Boundary Waters Voyageur Waterway, Ontario
Two Decades in the Canadian Heritage Rivers System
1996 - 2016

Prepared for the Canadian Heritage Rivers Board by
Ontario Parks (Northwest Zone)
March 2017

CANADA 150

Celebrate Canada's Heritage Rivers!
Célébrons les rivières du patrimoine canadien!

ONTARIO PARKS

©2017, Queen's Printer for Ontario

Printed in Ontario, Canada

Cover Photograph: Paddling on Basswood Lake, Quetico Provincial Park.
Photo Credits: Ontario Parks

Special Thanks to:

- **Lac La Croix First Nation youth Jessica Atatise, Trion Jourdain and Cody Berry-Ottertail for their enthusiastic paddling and portaging,**
- **Lac La Croix spiritual leader Danny Geyshick for his prayers for a safe and enjoyable trip,**
- **Cache Bay entry station staff Janice Matichuk and Hanna Blackjack for their generous hospitality, popcorn and bannock,**
- **Quetico staff including John Bartol and Allison Gray who helped with flights and shuttles,**
- **MNRF staff Michèle Proulx, Evan McCaul, Mike Carneiro, Danielle Gough and Mike Holm for their enthusiastic participation in the 2016 monitoring trips, and**
- **Michèle Proulx, Danielle Gough, Evan McCaul, MaryJane Moses and Jessica Atatise for their able assistance with the monitoring report.**

Additional copies of this publication are available from the Ministry of Natural Resources and Forestry at the following locations**:**

Ontario Parks (Northwest Zone)
Suite 221d
435 James Street South
Thunder Bay, Ontario
P7E 6S7
Telephone: (807) 475-1321
Fax: (807) 475-1499

0.02k P.R. 01 05 17
ISBN - **978-1-4868-0052-0** (Print)
ISBN - **978-1-4868-0053-7** (PDF)

Table of Contents

Figures

Tables

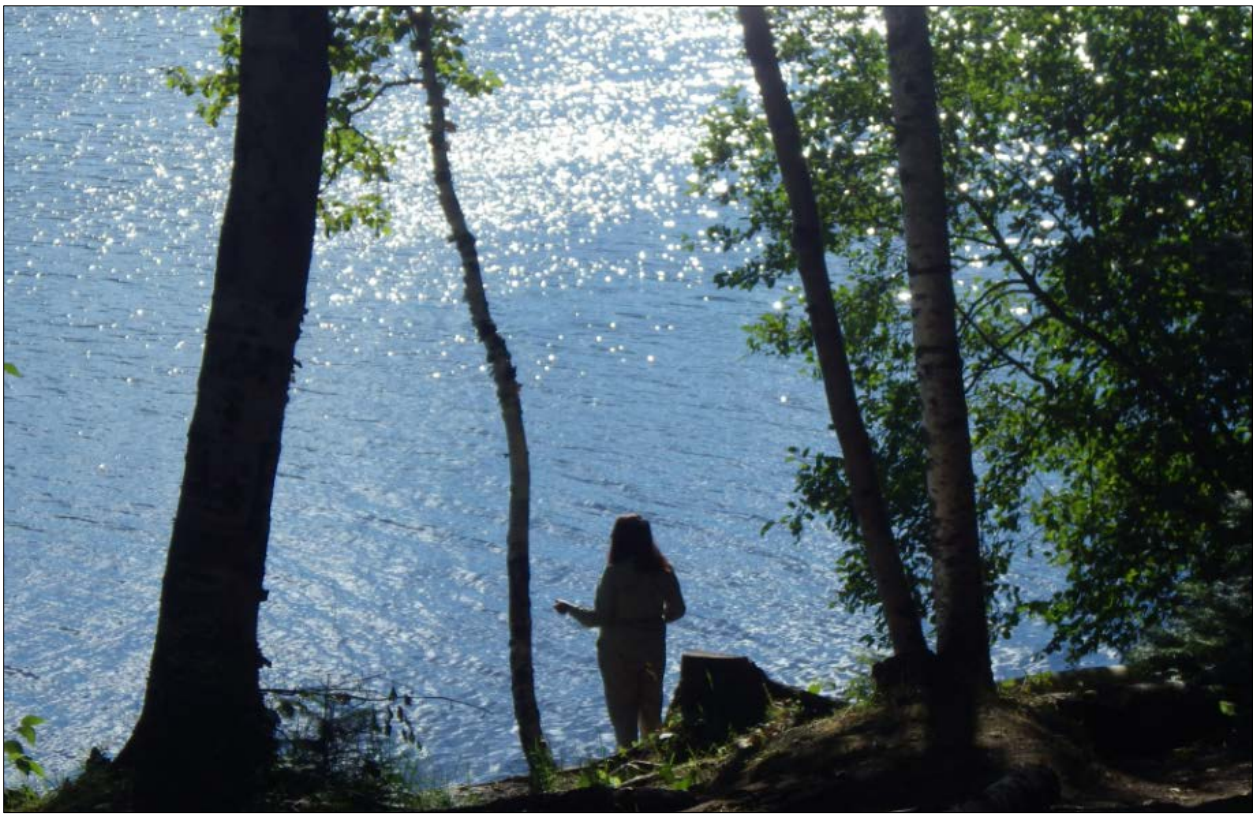


Figure 1: It is an Anishnaabe traditional practice to offer tobacco at all of the lakes and rivers as one takes to the water. It is intended to show respect for the spirits of the water and to ask for safe passage. Jessica, Trion and Cody offered tobacco to the lakes and the rivers that were travelled on the monitoring trip.

1.0 Executive Summary

The Boundary Waters Voyageur Waterway (BWVW) was nominated as a Canadian Heritage River in 1986 based upon its outstanding representation of natural, cultural and recreational values. With the completion of a Management Plan entitled "Managing the Boundary Waters-Voyageur Waterway as a Canadian Heritage River", the waterway was officially designated by the Canadian Heritage Rivers Board of Directors in September, 1996. The BWVW has maintained the qualities and values for which it was originally nominated since its designation in 1996.

A requirement of the Canadian Heritage Rivers System is to prepare a monitoring report every 10 years for each designated heritage waterway. A 10 year report was prepared in 2006. This 2016 report summarizes 20 years of monitoring and includes: a summary of the changes to the waterway's core natural, human heritage, and recreational values; a brief description of the publications, reports and plans associated with the waterway; as well as an evaluation of the 1996 Management Plan and the implementation priorities associated with it.

Figure 2: Robert Atatise (Chief, Lac La Croix First Nation) and Norm Richards (Managing Director, Ontario Parks) unveil the Boundary Waters Voyageur Waterway plaque at the dedication ceremony on July 5, 1997.

1.1 Highlights of the past two decades

The following is a summary of significant events that have taken place within the waterway over the past 20 years.

Land Acquisition
In 2000, Ontario Parks acquired 8.1 hectares of land at Middle Falls on the Pigeon River from the Minnesota Parks and Trails Association for the purpose of adding it to the Ontario Provincial Park System. In 2002, The Nature Conservancy of Minnesota acquired 304 hectares of land (known as the Horne Falls property) along the Pigeon River for the purpose of adding it to LaVerendrye Provincial Park. The acquired lands extend 11 kilometres along the Pigeon River. The lands capture some of the Pigeon River Clay Plain, one of the values for which the river was nominated. These parcels of land almost complete the land link between Lake Superior and Quetico Provincial Park and they provide critical habitat for several rare and significant species. These additions enhance the integrity values by further protecting the Boundary Waters Voyageur Waterway from development. The regulation of these additions is underway; they have been withdrawn from staking (2008), draft regulation plans prepared, a crown land use atlas amendment approved (2013), Environmental Registry regulation notice posted (2015), Ministry of Economic Development, Employment and Infrastructure Regulatory Registry notice posted (2015) and the Class EA-PPCR consultation completed (2015).

Three inholdings (forfeited mining patents) were added to Quetico Park since 2006. In 2011, a 29.14 hectare parcel near Lilypad Lake was added to the park, a 16 hectare parcel was added near Burt/Agnes lakes in 2013 and in 2014 a 64 hectare parcel near Veron Lake was added to the park.

Development
The Pigeon River Provincial Park campground was closed for camping in 2001. The buildings were demolished and materials removed in 2013. The Canadian Heritage Rivers plaque was relocated to the High Falls Trail along the river. The hiking trail network continues to receive a high level of use since its completion in 2002.

Abiotic Disturbances (Blowdown, Snow-down and Fire)
On July 4, 1999, one of the largest blowdown events ever recorded in North America hit northern Minnesota and a smaller area in Ontario with heavy rain and straight-line winds.

July 4, 1999 was a hot, muggy day with temperatures almost reaching 38°C. A cold front swept into the area. Typically this mix creates a thunderstorm, but on this occasion it produced a storm so powerful it pulled down winds from six kilometres above the earth's surface. The sudden, straight-line winds or *derechos*[1] that were generated were estimated at 128 to 160 km per hour.

[1] Literally meaning "straight on," a **derecho** describes a widespread convective windstorm with a complex of thunderstorms that develop into a long-lived squall line with straight-line winds. The area may extend for hundreds of miles along the path of the storm.

In the United States, the storm affected approximately 192,961 hectares (16 % of the Superior National Forest) with blowdown including approximately 149,736 hectares inside the Boundary Waters Canoe Area Wilderness. The BWCAW sustained the heaviest damage in a line from Ely to the end of the Gunflint Trail (Gunflint Lake, Magnetic Lake, Rose Lake, Mountain Lake and Moose Lake areas). This swath of blowdown is approximately 48.27 kilometres in length and up to 19 km wide.

In Canada this storm affected approximately 11,000 hectares of forest along the southern boundary of Quetico from North Bay on Basswood Lake through the south ends of Agnes and Louisa lakes through to Knife, Emerald and Plough lakes. The area in and around LaVerendrye saw even more serious forest blowdown in the Gunflint Lake, Magnetic Lake, Rose Lake, Mountain Lake and Moose Lake areas. The blowdown area continued to the northeast of the parks through Northern Lights Lake and Arrow Lake and sporadically as far east as Kakabeka Falls Provincial Park.

This blowdown killed many trees and led to an immense amount of dry wood piled on the forest floor. This buildup of fuel increased the risk of catastrophic wildfire. Both the Superior National Forest and Ontario Parks responded with restricted fires zones (RFZs) prohibiting campfires and requiring the use of cook stoves by canoeists in the affected areas for several subsequent operating seasons. Both Canadian and US agencies have used prescribed burns to reduce the fuel loads in the border area. Quetico's prescribed burns included the October 2000 Emerald Lake burn. The US Forest Service has undertaken several small prescribed burns in the border area to reduce fuel load and provide fire breaks in the event of large wildfires.

Figure 3: LaVerendrye Provincial Park South Lake blowdown August 2016.

There were large fires in the blowdown affected Gunflint area, some of which burned from Minnesota into Ontario. The Cavity Lake fire occurred in July 2006 from a lightning strike and burned more than 12,140 hectares. The Ham Lake fire occurred in May 2007 from an unattended campfire. It burned 20,233 hectares in Minnesota and 24,280 hectares in Ontario surrounding the Granite River corridor from Saganaga Lake to Gunflint Lake. The Ham Lake fire is considered to be one of the most catastrophic fires in 90 years for the destruction that occurred to human structures.

A mid-December 2015 snow storm delivered wet heavy snow which did considerable damage along the Border Route hiking trail in the Gunflint area of the BWCA and in LaVerendrye. The damage consisted of an unusual number of large pine knock downs in the general area as well as 6 to 10 metre saplings being permanently bent into the Border Route trail from 3 to 5 metres off the trail by the heavy snow loads effectively causing significant “snow-down” or blockage along the trail tread.

Another blowdown occurred on July 21, 2016. It affected an area along the border from lower Basswood Lake through to the Gunflint, South Lake and Rose Lake. Campsites on Basswood Lake in Quetico Park and the BWCA were affected. Campsites, portages and parts of the Kekekabic and Border Route hiking trails in the western area of the Superior National Forest / BWCA and LaVerendrye Provincial Park were closed until the USFS crews could clear the downed trees.

Figure 4: Omimi section of the TransCanada through LaVerendrye Provincial Park.

TransCanada Trail

Ontario Parks has a longstanding working arrangement to develop and support the TransCanada Trail (TCT) in Ontario, specifically northern Ontario. The TCT Ontario is currently working to complete two major projects in northern Ontario: the North Shore Project (Sault Ste. Marie to Thunder Bay) and the Path of the Paddle project (Thunder Bay to the Manitoba boarder). Both projects are focused on developing a waterway route connection and land base route connections to complete the TCT in the north. TCT goals are to complete these projects by 2017 to coincide with Canada’s 150th birthday. The Path of the Paddle Omimi section runs through Pigeon River and LaVerendrye Provincial Parks

(Figure 4) , while the Quetico sections runs from Cache Bay on Saganaga Lake north through the park to French Lake rather than along the boundary waters. LaVerendrye Provincial Park has received some trailhead signage to support this initiative.

North Country Trail

The North Country Trail is a National Scenic Trail currently under construction that stretches 4,600 miles from North Dakota to New York. The National Park Service is currently pursuing a re-route in northern Minnesota which will include the Border Route Trail into the North Country Trail. The re-route is dependent upon congress passing new legislation. This initiative is thematically similar to the TransCanada trail concept.

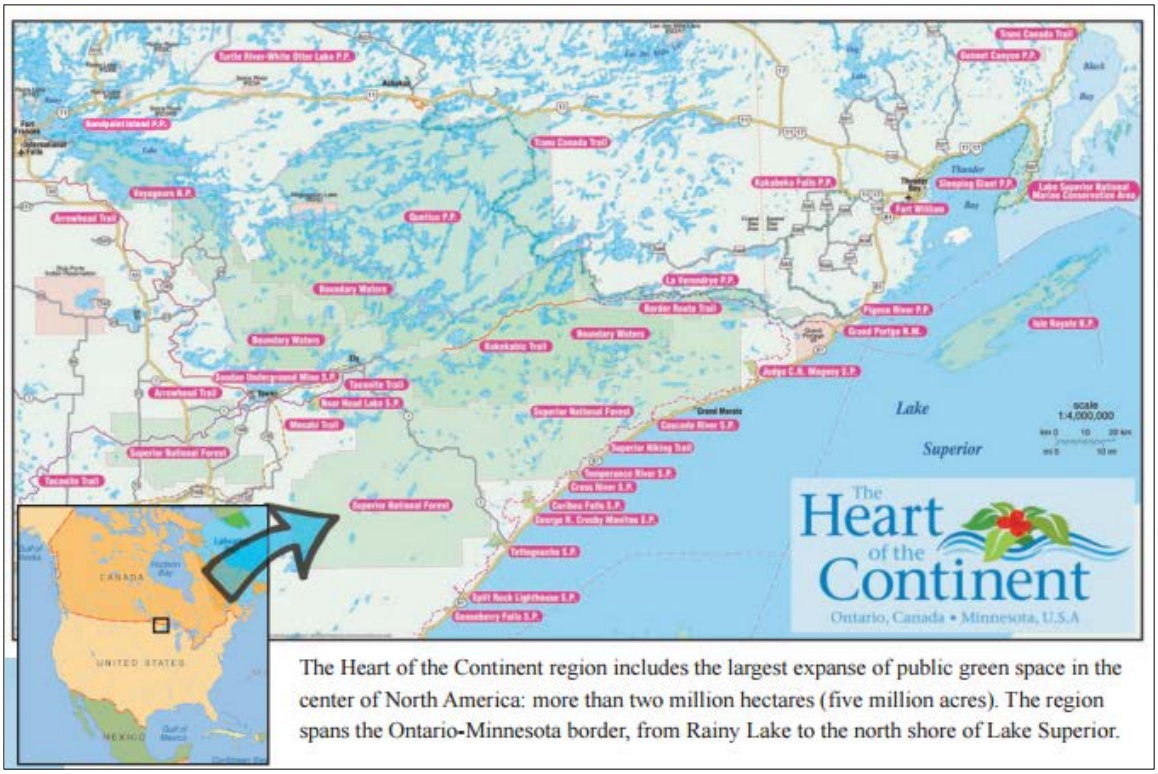


Figure 5: Heart of the Continent partnership map.

Heart of the Continent Partnership

The Heart of the Continent Partnership (HOCP) was established in 2007 and is a Canadian-American coalition of more than 90 agencies and organizations, land managers and local stakeholders working together on cross-border projects that promote the economic, cultural and natural health of the lakes, forests and communities on the Minnesota-Ontario border, from Rainy Lake to the north shore of Lake Superior (Figure 5). Within this broad coalition, HOCP is developing a common identity and sense of belonging to the larger cross-border area, the Heart of the Continent, which consists of over two million hectares. To date, the HOC has undertaken several initiatives including:

- An HOCP-National Geographic Collaboration to designate the Heart of the Continent as a part of a growing international network of regional geotourism destinations
- An HOC website to coordinate volunteering across the Heart of the Continent region.

- An HOC science committee to present lectures, to host a research database and to assist with sharing data among partner agencies and with applications for research funding.
- Quarterly meetings in different locations with the steering committee and regional and community representatives.
- A multi-day forum and training event, the International Community Congress, was held in 2011 in Thunder Bay, ON and Grand Portage, MN.
- An 18-day canoe expedition across the region in 2009, as a way to build awareness of the region, and to build relationships and good will among the diverse stakeholders in the region. Sixty partners took part in paddling a voyageur style canoe along the 563 kilometer route in celebration of the 100th anniversaries of Quetico Provincial Park and the Superior National Forest.

Sister Sites Arrangement

The Sister Sites Arrangement was signed in 2011 by representatives from Ontario Parks (Quetico and LaVerendrye) the U.S. Forest Service (Superior National Forest) and The U.S. National Park Service (Voyageur National Park and Grand Portage National Monument). It builds upon the *Memorandum of Understanding on Cooperation of Wilderness Conservation* between representatives of Canada, United Mexican States and the United States of America signed in 2009. The intent of this MOU is "the creation of a voluntary framework for cooperation and coordination among the participants concerning the commemoration, conservation and preservation of wilderness areas." The Sister Sites Arrangement is intended to apply this to the 2 million acres / 809,000 hectares of designated wilderness between Quetico Park and Superior National Forest (Boundary Waters Canoe Area Wilderness), as well as the 5.5 million acres / 2.2 million hectares of the five signatory protected areas that manage the lands and waters from Lake Superior in the east to Rainy Lake in the west. The Sister Sites Arrangement is intended to build upon agency efforts to:

- Provide visitor opportunities to experience these public lands and waters;
- Provide holistic interpretation of the significance and links between the sites;
- Support sustainable social and economic development in gateway communities;
- Preserve public lands and waters and their flora and fauna;
- Maintain the wilderness character in managed wilderness areas;
- Protect and promote cultural heritage and education;
- Implement research , inventory and monitoring programs necessary to achieve success in preservation, restoration, ecological integrity and resilience;
- Encourage scholarship and programs to protect heritage resources;
- Develop, enhance and share volunteer programs to encourage involvement with all participants; and
- Share and/or exchange staff and/or resources among the participants.

Border Security Measures and impacts to the BWVW

In America, a number of new and proposed laws and other government policies and measures present a new and potential threat to the wilderness integrity of the BWCAW, Quetico and the border lands associated with LaVerendrye and Pigeon River Provincial Parks. United States Congress and the Department of Homeland Security have worked to advance new border security measures. These include the administrative waiver of federal laws that currently protect legislated Wilderness,

clearing and construction of walls, fences and other infrastructure, motorized patrols including the use of ORVs, trucks, snowmobiles, airplanes, helicopters and drones.

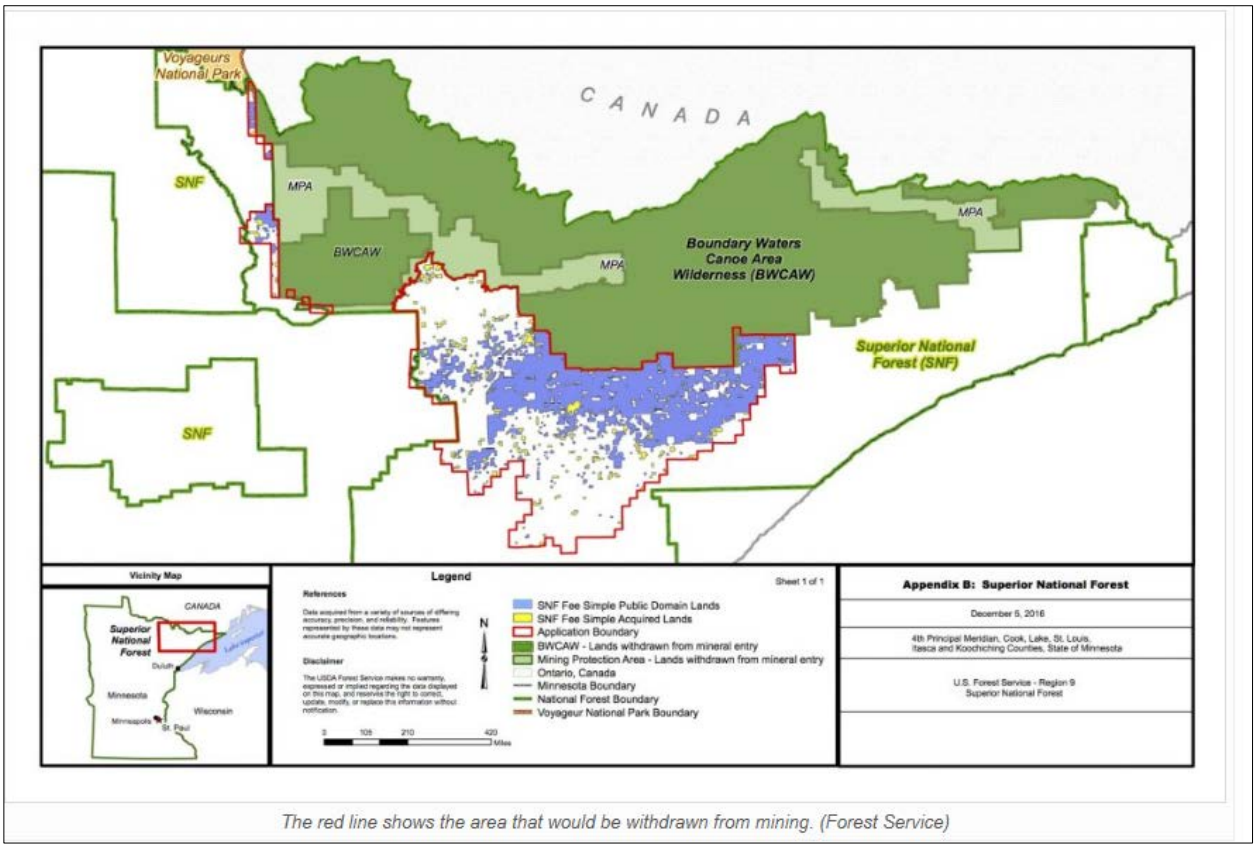


Figure 6: Map of the areas (outlined in red) being considered for withdrawal from mining in the Superior National Forest.

Sulfide-bearing rock mining in the Superior National Forest

There are two active proposals for mines on public lands in the Superior National Forest adjacent to the BWCAW. The PolyMet proposal is for an open–pit mine to extract copper, nickel and other metals near Babbitt in the Lake Superior watershed. The PolyMet proposal is in the permitting phases with Minnesota Department of Natural Resources and is subject to lawsuits from ENGOS seeking to protect endangered species habitat. The Twin Metals proposal is for an underground mine for the extraction of the same minerals near Ely, in the Rainy River watershed that flows north and west into the BWCAW, out of Minnesota into Quetico and Rainy Lake. The potential for the production of sulfuric acid and other contaminants from this mine's waste rock and tainted water leakage into this watershed represents an existential threat to the integrity of the aquatic and terrestrial wildlife in the area of influence. There was a two year moratorium on mineral lease renewal put into effect in December of 2016 and the US Forest Service is undertaking public consultation on a 20-year withdrawal from mining for the area (Figure 6). This withdrawal would effectively prevent the development of the Twin Metals mine but it will not affect the PolyMet proposal. The new federal administration may reverse these initiatives.

On the Horizon

A preliminary park management plan for Quetico provincial Park was released for public review in late September 2013 for 60 day review period. Ontario Parks staff met with about twenty Lac La Croix First Nation community members in early December 2013, where the creation of an advisory committee to revise the park plan was discussed. Staff were invited to Lac La Croix for a community meeting in early April 2014. The meeting included a fish fry, drumming, prayers and songs, and community members took turns speaking. The Lac La Croix Park Management Advisory Committee was formed and met from July 2014 until March 2015 to review the preliminary park plan. A number of themes emerged from these discussions:

- The Shared History and Relationship between Lac La Croix and Quetico
- Phase-out of motorized guiding
- Cultural heritage resource management
- Fish and wildlife resource management
- Changes to zoning (wilderness, nature reserve zones)
- Opportunities for youth

The revised preliminary plan provides direction for future cooperation between Ontario Parks and Lac La Croix First Nation. Both parties valued working together to organize and complete this heritage river assessment. Three Lac La Croix First Nation youth participated in the August 2016 monitoring field trip, one of whom also helped to update the 2016 monitoring report.

The 1993 Park Management Plan for LaVerendrye was assessed in 2007 and an administrative update is underway. The 1994 park Management Plan for Pigeon River was assessed in 2009 and an administrative update is underway.

A proposal to amend the existing designated Boundary Waters-Voyageur Waterway route to recognize the early fur trade route from Fort William through Quetico was submitted to the Canadian Heritage Rivers Board in 2013 and is underway.

Academics from the University of Minnesota and the University of Wisconsin, with the support of the US National Park Service, have initiated a dendrochronological study of the fire history of the red pine forests of the lakes along the border in the BWCAW (Johnson and Kipfmueller 2016). To date, these have included islands and shores of Lac La Croix, but also include sampling from Crooked Lake, Basswood Lake and Saganaga Lake (Figure 7) and there is interest in expanding the sampling into Quetico. The Fire History Project is reconstructing the landscape, fire and climate histories and describing the relative roles of lightning and human ignited fires. The project is serving to describe the fire history and the existence of culturally modified trees as well as to illustrate the role of the indigenous inhabitants, the Anishnaabe in lighting fires that among other purposes, maintained the red pine forests along this water route. The research is important for future wilderness and fire management decision making along the border.

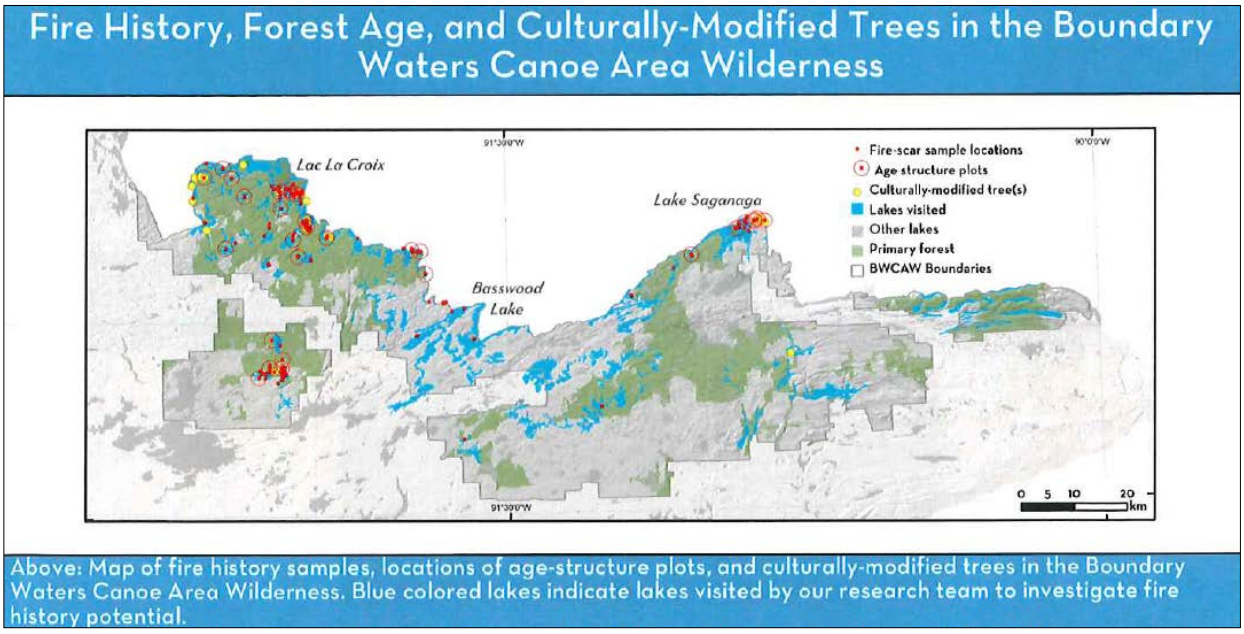


Figure 7: Map of the plot locations for the Fire Research Project.

2.0 Introduction

The Boundary Waters Voyageur Waterway (BWVW) extends 250 kilometres along the Canada – U.S. Border from Bottle Rapids on Lac La Croix in the west to the mouth of the Pigeon River at Lake Superior in the east (Appendix III). The BWVW is entirely located within three Ontario Provincial Parks: 115 kilometers in Quetico, 130 km in LaVerendrye and 5 km in Pigeon River. The southern boundary of the heritage river follows the Canada-U.S. border. Its northern border in Pigeon River and LaVerendrye follows the regulated park boundaries. Through Quetico Provincial Park however, the heritage designation includes the Canadian portion of rivers and lakes through which the International Boundary line passes, up to and including the first narrowing or falls, as well as 200 metres of surrounding land.

The waterway is somewhat unique in that for most of its length it also abuts protected area designations on the American side. These protected areas include the Superior National Forest (SNF) and the Boundary Waters Canoe Area Wilderness (BWCAW) which is located in the northern third of the National Forest. The Superior National Forest in Minnesota, and the Quetico Forest and Game Reserve in Ontario, were created on each side of the international boundary in January of 1909, while the BWCA was set aside in 1926 and protected as a legislated wilderness in 1964; together they represent more than a century of international cooperation and advocacy for wilderness. The majority of the people visiting the BWVW are of U.S. origin. The BWCAW and the Gunflint area of the Superior National Forest are a nationally significant tourist destination for Americans with backcountry canoe routes, hiking trails, residential summer youth camps, resorts, private cottages and other tourism infrastructure that provide year round opportunities.

Figure 8: South Lake, LaVerendrye Provincial Park.

Another unique feature of the waterway is that it flows in two directions. The waterway crosses the height of land between North and South Lakes, which separates the Atlantic and Arctic watersheds, in LaVerendrye Provincial Park.

There is a significant and strong Anishnaabek (Anishinabeg) presence along the waterway. The waterway spans parts of two treaty areas in Ontario; Treaty 3 and the Robinson-Superior 1850 Treaty; and abuts part of one treaty area in Minnesota: the 1854 Treaty. The Lac La Croix First Nation is located in Ontario on Lac La Croix at the western end of the waterway and the Bois Forte Band of Ojibwe is located to the south and west of the waterway in Minnesota, while the Grand Portage Indian Reservation is located in Minnesota on the eastern end of the waterway. The waterway runs through the traditional territories of these and other nearby indigenous communities. The waterway contains pictograph sites, and locations that were used as meeting places such as Table Rock and other places that are of spiritual and cultural significance to these communities (See Appendix I).

Figure 9: A cottage on an island on the American side of Magnetic Lake.

Although there are some parcels of privately owned property on the Canadian and U.S. sides of the border in the Saganaga Lake and Gunflint area (Figure 9), the primary managing agency of the BWVW is Ontario Parks. The waterway is managed according to:

- BWVW Management Plan (Managing the Boundary Waters-Voyageur Waterway as a Canadian Heritage River) (1996);
- Quetico Provincial Park (Wilderness Class) Management Plan (1995; in preparation 2017);
- Pigeon River Provincial Park (Natural Environment Class) Management Plan (1994);
- LaVerendrye Provincial Park (Waterway Class) Management Plan (1993);
- Provincial Parks and Conservation Reserves Act (2007);
- Class Environmental Assessment for Provincial Parks and Conservation Reserves (2005);

The different classifications of parks along the waterway (wilderness, waterway, and natural environment) provide a high level of protection as well as a large variety of recreational opportunities. Relevant management actions enabled in the park management plans for the three parks will be addressed in this document.

Quetico Provincial Park is classified as a wilderness park. The objective of wilderness class parks is *to protect large areas where the forces of nature can exist freely and visitors travel by non-mechanized means, except as may be permitted by regulation, while engaging in low-impact recreation to experience solitude, challenge and integration with nature*. 2006, c. 12, s. 8 (2).

As a wilderness park, Quetico's primary emphasis is protection. The classification does not affect Treaty #3 communities, including Lac La Croix First Nation's Aboriginal or Treaty Rights. The wilderness classification will also honour the deep spiritual sacrosanct connection with the land that is the cultural heritage of Lac La Croix First Nation. In the Quetico section of the Boundary Waters Voyageur Waterway, visitors may travel via non-mechanized means (almost exclusively by canoe in the summer, and in the adjacent BWCAW, via dog sled, snowshoes and skis in the winter).

LaVerendrye is classified as a waterway park. The objective of waterway class parks is *to protect recreational water routes and representative and significant terrestrial and aquatic ecosystems and associated natural and cultural features and to provide high quality recreational and educational experiences.* 2006, c. 12, s. 8 (6). In the LaVerendrye section of the BWVW, visitors may travel via mechanized means (motorboat in summer and snowmobile in winter), and in the adjacent BWCAW, via dog sled, snowshoes and skis in winter as well as canoeing and hiking in summer.

Pigeon River is classified as a natural environment park. The objectives of natural environment class parks *are to protect outstanding recreational landscapes, representative ecosystems and provincially significant elements of Ontario's natural and cultural heritage and to provide high quality recreational and educational experiences*. 2006, c. 12, s. 8 (5). In Pigeon River Provincial Park, visitors may travel via non-mechanized means (hiking, snowshoeing).

Individual park management plans provide policy direction for managers to protect, manage, operate and develop these areas. Any changes to the core values of the Boundary Waters Voyageur Waterway result primarily from natural disturbances or have resulted from actions being carried out in accordance with park management plans. Forestry, mining, and hydroelectricity activities are prohibited in these parks. Activities on adjacent landscapes may also affect cores values (i.e. mining and impacts to downstream water quality).

Visitor activities in the Boundary Waters Voyageur Waterway are managed according to their individual park management plan.

As an operating park with staff and facilities, park visitors in Quetico require paid permits and entry numbers are managed through the Visitor Regulation Program (VRP). Various components of the VRP have been implemented to minimize the deterioration of both the park's resources and the quality of the visitors' experience. This has included the implementation of a quota system based on entry points and use areas, a reservation service to accommodate the quotas, regulations specific to the control of visitor impacts on park values, and a user education/orientation program.

In Quetico, three entry stations (Lac La Croix, Prairie Portage and Cache Bay) provide permitting and park orientation for visitors to this section of the BWVW from mid- May to mid-September.
In 2011, 83% of park visitors were from the U.S. and 60% of interior visitors entered through the southern boundary of the park. The 2011 Quetico Provincial Park Interior Visitor Survey asked respondents to provide their entry point: 38% of visitors entered via Prairie Portage; another 20% of entries were associated with the Cache Bay Entry Station: these figures represent 58% of entries through the two southern entry stations.

In recent years, approximately 26,300 people (interior and campground) visit Quetico each year, with 118,000 camper nights (# visitors X length of stay) spent in the park. Approximately 18,000 people, on average, visit the interior of the park each year, resulting in 103,000 camper nights. Since the designation of the BWVW in 1996, there has been a gradual but steady decline in the number of interior park visitors. In 2014 there were 11,333 interior visitors.

As non-operating parks, LaVerendrye and Pigeon River Provincial Parks, fees are not charged (although Pigeon River has self-service pay and display at the trailhead) and there is no visitor regulation program. Canadian user numbers are not monitored but are very low compared to BWCAW user numbers. There is no regular maintenance of campsites and enforcement of PPCRA regulations in LaVerendrye. The trails at Pigeon River do receive annual brushing.

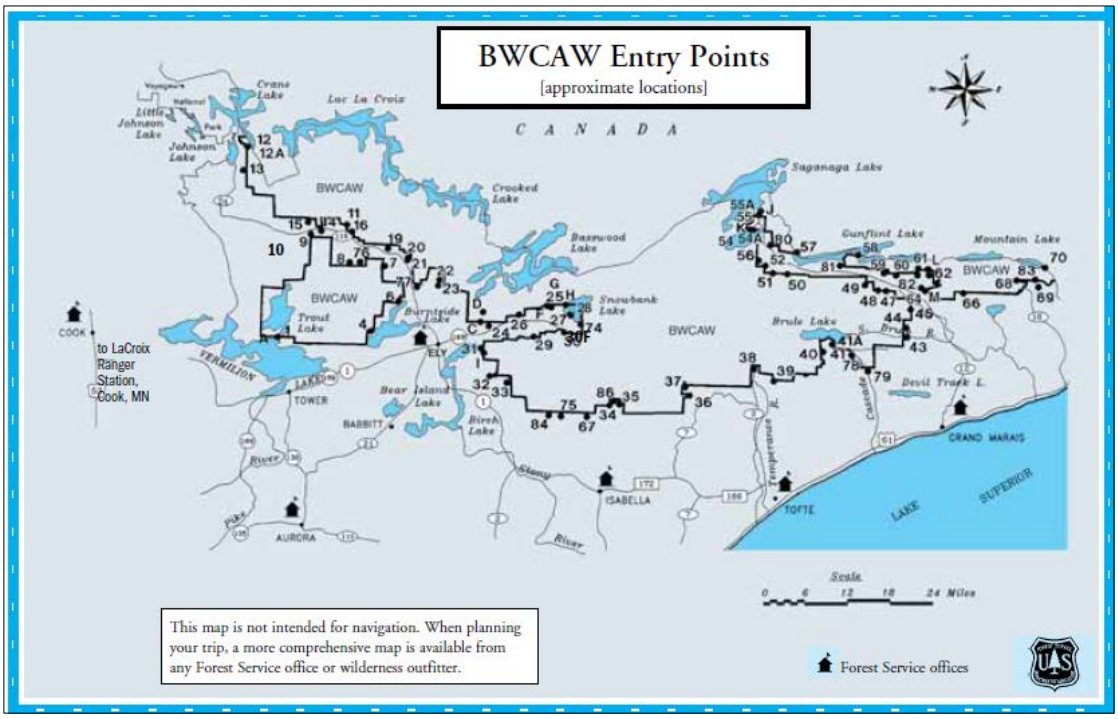


Figure 10: Boundary Waters Canoe Area Entry Points.

As was stated earlier, most of the people using the waterways associated with the BWVW are American and are using facilities associated with the Boundary Waters Canoe Area Wilderness and the Superior National Forest (Figure 10). Most of these people do not enter into Canada, but if they do come in to Quetico they must acquire permits and their numbers are reflected in the entry statistics for Prairie Portage, Cache Bay and Lac La Croix. The BWCAW also uses a quota system to regulate visitor numbers and applies user fees on a per person per trip basis. Many of the regulations specific to the control of visitor impacts on BWCAW values are similar to those in place for Quetico (e.g. party size limits, can and bottle ban), while others are not, (e.g. the use of live bait is permitted in the BWCAW).

The BWCAW has a well-developed and popular winter wilderness travel program. Activities include Nordic skiing, skijoring, snowshoeing and travel by dogsled. There are several outfitters

who provide winter camping expeditions in the BWCAW. The Border Lakes adjacent to the BWVW are popular winter travel destinations. Winter travelers in the BWCAW do not have to use designated campsites. The BWCAW has about 250,000 visitors annually although in recent years the number of visitors has totaled about 150,000; (about ten times the visitation of Quetico), and like Quetico has seen a decline in user numbers in the past decade or so. This decline is attributed in part to changes in demographics. People using the BWCAW and Quetico are ageing repeat visitors and there are fewer younger people engaging in wilderness canoeing.

2016 Monitoring Trip

Figure 11: The Quetico crew at Cache Bay at the end of the first leg of the monitoring trip.

The fieldwork for this report was undertaken in two legs of a 17 day canoe trip from Bottle Portage on Lac La Croix in Quetico Park to Arrow Lake, north of Rose Lake in LaVerendrye Provincial Park. The trip began on August 15 and ended on August 31 with a partial crew changeover on Day 11 at Cache Bay entry station on Saganaga Lake in Quetico Park. The first crew consisted of three young adults from Lac La Croix First Nation, (one of whom was hired as an assistant park planner to provide support for organizing the monitoring trip and the monitoring report), the northwest zone assistant ecologist, the zone planner, and a senior field technician from MNRF Science Branch (Figure 11).

At the beginning of the trip, the crew paused at the Painted Rocks on Lac La Croix to offer tobacco and then stopped at Warrior Hill for a ceremony with the spiritual leader from the community. The ceremony was meant to bless the trip, to ensure the safety of the crew and for good travel. As the crews travelled, the youth from Lac La Croix also offered tobacco at each new body of water to acknowledge and to honour the spirits of the lakes and rivers.

Figure 12: The crew changeover was by float plane.

The second crew was comprised of the assistant park planner, the zone planner, the zone ecologist intern and the operations field technician for LaVerendrye (Figure 13).

Three of the campsites that were visited in 2005 were re-assessed in 2016 and 10 new campsites were assessed. The assessment recorded the condition of the campsites with regard to the number of fire pits and tent pads, social trails, latrines, litter, human waste, vegetation damage/loss, dead trees, stumps and snags, swimming area and canoe landing. Campsites on the BWCAW side of the waterway were also observed to compare the intensity of user impacts.

Nineteen Ontario Parks Inventory and Monitoring (OPIAM) plots from 2005 were remeasured (17 in Quetico and two in LaVerendrye) and six new OPIAM plots were established (one in Quetico and five in LaVerendrye). At each plot, information was collected on ground cover, substrate, and vegetation, including a detailed flora inventory. Several already-established plots in Quetico were flooded due to high water levels and therefore not assessed.

Flora and fauna observations were recorded and entered in the Ontario Parks Inventory and Monitoring (OPIAM) database. The 2016 survey recorded a diversity of species including 52 fauna species and 130 Vascular/Non-vascular plant species (see Appendices IV and V).

Most notably, an Eastern Whip-poor-will was heard in LaVerendrye and a Canada Warbler was observed in Quetico. Both species are listed as threatened under COSEWIC (Committee on the Status of Endangered Wildlife in Canada). Several nesting bald eagles were observed in both the Quetico and LaVerendrye sections. A snapping turtle was also observed in Quetico. Both species are listed as species of special concern by COSSARO (Committee on the Status of Species at Risk in Ontario).

Figure 13: The LaVerendrye crew at the end of the second leg of the monitoring trip.

In Quetico, significant blowdown was observed on Basswood Lake near Ottawa Island and extending to Carp Lake resulting from the July 2016 blowdown event. One active fire was observed on a small island on Crooked Lake. Interesting flora observations included reconfirming the presence of northern pin oak in several locations of the park (a provincially rare species infrequently found this far north). There was also an increase in Great Lakes-St. Lawrence hardwood species such as red maple observed in the understory of the plots [3 of 7 sites (43%) that recorded red maple in 2016 did not have maple recorded in 2005]. This is thought to be linked to climate change.

In LaVerendrye, both remeasured plots and one newly established plot are found in fire-disturbed forests as a result of the 2007 Ham Lake fire. One plot was newly established in an area that had been impacted by the blowdown event in 1999. Significant new blowdown was observed from South Lake to Arrow Lake following a severe wind storm in July 2016.

In 2016, a number of lakes in Quetico and LaVerendrye were sampled for aquatic invasive species such as spiny water flea and rusty crayfish. Rusty crayfish were found in South Lake in LaVerendrye and in Basswood Lake in Quetico. Spiny water flea was detected in Gunflint Lake using a plankton tow net. Other invasive species detections include black crappie found in Wednesday Bay of Crooked Lake and earthworms detected on Knife Lake.

Figure 14: The Quetico crew at Table Rock which is located on the US side of the waterway on the Basswood River. Table Rock is a culturally significant site used by the Ojibway and the Sioux as a meeting place.

3.0 Status of Core Values

The Canadian Heritage Rivers Board has developed two new national thematic frameworks since the BWVW was designated in 1996. They include:

- A Cultural Framework for Canadian Heritage Rivers (2nd Edition) (2000)
- A Framework for the Natural Values of Canadian Heritage Rivers (2nd Edition) (2001)

3.1 Cultural Values

The park management plans for Quetico (2017), LaVerendrye (1991) and Pigeon River (1993) provide policy direction for the protection of cultural values. The following table describes the major changes to the Human Heritage Values in the BWVW since 2006.

Table 1 – Summary of Changes to Cultural Values Since 2006

VALUES	DESCRIPTION / CHANGE IN VALUE	THREAT/STRESSOR (Immediate, Current, Long-Term)	ACTIONS TAKEN
Resource Harvesting			
Shoreline Resource Harvesting Mines and quarries in bed or banks of river	Quarrying sites (Knife Lake – Late Paleo and Archaic Cultures). No Change		
Water Transport			
Commercial Transportation Historic human powered freight	Archaeological sites representative of Shield, Laurel, Selkirk and Blackduck cultures and fur trade artifacts. No Change		
Commercial Transportation Prehistoric Trade	Archaeological sites representative of Shield, Laurel, Selkirk and Blackduck cultures and fur trade artifacts. No Change		
Commercial Transportation Surface bulk transportation	Archaeological sites representative of Shield, Laurel, Selkirk and Blackduck cultures and fur trade artifacts. No Change		

Figure 15: The Cache Bay Entry Station on Saganaga Lake Quetico Provincial Park.

Table 1 – Summary of Changes to Cultural Values Since 2006 (Continued)

VALUES	DESCRIPTION / CHANGE IN VALUE	THREAT/STRESSOR (Immediate, Current, Long-Term)	ACTIONS TAKEN
Transportation Services Fur Trade Posts	Archaeological sites representative of Shield, Laurel, Selkirk and Blackduck cultures and fur trade artefacts (e.g., Moose Lake, Basswood Lake) No Change		
Navigational Improvements	Traditional Portages No Change		
Exploration and Surveying French Exploration	LaVerendrye and Quetico No Change		
Exploration and Surveying British Exploration	Alexander Henry (the elder), Peter Pond, Thomas Frobisher, Alexander Mackenzie, William McGillivray Paul Kane painting of the French Portage (1846)	In the summer of 2006, Ken Lister of the Royal Ontario Museum, discovered that one of Paul Kane's paintings 'French River Rapids' had been painted at the east end of the French Portage at Quetico, not at the French River at Georgian Bay on Lake Huron as it had previously been identified. Paul Kane's own journal makes reference to a sketch at this location and Lister confirmed this by locating the exact site of the painting. This painting portrays an important stage of Ontario's transportation history. Designated as part of a new Historical zone in the Quetico Park Management Plan (2017).	
Exploration and Surveying Surveying expeditions	David Thomson Delafield No Change		
Riparian Settlement			
Siting of Dwellings Shoreline Seasonal Dwellings	Prairie Portage and Cache Bay No Change		
Riverside Homesteads	Quetico Provincial Park History – Historical Ranger Cabin Sites (Cabin 16 and King Point; Fig. 16) No Change	New tin roofs installed (2004). Buildings are stable.	
Road Bridges	Site of former Outlaw Bridge located in Pigeon River Provincial Park. No Change	Historical plaque commemorating this site needs replacement (Stolen, Fall 2005)	

Table 1 – Summary of Changes to Cultural Values Since 2006 (Continued)

VALUES	DESCRIPTION / CHANGE IN VALUE	THREAT/STRESSOR (Immediate, Current, Long-Term)	ACTIONS TAKEN
Early Recreation Recreational Boating	Quetico Provincial Forest and Game Reserve and the Superior National Forest established in 1909. Quetico Provincial Park regulated in 1913. BWCA established in 1929 and BWCAW legislated in 1964. Lac La Croix Guides have provided motorized fish guiding for almost 100 years. No Change		
Spiritual Associations			
Sacred or Spiritual Sites	Pictograph Sites (3) Lac La Croix Painted Rocks (adjacent to BWVW) Lower Crooked Lake (BWCAW) Cache Bay (BWVW) Table Rock (BWCAW) Condition stable	Concerns expressed by LLCFN about respectful behaviour and use of sites by canoeists.	Quetico Park Management Plan (2017) sections 7.10 and 8.5 provide direction for visitor education and protocols for cultural values.
Aboriginal Burial Places	Archaeological sites representative of Shield, Laurel, Selkirk and Blackduck cultures and fur trade artifacts	Unknown	Quetico Park Management Plan (2017) sections 7.10 and 8.5 provide direction for visitor education and protocols for cultural values.
Jurisdictional Use			
Conflict and Military Associations Aboriginal internecine conflict	Ojibway/Sioux No Change		
Conflict and Military Associations Aboriginal/European Conflict	Includes the Establishment of Quetico Park and 24 C reserve at Kawa Bay. No Change		
Boundaries / International Borders	Canada – U.S.A. Border (Monument Portage, etc.)	Boundary markers are painted every ten years in turn by Canada/USA. They are presently bright metallic silver and are visually obtrusive, especially in the vicinity of cultural sites such as pictographs (Fig. 17/18).	

Table 1 – Summary of Changes to Cultural Values Since 2006 (Continued)

VALUES	DESCRIPTION / CHANGE IN VALUE	THREAT/STRESSOR (Immediate, Current, Long-Term)	ACTIONS TAKEN
Environmental Regulation Flood Canal	Dams – South Fowl Lake, Prairie Portage (run-of-the-river)	South Fowl Lake Dam still in need of repairs	Discussions ongoing regarding the need to repair dam.
Environmental Regulation Regulation of river access and use	Quetico Provincial Park est. 1913 LaVerendrye Provincial Park est. 1985 Pigeon River Provincial Park est. 1957 BWCA/W est. 1929 and 1964 Superior National Forest est. 1909	Three inholdings added to Quetico Park since 2006. In 2011, a 29.14 hectare parcel near Lilypad Lake was added to the park, a 16 hectare parcel was added near Burt/Agnes lakes in 2013 and in 2014 a 64 hectare parcel near Veron Lake was added to the park. Provincial Parks and Conservation Reserves Act (2006) places a priority on the maintenance or enhancement of ecological integrity.	

Figure 16: One of several cabins at King's Point on Basswood Lake in Quetico Provincial Park. Note the metal roof.

Figure 17: Example of a boundary marker on a campsite on Crooked Lake.

Figure 18: Detail of a boundary marker.

3.2 Natural Values

There have been relatively few changes to the status of the core values as they are almost entirely contained and protected within the three provincial parks. The following table describes the state of the Natural Heritage Values in the BWVW. Specific information for individual species can be found online through the Minnesota Department of Natural Resources and/or the Ontario Ministry of Natural Resources and Forestry (MNDNR 2017; OMNRF 2017).

Table 2 – Summary of Changes to Natural Heritage Values since 2006

CHRS Natural Framework (2001) Themes, Sub-Themes and Elements	BWVW Natural Heritage Values	Changes or Threats to Nomination Values	Significant Actions, Research or Studies
Hydrology Drainage Basin	A unique feature of the waterway is that it flows in two directions. The waterway crosses the height of land between North and South Lakes, which separates the Atlantic and Arctic watersheds in LaVerendrye Provincial Park.	No Change	
Geological Processes: Bedrock Formation Diversity of Precambrian Geological Units Canadian Shield Bedrock Metavolcanic, sedimentary and granitic rocks; faulting, resulting in river wall cliffs; erosion, resulting in east-west valleys and ridges; Gunflint Formation (containing some of Canada's oldest microfossils; intrusions of sills and dikes; cuestas; and mesas. Spectacular landscape resulting from 2500 million years of erosion.	The southeast corner of Quetico Park sits on bedrock of volcanic origin resulting in much higher levels of calcium in lakes in the southeast portion of the park and influencing the downstream lakes (Basswood and McAree). Ecological effects include higher productivity of these lakes and also increased risk of invasion by non-native crayfish or mussels such as zebra mussels which rely on calcium.	No Change	Recent analysis of the influence of bedrock geology on water chemistry of Quetico Park lakes (Jackson, B. 2016). In 2011, after the Ham Lake fire, geologic surveys conducted near the Gunflint Trail, south-west of Magnetic Lake and Gunflint Lake confirmed evidence of the 1.85 Billion year old meteor impact known as the "Sudbury Impact". These stratigraphic layers of iron-rich materials were deposited from the impact's ejecta. The meteor was over 155 miles in diameter centered near Sudbury, Ontario and was the second largest and fourth oldest terrestrial impact confirmed on Earth and the resulting ejecta from the impact has been identified in Ontario, Michigan and in Minnesota (Jirsa, M. and Fralick, P. 2010).

Table 2 – Summary of Changes to Natural Heritage Values since 2006 (Continued)

CHRS NATURAL FRAMEWORK (2001)	BWVW NATURAL HERITAGE VALUES	CHANGES OR THREATS TO NOMINATION VALUES	SIGNIFICANT ACTIONS, RESEARCH OR STUDIES
Geological Processes Surficial Material Formation	Glacial Scouring, Striations Inundation (Pigeon River Clay Plain)	No Change	
River Morphology Channel Patterns	Lake Chain (Bottle, Iron, Crooked, Basswood, Birch, Sucker, Knife, Ottertrack, Saganaga, Granite, Maraboeuf, Magnetic, Gunflint, North, South, Rose, Mountain, Moose, North Fowl, and South Fowl).	No Change	
Channel Profile Waterfalls	Waterfalls (e.g., High Falls, Middle Falls, Partridge Falls, The Cascades, Rebecca Falls, Curtain Falls, Lower Basswood Falls, Basswood Falls)	No Change	
BIOTIC ENVIRONMENTS AQUATIC ECOSYSTEMS			
Wetland Systems	Non-forested wetland including bogs, fens, shore fens, thicket swamps and marshes are found throughout the BWVW system. Found on most lakes along shorelines. Wetland ecosystem classifications sampled: W5, W6, W10, W14, W34 **descriptions available in Appendix VIII* Hydric Ecosites Sampled: B128, B130, B148, B149 (Fig. 23) * *descriptions available in Appendix VII*	Climate Change Anthropogenic Disturbance; Invasive species; *see Appendix IX* High Water Levels 2016	Ontario Parks Inventory and Monitoring Plot re-measurement (2005, 2016) Forest Resource Inventory (FRI) data based on 2006 aerial photography with ecosite interpretations.
BIOTIC ENVIRONMENTS TERRESTRIAL ECOSYSTEMS			
Great-Lakes St. Lawrence (GLSL) Forest Region	The BWVW corridor is contained within the Quetico-Rainy River Section of the GLSL Forest Region. This section is at the northern limit of mixed forests of Minnesota and Wisconsin as well as the western limit of this region in Canada. Due to the relatively warm climate and location of Ecoregion 4W, many northern, southern and western species are found in transition zones/edges of their range here.	Climate Change Anthropogenic Disturbance: Invasive Species Fire Suppression Biotic Disturbance: Jack Pine Budworm Outbreak (2006	Development of a model that will project biome shifts in the Boundary Waters region. (Frelich 2016). Climate Change and Ontario's Provincial Parks: Towards an Adaptation Strategy. (Lemieux, C. et al 2007)

Table 2 – Summary of Changes to Natural Heritage Values since 2006 (Continued)

CHRS NATURAL FRAMEWORK (2001)	BWVW NATURAL HERITAGE VALUES	CHANGES OR THREATS TO NOMINATION VALUES	SIGNIFICANT ACTIONS, RESEARCH OR STUDIES
BIOTIC ENVIRONMENTS **TERRESTRIAL ECOSYSTEMS**			
Great-Lakes St. Lawrence (GLSL) Forest Region	Forest ecosystem classifications sampled: V2, V3.1, V4, V5, V7, V8, V12, V13, V14, V21, V23, V27 * *descriptions available in Appendix VIII* Ecosite classifications sampled: B011, B033, B040, B048, B053, B055, B088, B097, B100, B104, B105, B107 (Fig. 21 and 22) * *descriptions available in Appendix VII*	Abiotic Disturbance: Cavity Lake fire (July 2006) ~12,881ha from Minnesota into Ontario caused by lightning. Turtle Lake fire (2006) <900ha suspected lightning fire in the area of Turtle, Pietro and Bald Eagle Lakes in BWCAW. Quetico reported three separate fires in 2006 including the Kahshahpiwi Lake fire, Argo/ Roland fire and the Agnes Lake fires (2006) burned a total of >1600ha. Ham Lake fire (May 2007) burned >30,000ha from an unattended campfire, impacted Granite River corridor from Saganaga Lake to Gunflint Lake Pagami Creek fire (August 2011) burned more than >37,635ha December 2015 snowstorm caused a number of large pines to be knocked down along the Border Route in the Gunflint Area and LaVerendrye July 2016 blowdown affecting Basswood Lake through Gunflint, South Lake and Rose Lakes, such that recreational activities within BWCAW, the Kekekabic and Border route trails, Quetico and LaVerendrye were restricted.	Naturally Resilient: MNRF's Natural Resource Climate Adaptation Strategy (*Draft*). OMNRF 2017. Forest Resource Inventory (FRI) data based on 2006 aerial photography with ecosite interpretations Changes in fire response due to the 2009 Quetico Park Fire Management Plan have resulted in an increase in area burnt/fire for the core area of the park including the BWVW. Fire effects monitoring data was collected in 2006, 2007, 2008 and 2011 in Quetico. Additional data was gathered in 2009, 2010 and 2012 in areas before fire-events have occur. Numerous small prescribed burns carried out by U.S. Forest Service in BWCAW. Ontario Parks Inventory and Monitoring Plots (2005, 2016)

Table 2 – Summary of Changes to Natural Heritage Values since 2006 (Continued)

CHRS NATURAL FRAMEWORK (2001)	BWVW NATURAL HERITAGE VALUES	CHANGES OR THREATS TO NOMINATION VALUES	SIGNIFICANT ACTIONS, RESEARCH OR STUDIES
BIOTIC ENVIRONMENTS **TERRESTRIAL ECOSYSTEMS**			
SIGNIFICANT PLANT COMMUNITIES	**Red and White Pine Stands** Large stands of Red and White Pine are relatively uncommon in Ecoregion 4W. Large intact stands were common in the western portions of the BWVW. Several trees were aged in the range of 150-200 years old. **Shoreline Communities** Significant open shoreline communities that support prairie species exist at several sites (Iron Lake, Lac La Croix). **Wetlands** Non-forested wetland including bogs, fens, shore fens, thicket swamps and marshes are found throughout the BWVW system. Found on most lakes along shorelines. Wetlands are important to many species at some stage of their life cycle, and as a result they often support a high diversity of species. **Cliff Communities** The Basic Open Cliff Type is provincially rare and ranked S3-S4 (Bakowsky 2002). Several examples exist along the BWVW route. Disjunct northern and western plant species have probably persisted at these cliffs for thousands of years. Example sites: North Fowl Lake, South Fowl Lake and Ottertrack Lake contain north facing cliffs which offer moist and shady conditions that support provincially rare plant species.	Refer to Terrestrial and Wetland Ecosystem Sections of Table 2 above (pg. 26-27).	In 2007, a Life Science Inventory was completed for Quetico Provincial Park. (OMNRF 2007). Forest Resource Inventory (FRI) data based on 2006 aerial photography with ecosite interpretations 2007-2016. Perry Scott completed annual botanical surveys in the Quetico portion of the BWVW (see Appendix VI). Ontario Parks Inventory and Monitoring Plots (2005, 2016). Quetico Park Plan (2017) has designated nature Reserve zones for significant cliff species.

Figure 19: An example of the trail hardening undertaken by USFS portage crews on the BWCAW side of the waterway.

Figure 20: metal fire grates provided at campsites on the US side of the waterway.

Table 2 – Summary of Changes to Natural Heritage Values since 2006 (Continued)

CHRS NATURAL FRAMEWORK (2001)	BWVW NATURAL HERITAGE VALUES	CHANGES OR THREATS TO NOMINATION VALUES	SIGNIFICANT ACTIONS, RESEARCH OR STUDIES
BIOTIC ENVIRONMENTS **TERRESTRIAL ECOSYSTEMS**			
SIGNIFICANT PLANT COMMUNITIES	**Hardwoods (Red Maple, Red Oak, Bur Oak, Green Ash, Basswood, Large-tooth Aspen)** Tolerant hardwoods more common of more southern climates appear along the border lakes concentrated in the area west of Basswood Lake. This area represents a unique transition zone between the GLSL and Boreal Forest Regions.		
RARE PLANT SPECIES	Numerous rare plant species have been identified in this waterway. Recent work completed by Perry Scott in the last decade identified over two dozen species in the area that were rare, newly reported to Quetico, or in new locations of the park which were rare or of interest. Examples include Northern Pin Oak (*Quercus ellipsoidis)*, American Basswood (*Tilia americana*), American Shoregrass (*Littorella uniflora*), and Oregon Woodsia (*Woodsia oregano ssp. Catchcartiana*). See Appendix VI for detailed species lists.	Refer to Terrestrial and Wetland Ecosystem Sections of Table 2 above (pg. 26-27).	2007-2016. Perry Scott completed annual botanical surveys in the Quetico portion of the BWVW. 2016 Natural Heritage Information Centre Quetico Park Botanical Survey.
FAUNA **SIGNIFICANT ANIMAL POPULATIONS**			
MAMMALS Moose	Minnesota DNR and Ontario's MNRF/Ontario Parks have partnered to study moose populations in the wild since 1995. Methods include winter aerial surveys and radio-collaring/tracking of individuals.	Climate Change Predation, parasites & disease pose increasing threats Wildfire can potentially increase preferred habitat	Moose populations are declining significantly with 2016 estimates currently at 55% less than in 2006 across Minnesota (DelGiudice 2016). Climate shifts are further stressing moose by heavy winter tick-loads, more interactions with white-tailed deer and risks of chronic wasting disease, higher predation from gray wolves.

Table 2 – Summary of Changes to Natural Heritage Values since 2006 (Continued)

CHRS Natural Framework (2001)	BWVW Natural Heritage Values	Changes or Threats to Nomination Values	Significant Actions, Research or Studies
FAUNA **SIGNIFICANT ANIMAL POPULATIONS**			
White-tailed Deer	Historically, white-tailed deer were rare or absent in the BWVW area which was occupied by moose and caribou. European settlement and related activities such as logging, created new habitats in more northerly areas and along with more modern climate warming provided greater opportunity to deer populations to expand into the BWVW areas.	Climate change Chronic-wasting disease	Populations are slowly increasing within the BWVW as climate conditions become more suitable. The highest densities of white-tailed deer are found in the south-west of the BWVW. Incidental monitoring has occurred in recent years during targeted moose aerial surveys in winter months (Schrage 2016).
Gray Wolves	In many natural environments including BWVW, wolves are one of the top predators and have many cascading ecological impacts. Wolf management in Ontario recognizes wolves as integral part of a functioning ecosystem, while balancing populations with established hunting and trapping practices.	Predator-prey dynamics Changing land use in greater ecosystem	In 2012, wolves in the Western Great Lakes Population were delisted from the US federal ESA; then harvest seasons were established in Minnesota; but after 3 consecutive harvest seasons, wolves were again listed as threated in 2014. Overall, wolves are highly dependent on availability of prey species including deer and moose, and are likely to continue increasing within the BWVW with increasing deer numbers (Erb and Sampson 2016).
Canada Lynx	Protected in Minnesota since 1984 & listed in the US as a federally threatened species. In Ontario lynx populations are ranked secure (S5) or apparently secure (S4) with licensed trapping permitted.	Climate change Anthropogenic activities	Lynx in the BWVW are at the southern edge of the boreal forest and susceptible to changing climate stressors. Bobcats are already replacing lynx in some areas (Johnson 2016).
Small Mammals	Several species of small mammal are listed as special concern in northern Minnesota. Limited information on these species abundances and distributions are available for the BWVW but can be sourced online from MN-DNR.		

Table 2 – Summary of Changes to Natural Heritage Values since 2006 (Continued)

CHRS NATURAL FRAMEWORK (2001)	BWVW NATURAL HERITAGE VALUES	CHANGES OR THREATS TO NOMINATION VALUES	SIGNIFICANT ACTIONS, RESEARCH OR STUDIES
FAUNA **SIGNIFICANT ANIMAL POPULATIONS**			
Bats	Reported in BWVW: Little Brown Bat (Myotis), Big Brown Bat, Northern Myotis/ Northern Long-Eared Bat, Hoary Bat Minnesota only : Tri-coloured bat (Eastern Pipistrelle)* Silver-haired Bat* Eastern Red Bat* Silver-haired Bat; Eastern Red Bat; Hoary Bat are solitary species roosting in trees and migratory in winter. Limited information is available for each of these species specifically at this time	White nose syndrome	White nose syndrome is spreading across the landscape and poses high risk to many bat populations. Concerns over rates of bat mortality due to wind turbine/electricity generation have been studied in Minnesota (Johnson, et al. 2003). Endangered species listing in Ontario: Little brown myotis; Northern myotis. Species of special concern in Minnesota: Little brown myotis, Northern myotis, Big brown bats and Tri-coloured bats.
FISH	The Quetico Provincial Park Fisheries Stewardship Plan was approved in 2006. As a wilderness park, the primary objective of the Fisheries Stewardship Plan is to maintain the biological integrity of the park's aquatic ecosystems.	Coldwater species (e.g. Lake Trout) are at risk from warming trends and changes to lake systems Invasive species; *see Appendix IX* Stocking occurs within the Rainy River district	Broadscale Monitoring of the aquatic ecosystem in 20 Quetico Park lakes (none of which are BWVW lakes) between 2010-2012 indicate healthy populations of sportfish populations (i.e. walleye, lake trout, northern pike and smallmouth bass) and ecosystem health in general (Jackson and Solomon, 2016). The same surveys were completed on 13 lakes in QPP in 2015-2016 with an additional six lakes planned for 2017.

Table 2 – Summary of Changes to Natural Heritage Values since 2006 (Continued)

CHRS NATURAL FRAMEWORK (2001)	BWVW NATURAL HERITAGE VALUES	CHANGES OR THREATS TO NOMINATION VALUES	SIGNIFICANT ACTIONS, RESEARCH OR STUDIES
FAUNA **SIGNIFICANT ANIMAL POPULATIONS**			
FISH con't	Lake surveys are also conducted in MN with an emphasis on lakes with higher angling pressure are sampled more frequently than less intensive use. Fish Population Surveys of BWVW lakes (since 2006) – Minnesota DNR: Mountain Lake (2011) Gunflint (2007, 2011, 2015) Saganaga Lake (2008, 2011, 2014) Ottertrack Lake (2006) Little Knife Lake (2006) Knife Lake (2006) Birch Lake (2010) Sucker (2010) Basswood Lake (2015) Crooked (2007) Lake Sturgeon – monitoring and reporting oversight by the Border Waters Lake Sturgeon Technical Committee within the Ontario-Minnesota Fisheries Management Committee. Shortjaw Cisco (Kiyi) Northern Brook Lamprey	Habitat degradation Invasive species; *see Appendix IX*	Sturgeon populations in the BWVW are split by watershed divisions. In both MN and the Rainy-River reservoir in northwestern Ontario sturgeon are listed as special concern; whereas in the Great Lakes – Upper St. Lawrence River basin they are designated as threatened. Cisco was already listed as threatened when the ESA came into law in Ontario in 2008, with general habitat protection designated in 2013. They are special concern in MN and found in 14 lakes in Northeastern MN and boundary water lakes. Northern Brook Lamprey is Special concern in Ontario and Minnesota.
BIRDS	The BWVW represents an area rich in avian diversity including many bird of prey and passerine species. Some species are only present during seasonal migrations. Overall, the greatest richness of species diversity was identified in mature forest stands (100-200 yr. post-fire) compared to early succession stands, and the lowest diversity found in old growth communities (>300 yr. post-fire).	Climate change; Habitat loss; Anthropogenic impacts	The presence of bird species in Quetico was done at 62 monitoring plots and is documented in the park's life science inventory (2007). Audio recording equipment is deployed every spring at 14 monitoring plots (n=2 within the BWVW) to automatically record bird song and other sounds following the OPIAM bird plot monitoring protocols.

Table 2 – Summary of Changes to Natural Heritage Values since 2006 (Continued)

CHRS NATURAL FRAMEWORK (2001)	BWVW NATURAL HERITAGE VALUES	CHANGES OR THREATS TO NOMINATION VALUES	SIGNIFICANT ACTIONS, RESEARCH OR STUDIES
FAUNA **SIGNIFICANT ANIMAL POPULATIONS**			
BIRDS con't	Much of the BWVW has lower abundance of waterfowl species, especially colonial birds, due to a limited size and distribution of marshes and wetland habitats. Although Common Loons are found throughout the area. Bald Eagle – reported common/increasing within the BWVW Black-billed Cuckoo & Indigo Bunting occur at their northern range limits. Yellow-headed Blackbird & Western Meadowlark occur at the western edge of their range limits. **Minnesota DNR Species of Special concern:** American White Pelican, Boreal Owl, Nelson's Sparrow, Northern Goshawk, Trumpeter Swan, Yellow Rail **Ontario Species at Risk:** American White Pelican, Bald Eagle, Barn Swallow, Black Tern, Bobolink, Eastern Meadowlark, Golden Eagle, Least Bittern, Loggerhead Shrike, Piping Plover, Short-Eared Owl, Yellow Rail. Whip-poor-will and Peregrine.		Bald Eagles were delisted from US federal threatened and endangered species lists in 2007. Whereas in Ontario, Bald Eagle status remains classified as special concern. Peregrine falcons are listed as special concern across borders. Ontario's captive-breeding program was phased out in 2006 as most populations are stable and/or increasing. Originally added to the SAR list for Ontario in 2011 and reassessed in 2013. MNDNR releases annual reports. Eastern Whip-Poor-Will was added to the Ontario SAR list as threatened in 2009. Species at the edge of their range limits may or may not increase or decrease based on habitat and climate suitability. Species of special concern or listed as threated have varying requirements for monitoring and reporting. Complete listings of species at risk and related information can be found through various government agencies.

Table 2 – Summary of Changes to Natural Heritage Values since 2006 (Continued)

CHRS NATURAL FRAMEWORK (2001)	BWVW NATURAL HERITAGE VALUES	CHANGES OR THREATS TO NOMINATION VALUES	SIGNIFICANT ACTIONS, RESEARCH OR STUDIES
FAUNA **SIGNIFICANT ANIMAL POPULATIONS**			
HERPTILES	**Western Painted Turtle** – Subspecies of the painted turtle resides in a narrow band along the MN border. **Snapping Turtle** – Special Concern in Ontario. Blanding's and Wood Turtles are both threatened in Minnesota. **Northern Leopard Frog** – reported in decline. Incidental monitoring only. Eastern Red Backed Salamander & Blue Spotted Salamander – Rare. Eastern Newt.	No Change	Additional information on amphibian and reptile species can be found in the Quetico Life Science Inventory. Audio recording equipment is deployed every spring at 14 monitoring plots (n=2 within the BWVW) to automatically record amphibian sounds following OPIAM frog/toad plot monitoring protocols.
INVERTEBRATES	**Butterflies:** Monarch Butterfly Hoary Comma **Dragonflies/Damselflies**: Williamson's Emerald Shadow Darner Extra-striped Snaketail Exuvia of Pygmy Snaketail found on the Namakan River at Lady Rapids in 2007	No Change	Incidental occurrences of rare/indicator species of Odonates are documented but not based on any explicit monitoring protocols.
HUTNING/TRAPPING	Sport hunting is not permitted in Quetico Provincial Park. Sport hunting is permitted in LaVerendrye and Pigeon River Provincial Parks (under review for Pigeon River in 2017). Subsistence hunting by indigenous people exercising aboriginal and treaty rights occurs. There are no commercial traplines located within or adjacent the Quetico section of the BWVW. Commercial trapping occurs in parts of LaVerendrye and Pigeon River Provincial Park.	No Change	

Figure 21: OPIAM plot in Quetico section of BWVW Ecosite B088.

Figure 22: OPIAM plot in recent low intensity burn in Quetico section of BWVW Ecosite B097.

Figure 23: Wetland OPIAM plot on Knife Lake Ecosite B148.

Figure 24: Campsite assessment in Quetico section of BWVW.

3.3 Recreation Values

The Boundary Waters-Voyageur Waterway is renowned for its outstanding recreational values. The section of the waterway in Quetico Provincial Park offers visitors a remote wilderness experience (Figure 25). LaVerendrye Provincial Park offers a similar remote camping experience to Quetico but is accessible by motor vehicle in several locations and allows access by motorboats to Gunflint Lake, Little Gunflint Lake, North Lake, Mountain Lake, and North Fowl Lake. The majority of the visitors to the Boundary Waters-Voyageur Waterway are Americans who access the waterway remotely from the Boundary Waters Canoe Area Wilderness and Superior National Forest. Canadian access is via Quetico Park, Saganaga Lake and the aforementioned road accessible lakes. Pigeon River Provincial Park offers day use hiking and viewing opportunities and is more easily accessible to the public. Trails leading directly from Highway 61 introduce visitors to scenic High Falls, Middle Falls and to Lake Superior.

Figure 25: Beach landing at Kings Point on Basswood Lake in Quetico Provincial Park.

Changes to Recreation Values since 2006

Over the past 10 years there have been few changes to the nature of the available recreational opportunities within the BWVW.

Quetico

The campsites that were assessed in 2006 and revisited in 2016 showed that use levels and impacts were stable. Intensely used sites were still well-used. Of note however, is that some sites showed less use and some sites were growing in. It appeared that that the decline in use numbers in both Quetico and the BWCAW has resulted in lightly or occasionally used sites not receiving enough use to remain in a useable condition.

LaVerendrye

The Saganaga Lake and Granite River sections of LaVerendrye Provincial Park were impacted by the Ham Lake fire of 2007. Some of the backcountry campsites were impacted by this event. In other reaches of the park such as North Lake, South Lake and Rose Lake, some campsites are growing in due to lack of use.

Campsites in Quetico and LaVerendrye have no site amenities other than a fire ring. Campsites in the BWCAW have fire pit grills and pit privies and occasional site hardening such as stairs at landing sites. Campsites on the American side of the waterway in the BWCAW show moderate to high levels of use in both the Quetico and LaVerendrye sections of the waterway.

Pigeon River

The campground at Pigeon River Provincial Park was closed for camping in 2001. The buildings were demolished and materials removed in 2013. The Canadian Heritage Rivers plaque was relocated to the High Falls Trail along the river (Figure 27). The hiking trail network continues to receive a high level of use since its expansion in 2002 (Figure 26).

Figure 26: High Falls on the Pigeon River, accessible from the hiking trail.

Table 3 – Summary of Changes to Recreational Values since 2006

VALUES	DESCRIPTION / CHANGE IN VALUE	THREAT/STRESSOR (Immediate, Current, Long-Term)	ACTIONS TAKEN
Water-based Activities **Open water**			
Motor boating	Motor boating is permitted on all waters, except for Granite River from Saganaga Lake to Granite Lake, Maraboeuf Lake, including Cross Bay and Devil's Elbow, Gneiss Lake, Granite Lake, Clove Lake and Pine River from Clove Lake to Magnetic Lake. There are boat launches at Mountain Lake and North Fowl Lake with unauthorized boat caches. Recreational motor boating is not permitted on the Canadian side of BWVW in Quetico Park. It is permitted in BWCAW in parts of Basswood Lake and Sucker Lake. No change to recreational motor boating.	Since 1995 the Lac La Croix Guides Association used 10 lakes out of 20 identified lakes in Quetico for mechanized fish guiding. Lakes located along the BWVW included Basswood, Bottle, Iron, and Crooked Lakes. The Quetico Park Management plan (in preparation 2017) identifies a reduced number of lakes for motorized fish guiding. None of the lakes identified for this activity are within the BWVW.	Unauthorized boat caches in LaVerendrye are removed by MNRF Conservation officers and Ontario Parks enforcement staff.
Canoeing	Canoeing is the most common form of travel within the BWVW. No Change		Portages are maintained by Ontario Parks staff as well as USFS crews.
Kayaking	Sea Kayaking is still a relatively uncommon activity within the BWVW. No Change		Sea kayaking is growing in popularity especially in the larger lakes along the border route.
Stand Up Paddle boarding (SUP)	Stand Up Paddle boarding (SUP) is an emerging activity. No Change		SUP is growing in popularity especially in the larger lakes along the border route.

Table 3 – Summary of Changes to Recreational Values since 2006 (Continued)

VALUES	DESCRIPTION / CHANGE IN VALUE	THREAT/STRESSOR (Immediate, Current, Long-Term)	ACTIONS TAKEN
Water-based Activities **Open Water**			
Fishing	Sport angling for walleye and bass is a major activity engaged by a majority of visitors to the border lakes. The use of live bait is prohibited in Quetico and the use of non-lead tackle is encouraged. The use of live bait is permitted in Minnesota. No Change		
Canoe Tripping/Portaging	Canoe trips are the primary activity in Quetico Provincial Park and the BWCAW including the US waters adjacent to LaVerendrye Provincial Park. The lower reaches of LaVerendrye and the Pigeon River are not navigable due to the many waterfalls and shallow rapids. Portages along the border lakes receive moderate to heavy use in Quetico and the BWCAW. No Change		Portages along the boundary lakes in Quetico are maintained by both park staff and USFS crews, depending upon which side of the border they are located. Portages on the BWCAW side receive higher levels of hardening with waterbars and stairs. Portages in LaVerendrye maintained by USFS crews.

Table 3 – Summary of Changes to Recreational Values since 2006 (Continued)

VALUES	DESCRIPTION / CHANGE IN VALUE	THREAT/STRESSOR (Immediate, Current, Long-Term)	ACTIONS TAKEN
Water-based Activities **Open water**			
Backcountry camping	There are several hundred remote campsites along the border lakes that comprise the BWVW. Campsites in Quetico are identified by a fire ring made of rocks. Campsites in the BWCAW have cast iron fire grates and pit privies. Campsites in LaVerendrye may have privies constructed by campers. Campsites throughout the waterway receive moderate to heavy use. In LaVerendrye there are fewer remote campsites. Back country camping is not permitted in Pigeon River Provincial Park.	Visitor numbers are difficult to monitor for LaVerendrye due to the fact that this park is non-operational. Some campsites in LaVerendrye Provincial Park are growing in from lack of regular use.	In Quetico and the BWCAW, visitors receive a detailed orientation on wilderness etiquette. Visitors to LaVerendrye do not. Camping activities should be more closely monitored in LaVerendrye Provincial Park.
Winter Activities			
Dog sledding	Minnesota is a hub for outfitters providing dog sledding adventures. Dog sledding is well established in the BWCAW and the border lakes are a well-used route for commercially outfitted groups. Lakes adjacent to the BWVW in Quetico and LaVerendrye are used for this activity. Travel routes are determined by ice conditions. Organized dog sled races such as the Gunflint Mail Run have been held in the Gunflint corridor since the late 1970s.	This activity continues to gain popularity in the BWCAW. Concerns include the introduction of distemper and parvovirus to wolves by non-immunized sled dogs, damage to vegetation for dog bedding, noise and increased human presence that may cause stress to wildlife as well as dog and human feces and urine. Outfitters set fishing lines to feed dogs and recreational fishing pressure is also higher. Fuel and equipment are illegally cached and base camps established.	The Quetico Park Plan (in preparation 2017) prohibits commercial dogsledding in the park. The park plan directs that non-commercial dog teams entering the park be vaccinated for distemper and parvovirus. MNRF undertakes winter enforcement patrols of Quetico Park along the border lakes. Dog sled race organizers in Minnesota require participating dogs to be vaccinated for parvovirus, distemper, and adenovirus-2.

Table 3 – Summary of Changes to Recreational Values since 2006 (Continued)

VALUES	DESCRIPTION / CHANGE IN VALUE	THREAT/STRESSOR (Immediate, Current, Long-Term)	ACTIONS TAKEN
Winter Activities			
Cross Country Skiing	Cross country skiing is an occasional activity within the BWVW.	This activity is increasing and is often carried out in combination with dog sledding activities.	
Snowshoeing	Snowshoeing is an occasional activity within the BWVW. Trails in Pigeon River are suited for snowshoeing.	This activity is increasing and is often carried out in conjunction with dog sledding activities.	
Snowmobiling	Snowmobiling is not permitted in Quetico Provincial Park, nor is it permitted in BWCAW. There are occasional incursions by snowmobiles into Basswood Lake. Snowmobiling takes place on the lakes in LaVerendrye. Snowmobiling does not currently occur in Pigeon River. There is an access corridor that runs parallel to Highway 61 in Pigeon River Provincial Park that is intended for a snowmobile trail linking U.S. and Canadian Trails.	As of 2016, there are two authorized OFSC (Ontario Federation of Snowmobile Clubs) trails that provide access to the Canadian side of Gunflint Lake and to Arrow Lake (which links to Rose and the other lakes in LaVerendrye). The trail that went to North Lake is no longer active. Trail status monitoring indicates that these trails are not always available to snowmobilers due to lack of snow or maintenance /grooming. The Gunflint and other snowmobile trails in Minnesota provide access to lands outside of the BWCAW including access to Gunflint Lake and to Seagull Lake. The Cross Border Snowmobile Tour is a 500 mile route using existing trails that encircles Quetico Park and the BWCAW.	An unauthorized trail that was built into South Fowl Lake has been closed and relocated outside of the BWCAW by the USFS. Monitor and provide compliance enforcement. Ensure that park policy and legislation is followed in any proposals for extending or creating new snowmobile trails in Pigeon River or LaVerendrye Provincial Parks.

Table 3 – Summary of Changes to Recreational Values since 2006 (Continued)

VALUES	DESCRIPTION / CHANGE IN VALUE	THREAT/STRESSOR (Immediate, Current, Long-Term)	ACTIONS TAKEN
Winter Activities			
Ice-fishing	Ice-fishing occurs in association with winter camping along the border route. Ice-fishing also occurs on lakes associated with snowmobile trails in LaVerendrye.	Unknown level of use Level of activity and impacts on fisheries resources should be assessed, particularly in areas of LaVerendrye Provincial Park that are accessed by snowmobile.	
Other Activities			
Cottaging	There are cottages on patent land in the USA and Canada within the LaVerendrye Provincial Park area on Saganaga, Gunflint and Magnetic Lakes. No Change		
Resorts/Lodges Tourism	Tourism accommodations on the US side of Gunflint Lake date back a century and range for rustic cabins and campgrounds to full-service lodges and canoe outfitting. These include: Gunflint Lodge, Heston's Lodge, Gunflint Pines, and Cross River Lodge. No Change		
Viewing	Spectacular landscape and wildlife viewing opportunities exist within the waterway. No Change		
Hiking	There are four hiking trails at Pigeon River (Finger Point, Middle Falls, High Falls and the Boardwalk). Some of these trails are included in the TransCanada Trail. Across the border/river, Grand Portage State Park also provides hiking and viewing opportunities.	Improvements to the hiking trails at Pigeon River Provincial Park have enhanced this activity.	

4.0 Integrity Guidelines since Designation

Table 4 summarizes the integrity requirements of the Canadian Heritage Rivers System as they pertain to Natural Heritage, Human Heritage and Recreation Values in the Boundary Waters Voyageur Waterway. Through the course of the research undertaken and fieldwork completed in 2016, Ontario Parks has determined that the natural, cultural, and recreational values that were identified in the nomination and designation of the Boundary Waters Voyageur Waterway remain intact and continue to have good integrity.

Table 4 - Summary of Changes to Integrity Values since Designation

	CHRS Requirements	Change in integrity value
Cultural Integrity Values	The area is of sufficient size and contains all or most of the key interrelated and interdependent elements to demonstrate the key aspects of the features, activities or other phenomena which give the waterway its outstanding cultural value. The visual appearance of the river enables uninterrupted appreciation of at least one of the periods of the river's historical importance. Key artifacts and cultural values for which the river is nominated are unimpaired by impoundments and human land use. The water quality of the nominated area does not detract from the visual character or the cultural experience provided by its cultural values.	No Change Integrity values in the BWVW are protected by the provisions of the Provincial Parks and Conservation Reserves Act and Ontario Provincial Parks Policy. Acquired land connects Pigeon River Provincial Park and LaVerendrye Provincial Park.
Recreation Integrity Values	The waterway possesses water of a quality suitable for contact recreational activities, including those recreational opportunities for which it is nominated. The appearance of the waterway is capable of providing waterway travellers with a continuous natural experience, or a combined natural and cultural experience, without significant interruption by human intrusions; and The waterway is capable of supporting recreational uses without significant loss of, or impact on, its natural, cultural or aesthetic values.	No Change Integrity values in the boundary Waters-Voyageur Waterway are protected by Ontario Provincial Park Policy and the Provincial Parks Act. Acquired land provides a linkage between Pigeon River Provincial Park and LaVerendrye Provincial Park. Canoeing and motor boating continue to be popular (depending on the park). Sea kayaking, stand up paddle boarding and dog sledding are continuing to grow in popularity. Phat tire biking is emerging as a popular activity.
Natural Integrity Values	The area is of sufficient size and contains all or most of the key interrelated and interdependent elements to demonstrate key aspects of the natural processes, features, or other phenomena which give the river its outstanding natural value.	No Change Integrity values in the BWVW are protected by the provisions of the Provincial Parks and Conservation Reserves Act and Ontario Regulations.

Table 4 - Summary of Changes to Integrity Values since Designation (Continued)

	CHRS Requirements	Change in integrity value
Natural Integrity Values con't	The area contains those ecosystem components required for the continuity of the species, features or objects. There are no human-made impoundments within the nominated section. All key elements and ecosystem components are unaffected by impoundments located outside the nominated area. Natural values for which the river was nominated have not been degraded by impoundments. Water in the nominated section is uncontaminated to the extent that its natural aquatic ecosystem is intact. Natural aesthetic character of the nominated section is not compromised by human developments.	Acquired land connects Pigeon River Provincial Park and LaVerendrye Provincial Park. Spiny water flea has invaded lakes border lakes and is now found in Gunflint Lake, Knife Lake and Basswood Lake. Rusty crayfish and northern clearwater crayfish, both non-native species to this area, are now found in Knife Lake, Birch Lake, Sucker Lake, Basswood Lake and Crooked Lake (2015). Black Crappie has also appeared in Saganaga Lake in recent years (2014). The Quetico Park Biologist and USFS biologists are working together through the Heart of the Continent initiative and the International Rainy Lake – Lake of the Woods Watershed Forum on a number of different projects, including work on aquatic invasive species. Ontario Parks has modelled the future forest condition based on natural disturbance (fire) from MNRF Science and Information research.

5.0 Designation Document Recommendations and Current Status

Table 5 – Designation Document Recommendations and Current Status

RECOMMENDATION OR KEY ACTION	DEGREE OF ACHIEVEMENT 1. NOT YET INITIATED 2. INITIATED / UNDERWAY 3. COMPLETED/ADDRESSED 4. ONGOING	COMMENTS
Resource Management Create a BWVW ecological data base	**ONGOING**	There are 36 Ontario Parks Inventory and Monitoring (OPIAM) plots established along the waterway from Bottle Portage to Rose Lake. In 2016, nineteen OPIAM plots from 2005 were remeasured (17 in Quetico and two in LaVerendrye) and six new OPIAM plots were established (one in Quetico and 5 in LaVerendrye). All data is stored in the OPIAM database. Aquatic invasive species monitoring confirms presence of known and new species. Using the Ontario Benthos Biomonitoring Network (OBBN) protocols, Ontario Parks established a reference site in Pigeon River Provincial Park in 2005.
Resource Management Integrate individual provincial park resource stewardship and implementation plans to have regard for the BWVW.	**ONGOING**	Quetico Park Management Plan (2017) addresses BWVW and the border lake portages and campsites are included in interior maintenance and enforcement programs. The administrative updates to the LaVerendrye and Pigeon River Park Management plans will have regard for the BWVW. Park and zone staff participate in monitoring and resource stewardship in the BWVW.
Resource Management Develop a water resources plan specifically for the BWVW	**NOT YET INITIATED**	Park and zone staff participate in monitoring and resource stewardship related to water quality and potential threats to such in the BWVW.
Resource Management Ensure that the lac La Croix First Nation and the Grand Portage Reserve and included in planning for aboriginal heritage values in the BWVW.	**NOT YET INITIATED**	There has been no specific planning or other initiatives related to indigenous heritage values in the BWVW. The Quetico Park Management Plan 2017 does explicitly direct the involvement of Lac La Croix and other nearby indigenous communities in cultural heritage resource management activities.
Recreation Management Conduct a comprehensive visitor use survey.	**ONGOING**	Visitor surveys for Quetico Interior were conducted in 2011 and 2015. Respondents consistently reported very high levels of satisfaction with their park visits. User surveys are not conducted for LaVerendrye and Pigeon River.

Table 5 – Designation Document Recommendations and Current Status (Continued)

RECOMMENDATION OR KEY ACTION	DEGREE OF ACHIEVEMENT 1. NOT YET INITIATED 2. INITIATED / UNDERWAY 3. COMPLETED/ADDRESSED 4. ONGOING	COMMENTS
Monitoring Establish standard survey stations for monitoring changes to the Heritage River values using agency or volunteer programs.	**ONGOING**	Quetico Park has stewardship plans for fire and fisheries and invasive species. These plans include the BWVW within the park. The Quetico Forest Fire Management Plan (2009) also provides direction for cooperation with USFS on fires in the vicinity of the international boundary. There are no stewardship plans for Pigeon River and LaVerendrye; there is a target to develop such for 2018.
Communication Develop a communication plan for the BWVW including an international communication plan.	**NOT YET INITIATED**	
Communication Develop a Natural Heritage Education Plan specifically for the BWVW.	**NOT YET INITIATED**	
International Cooperation Formalize communication among park superintendents and land managers.	**ONGOING**	The Sister Sites Arrangement was signed in 2011 by representatives from Ontario Parks (Quetico and LaVerendrye) the U.S. Forest Service (Superior National Forest) and the U.S. National Park Service (Voyageur National Park and Grand Portage National Monument). The Heart of the Continent Partnership (HOCP) was established in 2007 and is a Canadian-American coalition of more than 90 agencies and organizations, land managers and local stakeholders working together on cross-border projects that promote the economic, cultural and natural health of the lakes, forests and communities on the Minnesota-Ontario border, from Rainy Lake to the north shore of Lake Superior.
International Cooperation Explore the potential for designating Pigeon River Provincial Park and Grand Portage State Park as an international cooperative park.	**NOT YET INITIATED**	

Figure 27: BWVW Heritage Plaque at the Pigeon River.

5.0 Summary of Benefits and Costs since Designation

Long before its designation to the CHRS in 1996, the border lakes and rivers of the Boundary Waters Voyageur Waterway were managed to protect their significant natural, cultural and recreational values. The CHRS designation enhances both the awareness and the continued protection of the waterway's many values.

Table 6 – Summary of Benefits and Costs since Designation

TYPE OF BENEFIT	DESCRIPTION
Cultural Benefits Improved appreciation of river, watershed, indigenous or other history of river use.	The BWVW has always been important to indigenous people and it played an important role in the fur trade and subsequent settlement of Canada to the west. The contemporary stewardship of this waterway as part of Quetico, LaVerendrye and Pigeon River Ontario Provincial Parks and the Boundary Waters Canoe Area Wilderness within the Superior National Forest in Minnesota represent decades of international agency cooperation as well as international advocacy for wilderness.

Table 6 - Summary of Benefits and Costs since Designation (Continued)

TYPE OF BENEFIT	DESCRIPTION
Community engagement and collaboration Increased dialogue with community and other partners and stakeholders.	The decadal monitoring trips of the BWVW provide opportunities for collaboration and partnership with Lac La Croix First Nation and other indigenous communities as well with sister agencies in the United States of America.
Improved knowledge Increased understanding of river wildlife, vegetation, history or traditional knowledge.	The decadal monitoring trips provide the opportunity for longitudinal records of changes to natural forest values, aquatic communities and the nature and intensity of recreational activities.
DETRIMENTAL EFFECTS	**DESCRIPTION**
None	

6.0 Overall Assessment

The designation as a Canadian Heritage River should

☑ remain in place

☐ be reviewed by the board due to the following concerns:

7.0 References

Atikokan Progress (2016). Colder Winters Helping Moose Populations Rebound. 02 November 2016. Website accessed 13 January 2017: http://atikokanprogress.ca/2016/11/02/colder-winters-helping-moose-populations-rebound/

Bakowsky, W.D. (2002). Rare Vegetation of Ontario: Diabase Cliffs in Northwestern Ontario. NHIC Newsletter **6**(1): 12-15.

Border Route Trail Website accessed December 5 2016: http://www.borderroutetrail.org/trail.html

Canadian Heritage Rivers System (1986) Nomination Document for the Boundary Waters, Voyageur Waterway Ontario. Unpublished Document.

Canadian Heritage Rivers System (2001) A Framework for the Natural Values of Canadian Heritage Rivers. 2nd Edition. Unpublished Report.

Canadian Heritage Rivers System (2000) A Cultural Framework for Canadian Heritage Rivers. 2nd Edition. Unpublished Report.

Canadian Heritage Rivers System (2016) Canadian Heritage Rivers System Principles, Procedures and Operational Guidelines 2016.

DelGiudice, G. D. (2016). 2016 Aerial Moose Survey. Forest Wildlife Populations and Research Group. Minnesota Department of Natural Resources. Website accessed January 10 2017 http://files.dnr.state.mn.us/wildlife/moose/2016_moosesurvey.pdf

Dvorak, R.G., Watson A.E., Christensen, N., Borrie, W.T., Shwaller, A. (2012). Boundary Waters Canoe Area Wilderness; Examining Changes in Use, Users, and Management Challenges. United States Department of Agriculture / Forest Service.

Erb, J., and B. Sampson (2016). Minnesota Wolf Population Update 2016. Minnesota Department of Natural Resources, St. Paul, Minnesota.

Frelich, L.E., and P.B. Reich (2009). Wilderness conservation in an era of global warming and invasive species: a case study from Minnesota's Boundary Waters Canoe Area Wilderness. Natural Areas Journal 29:385-393.

Frelich, L. (2016). *Changing Landscapes:* What Climate Change Means for the Boundary Waters Region. Wilderness News, Summer 2016. Quetico Superior Foundation. Minneapolis, Minnesota. Website accessed January 4 2017: http://www.queticosuperior.org/pdfs/WNews-Summer-2016.pdf

Gunflint Mail Run. Website accessed January 4 2017: http://www.gunflintmail.com/

Heart of the Continent Partnership. Website accessed December 6 2016: http://www.heartofthecontinent.org/about-hocp/history/

Jackson, B. W. (2015). Crayfish in Quetico Park – Known Status and Distribution as of 2014. Unpublished Report.

Jackson, B.W. (2016). Influence of Bedrock Geology on Water Chemistry of Quetico Park Lakes *(Draft).* Quetico Provincial Park. Unpublished Report.

Jackson, B.W., and L. Solomon (2016). Results of 2010-2012 Broadscale Monitoring of Quetico Park Fish Populations**.** Quetico Provincial Park. 26p

Jirsa, M., and P. Fralick, (2010). Geology of the Gunflint Iron Formation and the Sudbury Impact Layer, Northeastern Minnesota, Institute on Lake Superior Geology, Field Trip 4. Field Trip Guidebooks **53**: 77-92.

Johnson, L.B., and K.F. Kipfmueller, (2016). A fire history derived from *Pinus resinosa* Ait. For the Islands of Eastern Lac La Croix, Minnesota, USA. Ecological Applications, 0(0), 2016, pp1-7 Uncorrected Manuscript.

Johnson, A., (2016). What Climate Change Means for the Boundary Waters Region. Wilderness News, Summer 2016. Quetico Superior Foundation. Minneapolis, Minnesota. Website accessed January 20 2017: http://www.queticosuperior.org/pdfs/WNews-Summer-2016.pdf

Johnson, G. D., Erickson, W. P., Strickland, M. D, Sheppard, M. F. and Sheppard, D. A., (2003). Mortality of Bats at a Large-scale Wind Power Development at Buffalo Ridge, Minnesota. American Midland Naturalist **150**: 332-342.

Jones, C., Somers, K.M., Craig, B., and T.B. Reynoldson (2005). Ontario Benthos Biomonitoring Network Protocol Manual (Version 1). Ontario Ministry of Environment and Climate Change. Unpublished Document.

Kipfmueller, K.F., and E. Larson, (2016). Fire History Research in the Border Lakes Region: Using the Past to Understand Tomorrow. Project description.

Leather, J. (2001). "The Emerald Lake Prescribed Burn" Quetico Provincial Park Information Guide. Page A9.

Minnesota Department of Natural Resources, (2008). Rare Species Guide: An online encyclopedia of Minnesota's rare native plants and animals . Division of Ecological Resources. Minnesota Department of Natural Resources, St. Paul, Minnesota. Website accessed January 12 2017: www.dnr.state.mn.us/rsg.

Minnesota Department of Natural Resources, (2017). Nature Index. Minnesota Department of Natural Resources, St. Paul, Minnesota. Website accessed January 12 2017: http://www.dnr.state.mn.us/nr/index.html.

Minnesota Department of Natural Resources (MNDNR), (2016). Infested Waters List. Website accessed November 28 2016: http://www.dnr.state.mn.us/invasives/ais/infested.html

Minnesota GOP Official Asks President to Reverse Twin Metals Decision. Wilderness News. Website accessed January 26 2017: http://queticosuperior.org/blog/minnesota-gop-official-asks-president-to-reverse-twin-metals-decision

Mulrooney, D. and H. Johnson, (1999). Quetico Provincial Park Interior Visitor Survey Statistical Summary – 1998. Unpublished Report.

Mulrooney, D. and H. Johnson, (1999). Ontario Parks Park User Survey – Camper Statistical Summary – 1998. Unpublished Report.

Nelson, J. and A. Hinshelwood, (2000). Understanding the Anishinawbe Landscape. Working with Lac La Croix Elders to Manage Quetico's Cultural Heritage. Unpublished Report.

Nickas, G., and K. Proescholdt, (2013). Wilderness in Peril: Border Security Measures Threaten Wilderness along the Northern Border with Canada. An Analysis Prepared by Wilderness Watch. Missoula MT.

North Country Trail. Website accessed December 5 2016: https://northcountrytrail.org/trail/trail-alerts/

Ontario Department of Lands and Forests. (1969). Management Guidelines for the International Boundary Waters in the Districts of Fort Frances and Port Arthur.

Ontario Ministry of Natural Resources/Canadian Heritage Rivers System, (1996). Managing the Boundary Waters Voyageur Waterway as a Canadian Heritage River. Queen's Printer for Ontario, Ontario, Canada.

Ontario Ministry of Natural Resources and Forestry, (2017). Naturally Resilient: MNRF's Natural Resource Climate Adaptation Strategy (*Draft*). Unpublished report.

Ontario Ministry of Natural Resources, (2009). Quetico Provincial Park Fire Management Plan. Unpublished Report.

Ontario Ministry of Natural Resources, (2006). Quetico Fisheries Stewardship Plan. Queen's Printer for Ontario, Ontario, Canada.

Ontario Ministry of Natural Resources, (1998). Quetico Provincial Park Fire Management Plan. Unpublished Report.

Ontario Ministry of Natural Resources, (1995). Quetico Provincial Park Revised Policy. Queen's Printer for Ontario. Ontario, Canada.

Ontario Ministry of Natural Resources, (1994). Pigeon River Provincial Park Management Plan. Queen's Printer for Ontario. Ontario, Canada.

Ontario Ministry of Natural Resources, (1993). LaVerendrye Provincial Park Management Plan. Queen's Printer for Ontario, Ontario, Canada.

Ontario Ministry of Natural Resources, (1992). Ontario Provincial Parks: Planning and Management Policies. Queen's Printer for Ontario. Ontario, Canada.

Ontario Ministry of Natural Resources and Forestry, (2017). Species at Risk Guides and Resources. Queen's Printer for Ontario. Ontario, Canada. Website accessed January 12 2017: https://www.ontario.ca/environment-and-energy/species-risk-guides-and-resources

Ontario Ministry of Natural Resources, (2005). Strategy for Wolf Conservation in Ontario. Queen's Printer for Ontario. Ontario, Canada.

Ottertail, K. and M. Ottertail, (2000). Lac La Croix First Nation Quetico's Traditional Lake Names.

Ontario Ministry of Natural Resources, (2007). Quetico Background Information. Queen's Printer for Ontario.

Ontario Ministry of Natural Resources, (2007). Quetico Provincial Park Life Science Report. Unpublished Report.

Path of the Paddle. Website accessed December 6 2016: http://www.pathofthepaddleassociation.com/

Peruniak, S.F. (2000) Quetico Provincial Park An Illustrated History. VISTAinfo Canada, Inc. Scarborough, Ontario.

Polymet and Twin Metals mine proposal. Websites accessed on January 13 2017: http://www.miningtruth.org/sulfide-mining-minnesota/twin-metals/#.WHkvRdLR_IU https://www.minnpost.com/dc-dispatches/2015/04/mccollum-seeks-ban-new-mines-much-northeastern-minnesota

Proescholdt K., (2007). Wilderness Between the Cracks: Where Motor Use and other Wilderness Violations Have Degraded the Eastern Part of the Boundary Waters Canoe Area W Wilderness. For the Izaak Walton League of America, Sierra Club North Star Chapter, Northeastern Minnesotans for Wilderness, and Wilderness Watch.

Quetico Superior Foundation Wilderness News Blog. Website accessed January 17 2017: http://queticosuperior.org/blog/public-input-requested-on-move-to-block-mining-near-the-boundary-waters

Rimmington P.G., (1970). Management Guidelines for the International Boundary Waters in the Districts of Fort Frances and Port Arthur. Ontario Department of Lands and Forests.

Schrage, M. W. (2016). Observations of Wolf and Deer during the 2016 Moose Survey. Fond du Lac Resource Management Division. Cloquet, Minnesota.

Scott, Perry. 2016. Quetico Botany Report (2007-2016). Unpublished Report.

Sister Sites Arrangement between Quetico Provincial Park, LaVerendrye Provincial Park, Grand Portage National Monument, Superior National Forest and Voyageurs National Park. September 20, 2011.

The Center for Biological Diversity. Website accessed January 17 2017: http://www.biologicaldiversity.org/news/press_releases/2017/polymet-mine-01-10-2017.php

United States Department of Agriculture / Forest Service. Boundary Waters Canoe Area Wilderness Permits and Visitor Use Trends 2009-2015.

United States Department of Agriculture / Forest Service. Boundary Waters Canoe Area Wilderness Trip Planning Guide.

Appendix I - Anishnaabek Lake names in the BWVW*

Lake Name	Anishnaabe Name	Traditional Story for the lake name*
Basswood Lake	Baasiminaani Zaaga'igan	This is where the people of the Lac La Croix First Nation used to go to pick berries before the start of the fall season. Blueberries, chokecherries, strawberries, raspberries were picked and prepared in the areas where camps were made for this event. Certain areas were reserved for this yearly event just like the annual fishing trips that were located in certain areas of Quetico. Berries were some of the last items to be picked as well as the wild rice.
Bottle Lake	Moodaabiko Zaaga'igan	
Curtain Falls	Gaagakaabakijiwanoo Baawitig	The falls that goes over the cliff, is another beautiful place in Quetico. It is another special place for the people of the Lac La Croix community. Many spiritual experiences were had there.
Crooked Lake	Gaawaawaagigamaang	This lake is named for the shape of the lake, being long and windy and curvy. It is a lake that has many islands, rivers and bays.
Iron Lake	Biiwaabiko Zaaga'igan	The lake has iron all along the shorelines. Iron looks like a rusty kind of lake along the shorelines in the spring.
Lac La Croix	Ningwaakwaani Zaaga'igan	Big pine trees hanging or bowing over the lake. The pines around Lac La Croix were one of the earliest to be cut down during the logging days. Trees like the ones we had on lac La Croix are rarely seen today.
Ottertrack Lake	Nigig Gaabimikawed	The lake with Ottertracks on the rock. On a part of the lake there is a set of otter Tracks seen on the rocks. During the time of the Earth's creation there is a story explaining how they were made. The story is a legend and can only be told by the elders.
Rebecca Falls	Gaadaashkaabakijiwang	The Smooth Rock Rapids or Falls. This falls was named for the appearance of the falls rather than an event. The falls comes over a crevice which looks like a rock cut and into McAree lake. In the western version there is a story that comes with this lake. There is a story about a girl named Rebecca who drowned at this site.

*From : Lac La Croix First Nation Quetico's Traditional Lake Names, March 2000. Mr. Kalvin Ottertail and Mrs. Margaret Ottertail.

Appendix II - Chronology of Events Affecting the Boundary Waters Voyageur Waterway

1996

- "Managing the Boundary Waters-Voyageur Waterway as a Canadian Heritage River" is published.
- Boundary Waters-Voyageur Waterway designated as a Canadian Heritage River.

1997/1998

- Boundary Waters-Voyageur Waterway Dedication Ceremony took place on July 5th, 1997.
- Friends of Northern Lights Country established.
- Quetico Provincial Park Fire Management Plan approved.
- Quetico Provincial Park Interior Visitor Survey Conducted.
- Trial fly-in access for Canadian residents and outfitters to Cache Bay (1 permit daily).
- Differential park fees for southern entries to Quetico (Cache Bay and Prairie Portage).

1999/2000

- Severe blowdown event affecting large areas in Quetico and LaVerendrye Provincial Park on July 4th, 1999.
- Ontario's Living Legacy Land Use Strategy introduced recommending many new provincial parks and park additions.
- Construction of a snowmachine trail along the Port Arthur Duluth railway bed occurs in LaVerendrye Provincial Park.
- An Illustrated History of Quetico Provincial Park by Shirley F. Peruniak is published (2000).
- Friends of Quetico Park and Quetico Provincial Park initiate the Voyageur Canoe Program at Dawson Trail Campgrounds at French Lake. This program consists of guided outings in historic voyageur replica canoes. Fur trade themes relevant to Quetico Park are explored and the Canadian Heritage River designation is promoted through this program.

2001/2002

- Campground with 22 campsites is closed in Pigeon River Provincial Park.
- First of many prescribed burns in blowdown area of BWCAW adjacent to LaVerendrye Provincial Park.
- Emerald Lake prescribed burn occurs in Quetico.
- Infrastructure improvements (trails) initiated in Pigeon River Provincial Park.
- Logging operations take place in several locations along the boundary of LaVerendrye Provincial Park. (Blowdown salvage cuts).
- Quetico Provincial Park – Qualitative open-ended survey conducted.
- 304 hectares of land that connects Pigeon River Provincial Park and LaVerendrye Provincial Park was purchased by The Nature Conservancy of Minnesota (2002). This land is slated for

addition to LaVerendrye Provincial Park through a partnership between the Nature Conservancy of Canada, Ontario Parks and the Nature Conservancy of Minnesota.

2003/2004

- New trails completed at Pigeon River Provincial Park.
- Fish population and creel survey carried out by Minnesota Department of Natural Resources on Gunflint and Mountain Lakes.
- Forestry operations took place adjacent to LaVerendrye boundary in several locations.
- Spiny Water Flea discovered in Saganaga Lake.
- Composting toilets installed at Prairie Portage for park visitors.

2005/2006

- 30 Rapid Assessment Plots established within the waterway by Ontario Parks staff (summer 2005).
- Campsite Inventory completed in the Quetico section of the waterway and in the Granite River section of LaVerendrye (Summer 2005).
- Friends of Northern Lights Country disbands.
- Quetico Provincial Park Fisheries Stewardship Plan is approved in March 2006.
- Park biologist position established for Quetico.
- Trial fly-in access to King's Point for Canadian residents and outfitters (2 permits daily).
- Park management plan review process for Quetico initiated with release of the terms of reference in July 2006.

2006/2007

- Metal roof installation on buildings at King's Point and at Cabin 16.
- Changes to the fishing regulations for Quetico that require use of barbless hooks and use of manufactured organic bait.
- Provincial Parks and Conservation Reserves Act (PPCRA) proclaimed.
- Cavity Lake fire in Minnesota (2006).
- Ham Lake fire in Minnesota spreads into Ontario (LaVerendrye) in 2007.
- TransCanada Trail route registered for Quetico.
- Heart of the Continent Partnership (HOCP) established.
- Quetico Provincial Park Detailed Life Science Inventory Report.
- Background document released in August 2007 for the Quetico park management plan review.

2008/2009

- Quetico Provincial Park and the Superior National Forest celebrate 100 years since establishment (January 1909).
- Quetico Fire Management Plan updated.

2010/2011

- Management options document released in August 2010 for the Quetico park management plan review.
- The Sister Sites Arrangement signed.

2012/2013

- TransCanada Trail route registered for LaVerendrye.
- Buildings demolished at the former Middle Falls campground in Pigeon River Provincial Park.

2013/2014

- Preliminary management plan document released in September 2013 for the Quetico park management plan review.
- The Lac La Croix Park Management Advisory Committee was formed and met from July 2014 until March 2015 to review the preliminary park plan. A revised preliminary park management plan resulted from this review.

2015/2016

- Revised preliminary plan is submitted for MNRF Minister's approval to release for public review.
- Three youth from Lac La Croix First Nation participate in the BWVW monitoring trip in August 2016.
- Six new OPIAM plots established along the BWVW.
- Blowdown event occurs along BWVW in Basswood Lake and South and Rose Lakes.
- The Sister Sites Arrangement renewed.
- Park specific stewardship plans for LaVerendrye and Pigeon River are targeted for 2018.

Appendix III – Recommendations for the BWVW

- More routine compliance enforcement in LaVerendrye and Pigeon River Provincial Parks.
- More routine winter compliance enforcement along the waterway.
- Consideration of hardening to USFS standards (waterbars, steps etc.) for portages on the Canadian side of the waterway.
- Installation of pit privies on Canadian side campsites along the route in Quetico and LaVerendrye with consideration of the BWCAW style privy (see Figure 28 below).

Figure 28: Style of pit privy used in the BWCAW.

- Installation of a second Boundary Waters Voyageur Heritage Waterway CHRS sign for the waterway at Prairie Portage where more waterway visitors will see it.
- Interpretive information about the Boundary Waters Voyageur Heritage Waterway at Cache Bay and Prairie Portage entry stations and at the North Fowl Lake access point.
- Improved route information about the LaVerendrye section of the waterway (portages and campsites).
- Updated life science inventories for LaVerendrye and Pigeon River provincial parks.
- Partnership trips along the BWVW/BWCAW with USFS staff and Ontario Parks staff, Lac La Croix First Nation and Grand Portage and Bois Forte Indian Bands.
- Focussed Quetico (along the route) and LaVerendrye campsite inventory.
- Improved liaison with Canadian Border Services and United States Homeland Security to ensure that measures undertaken for border security consider the waterway's natural, cultural and recreational values (for example the present colour chosen for boundary markers is a bright metallic silver and visually intrusive).
- For the 2026 monitoring trip consider 3 legs of seven days each: Bottle Portage to Cache Bay; Cache Bay to Rose Lake; and Rose Lake to South Fowl Lake. Consider staging trips in June for floristic diversity, August for recreation impacts and September for autumn (shoulder season) uses. Consider a winter monitoring trip by dogsled.

Appendix IV – Fauna Species Observations for LaVerendrye Provincial Park and Quetico Provincial Park taken from the OPIAM database and records from the 2016 Monitoring Trip.

PROTECTED AREA NAME	PROTECTED AREA ID
LA VERENDRYE RIVER PROVINCIAL PARK	P2643

Amphibians

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME	Last Date Recorded	Total # of Indiv.	Total # of Obser.
SPPE	Northern Spring Peeper	*Pseudacris crucifer crucifer*	09/19/2016	1	1

Number of species of Amphibians recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 1

Birds

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME	Last Date Recorded	Total # of Indiv.	Total # of Obser.
AMRO	American Robin	*Turdus migratorius*	08/26/2016	2	1
BAEA	Bald Eagle	*Haliaeetus leucocephalus*	08/30/2016	4	3
BCCH	Black-capped Chickadee	*Poecile atricapillus*	08/30/2016	2	1
BLJA	Blue Jay	*Cyanocitta cristata*	08/30/2016	12	4
CEDW	Cedar Waxwing	*Bombycilla cedrorum*	08/24/2016	2	1
CORA	Common Raven	*Corvus corax*	08/26/2016	3	2
DOWO	Downy Woodpecker	*Picoides pubescens*	08/26/2016	1	1
GRAJ	Gray Jay	*Perisoreus canadensis*	08/30/2016	2	1
RBNU	Red-breasted Nuthatch	*Sitta canadensis*	09/19/2016	6	4
REVI	Red-eyed Vireo	*Vireo olivaceus*	08/30/2016	1	1
TRUS	Trumpeter Swan	*Cygnus buccinator*	08/30/2016	1	1
WPWI	Whip-poor-will	*Caprimulgus vociferus*	08/24/2016	1	1

Number of species of Birds recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 12

Crustaceans

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME	Last Date Recorded	Total # of Indiv.	Total # of Obser.
ORCORUS	Rusty Crayfish	*Orconectes rusticus*	08/28/2016	1	1
BYTHCEDE	Spiny Water Flea	*Bythotrephes cederstroemi*	08/27/2016	1	1

Number of species of Crustaceans recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 2

Fish

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME	Last Date Recorded	Total # of Indiv.	Total # of Obser.
SMBA	Smallmouth Bass	*Micropterus dolomieu*	08/30/2016	2	1

Number of species of Fish recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 1

PROTECTED AREA NAME	PROTECTED AREA ID
QUETICO PROVINCIAL PARK	P2588

Amphibians

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME	Last Date Recorded	Total # of Indiv.	Total # of Obser.
AMTO	Eastern American Toad	*Bufo americanus americanus*	08/19/2016	3	2
TGTF	Gray Treefrog	*Hyla versicolor*	08/18/2016	2	3
GRFR	Northern Green Frog	*Rana clamitans melanota*	08/18/2016	5	3

Number of species of Amphibians recorded in QUETICO PROVINCIAL PARK = 3

Birds

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME	Last Date Recorded	Total # of Indiv.	Total # of Obser.
AMCR	American Crow	*Corvus brachyrhynchos*	08/15/2016	1	1
AMRO	American Robin	*Turdus migratorius*	08/20/2016	3	3
BAEA	Bald Eagle	*Haliaeetus leucocephalus*	08/23/2016	15	10
BDOW	Barred Owl	*Strix varia*	08/17/2016	0	1
BEKI	Belted Kingfisher	*Ceryle alcyon*	08/20/2016	2	2
BAWW	Black-and-white Warbler	*Mniotilta varia*	08/18/2016	0	1
BCCH	Black-capped Chickadee	*Poecile atricapillus*	08/16/2016	1	1
BLJA	Blue Jay	*Cyanocitta cristata*	08/20/2016	6	6
BOCH	Boreal Chickadee	*Poecile hudsonica*	08/21/2016	1	1
BWHA	Broad-winged Hawk	*Buteo platypterus*	08/19/2016	1	1
BRCR	Brown Creeper	*Certhia americana*	08/18/2016	0	1
CAGO	Canada Goose	*Branta canadensis*	08/17/2016	2	1
CAWA	Canada Warbler	*Wilsonia canadensis*	08/18/2016	1	2
CEDW	Cedar Waxwing	*Bombycilla cedrorum*	08/20/2016	3	1
COGR	Common Grackle	*Quiscalus quiscula*	08/20/2016	1	1
COLO	Common Loon	*Gavia immer*	08/21/2016	14	6
COME	Common Merganser	*Mergus merganser*	08/19/2016	23	2
CORA	Common Raven	*Corvus corax*	08/16/2016	1	1
DCCO	Double-crested Cormorant	*Phalacrocorax auritus*	08/19/2016	1	1
GRAJ	Gray Jay	*Perisoreus canadensis*	08/23/2016	2	1
MALL	Mallard	*Anas platyrhynchos*	08/20/2016	1	1
NOFL	Northern Flicker	*Colaptes auratus*	08/20/2016	5	3

PIWO	Pileated Woodpecker	*Dryocopus pileatus*	08/17/2016	2	2
RBME	Red-breasted Merganser	*Mergus serrator*	08/18/2016	6	1
RBNU	Red-breasted Nuthatch	*Sitta canadensis*	08/22/2016	9	8
REVI	Red-eyed Vireo	*Vireo olivaceus*	08/19/2016	2	3
RNGR	Red-necked Grebe	*Podiceps grisegena*	08/19/2016	2	1
RBGU	Ring-billed Gull	*Larus delawarensis*	08/21/2016	23	2
RUGR	Ruffed Grouse	*Bonasa umbellus*	08/18/2016	1	1
SPSA	Spotted Sandpiper	*Actitis macularia*	08/19/2016	3	3
TRUS	Trumpeter Swan	*Cygnus buccinator*	08/17/2016	2	1
TUVU	Turkey Vulture	*Cathartes aura*	08/21/2016	3	2
WIWR	Winter Wren	*Troglodytes troglodytes*	08/18/2016	0	1
YWAR	Yellow Warbler	*Dendroica petechia*	08/19/2016	0	1

Number of species of Birds recorded in QUETICO PROVINCIAL PARK = 34

Crustaceans

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME	Last Date Recorded	Total # of Indiv.	Total # of Obser.
ORCORUS	Rusty Crayfish	*Orconectes rusticus*	08/19/2016	1	1

Number of species of Crustaceans recorded in QUETICO PROVINCIAL PARK = 1

Dragonflies

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME	Last Date Recorded	Total # of Indiv.	Total # of Obser.
AESHCANA	Canada Darner	*Aeshna canadensis*	08/17/2016	0	1
AESHUMBR	Shadow Darner	*Aeshna umbrosa*	08/17/2016	1	1

Number of species of Dragonflies recorded in QUETICO PROVINCIAL PARK = 2

Fish

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME	Last Date Recorded	Total # of Indiv.	Total # of Obser.
BLCR	Black Crappie	*Pomoxis nigromaculatus*	08/17/2016	1	1
SMBA	Smallmouth Bass	*Micropterus dolomieu*	08/21/2016	5	2

Number of species of Fish recorded in QUETICO PROVINCIAL PARK = 2

Mammals

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME	Last Date Recorded	Total # of Indiv.	Total # of Obser.
BEAV	Beaver	*Castor canadensis*	08/18/2016	1	1
GRWO	Gray Wolf	*Canis lupus*	08/20/2016	6	2
RESQ	Red Squirrel	*Tamiasciurus hudsonicus*	08/19/2016	4	4
WTDE	White-tailed Deer	*Odocoileus virginianus*	08/19/2016	1	1

Number of species of Mammals recorded in QUETICO PROVINCIAL PARK = 4

Turtles, tortoises

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME	Last Date Recorded	Total # of Indiv.	Total # of Obser.
SNTU	Eastern Snapping Turtle	*Chelydra serpentina serpentina*	08/18/2016	1	1
WPTU	Western Painted Turtle	*Chrysemys picta bellii*	08/21/2016	7	4

Number of species of Turtles, tortoises recorded in QUETICO PROVINCIAL PARK = 2

Number of fauna species recorded in QUETICO PROVINCIAL PARK = 48

Appendix V – Flora Species Observations for LaVerendrye Provincial Park and Quetico Provincial Park taken from the OPIAM database and records from the 2016 Monitoring Trip.

PROTECTED AREA NAME	PROTECTED AREA ID
LA VERENDRYE RIVER PROVINCIAL PARK	P2643

*Special Codes

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
UNKN		Unknown species observed	08/25/2016	1

Number of species of *Special Codes recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 1

Club mosses and scale trees

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
LYCOCLAV	*Lycopodium clavatum*	Running Pine	08/29/2016	2
LYCODEND	*Lycopodium dendroideum*	Treelike Clubmoss	09/19/2016	3

Number of species of Club mosses and scale trees recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 2

Conifers

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
ABIEBALS	*Abies balsamea*	Balsam Fir	09/19/2016	6
PICEMARI	*Picea mariana*	Black Spruce	09/19/2016	4
PINUBANK	*Pinus banksiana*	Jack Pine	08/27/2016	1
PINURESI	*Pinus resinosa*	Red Pine	09/19/2016	3
PINUSTRO	*Pinus strobus*	Eastern White Pine	09/19/2016	2
THUJOCCI	*Thuja occidentalis*	Eastern White Cedar	09/19/2016	4

Number of species of Conifers recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 6

Ferns and allies

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
ATHYFILI	*Athyrium filix-femina*	Subarctic Lady-fern	08/25/2016	1
GYMNDRYO	*Gymnocarpium dryopteris*	Oak Fern	08/25/2016	1
ONOCSENS	*Onoclea sensibilis*	Sensitive Fern	08/25/2016	1

Number of species of Ferns and allies recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 3

Flowering plants

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
ACERSPIC	*Acer spicatum*	Mountain Maple	08/28/2016	2
ALNUINCA	*Alnus incana*	Speckled Alder	08/29/2016	1

ANAPMARG	*Anaphalis margaritacea*	Pearly Everlasting	08/29/2016	1
APOCANDR	*Apocynum androsaemifolium*	Spreading Dogbane	08/29/2016	1
AQUICANA	*Aquilegia canadensis*	Wild Columbine	08/27/2016	1
ARALNUDI	*Aralia nudicaulis*	Wild Sarsaparilla	09/19/2016	6
BETUPAPY	*Betula papyrifera*	Paper Birch	09/19/2016	6
CARESP	*Carex sp.*	Sedge	09/19/2016	6
CHIMUMBE	*Chimaphila umbellata*	Common Wintergreen	09/19/2016	1
CIRCALPI	*Circaea alpina*	Small Enchanter's Nightshade	08/25/2016	1
CLINBORE	*Clintonia borealis*	Blue Bead-lily	08/29/2016	1
CORNCANA	*Cornus canadensis*	Bunchberry	09/19/2016	3
CORNSERI	*Cornus sericea*	Red-osier Dogwood	08/30/2016	3
CORYCORN	*Corylus cornuta*	Beaked Hazelnut	09/19/2016	5
DIERLONI	*Diervilla lonicera*	Northern Bush-honeysuckle	09/19/2016	3
EPILANGU	*Epilobium angustifolium*	Fireweed	08/27/2016	1
EURYMACR	*Eurybia macrophylla*	Large-leaf Wood-aster	09/19/2016	5
FRAXNIGR	*Fraxinus nigra*	Black Ash	08/25/2016	1
GALITRID	*Galium trifidum*	Small Bedstraw	08/30/2016	1
GALITRIF	*Galium triflorum*	Sweet-scent Bedstraw	08/30/2016	2
LATHOCHR	*Lathyrus ochroleucus*	Pale Vetchling Peavine	08/28/2016	1
LINNBORE	*Linnaea borealis*	Twinflower	09/19/2016	3
LONICANA	*Lonicera canadensis*	American Fly-honeysuckle	09/19/2016	2
LONIDIOI	*Lonicera dioica*	Mountain Honeysuckle	08/27/2016	1
LONIHIRS	*Lonicera hirsuta*	Hairy Honeysuckle	08/28/2016	1
MAIACANA	*Maianthemum canadense*	Wild-lily-of-the-valley	09/19/2016	7
MAIATRIF	*Maianthemum trifolium*	Three-leaf Solomon's-seal	08/30/2016	1
MITENUDA	*Mitella nuda*	Naked Bishop's-cap	08/25/2016	1
MONEUNIF	*Moneses uniflora*	One-flower Wintergreen	08/29/2016	2
POPUBALS	*Populus balsamifera*	Balsam Poplar	08/28/2016	1
POPUTREM	*Populus tremuloides*	Trembling Aspen	09/19/2016	1
PRUNPENS	*Prunus pensylvanica*	Pin Cherry	08/27/2016	1
PYROSP	*Pyrola sp.*		08/27/2016	1
RIBEOXYA	*Ribes oxyacanthoides*	Canada Gooseberry	08/27/2016	1
ROSAACIC	*Rosa acicularis*	Prickly Rose	09/19/2016	5
RUBUPARV	*Rubus parviflorus*	A Bramble	09/19/2016	4

RUBUPUBE	*Rubus pubescens*	Catherinettes Berry	08/29/2016	4
SALISP	*Salix sp.*	Willow	08/29/2016	1
SANIMARI	*Sanicula marilandica*	Black Snake-root	08/30/2016	1
SOLIULIG	*Solidago uliginosa*	Bog Goldenrod	08/27/2016	1
SORBDECO	*Sorbus decora*	Northern Mountain-ash	09/19/2016	1
STRELANC	*Streptopus lanceolatus*	Rose Twisted-stalk	08/28/2016	1
TRIEBORE	*Trientalis borealis*	Northern Starflower	08/28/2016	2
TRIFREPE	*Trifolium repens*	White Clover	08/27/2016	1
VICISP	*Vicia sp.*		08/30/2016	3
VIOLRENI	*Viola renifolia*	Kidney-leaf White Violet	08/27/2016	1

Number of species of Flowering plants recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 46

Horsetails and scouring rushes

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
EQUISYLV	*Equisetum sylvaticum*	Woodland Horsetail	08/25/2016	1

Number of species of Horsetails and scouring rushes recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 1

Lichen

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
LICHSP	*Lichen sp.*	Lichen Species	09/19/2016	2

Number of species of Lichen recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 1

Mosses

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
DICNSP	*Dicranum sp.*		09/19/2016	4
HYLOSPLE	*Hylocomium splendens*	Stair-step Moss	09/19/2016	1
LEUCGLAU	*Leucobryum glaucum*	A Moss	08/26/2016	1
MOSSSP	*Moss sp.*	Moss Species	08/30/2016	5
PLEUSCHR	*Pleurozium schreberi*	A Moss	09/19/2016	3
POLYJUNI	*Polytrichum juniperinum*	Juniper Moss	08/26/2016	1

Number of species of Mosses recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 6

Number of flora species recorded in LA VERENDRYE RIVER PROVINCIAL PARK = 66

PROTECTED AREA NAME	PROTECTED AREA ID
QUETICO PROVINCIAL PARK	P2588

*Special Codes

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
UNKN		Unknown species observed	08/23/2016	3

Number of species of *Special Codes recorded in QUETICO PROVINCIAL PARK = 1

Club mosses and scale trees

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
LYCOANNO	*Lycopodium annotinum*	Stiff Clubmoss	08/19/2016	1
LYCOCLAV	*Lycopodium clavatum*	Running Pine	08/22/2016	1
LYCODEND	*Lycopodium dendroideum*	Treelike Clubmoss	08/19/2016	2
LYCOOBSC	*Lycopodium obscurum*	Tree Clubmoss	08/18/2016	1

Number of species of Club mosses and scale trees recorded in QUETICO PROVINCIAL PARK = 4

Conifers

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
ABIEBALS	*Abies balsamea*	Balsam Fir	08/22/2016	8
LARILARI	*Larix laricina*	American Larch	08/23/2016	1
PICEGLAU	*Picea glauca*	White Spruce	08/21/2016	3
PICEMARI	*Picea mariana*	Black Spruce	08/23/2016	2
PINURESI	*Pinus resinosa*	Red Pine	08/18/2016	5
PINUSTRO	*Pinus strobus*	Eastern White Pine	08/22/2016	9
THUJOCCI	*Thuja occidentalis*	Eastern White Cedar	08/23/2016	4

Number of species of Conifers recorded in QUETICO PROVINCIAL PARK = 7

Ferns and allies

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
CYSTBULB	*Cystopteris bulbifera*	Bulblet Fern	08/23/2016	1
GYMNDRYO	*Gymnocarpium dryopteris*	Oak Fern	08/22/2016	2
POLPVIRG	*Polypodium virginianum*	Rock Polypody	08/22/2016	2
PTERAQUI	*Pteridium aquilinum*	Bracken Fern	08/21/2016	5

Number of species of Ferns and allies recorded in QUETICO PROVINCIAL PARK = 4

Flowering plants

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
ACERRUBR	*Acer rubrum*	Red Maple	08/23/2016	6
ACERSACN	*Acer saccharinum*	Silver Maple	08/17/2016	2
ACERSPIC	*Acer spicatum*	Mountain Maple	08/22/2016	4
ACORCALA	*Acorus calamus*	Sweetflag	08/20/2016	2
ALNUINCA	*Alnus incana*	Speckled Alder	08/23/2016	3
AMELSP	*Amelanchier sp.*	Serviceberry	08/21/2016	5
ARALNUDI	*Aralia nudicaulis*	Wild Sarsaparilla	08/22/2016	8
BETUPAPY	*Betula papyrifera*	Paper Birch	08/22/2016	5
CALACANA	*Calamagrostis canadensis*	Canada Blue-joint	08/20/2016	1
CALTPALU	*Caltha palustris*	Marsh Marigold	08/23/2016	1
CAREINTU	*Carex intumescens*	Bladder Sedge	08/23/2016	1
CARELASI	*Carex lasiocarpa*	Slender Sedge	08/23/2016	2
CAREPSEU	*Carex pseudocyperus*	Cyperus-like Sedge	08/23/2016	1
CARESP	*Carex sp.*	Sedge	08/23/2016	5
CHAMCALY	*Chamaedaphne calyculata*	Leatherleaf	08/23/2016	1
CHIMUMBE	*Chimaphila umbellata*	Common Wintergreen	08/17/2016	1
CICUMACU	*Cicuta maculata*	Spotted Water-hemlock	08/18/2016	2
CLINBORE	*Clintonia borealis*	Blue Bead-lily	08/22/2016	4
COMAPALU	*Comarum palustre*	Marsh Cinquefoil	08/23/2016	3
CORNCANA	*Cornus canadensis*	Bunchberry	08/22/2016	3
CORNRUGO	*Cornus rugosa*	Roundleaf Dogwood	08/16/2016	1
CORNSERI	*Cornus sericea*	Red-osier Dogwood	08/23/2016	1
CORYCORN	*Corylus cornuta*	Beaked Hazelnut	08/19/2016	5
CRATSP	*Crataegus sp.*		08/16/2016	1
DIERLONI	*Diervilla lonicera*	Northern Bush-honeysuckle	08/21/2016	3
DULIARUN	*Dulichium arundinaceum*	Three-way Sedge	08/23/2016	2
ELEOSMAL	*Eleocharis smallii*	Creeping Spike-rush	08/20/2016	2
EURYMACR	*Eurybia macrophylla*	Large-leaf Wood-aster	08/21/2016	4
FRAXNIGR	*Fraxinus nigra*	Black Ash	08/23/2016	1
FRAXPENN	*Fraxinus pennsylvanica*	Green Ash	08/17/2016	3
GALITRIF	*Galium triflorum*	Sweet-scent Bedstraw	08/23/2016	2
GAULPROC	*Gaultheria procumbens*	Teaberry	08/18/2016	3
GRASSP	*Grass sp.*	Grass Species	08/23/2016	1

IRISVERS	*Iris versicolor*	Blueflag	08/17/2016	1
LATHOCHR	*Lathyrus ochroleucus*	Pale Vetchling Peavine	08/21/2016	1
LEDUGROE	*Ledum groenlandicum*	Common Labrador Tea	08/23/2016	1
LINNBORE	*Linnaea borealis*	Twinflower	08/22/2016	2
LONICANA	*Lonicera canadensis*	American Fly-honeysuckle	08/21/2016	4
LONIINVO	*Lonicera involucrata*	Fly Honeysuckle	08/17/2016	1
MAIACANA	*Maianthemum canadense*	Wild-lily-of-the-valley	08/22/2016	6
MELALINE	*Melampyrum lineare*	American Cow-wheat	08/17/2016	1
MENTARVE	*Mentha arvensis*	Corn Mint	08/23/2016	1
MITENUDA	*Mitella nuda*	Naked Bishop's-cap	08/22/2016	2
MYRIGALE	*Myrica gale*	Sweet Bayberry	08/23/2016	1
POPUGRAN	*Populus grandidentata*	Large-tooth Aspen	08/18/2016	1
POPUTREM	*Populus tremuloides*	Trembling Aspen	08/21/2016	3
PRUNPENS	*Prunus pensylvanica*	Pin Cherry	08/16/2016	1
QUERELLI	*Quercus ellipsoidalis*	Northern Pin Oak	08/19/2016	3
QUERMACR	*Quercus macrocarpa*	Mossy-cup Oak	08/21/2016	1
QUERRUBR	*Quercus rubra*	Northern Red Oak	08/18/2016	6
RANUSCEL	*Ranunculus sceleratus*	Cursed Crowfoot	08/23/2016	1
RHUSGLAB	*Rhus glabra*	Smooth Sumac	08/21/2016	1
RIBETRIS	*Ribes triste*	Swamp Red Currant	08/22/2016	1
ROSAACIC	*Rosa acicularis*	Prickly Rose	08/18/2016	2
RUBUALLE	*Rubus allegheniensis*	Allegheny Blackberry	08/17/2016	1
RUBUIDID	*Rubus idaeus ssp. idaeus*	Common Red Raspberry	08/17/2016	2
RUBUPARV	*Rubus parviflorus*	A Bramble	08/21/2016	1
RUBUPUBE	*Rubus pubescens*	Catherinettes Berry	08/22/2016	3
SAGILATI	*Sagittaria latifolia*	Broadleaf Arrowhead	08/20/2016	2
SCUTGALE	*Scutellaria galericulata*	Hooded Skullcap	08/23/2016	1
SEDGSP	*Sedge sp.*	Sedge Species	08/23/2016	4
SPAREURY	*Sparganium eurycarpum*	Large Bur-reed	08/17/2016	1
SPIRALBA	*Spiraea alba*	Narrow-leaved Meadow-sweet	08/17/2016	1
STRELANC	*Streptopus lanceolatus*	Rose Twisted-stalk	08/18/2016	1
TOXIRADI	*Toxicodendron radicans*	Poison Ivy	08/21/2016	4
TRIAFRAS	*Triadenum fraseri*	Marsh St. John's-wort	08/23/2016	2
TRIEBORE	*Trientalis borealis*	Northern Starflower	08/23/2016	6

TYPHLATI	*Typha latifolia*	Broad-leaf Cattail	08/23/2016	3
UTRICORN	*Utricularia cornuta*	Horned Bladderwort	08/23/2016	1
VACCANGU	*Vaccinium angustifolium*	Late Lowbush Blueberry	08/21/2016	4
VACCMYRT	*Vaccinium myrtilloides*	Velvetleaf Blueberry	08/19/2016	2
VACCOXYC	*Vaccinium oxycoccos*	Small Cranberry	08/23/2016	1
VIBURAFI	*Viburnum rafinesquianum*	Downy Arrowwood	08/18/2016	1
VIOLRENI	*Viola renifolia*	Kidney-leaf White Violet	08/22/2016	1
VIOLSP	*Viola sp.*	Violet	08/18/2016	1
ZIZAAQSU	*Zizania aquatica var. subbrevis*	Wild Rice	08/20/2016	1

Number of species of Flowering plants recorded in QUETICO PROVINCIAL PARK = 76

Horsetails and scouring rushes

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
EQUIFLUV	*Equisetum fluviatile*	Water Horsetail	08/21/2016	3

Number of species of Horsetails and scouring rushes recorded in QUETICO PROVINCIAL PARK = 1

Lichen

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
CLADRANG	*Cladina rangiferina*	A Lichen	08/21/2016	2
CLADSTEL	*Cladina stellaris*	A Lichen	08/21/2016	1

Number of species of Lichen recorded in QUETICO PROVINCIAL PARK = 2

Mosses

SPECIES CODE	SCIENTIFIC NAME	COMMON NAME	Last Date Recorded	Total # of Obser.
DICRONTA	*Dicranum ontariense*	A Moss	08/21/2016	1
DICRPOLY	*Dicranum polysetum*	A Moss	08/21/2016	1
DICNSP	*Dicranum sp.*		08/18/2016	2
HYLOSPLE	*Hylocomium splendens*	Stair-step Moss	08/22/2016	1
MOSSSP	*Moss sp.*	Moss Species	08/23/2016	4
PLEUSCHR	*Pleurozium schreberi*	A Moss	08/21/2016	6
POLYCOMM	*Polytrichum commune*	Common Hair Cap Moss	08/17/2016	1
RHYTTRIQ	*Rhytidiadelphus triquetrus*	Shaggy Moss	08/22/2016	1
SPHASP	*Sphagnum sp.*		08/23/2016	1

Number of species of Mosses recorded in QUETICO PROVINCIAL PARK = 9

Number of flora species recorded in QUETICO PROVINCIAL PARK = 104

Appendix VI – Summary of Perry Scott Botanical Surveys in the Boundary Waters Heritage River Area of Quetico Provincial Park (2007-2015).

Scientific Name	Common Name
Acer saccharinum	Silver Maple
Agrostis perennans	Perenial Bentgrass
Alopecurus aequalis	Short-awn Foxtail
Anemone virginiana	Virginia Anemone
Arabis hirsuta	Hairy Rock-cress
Artemisia campestris	Pacific Wormwood
Asplenium trichomanes	Maidenhair Spleenwort
Bidens frondosa	Devil's Beggar-ticks
Carex cryptolepis	Northeastern Sedge
Chamaesyce maculata	Spotted Spurge
Clinopodium vulgare	Field Basil
Crataegus chrysocarpa	Fireberry Hawthorn
Dichanthelium columbianum	Panic Grass
Elatine minima	Small Water-wort
Eleocharis ovata	Ovate Spikerush
Eleocharis robbinsii	Robbins Spikerush
Epilobium ciliatum ssp. glandulosum	Willow-herb
Festuca saximontana	Rocky Mountain Fescue
Gymnocarpium jessoense	Provincially Tracked Species
Hackelia deflexa	Northern Stickseed
Lechea intermedia	Narrowleaf Pinweed
Lemna minor	Lesser Duckweed
Littorella uniflora	American Shore-grass
Muhelenbergia racemosa	Provincially Tracked Species
Parietaria pensylvanica	Pennsylvania Pellitory
Pinus resinosa	Red Pine
Poa palustris	Fowl Bluegrass
Polygonum amphibium var. emersum	Unknown
Polygonum punctatum	Dotted Smartweed
Potamogeton friesii	Fries' Pondweed
Potamogeton obtusifolius	Blunt-leaf Pondweed
Potamogeton strictifolius	Straight-leaf Pondweed
Potamogeton zosteriformis	Flatstem Pondweed
Potentilla argentea	Silvery Cinquefoil
Rhynchospora fusca	Brown Beakrush
Rumex triangulivalvis	Triangular-valve Dock
Salix planifolia	Tea-leaved Willow

Scientific Name	Common Name
Schoenoplectus acutus	Hard-stem Club-rush
Schoenoplectus torreyi	Torrey's Club-rush
Scirpus pedicellatus	Stalked Bulrush
Scrophularia lanceolata	Hare Figwort
Shepherdia canadensis	Canada Buffalo-berry
Spirodela polyrrhiza	Common Water-flaxseed
Tilia americana	American Basswood
Torreyochloa pallida var. fernaldii	Fernald's Manna Grass
Utricularia minor	Lesser Bladderwort
Utricularia resupinata	Northeastern Bladderwort
Vaccinium macrocarpon	Large Cranberry
Veronica serpyllifolia	Thyme-leaved Speedwell
Viola lanceolata	Lance-leaf Violet
Woodsia oregana ssp. cathcartiana	Oregon Woodsia (tetraploid)

*Significance

NL = New Location in Quetico

NR = Newly Reported Species in Quetico

R = Natural Heritage Information Centre Tracked Species

Appendix VII – Summary of Boreal Ecosite Types Surveyed in the BWVW (2016).

B-Ecosite Code	Ecosite Description	Count of Plots
011	Very Shallow, Dry to Fresh: Red Pine - White Pine Conifer	1
033	Dry, Sandy: Red Pine- White Pine Conifer	4
040	Dry, Sandy: Aspen - Birch Hardwood	1
040	Dry, Sandy: Aspen - Birch Hardwood	1
048	Dry to Fresh, Coarse: Red Pine - White Pine Conifer	2
053	Dry to Fresh, Coarse: Conifer	1
055	Dry to Fresh, Coarse: Aspen - Birch Hardwood	2
088	Fresh, Clayey: Aspen - Birch Hardwood	1
097	Fresh, Silty to Fine Loamy: Red Pine - White Pine Conifer	1
100	Fresh, Silty to Fine Loamy: Hemlock - Cedar Conifer	1
104	Fresh, Silty to Fine Loamy: Aspen - Birch Hardwood	1
105	Fresh, Silty to Fine Loamy: Elm - Ash Hardwood	1
107	Fresh, Silty to Fine Loamy: Maple Hardwood	1
128	Organic Intermediate Conifer Swamp	1
130	Intolerant Hardwood Swamp	1
148	Mineral Shallow Marsh	4
149	Organic Shallow Marsh	1

Appendix VIII – Summary of Forest and Wetland Ecosystem Classification V/W-Types Surveyed in the BWVW (2016).

V/W Type Code	V/W Type Description	Count of Plots
V2	Black Ash Hardwood and Mixedwood	1
V3.1	Maple (Yellow Birch) Hardwood and Mixedwood	1
V4	White Birch Hardwood and Mixedwood	3
V5	Aspen Hardwood	1
V7	Trembling Aspen - Balsam Fir / Balsam Fir Shrub	1
V8	Trembling Aspen (White Birch) / Mountain Maple	1
V12	White Pine Mixedwood	3
V13	Red Pine Mixedwood	1
V14	Balsam Fir Mixedwood	1
V21	Cedar (inc. Mixedwood) / Mountain Maple	2
V23	Tamarack (Black Spruce) / Speckled Alder / Labrador Tea	1
V27	Red Pine Conifer	3
W5	Marsh: mixed: mineral substrate	2
W6	Marsh: spikerush-water horsetail: mineral substrate	1
W10	Marsh : mixed: organic substrate	1
W14	Open graminoid shore fen: wire sedge	1
W34	Hardwood swamp: black ash (other hardwood): riparian	1

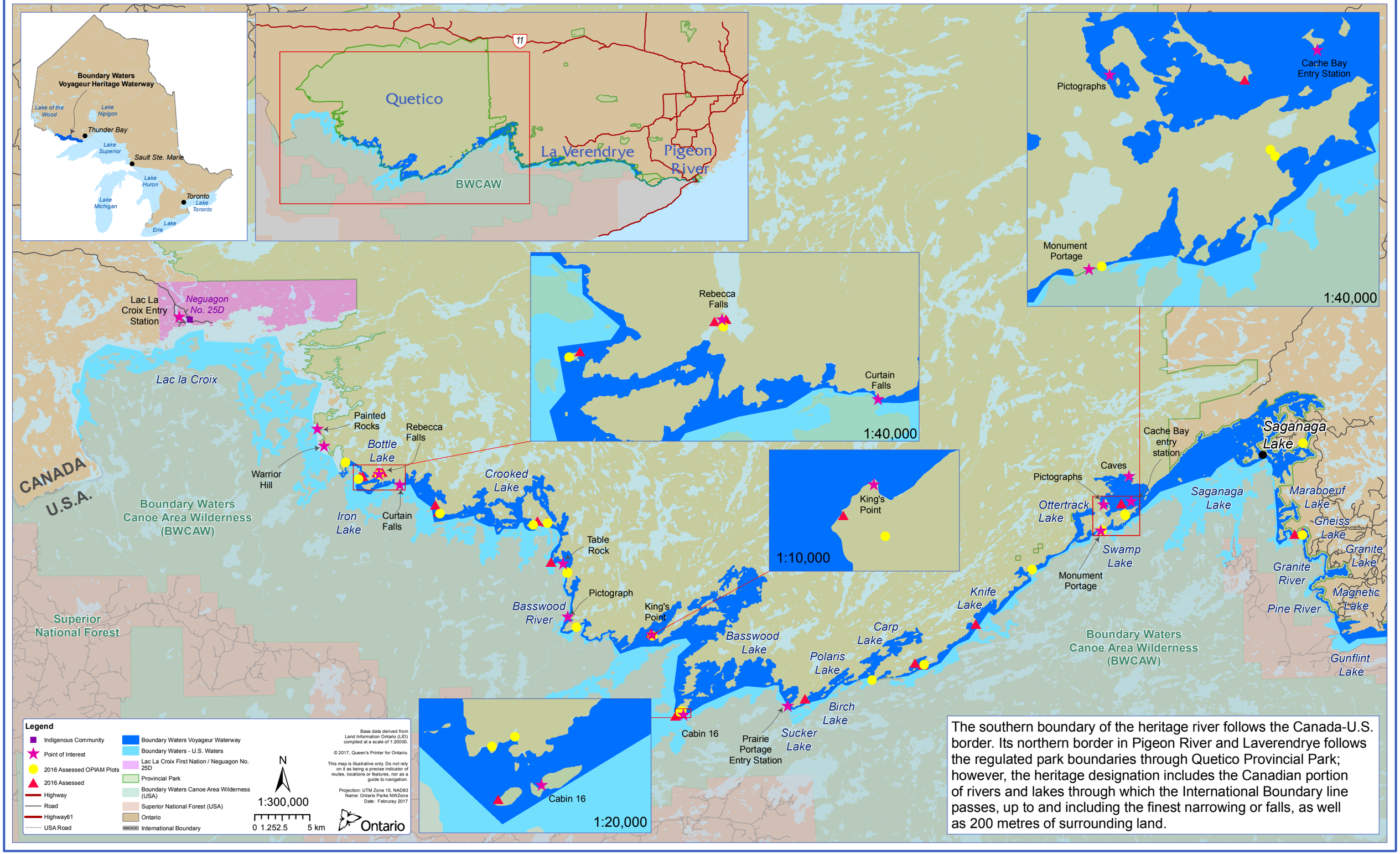
Appendix IX – List of Invasive Species reported within the BWVW.

Aquatic Species	**Confirmed Presence:**
Spiny Water Flea (*Bythotrephis longimanus*)	Basswood Lake and River Bottle Lake and River Crooked Lake Granite Lake Gunflint Lake Iron Lake North Fowl Lake Pigeon River downstream of South Fowl Lake Saganaga Lake South Fowl Lake
Rusty Crayfish (*Orconectes rusticus*)& Northern Clearwater Crayfish (*Orconectes propinquus*):	Basswood Lake Birch Lake Crooked Lake Knife Lake Sucker Lake
Zebra Mussel (*Dreissena polymorpha*)	Crooked Lake Rose Lake
Rainbow Smelt (*Osmerus mordax*)	French Lake Pickerel Lake Saganaga Lake Unconfirmed extent of invasion
Black Crappie (Pomoxis nigromaculatus)	Unconfirmed extent of invasion
Smallmouth Bass (*Micropterus dolomieui*)	First introduced in Basswood and Knife Lakes; Unconfirmed extent of invasion
Faucet Snail (*Bithynia tentaculata*)	Knife Lake
Freshwater Jellyfish (*Craspedacusta sowerbyi*)	Saganaga Lake
Eurasian Watermilfoil (*Myriophyllum spicatum*)	Knife Lake

Terrestrial Species	
Purple Loosestrife (*Lythrum salicaria*)	Several pockets exist within the BWVW area, but no surveys have been undertaken to confirm extent
European Earthworms (Lumbricidae)	Widely distributed but unconfirmed extent
Pathogens	
Chronic Wasting Disease (CWD)	Potential
White Nose Syndrome (WNS)	Confirmed near Atikokan, ON
White Pine Blister Rust	Historical impacts

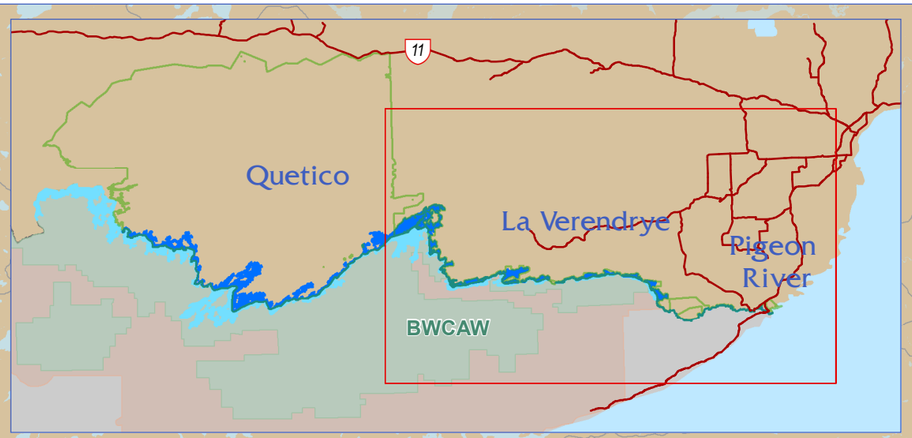
**Information referenced here does not represent an exhaustive list; species reported here are reference in the Quetico Invasive Species Strategy (2014) and the Minnesota Department of Natural Resource online sources (2017).*

Figure 1 — The Boundary Waters Voyageur Waterway: 2016 Monitoring Trip



The southern boundary of the heritage river follows the Canada-U.S. border. Its northern border in Pigeon River and Laverendrye follows the regulated park boundaries through Quetico Provincial Park; however, the heritage designation includes the Canadian portion of rivers and lakes through which the International Boundary line passes, up to and including the finest narrowing or falls, as well as 200 metres of surrounding land.

Figure 2 — The Boundary Waters Voyageur Waterway: 2016 Monitoring Trip — Map 2 of 2



Kakabeka Falls
Murillo
11
17
Rosslyn Village
Stanley
130
61
Cloud Bay
588
Saganaga Lake
Maraboeuf Lake
Gneiss Lake
Granite Lake
Granite River
Magnetic Lake
Pine River
Peedee Railbed
Little North Lake
North Lake
Watap Lake
Vaseux Lake
North Fowl Lake
Fan Lake
Moose Lake
Mountain Lake
Rose Lake
Rove Lake
Little Gunflint Lake
South Lake
Gunflint Lake
Height of Land Portage
South Fowl Lake
Pigeon River
61
Grand Portage National Monument
Lake Superior
CANADA
U.S.A.
Lake Superior
Boundary Waters Canoe Area Wilderness (BWCAW)
Superior National Forest

Legend

- Community
- Point of Interest
- Grand Portage National Monument
- 2016 Assessed OPIAM Plots
- 2016 Assessed Campsites
- Highway
- Road
- USA Road
- Grand Portage Trail
- Railway
- Boundary Waters Voyageur Waterway
- Boundary Waters - U.S. Waters
- Lake
- Indigenous Reserve
- Provincial Park
- Grand Portage State Park (USA)
- Boundary Waters Canoe Area Wilderness (USA)
- Superior National Forest (USA)
- Ontario
- U.S.A.

N

1:300,000

0 2.5 5 10 km

Ontario

Base data derived from Land Information Ontario (LIO) compiled at a scale of 1:20000.

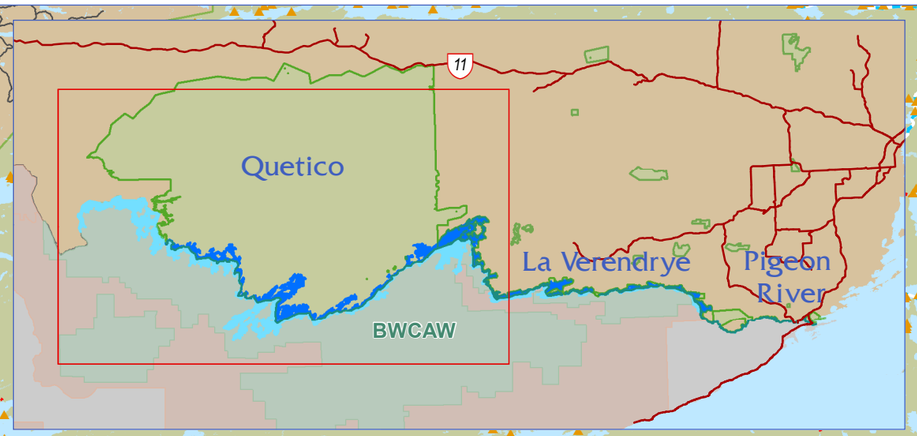
© 2017, Queen's Printer for Ontario.

This map is illustrative only. Do not rely on it as being a precise indicator of routes, locations or features, nor as a guide to navigation.

Projection: UTM Zone 15, NAD83
Name: Ontario Parks NWZone
Date: Februray 2017

The southern boundary of the heritage river follows the Canada-U.S. border. Its northern border in Pigeon River and Laverendrye follows the regulated park boundaries through Quetico Provincial Park; however, the heritage designation includes the Canadian portion of rivers and lakes through which the International Boundary line passes, up to and including the finest narrowing or falls, as well as 200 metres of surrounding land.

Figure 3 — The Boundary Waters Voyageur Waterway: Recreational Features



Legend -- Canadian Site

- Indigenous Community
- Backcountry Campsite
- Main Base Lodge
- Outpost Camp
- Portage
- Trans Canada Trail (Path of the Paddle)
- Road
- Lac La Croix First Nation / Neguagon No. 25D
- Boundary Waters Voyageur Waterway
- Lake
- Provincial Park
- Ontario

N

1:300,000

0 2.5 5 10 km

Ontario

Base data derived from Land Information Ontario (LIO) compiled at a scale of 1:20000.

© 2017, Queen's Printer for Ontario.

This map is illustrative only. Do not rely on it as being a precise indicator of routes, locations or features, nor as a guide to navigation.

Projection: UTM Zone 15, NAD83
Name: Ontario Parks NWZone
Date: Februay 2017

Quetico Trail - Path of the Paddle (Quetico Provincial Park Main Route)

Omimi Trail - Path of the Paddle (Northern Light Lake)

Neguagon No. 25D

Lac la Croix

CANADA

U.S.A.

Bottle Lake

Crooked Lake

Iron Lake

Boundary Waters Canoe Area Wilderness (BWCAW)

Basswood River

Basswood Lake

Superior National Forest

Polaris Lake

Carp Lake

Knife Lake

Ottertrack Lake

Swamp Lake

Saganaga Lake

Maraboeuf Lake

Gneiss Lake

Granite Lake

Granite River

Magnetic Lake

Pine River

Gunflint Lake

Birch Lake

Sucker Lake

Boundary Waters Canoe Area Wilderness (BWCAW)

The southern boundary of the heritage river follows the Canada-U.S. border. Its northern border in Pigeon River and Laverendrye follows the regulated park boundaries through Quetico Provincial Park; however, the heritage designation includes the Canadian portion of rivers and lakes through which the International Boundary line passes, up to and including the finest narrowing or falls, as well as 200 metres of surrounding land.

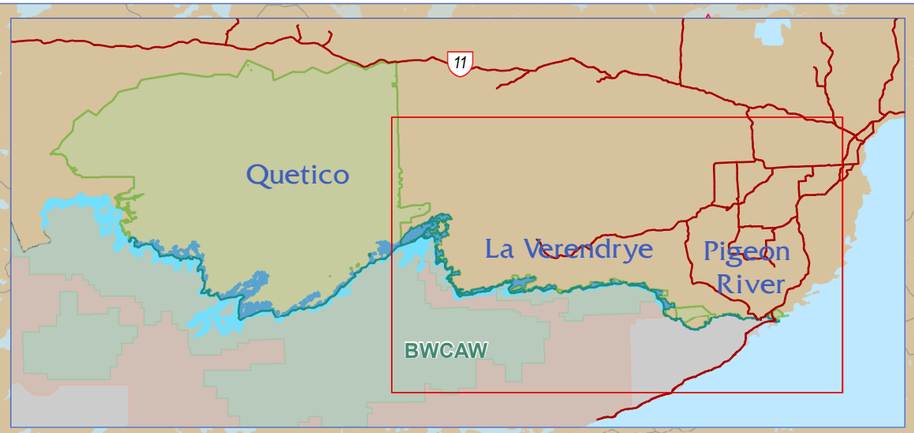
Legend - U.S.A. Site

- Backcountry Campsite
- Observation Site
- Trailhead
- Trail
- Road
- Boundary Waters - U.S. Waters
- Boundary Waters Canoe Area Wilderness
- Superior National Forest

Figure 4

The Boundary Waters Voyageur Waterway: Recreational Features

Map 2 of 2



Legend -- Canadian Site

- Backcountry Campsite
- Main Base Lodge
- Outpost Camp
- Portage
- Trans Canada Trail (Path of the Paddle)
- Highway
- Road
- Indigenous Reserve
- Boundary Waters Voyageur Waterway
- Lake
- Provincial Park
- Ontario

Base data derived from Land Information Ontario (LIO) compiled at a scale of 1:20000.

© 2017, Queen's Printer for Ontario.

This map is illustrative only. Do not rely on it as being a precise indicator of routes, locations or features, nor as a guide to navigation.

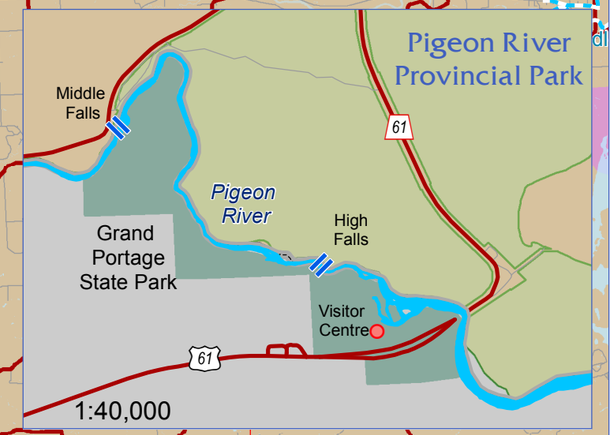
Projection: UTM Zone 15, NAD83
Name: Ontario Parks NWZone
Date: Februray 2017

N

1:300,000

0 2.5 5 10 km

Ontario



Omimi Trail - Path of the Paddle (Northern Light Lake)

588

593

Saganaga Lake

Maraboeuf Lake

Gneiss Lake

Granite River

Granite Lake

Little North Lake

North Lake

Omimi Trail - Path of the Paddle (LaVerendrye Provincial Park)

Watap Lake

Vaseux Lake

North Fowl Lake

Animiki Trail - Path of the Paddle (Lake Superior)

Magnetic Lake

Pine River

Gunflint Lake

Little Gunflint Lake

South Lake

Rose Lake

Rove Lake

Mountain Lake

Fan Lake

Moose Lake

South Fowl Lake

Omini Trail (Path of the Paddle)

Lake Superior

CANADA

U.S.A.

Pigeon River

Boundary Waters Canoe Area Wilderness (BWCAW)

Grand Portage National Monument

Lake Superior

Superior National Forest

61

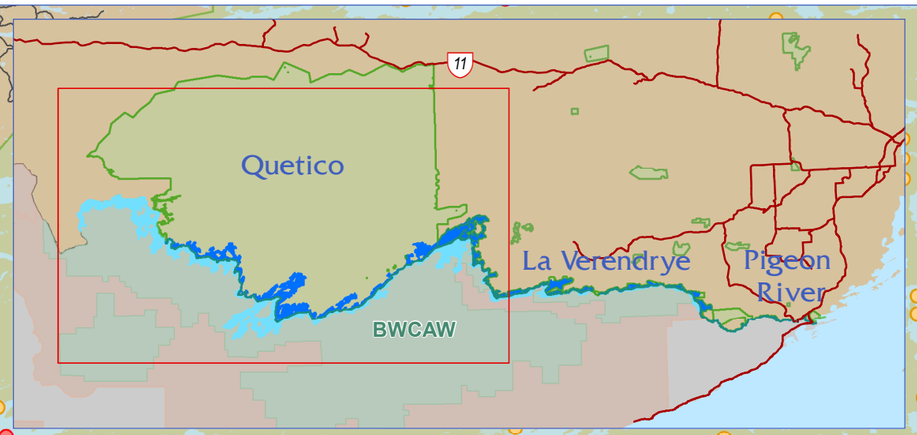
The southern boundary of the heritage river follows the Canada-U.S. border. Its northern border in Pigeon River and Laverendrye follows the regulated park boundaries through Quetico Provincial Park; however, the heritage designation includes the Canadian portion of rivers and lakes through which the International Boundary line passes, up to and including the finest narrowing or falls, as well as 200 metres of surrounding land.

Legend- U.S.A. Site

- Backcountry Campsite
- Observation Site
- Trailhead
- Grand Portage National Monument
- Highway
- Road
- Trail
- Boundary Waters - U.S. Waters
- Boundary Waters Canoe Area Wilderness
- Grand Portage State Park
- Superior National Forest
- U.S.A

Figure 5 The Boundary Waters Voyageur Waterway: Blowdown and Forest Fire History since 1990

Map 1 of 2



Legend

- Indigenous Community
- Fire Communications Tower
- Blowdown - July 4, 1999

Fire Disturbance Point Since 1990

- Human Caused
- Lightning

Fire Disturbance Area Since 1990

- Human Caused
- Lightning
- Prescribed Burn
- Boundary Waters Voyageur Waterway
- Lake
- Provincial Park
- Lac La Croix First Nation / Neguagon No. 25D
- Ontario
- Highway
- Road
- Trail
- Boundary Waters - U.S. Waters
- Boundary Waters Canoe Area Wilderness
- Superior National Forest

The southern boundary of the heritage river follows the Canada-U.S. order. Its northern border in Pigeon River and Laverendrye follows the egulated park boundaries throuth Quetico Provincial Park however, the heritage designation includes the Canadian portion of rivers and lakes throught which the International Boundary line passes, up to and including the firest narrowing or falls, as well as 200 metres of surrounding land.

Base data derived from Land Information Ontario (LIO) compiled at a scale of 1:20000.

© 2017, Queen's Printer for Ontario.

This map is illustrative only. Do not rely on it as being a precise indicator of routes, locations or features, nor as a guide to navigation.

Projection: UTM Zone 15, NAD83
Name: Ontario Parks NWZone
Date: Februray 2017

N

1:300,000

0 2.5 5 10 km

Ontario

Neguagon No. 25D

Lac la Croix

CANADA

U.S.A.

Boundary Waters Canoe Area Wilderness (BWCAW)

Bottle Lake

Crooked Lake

Iron Lake

Basswood River

Basswood Lake

Polaris Lake

Carp Lake

Knife Lake

Ottertrack Lake

Swamp Lake

Saganaga Lake

Maraboeuf Lake

Ham Lake 2007

Gneiss Lake

Granite Lake

Granite River

Magnetic Lake

Pine River

Cavity Lake 2006

Gunflint Lake

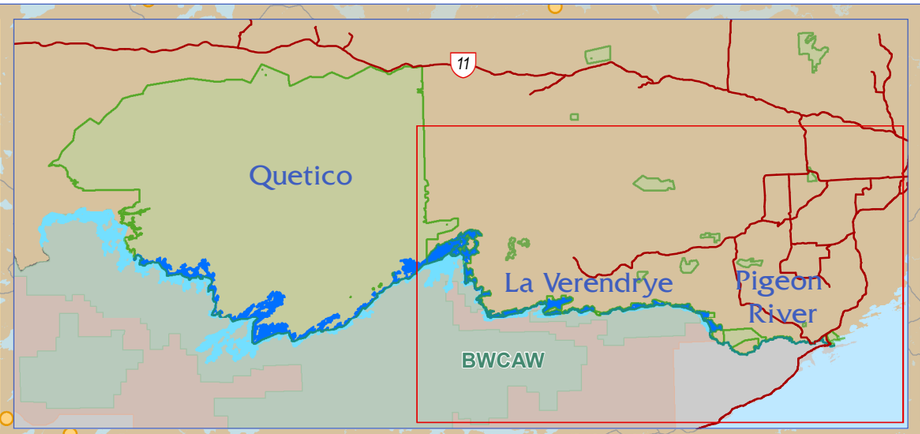
Birch Lake

Sucker Lake

Superior National Forest

Boundary Waters Canoe Area Wilderness (BWCAW)

Figure 6 — The Boundary Waters Voyageur Waterway: Forest Fire History since 1990 — Map 2 of 2



Legend

- Fire Communications Tower
- Blowdown - July 4, 1999

Fire Disturbance Point Since 1990

- Human Caused
- Lightning

Fire Disturbance Area Since 1990

- Human Caused
- Lightning
- Prescribed Burn

- Boundary Waters Voyageur Waterway
- Lake
- Provincial Park
- Indigenous Reserve
- Ontario
- Highway
- Road
- Trail
- Boundary Waters - U.S. Waters
- Boundary Waters Canoe Area Wilderness
- Superior National Forest
- U.S.A.

The southern boundary of the heritage river follows the Canada-U.S. order. Its northern border in Pigeon River and Laverendrye follows the egulated park boundaries throuth Quetico Provincial Park however, the heritage designation includes the Canadian portion of rivers and lakes througth which the International Boundary line passes, up to and including the firest narrowing or falls, as well as 200 metres of surrounding land.

Base data derived from Land Information Ontario (LIO) compiled at a scale of 1:20000.

© 2017, Queen's Printer for Ontario.

This map is illustrative only. Do not rely on it as being a precise indicator of routes, locations or features, nor as a guide to navigation.

Projection: UTM Zone 15, NAD83
Name: Ontario Parks NWZone
Date: Februray 2017

N

1:300,000

0 2.5 5 10 km

Ontario

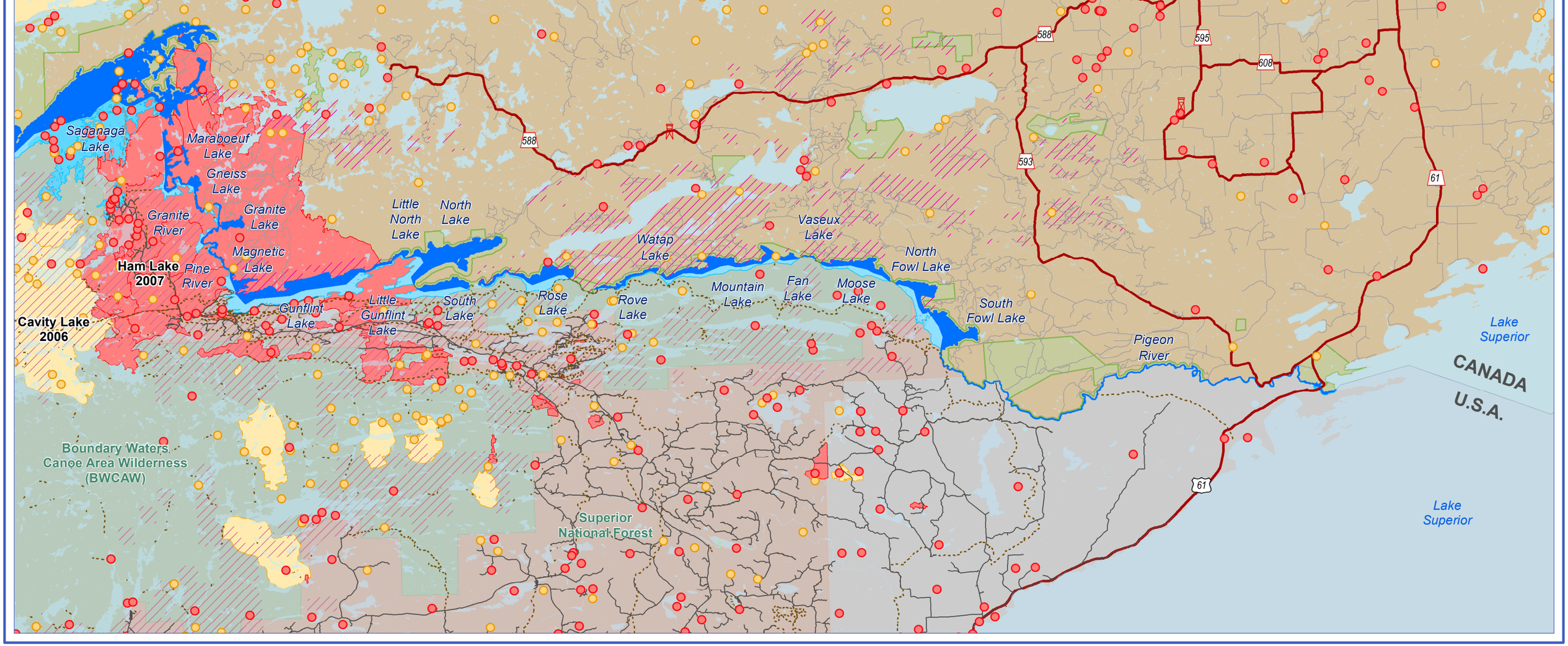


Figure 7 The Boundary Waters Voyageur Waterway: Pigeon River Provincial Park Trails