure 2).

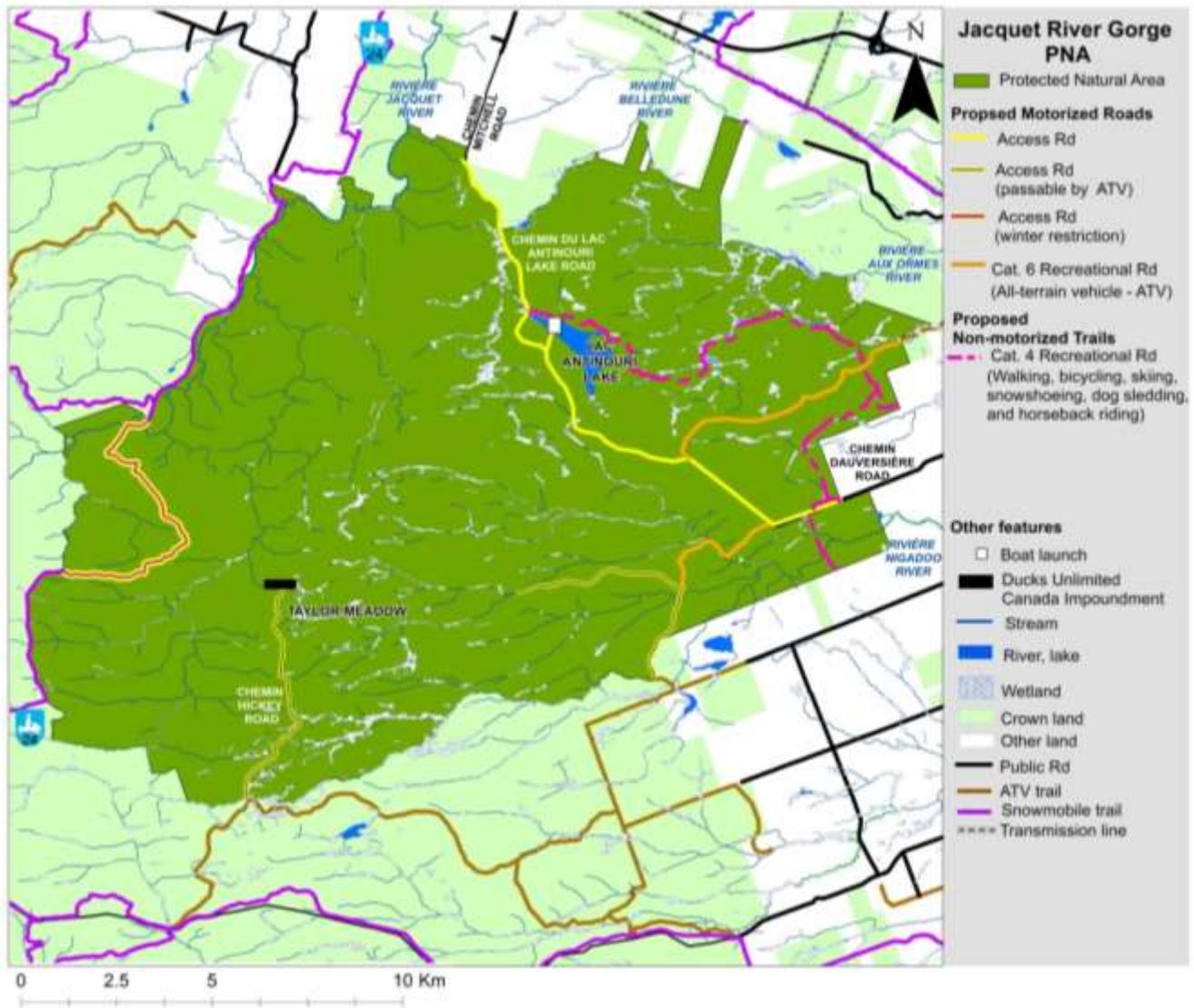


Figure 2: Proposed site plan for the Jacquet River Gorge PNA.

Proposed Designated Roads

The roads that meet the minimum legitimate access needs in the PNA have been identified and are proposed for legal designation as either access or recreational roads. All other existing roads within the boundaries of the PNA will be decommissioned or abandoned. The use of non-designated roads within the PNA is prohibited under the PNA Act.

Designated Access Roads

Roads that are designated as access roads under the *PNA Act* provide access to private or leasehold lands, infrastructures, recreational resources, or other Crown commitments. The maintenance of designated access roads requires formal authorization from ERD, unless it is already addressed in an existing agreement. The following four access roads are being proposed for designation in the Jacquet River Gorge PNA:

- 1) The Antinouri Lake Road, connecting Dauversière road to Mitchell road, and providing access to Antinouri Lake. This road may be maintained by ERD from Mitchell Settlement to Antinouri Lake, including the boat landing, as needed.
- 2) The portion of the road that follows the western border of the PNA, veering into the PNA for approximately 9 kilometres. This road is widely used for general traffic during the snow free months and by snowmobiles in winter. A License of Occupation may be issued to the New Brunswick Federation of Snowmobile Clubs in the snow covered months as this access road is part of snowmobile route no. 24.
- 3) The Hickey Road in the south of the PNA, providing access to the DUC impoundment at Taylor Meadow. It will be maintained by DUC as needed to access and maintain the impoundment and to address environmental or safety concerns.
- 4) The camp access road in the south-centre of the PNA, which is currently maintained to all-terrain vehicle and snowmobile standards, and does not accommodate vehicles larger than 5 feet wide. Maintenance from the ATV trail to the camp is the responsibility of the camp lot lessee.

Designated Recreational Roads

Roads that are designated as recreational roads under the *PNA Act* are primarily intended for recreational pursuits. Activities such as hiking, snowshoeing, skiing, bicycling, horseback riding, dog sledding and the use of all-terrain vehicles and snowmobiles are assigned a recreational road category from 1 to 8, specific to the intended activities (Appendix C). The maintenance of designated recreational roads requires formal authorization from ERD, unless it is already addressed in an existing agreement. The following two recreational roads are being proposed for designation in the Jacquet River Gorge PNA:

- 1) A Category 6 recreational road (use of all-terrain vehicles) located in the eastern section of the PNA, from Dauversière to the Nigadoo River. This recreational road is intersected by the Antinouri Lake access road and the south-central camp access road. Maintenance of this road is the responsibility of the New Brunswick All-Terrain Vehicle Federation.
- 2) A Category 4 recreational road (walking, bicycling, skiing, snowshoeing, dog sledding, and horseback riding) that spans from the Dauversière area to Antinouri Lake for approximately 20 kilometres. This road provides access to the historical gravel pit on the north shore of Antinouri Lake. It contains two small loops for dog sleds to turn around, one at the gravel pit and the other at an open field near Dauversière road. Maintenance of this road is the responsibility of relevant interest groups.

Boat Launch

The Boat Launch on the west side of Antinouri Lake is part of the designated Antinouri Lake Road and is the only authorised location to launch a boat in the lake. The structure has been upgraded in 2010 and 2011, and regular maintenance might be required to prevent siltation in the lake. ERD and DPS will monitor the structure and ERD may maintain it.

Camp Lots

There are 3 camp lots in the Jacquet River Gorge PNA. Leaseholders are able to maintain their leases and renew them, as per the Department's Camp Lot leasing Policy. When an isolated camp lot lease (i.e. not in a designated group or cluster) on Crown land is cancelled, it may not be re-offered. New campsites leases are not allowed in PNAs.

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Bibliography

Fenton, N. (Ed.). 2001. Baseline Inventory of Representative Protected Areas. New Brunswick Department of Natural Resources and Energy (DNRE), Fredericton, NB, Canada. 82 pages.

IUCN. Protected Areas. 2016.

<http://www.iucn.org/theme/protected-areas/about>

New Brunswick Department of Natural Resources. Local Advisory Committee Management Plan for the Jacquet River Gorge Protected Natural Area (draft). April 2009.

New Brunswick Department of Natural Resources. Designation and Management of access roads and recreational roads in Class II protected natural areas on Crown lands. May 2008. Policy number PPB 006-2006.

Useful Links

Check, Clean, Dry Method

http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/Didymo.html

Designation and Management of Access Roads and Recreational Roads in Class II Protected Natural Areas on Crown Lands (Policy Number PPB 006-0004)

<http://www2.gnb.ca/content/dam/gnb/Departments/nr-rn/pdf/en/Publications/PPB0062006.pdf>

General Regulation – Protected Natural Areas Act

<http://laws.gnb.ca/en/showpdf/cr/2004-57.pdf>

Our Landscape Heritage – The Story of Ecological Land Classification in New Brunswick

http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/ForestsCrownLands/content/ProtectedNaturalAreas/OurLandscapeHeritage.html

Protected Natural Areas Act

<http://laws.gnb.ca/en/showpdf/cs/P-19.01.pdf>

**Appendix A – Potential internal Threats for PNAs and
their relevance to the Jacquet River Gorge PNA**

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Potential Internal Threats for the PNAs	Identified in the JRG PNA	Addressed in this Plan?	How is the threat addressed, or why it is not being addressed in this Strategic Plan
private land			N/A
dams and fishways	✓	✓	There is a DUC impoundment at Taylor Meadow. This organisation will manage the dam and berm to maintain waterfowl productivity.
fish stocking	✓	✓	Maintain or restore the natural fish population of Antinouri Lake.
camp lots	✓		Due to the relatively few camp lots (3) in the PNA, it is not considered to be a significant internal Threat. The general Objective is to reduce the number of camp lot leases if they are no longer desired or if there are breaches of the terms and conditions of the lease by the lessee.
unauthorised structure			N/A
illegal dumping / dumpsite			N/A
Boating / boat launch	✓	✓	The boat launch was upgraded to minimise siltation of the lake.
high recreational use	✓	✓	Eliminate trailer camping, and reduce littering at Antinouri Lake.
activity in sensitive habitats			N/A
Roads in sensitive habitats			N/A
demand for new roads or existing roads through sensitive areas			N/A
illegal ford			N/A
poaching	✓	✓	Monitoring of the PNA will diminish the risk of poaching.
boundary lines growing in	✓	✓	Partial maintenance of the PNA boundary lines will diminish the risk of inadvertent intrusions. Mineral exploration, forestry activities, and oil and natural gas tenures occur near the PNA.
plantations	✓		
utility corridor			N/A
insufficient knowledge of species composition	✓		Biological surveys were conducted during the summers of 2009 and 2010.
lack of public awareness	✓	✓	Promote Stewardship and public awareness program.
fires	✓	✓	Respond to fires in the PNA as those on non-PNA lands.
Invasive alien species	✓	✓	Monitor for and prevent the spread/introduction; public awareness
insect/disease control	✓	✓	Monitor for, and intervene or prevent infestations when necessary.
network of existing roads	✓	✓	Designate roads that meet minimum needs, where feasible rehabilitate undesigned roads.
Motor vehicle use	✓	✓	Designate roads to limit the environmental footprint caused by motor vehicle use
Off-road use of ATV and 4x4 vehicles	✓	✓	Eliminate Off-road use of ATV and 4x4 vehicles

**Appendix B – Detailed Strengths and Threats Analysis
for the Jacquet River Gorge PNA**

Internal Strengths

- **Vegetation Diversity.** The vegetation of the Jacquet River Gorge PNA is very diverse (Fenton, 2001). The site is characterised by a rich soil and an extended growing season resulting from the moderating effect of the Chaleur Bay. These favour the presence of plant species that would not commonly occur at this latitude.
- **Good knowledge of biodiversity.** In 2009 and 2010, biological surveys were conducted in the Jacquet River Gorge PNA. In addition, some reconnaissance work done the previous spring. This work has resulted in a better knowledge of the PNA's species and a basis for management planning.
- **High quality fish habitat.** The PNA is important for Atlantic salmon and sea-run Brook trout migration. There are approximately 9 major salmon holding pools in the PNA on the Jacquet River alone. The actual number of effective holding pools may vary throughout the season based on water level fluctuations.
- **Species of conservation concern.** A few species of conservation concern have been recorded in the PNA, such as:
 - **Olive-sided Flycatcher** (*Contopus borealis*) ('At Risk', ERD General Status Ranks, 2008; SARA Schedule 1 Threatened).
 - **Canada Warbler** (*Wilsonia canadensis*) ('At Risk', ERD General Status Ranks, 2008; SARA Schedule 1 Threatened).
 - **Chimney Swift** (*Chaetura pelagica*) ('At Risk', ERD General Status Ranks, 2007; SARA Schedule 1 Threatened).
 - **Common Nighthawk** (*Chordeiles minor*) ('At Risk', ERD General Status Ranks, 2007; SARA Schedule 1 Threatened).
 - **Eastern Bluebird** (*Sialia sialis*) ('Sensitive', ERD General Status Ranks, 2006; SARA Not At Risk).
 - **Little Brown Myotis** (*Myotis lucifugus*) and the **Northern Myotis** (*Myotis septentrionalis*) (both designated as Endangered during an emergency COSEWIC assessment).
 - Several S2 (Subnational rarity rankings; Rare in Province) and S3 (Subnational rarity rankings; Uncommon in Province) plant species; **in Belledune pond:** Pondweed (*Potamogeton confervoides*), Yellow Cowlily (*Nuphar lutea* spp. *pumila*), and Small Bur-Reed (*Sparganium natan*); **in the Jacquet River:** Blunt-Fruited Sweet-Cicely (*Osmorhiza depauperata*); **in Antinouri Lake:** Small Water-Wort (*Elatine minima*), and **in other wetlands:** Redhead Grass (*Potamogeton richardsonii*), and Hornemann Willow-Herb (*Epilobium hornemannii*)
 - Provincially Endangered species including the Pine-drops plant (*Pterospora andromedea*) ('At Risk', ERD General Status Ranks, 2010), and Canada Lynx (*Lynx canadensis*) ('At Risk', ERD General Status Ranks, 2005).
 - Other rare and uncommon species, including the Long-Bract Green Orchis (*Coeloglossum viride*) ('May be at Risk', ERD General Status Ranks, 2006), the boreal Northern Bog Lemming (*Synaptomys borealis*), the Rock Vole (*Microtus chrotorrhinus*), and Southern Bog Lemming (*Synaptomys cooperi*).
- **Areas of ecological significance occur in the PNA.** Over 50% of the forested area within the PNA is old forest wildlife habitat. These 13,000 ha maintain the diversity and distribution of life that requires old forest attributes to exist. There are 3,725 ha of Deer Wintering Area within the PNA. There are also four Environmentally Significant Areas (ESAs) in the PNA. ESAs were identified through the Nature Trust of New Brunswick as sites with special features. They have no legal status, but they indicate areas worthy of conservation. Since many ESA's were chosen based on local input, the public often has an attachment to the sites and wish to see them preserved. Management activities in the PNA should consider the biodiversity value of these sites. One is a small Ducks Unlimited Canada pond at Taylor Meadow. This man-modified wetland was very productive when the water control structure was first built and was therefore identified as an ESA. While the non-natural aspect of this site does not conform to the intent of PNAs, its existence is considered as a Strength due to the conservation value that

local residents may place on it. The Jacquet River System ESA was mainly selected for the aesthetic appeal of the steep gorge, but also for its mature Balsam fir-Spruce forest habitat. This river system has the potential to be an important salmon river. The South Branch Nigadoo River Wetland Complex ESA is dominated by wetland shrub vegetation and is recognised for the high productivity of Brook trout and other fish. Antinouri Lake Area ESA provides good Brook trout habitat. The site includes a large, high quality wetland complex at the western outlet of the lake, which is dominated by shrub vegetation and deep marsh.

- **Large size.** The Jacquet River Gorge PNA is the largest PNA in all of New Brunswick, at 26,000 hectares. It's relatively circular shape gives extra protection to the interior of the PNA, by providing a buffer from exterior Threats as well as limiting access.

Internal Threats

- **Network of existing roads.** There is a fairly extensive network of old roads, which are used to reach remote areas, with local interest for continued use of these roads, mostly for hunting, trapping, and fishing purposes. Continued use of unmaintained roads could exacerbate the environmental degradation caused by road deterioration and allow continued access to remote areas, thus maintaining the human influence on a larger area. Furthermore, it slows down the naturalisation of these roads, prolonging the impacts of habitat loss on the road's footprint, habitat fragmentation, and edge effect. Old culverts will eventually deteriorate and erode causing siltation in rivers and ponds. Siltation of the cool, clear rivers of the PNA may impact the spawning ground of salmon, trout and other fish species. Degraded ponds and wetlands would also impact water dependant species.
- **Motor vehicle use.** The use of motorised wheeled-vehicles may result in increased siltation of watercourses, rutting of soil, change in drainage patterns, introduction of invasive alien species in the PNA, impacted air quality, sound impacts, and increased pollution (e.g. oil and fuel spills). Snowmobiles may cause less damage to the ground than wheeled-vehicles, given a sufficient amount of snow cover, but other risks and Threats still persist. These include degraded air quality, as well as potential oil and fuel spills and sound impacts. The required maintenance of snowmobile trails would also result in brush being cut back, allowing continued access during the summer months. The impacts to air quality, from snowmobiles and all-terrain vehicles, are much greater when using vehicles with 2-stroke engines.
- **Off-road use of all-terrain and four-by-four vehicles.** As all-terrain vehicles and four-by-four vehicles are capable of handling rugged terrain, the human urge to explore and reach new grounds, to bypass impassable roads, or to challenge oneself by driving on wet, muddy ground often results in destructive off-road activity. Irresponsible vehicle use during snow-free conditions may cause erosion and rutting of the forest soil or wetland substrate which may change drainage patterns, damage habitats, generate silt runoff affecting watercourses and fish habitat, and create new roads in the PNA. The disruption of drainage patterns may affect the hydrology of watercourses and associated habitat. Wetlands are particularly vulnerable. In one wetland, off-roading has created deep ruts and erosion of the wetland substrate. Vernal pools, which are small, biologically diverse ephemeral ponds, may be highly degraded or destroyed by off-road vehicle use. These ponds are important breeding grounds for frogs, salamanders and various invertebrates.
- **High recreational use of focal points; particularly at Antinouri Lake.** Excessive use of recreational areas may result in trampling and destruction of vegetation. This is mainly a concern at Taylor Meadow during hunting season, at a well-known salmon fishing location called Kettle Hole, and in the forest and lakeshore surrounding Antinouri Lake. Antinouri Lake is the most frequented area of the PNA. The lake and surrounding ecosystems are therefore subject

to potential degradation stemming from recreational pressure. The main clearing is a popular gathering, picnic and camping site, and is a favourite hangout and party ground. Roads parallel the western shoreline, leading to additional clearings ideal for setting up camp. Trailer camping is a common occurrence, despite the presence of signs indicating that the activity is prohibited. Litter has been a recurring problem at the clearing and in the lake. Use of the surrounding woods as a bathroom facility further deteriorates the site's integrity and creates a potential risk of sewage seeping into the lake. Sewage is an added concern with illegal trailer camping. The use of motor boats on the lake and vehicles near the lake represents a risk of fuel and oil spills.

- **Siltation from the boat launch.** The boat launch at Antinouri Lake was upgraded in 2010 and 2011. To prevent siltation of the lake, regular maintenance may be needed to control runoff, which could degrade the aquatic habitat for brook trout, numerous dragonfly species, waterfowl and other aquatic species.
- **Poaching.** Poaching of fish, wildlife, timber, and other forest products may occur and could affect biodiversity.
- **Lack of Public Awareness.** People's actions have the greatest ability to disrupt biological diversity. In fact, most of the identified Threats are associated with human activities. Today, there is a greater awareness of the importance of biological diversity and there are improved efforts to protect the environment. Yet there are still many people that don't realize the impact of their actions. Even when activities are conducted responsibly, the pursuit of recreation in a PNA implies that there will be some impact on natural processes.
- **Forest fires and fire suppression activity.** Fire can be an important component of some NB forest ecosystems. Fire may originate from natural causes as well as human-causes. To protect resources outside of the PNA, it is ERD's policy to suppress forest fires regardless of their origin. This activity is permitted under the *PNA Act*.
- **Fish stocking of Antinouri Lake.** Antinouri Lake has been stocked with Brook trout for over 30 years to sustain a recreational fishery in the lake. Artificial enhancement for recreational purposes, and heavy fishing pressure, result in an artificial ecosystem. Some of the risks from fish stocking include competition for resources, predation on indigenous species, introduction of parasites, hybridisation, transmission of disease (bacterial and viral), impairment of natural reproduction of resident brook trout, and displacement of resident brook trout. Most of these risks are mitigated by only stocking fish that are native to New Brunswick, are of wild strain, are genetically appropriate for the receiving waters, and are certified disease free.
- **Invasive alien species.** Invasive alien species may cause serious and irreversible damage to biological diversity. They may negatively alter a habitat thus displacing native species; they may predate on or compete with native species thereby directly or indirectly impacting on populations; they may interbreed with native species which often results in a population decline of the native species; they may introduce disease and parasites to which native species are often very susceptible. Invasive alien species are often introduced unintentionally through human activity.
- **Spraying for insects and disease.** Some insect and disease outbreaks bring about long established natural cycles in New Brunswick forest ecosystems. Others are part of a natural range expansion or are exotic. Insect and disease suppression is the responsibility of ERD and is permitted in the PNA. This may be required, if there is a threat to the forest resources exterior to the PNA. While such management helps protect commercial tree species, the activity may impede or otherwise affect natural processes.
- **Boundary lines growing in.** Visible boundary lines are essential to make users aware when they have entered the PNA and to ensure compliance of the Regulations. As boundary lines grow in, it may be more difficult for people who use the area to notice them.

- **Dams and fishways.** There is a Ducks Unlimited Canada (DUC) impoundment at Taylor Meadow. Changes in the water levels can have a negative impact on organisms dependent on certain conditions at critical times in their life cycle. Fishways can fail due to inadequate flow, blockage by debris, or other factors.
- **Camp lots.** There are three camp lots in the Jacquet River Gorge PNA. The presence of infrastructure, cleared sections of natural habitat, and concentrated activity are considered to have an impact on the lot's biodiversity as well as that of the surrounding area (e.g. access to the lot, recreational activity, sewage and waste management). However, due to the relatively few camp lots, it is not considered to be a significant internal Threat to this PNA.

External Strengths:

- **First Nations.** Aboriginal and treaty rights are communal rights held collectively by First Nations communities in New Brunswick. As such, community members may hunt, trap, fish and gather in PNAs for food, social and ceremonial purposes. However, harvesting timber is prohibited within the PNA. Intact old growth forests are important features for protecting biodiversity, as they support a larger variety of wildlife species. Indeed, some of the species that are gathered by First Nations, such as Chanterelle and Chaga mushrooms, require old growth forests to thrive. Community gatherers respect certain customs while collecting medicinal plants and may watch over the PNA to ensure that the activities of other users are not damaging. ERD is committed to respecting these rights and to balance these with the interests of the public, interest groups, and other users of the PNA.
- **Numerous interest groups.** Central to several Northeastern communities, the Jacquet River Gorge PNA is visited and valued by many local people and groups for its recreational and educational opportunities. These interest groups strengthen the PNA's ability to achieve its purpose, as people who have an interest in the PNA are more likely to protect it and encourage others to do the same. Interest groups include adjacent landowners, hunters, trappers, anglers, naturalists, environmental groups, outfitters and organised recreational vehicle clubs. Public support for the fish fence, which is managed by the Village of Belledune, has increased local appreciation for the Jacquet River. Through a Fish Friends Program, school children oversee the hatching and release of fish into the wild, thus furthering an awareness of the PNA's ecosystems.
- **Fish protection barrier.** The fish protection barrier, located downstream of the PNA, holds salmon and other species in monitored pools during the summer. This reduces the risk of poaching. The fish are contained until mid-October when the conditions in the river are right for spawning. Other benefits have been the opportunities available to collect fish data; to collect brood salmon stock for restocking other waterways; and for educational purposes.
- **Surrounding areas with environmental designations.** The Nigadoo River Designated Watershed, which is a municipal drinking water supply, covers over a third of the PNA and extends beyond the southeastern boundary. This adds greater protection by buffering certain activities in this area. The restrictions on land use are largely related to agriculture, forestry, mineral development and road construction. There are also restrictions pertaining to residential properties and landscaping. The designation results in greater protection against pollution entering the Nigadoo watercourses through restrictions on siltation and mining effluents. Restrictions are also placed on the size of clear cuts and time between adjacent clear cuts, reducing forest fragmentation adjacent to the PNA. The Nigadoo Lake Environmentally Significant Area (ESA) also borders the PNA. This lake is 90 feet deep and is virtually a closed system. ESAs were identified by the New Brunswick Nature Trust in the 1990s. They have no legal conservation status, but they are recognised as areas worthy of conservation during Environmental Impact Assessments.

External Threats:

Although the following external Threats have been identified as posing a potential risk to the biodiversity of the PNA, they are not within the scope of this Strategic Plan. The document focusses on resolving the conservation issues occurring within the boundaries of the PNA.

- **Pollutants.** The PNA may occasionally be exposed to air pollutants, including trace metals and other industrial pollutants (e.g. carbon dioxide, sulphur, nitrogen). Toxic metals may accumulate in soil and sediments, becoming a health hazard for wildlife. Fuel spills, oil spills, sewage, grey water, forestry herbicides and agrichemicals discharged in the PNA's watersheds are also a threat to ecological systems within the PNA. Mineral exploration for base metals and precious metals on the lands surrounding the PNA is ongoing. Future mineral extraction could pose a potential risk of pollutants.
- **Acid rain and snow.** Acid rain and snow can acidify soils, affecting and potentially altering the vegetation in the PNA, which in turn alters existing habitat and wildlife species. Acidity levels are generally higher in the spring, when the trapped pollutants are released all at once with snow melt, causing high concentrations in the environment. This phenomenon, known as acid shock, is especially harmful to the spawning and early life stages of aquatic fauna that inhabit vernal pools. If acidity levels are too high, the development of eggs and larval stages can be severely affected and they may not survive. The origins of acid rain and snow are both long range and regional with primary sources being fossil fuel power plants, other industrial emissions and motor vehicles. The biggest contributors of acid rain and snow are external to the PNA and beyond the ability of this strategic plan to mitigate effectively. Acidity levels in the environment can be somewhat buffered if on calcareous bedrock such as limestone.
- **Motor vehicle use.** Motor vehicle use exterior to the PNA can also threaten the biological diversity within the PNA. If this activity occurs within the PNA's watershed, siltation may impact the aquatic ecosystems downstream. Altered water flow may also affect the hydrology of PNA watercourses and their associated habitats.
- **Invasive alien species, insect and disease, and forest fires.** As discussed for internal Threats, each of these is also considered an external Threats as potential exists that they will either spread or be transported to within the PNA. Insect and disease and forest fires entail management activities that have impacts on natural processes.
- **Climate change.** Climate change greatly affects biological diversity. Rapid temperature changes may impact ecosystems and species ability to adapt. It is predicted that it will affect water quality and quantity, and as previously mentioned, changes in water regime can have associated negative impacts.
- **Natural resource extraction and/or exploration.** Mineral exploration for base metals and precious metals on the lands surrounding the PNA is ongoing. Oil and natural gas tenures occur near the PNA. Forestry activities occur near the PNA. If boundary lines are not maintained, these activities could inadvertently occur in the PNA.

Appendix C – Designated Recreational Roads Categories

The activities allowed in each of the recreational road categories are listed in the following table. All authorised modes of transportation are allowed on designated access roads.

Categories	Activity
1	walking, skiing, and snowshoeing
2	walking, bicycling, skiing, snowshoeing, and dog sledding
3	horseback riding
4	walking, bicycling, skiing, snowshoeing, dog sledding, and horseback riding
5	use of a snowmobile
6	use of an all-terrain vehicle (ATV)
7	use of a motor vehicle other than an off-road vehicle*
8	use of all motor vehicle allowed in Categories 5, 6, and 7

*As per the *Protected Natural Areas Act*, an off-road vehicle is any motor vehicle designed and adapted for off-road use, but does not include any vehicle which is designed for use and is being used in agriculture, forestry, mining or construction.

Appendix D – Acronyms

DPS Department of Public Safety
DUC Ducks Unlimited Canada
ERD Department of Energy and Resource Development
LAC Local Advisory Committee Jacquet River Gorge PNA
PAC Provincial Advisory Committee for Protected Natural Areas
PNA Protected Natural Area
SAC Scientific Advisory Committee for the Protected Natural Areas