



United Nations
Educational, Scientific and
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Organisation
des Nations Unies
pour l'éducation,
la science et la culture



Wood Buffalo National Park
inscribed on the World
Heritage List in 1983

Parc national Wood Buffalo
inscrit sur la Liste du
patrimoine mondial en 1983



Wood Buffalo National Park World Heritage Site

Action Plan



Parks
Canada

Parcs
Canada

Canada

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Library and Archives Canada – Cataloguing in Publication

Wood Buffalo National Park World Heritage Site Action Plan
ISBN: R64-546/2019E-PDF
Cat. No.: 978-0-660-27537-6

Issued also in French under the title:

Plan d'action pour le site du patrimoine mondial du parc national Wood Buffalo.
ISBN: R64-546/2019F-PDF
Cat. No.: 978-0-660-29260-1

Available on the Internet.

Cover page photo: *Lakes and grasslands of the Peace-Athabasca Delta in southern Wood Buffalo National Park.*

Message from the Minister



"As Minister responsible for Parks Canada, I am pleased to present the Action Plan for Wood Buffalo National Park World Heritage Site. This plan represents a collective commitment by the Government of Canada and its partners to ensure the protection and management of the Outstanding Universal Value of Wood Buffalo National Park World Heritage Site.

World Heritage sites represent some of humanity's most impressive achievements and nature's most inspiring creations. The UNESCO World Heritage Convention established the World Heritage List as a means of recognizing that some places are so exceptional as to be of universal importance to all humanity. By joining the Convention, Canada recognizes the duty to identify, protect, conserve and present its World Heritage sites and to pass them on to future generations. Internationally, inscription of a site on the World Heritage List is the highest possible recognition of heritage value.

In Canada, we are fortunate to have some of the world's most remarkable historic and natural wonders right in our own backyards. Our country is home to 19 UNESCO World Heritage sites that represent the very best that Canada has to offer and allow visitors to learn about our rich and diverse heritage. These include places such as the Canadian Rocky Mountain Parks, the Historic District of Old Québec, the Landscape of Grand Pré, Pimachiowin Aki, and Wood Buffalo National Park.

I extend my thanks to the Government of Alberta, the Government of British Columbia and the Government of the Northwest Territories as well as to the Indigenous partners of Wood Buffalo National Park: the Mikisew Cree First Nation, the Athabasca Chipewyan First Nation, Fort Chipewyan Métis, Kátl'odeeche First Nation, Deninu K'ue First Nation, Salt River First Nation, Smith's Landing First Nation, Little Red River Cree First Nation, Fort Resolution Métis Council, Hay River Métis Council and Fort Smith Métis Council. I also express my appreciation to other interested stakeholders and groups who contributed time and effort into sharing their views to shape this Action Plan. I am confident that through continued collaboration, we can continue to protect the Outstanding Universal Value of Wood Buffalo National Park World Heritage Site for present and future generations."

A handwritten signature in black ink, appearing to read 'C McKenna'.

The Honourable Catherine McKenna, P.C., M.P.
Minister of Environment and Climate Change and
Minister responsible for Parks Canada



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List of Acronyms

AB: Alberta
ABF: Aboriginal Base Flow
ACFN: Athabasca Chipewyan First Nation
AEP: Alberta Environment and Parks
AER: Alberta Energy Regulator
ANI: Aboriginal Navigation Index
ARFN: Athabasca Region First Nations
AXF: Aboriginal Extreme Flow
BC: British Columbia
BSA: Biodiversity Stewardship Area
CBM: Community-Based Monitoring
CEAA: Canadian Environmental Assessment Agency / *Canadian Environmental Assessment Act*
CMC: Cooperative Management Committee
ECCC: Environment and Climate Change Canada
EFH: Environmental Flows and Hydrology
EI: ecological integrity
EIS: Environmental Impact Statement
EPEA: *Environmental Protection and Enhancement Act*
FPTI: Federal-Provincial-Territorial-Indigenous
GNWT: Government of the Northwest Territories
HLHP: *Healthy Land, Healthy People: GNWT Priorities for Advancement of Conservation Network Planning 2016–2021*
IAS: invasive alien species
IGOs: Indigenous Governments and Organizations
IKRP: Indigenous Knowledge Research Process
ITA: Imminent Threat Assessment
IUCN: International Union for Conservation of Nature
LARP: Lower Athabasca Regional Plan
LRRCN: Little Red River Cree Nation
MCFN: Mikisew Cree First Nation
MOU: Memorandum of Understanding
MRBB: Mackenzie River Basin Board
NRBS: Northern River Basins Study
NREI: Northern Rivers Ecosystem Initiative
NWTMN: Northwest Territories Métis Nation
OSM: Oil Sands Monitoring Program
OUV: Outstanding Universal Value
PACs: polycyclic aromatic compounds
PAD: Peace–Athabasca Delta
PADEMP: Peace–Athabasca Delta Ecological Monitoring Program
PAHs: polycyclic aromatic hydrocarbons
PCA: Parks Canada Agency
RLBH: Ronald Lake Bison Herd
RLBH TT: Ronald Lake Bison Herd Technical Team
RMM: Reactive Monitoring Mission
SEA: Strategic Environmental Assessment
SMART: Specific, Measurable, Achievable, Realistic, Time-bound
SWQMF: Surface Water Quantity Management Framework
TMF: Tailings Management Framework
TOR: Terms of Reference
WBNP: Wood Buffalo National Park
WBNP WHS: Wood Buffalo National Park World Heritage Site
WH Centre: World Heritage Centre
WH Committee: World Heritage Committee

Executive Summary



The Peace River flows through Wood Buffalo National Park. Photo by J.F. Bergeron, Parks Canada

Wood Buffalo National Park (WBNP) is Canada's largest national park, encompassing 4.5 million hectares of forests, wetlands, and grasslands. Established in 1922 to protect the last remaining herds of Wood Bison, the park now protects the largest free-roaming, self-regulating Wood Bison herd in the world, the nesting ground of the last remaining wild flock of endangered Whooping Cranes, the biologically rich Peace–Athabasca Delta, extensive salt plains unique in Canada, and some of the finest examples of gypsum karst topography in North America.

The presence of these rare and superlative natural phenomena were the key reasons for the inscription of WBNP as Canada's eighth UNESCO World Heritage Site in 1983 under the authority of the World Heritage Convention. The three World Heritage criteria for which the site has been inscribed, and the specifics of the Outstanding Universal Value (OUV) of WBNP, recognize the importance of the site's significance for:

- *Criterion (vii) "the great concentrations of migratory wildlife are of world importance and the rare and superlative natural phenomena include a large inland delta, salt plains and gypsum karst that are equally internationally significant."*
- *Criterion (ix) "the most ecologically complete and largest example of the entire Great Plains–Boreal grassland ecosystem of North America, the only place where the predator-prey relationship between wolves and Wood Bison has continued, unbroken, over time."*
- *Criterion (x) "the only breeding habitat in the world for the Whooping Crane, an endangered species brought back from the brink of extinction through careful management of the small number of breeding pairs in the park. The park's size (4.5 million ha), complete ecosystems and protection are essential for in-situ conservation of the Whooping Crane."*

Wood Buffalo National Park includes the traditional territories of First Nations and Métis people who have inhabited and used the lands, waters, and resources of WBNP for generations and continue to do so, and who rely on the natural and cultural heritage of WBNP to sustain their livelihoods, way of life, and culture.

Though renowned for its size, remoteness, and the absence of industrial resource extraction activities within its boundaries, the Wood Buffalo National Park World Heritage Site (WBNP WHS), like other World Heritage sites globally, is vulnerable to the impacts of external development outside its boundaries. The Peace and Athabasca river sub-basins and Lake Athabasca drain an area of about 600,000 square kilometres of northern British Columbia, Alberta, and Saskatchewan and meet in WBNP at the Peace–Athabasca Delta (PAD). Upstream and adjacent developments with the potential to impact the Outstanding Universal Value (OUV) of WBNP WHS include flow regulation, oil sands development, pulp and paper production, forestry, agriculture, and municipal development. In addition to these external pressures, there are influences on WBNP WHS from



"The scope of work of the Action Plan is broad, encompassing areas under the jurisdictional authorities of the Government of Canada, the Government of Alberta, the Government of British Columbia, the Government of the Northwest Territories, and the stewardship responsibilities of Indigenous governments."



Fort Chipewyan Indigenous land users and Parks Canada employees jointly conduct the Peace–Athabasca Delta muskrat survey.

a changing climate in which average annual temperatures are increasing, leading to earlier spring thaw and later fall freeze up and a shorter duration of seasonal ice cover. These warmer temperatures have influenced the amount and timing of spring run-off and peak river flows. Cumulative impacts of a changing climate and development pressures are causing ecological change on a landscape scale within the Peace–Athabasca Delta. These environmental changes, including concerns about cumulative effects, are part of the lived experience of Indigenous land users who have generations of knowledge about conditions in the Peace–Athabasca Delta.

In response to Decision 41 COM 7B.2 of the World Heritage Committee, the Government of Canada has led a collaborative effort with the Government of Alberta, the Government of British Columbia, the Government of the Northwest Territories, and Indigenous partners to develop this Action Plan to ensure the ongoing protection and maintenance of the OUV of WBNP WHS.

This Action Plan focuses on the specific actions required to understand and protect those elements of WBNP that contribute to its OUV. In doing so, the Action Plan leverages and enhances efforts by a range of government partners, Indigenous governments, and stakeholders and also identifies new collaborative actions and strategies. The scope of work of the Action Plan is broad, encompassing areas under the jurisdictional authorities of the Government of Canada, the Government of Alberta, the Government of British Columbia, the Government of the Northwest Territories, and the stewardship responsibilities of Indigenous governments.

On June 28, 2018, the Government of Canada announced \$27.5 million dollars (CAD) in funding over 5 years to support the development of this Action Plan and to ensure early implementation of priority actions outlined within.

The Action Plan is organized around a series of seven thematic areas that correspond to the recommendations of a report following a Reactive Monitoring Mission to WBNP in 2016. Specific actions are outlined under each thematic area to support broad goals that will ensure the continued maintenance of the OUV of the site.

The nature of the current challenges and development pressures on the ecological integrity of WBNP requires inter-jurisdictional collaboration and coordination to better understand and assess potential impacts and to inform decision-making. This Action Plan represents a commitment by the Government of Canada and its provincial and territorial government partners to advance actions that will ensure the ongoing protection and maintenance of the Outstanding Universal Value of WBNP WHS. The successful implementation of this Action Plan will be achieved through the collective efforts of all those with jurisdictional responsibilities, with the support of Indigenous partners for whom the WBNP WHS is home, and of other stakeholders.



The Sweetgrass Prairie of the Peace–Athabasca Delta is the largest undisturbed boreal prairie in Canada. Photo by Mike Keizer/Parks Canada

1.0 Introduction

1.1 International Recognition of Wood Buffalo National Park

Wood Buffalo National Park is a special place. Straddling the boundary between the province of Alberta and the Northwest Territories, the park encompasses 4.5 million hectares of forests, wetlands and grasslands, including the majority of the Peace–Athabasca Delta (PAD) (Figure 1). Established in 1922 to protect the last remaining herds of Wood Bison, it is Canada's largest national park and includes the traditional territories of First Nations and Métis peoples of the region.

Today, WBNP protects the largest free-roaming, self-regulating Wood Bison herd in the world, the nesting ground of the last remaining wild flock of endangered Whooping Cranes, the biologically rich Peace–Athabasca Delta, extensive salt plains unique in Canada, and some of the finest examples of gypsum karst topography in North America.

This presence of rare and superlative natural phenomena led to the park's inscription as Canada's eighth UNESCO World Heritage Site in 1983, based on the following World Heritage criteria that contribute to its Outstanding Universal Value (OUV):

- *Criterion (vii): The great concentrations of migratory wildlife are of world importance and the rare and superlative natural phenomena include a large inland delta, salt plains and gypsum karst that are equally internationally significant.*
- *Criterion (ix): Wood Buffalo National Park is the most ecologically complete and largest example of the entire Great Plains–Boreal grassland ecosystem of North America, the only place where the predator-prey relationship between wolves and Wood Bison has continued, unbroken, over time.*
- *Criterion (x): Wood Buffalo National Park contains the only breeding habitat in the world for the Whooping Crane, an endangered species brought back from the brink of extinction through careful management of the small number of breeding pairs in the park. The park's size (4.5 million ha), complete ecosystems and protection are essential for in-situ conservation of the Whooping Crane.*

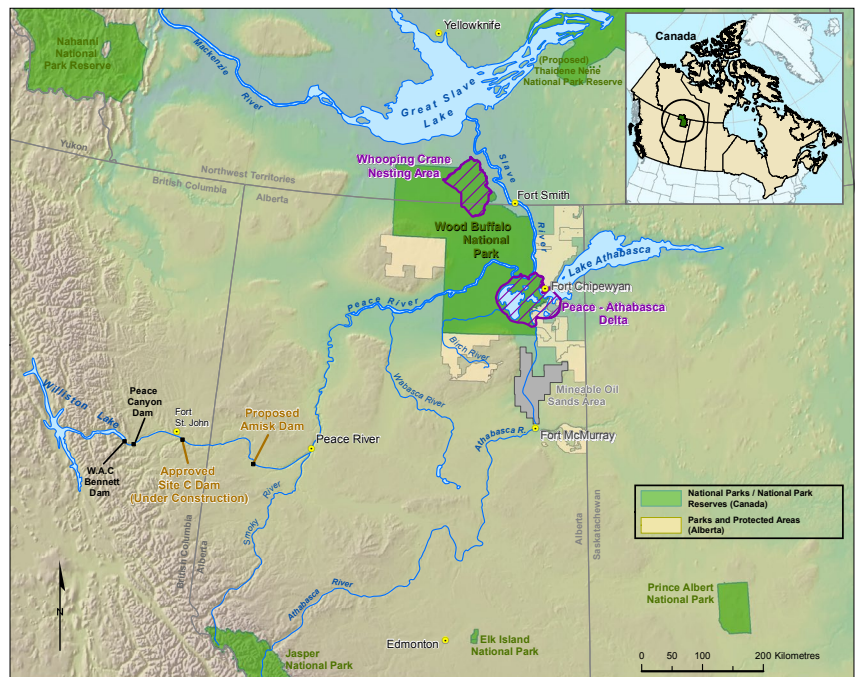


Figure 1: Wood Buffalo National Park regional context

Two of the largest wetlands within WBNP, the PAD and the Whooping Crane Summer Range, are designated Wetlands of International Importance under the *Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention)*. This Convention provides a framework for the conservation and wise use of wetlands and their resources, including the designated wetlands found within WBNP.

The Government of Canada also coordinates implementation of a number of international conventions and agreements that are relevant to the management of WBNP. These include the *Convention on Biological Diversity*, the *Convention on the Conservation of Migratory Species of Wild Animals*, and the *Convention for the Protection of Migratory Birds in the United States and Canada*.



The world's largest herd of free-roaming bison – North America's largest land mammal – is found in Wood Buffalo National Park. Parks Canada Photo

1.2 Pressures on WBNP

Though renowned for its size, remoteness, and the absence of industrial resource extraction activities within its boundaries, WBNP is vulnerable to the impacts of external development given its location within the Mackenzie River Basin (Figure 1). The Peace and Athabasca river sub-basins and Lake Athabasca drain an area of about 600,000 square kilometres of northern British Columbia, Alberta, and Saskatchewan and meet in the park at the PAD. Upstream and adjacent developments with the potential to impact the OUV of WBNP include flow regulation, oil sands development, pulp and paper production, forestry, agriculture, and municipal development.

Superimposed upon these activities are the impacts of a changing climate. Over the last 50 years, the average annual temperature in this area has increased by 2°C and the average winter temperature has increased by 4°C. The number of extremely warm days has increased, while the number of extremely cold days has decreased. Spring thaw happens earlier and fall freeze-up happens later. The ice-covered season is shorter. Warmer temperatures have also shifted the amount and timing of spring run-off and of peak river flows. For these reasons, assessments of the PAD have concluded that it is “a clear example where cumulative effects have generated ecological change on a landscape scale.”¹ These environmental changes and concerns about cumulative effects are supported by the lived experience of Indigenous land users who have generations of knowledge about conditions in the PAD.²

1.3 Origins of the Action Plan

In December 2014, the Mikisew Cree First Nation (Mikisew Cree) petitioned the World Heritage Committee (the Committee) to have WBNP WHS added to the “List of World Heritage in Danger” (Figure 2). Their concerns focused on known and potential dangers to the property from existing and planned hydroelectric and oil sands development projects, climate change and inadequacies in the management frameworks for the property that could compromise the integrity of the site's OUV.

In July 2015, the Committee issued a decision requesting that Canada invite a World Heritage Centre (WHC)/ International Union for Conservation of Nature (IUCN) Reactive Monitoring Mission (RMM) to WBNP “to review the impact of the developments on the property, to evaluate its state of conservation, and to exchange in more depth with the State Party [Canada], petitioning First Nation, and other stakeholders as appropriate.” The Committee also requested that Canada undertake a Strategic Environmental Assessment (SEA) to assess the potential cumulative impacts of all developments on the OUV of the property, including hydroelectric dams, oil sands development, and mining (World Heritage Committee Decision 39 Com 7B.18, 2015).

¹ Mackenzie River Basin Board (MRBB), 2012. *The Mackenzie River Basin Board's 2012 Issues Report: Oil sands development, hydroelectric development and climate change in the Mackenzie River Basin*. Mackenzie River Basin Board Secretariat, Yellowknife, NWT. 11pp.

² Independent Environmental Consultants (IEC), 2018. *Strategic Environmental Assessment of potential cumulative impacts of all developments on the World Heritage Values of Wood Buffalo National Park*, Markham, ON.

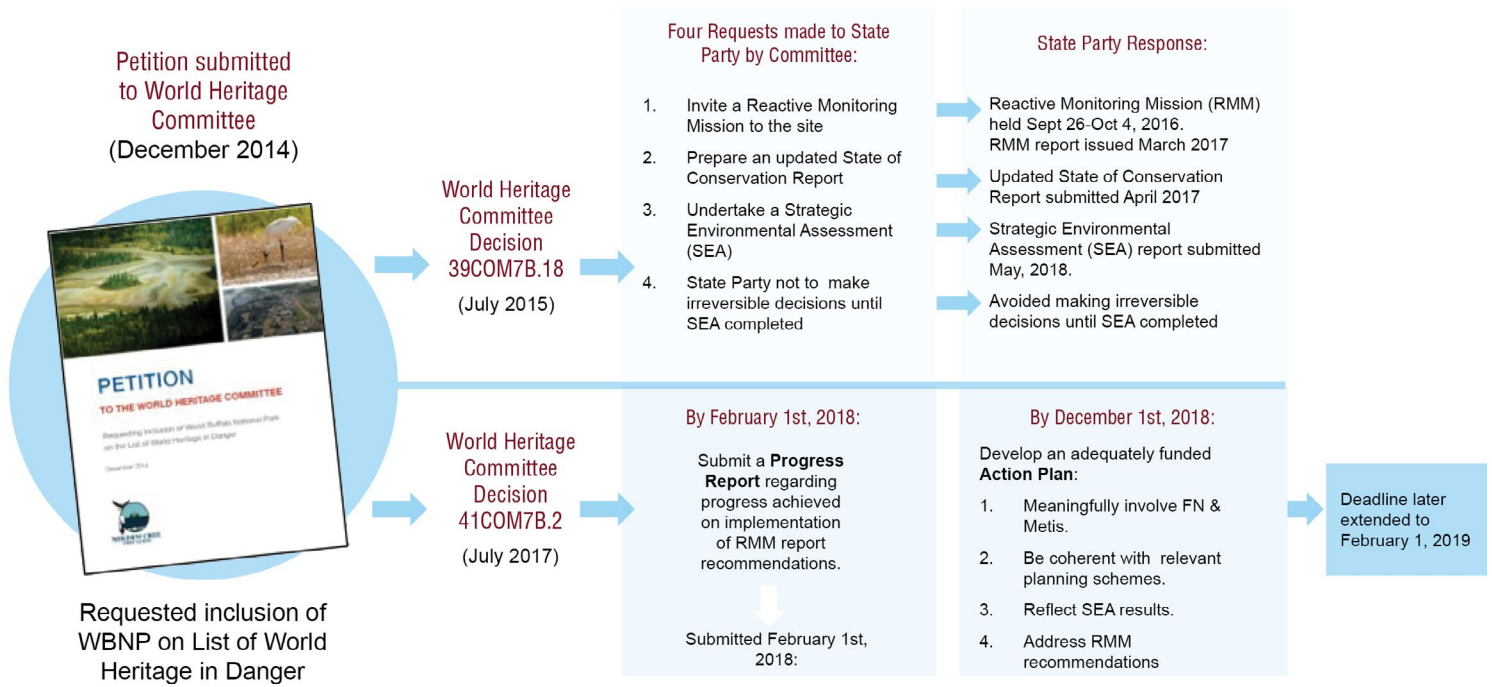


Figure 2: World Heritage Committee decisions flowing from Mikisew Cree First Nation petition.

The Government of Canada welcomed the RMM and worked closely with the WHC, the IUCN, and Indigenous partners (including the Mikisew Cree) to plan the visit. Representatives of the WHC and the IUCN met with federal, provincial, and territorial governments; Indigenous communities; industry; academics; and environmental non-government organizations in late September and early October, 2016. The RMM report³ (released March 10, 2017) concluded that the PAD, “widely recognized as the particularly valuable and vulnerable heart of the park,” is being impacted by external developments and climate change and that these impacts are not being adequately addressed through existing management frameworks and collaborative efforts. Key concerns identified included the longstanding tensions between Indigenous people and governmental and private sector actors, governance deficiencies in relation to water management, cumulative effects assessment and environmental monitoring, and the effects of climate change on the property’s ecosystems.

The RMM report recommended that Canada “be given one opportunity...to immediately develop a structured and adequately funded Action Plan” guided by 17 recommendations (Appendix A). In response to the report, Canada submitted a State of Conservation Report to the WHC on March 30, 2017, acknowledging the RMM report and committing to the development of the SEA and Action Plan in collaboration with provincial and territorial governments, Indigenous communities, industry, and stakeholders.

The World Heritage Committee subsequently adopted a decision at their July 2017 Committee meeting requesting that Canada submit two documents to the WHC: a report on the progress achieved with its implementation of the RMM report recommendations by February 1, 2018, and an updated report on the state of conservation of the property and an Action Plan by December 1, 2018. These documents will be examined by the Committee at its 43rd session in 2019 (*World Heritage Committee Decision 41 Com 7B.2, 2017*). In September 2018, the World Heritage Committee extended the deadline for Canada to submit the Action Plan to February 1, 2019 as a result of a request initiated by an Indigenous partner of WBNP.

“WBNP protects the largest free-roaming, self-regulating Wood Bison herd in the world, the nesting ground of the last remaining wild flock of endangered Whooping Cranes, the biologically rich Peace–Athabasca Delta, extensive salt plains unique in Canada, and some of the finest examples of gypsum karst topography in North America.”

³ UNESCO, 2017. Reactive Monitoring Mission (RMM) to Wood Buffalo National Park, Canada. Mission Report March 2017. UNESCO World Heritage Centre – WHC International Union for Conservation of Nature (IUCN), 25 September – 4 October 2016.



A winter sunset over the Peace–Athabasca Delta in Wood Buffalo National Park.
Parks Canada Photo

2.0 About the Action Plan

2.1 Purpose

This Action Plan responds to the World Heritage Committee's 2017 decision that requested Canada to develop an Action Plan informed by the recommendations of the IUCN/World Heritage Centre RMM report (Appendix A). The Action Plan outlines specific priorities and actions, to be undertaken by a range of responsible jurisdictional authorities, committing the Government of Canada to the ongoing protection and stewardship of WBNP, while ensuring the maintenance of WBNP's OUV.

The development of this Action Plan has also been informed by the findings and recommendations of the Strategic Environmental Assessment of WBNP WHS (2018), which assessed the cumulative impacts of developments on the OUV (Appendix C).

The initiatives identified in this Action Plan require ongoing collaboration with relevant jurisdictional governmental authorities and key partners. This includes the Indigenous governments representing the Indigenous peoples of the area, who have deep cultural, ecological, and spiritual connections to Wood Buffalo National Park.



"Though renowned for its size, remoteness, and the absence of industrial resource extraction activities within its boundaries, the Wood Buffalo National Park World Heritage Site (WBNP WHS), like other World Heritage sites globally, is vulnerable to the impacts of external development outside its boundaries."

2.2 Scope

This Action Plan focuses on WBNP and the actions required to understand and protect those elements of WBNP that contribute to its OUV. Actions will take place within the park and in other, neighbouring jurisdictions where necessary to support the site's OUV.

As WBNP is the homeland of local First Nations and Métis peoples, this Action Plan has been developed in recognition of the cultural significance of the site. It supports actions that will contribute to the ability of Indigenous peoples to continue to exercise Indigenous rights⁴ within WBNP.

The Action Plan builds upon and enhances ongoing efforts by a range of government partners, Indigenous governments, and stakeholders. It identifies new collaborative actions and strategies when required. The scope of work of the Action Plan is broad, encompassing areas under the jurisdictional authorities of the Government of

⁴ Aboriginal rights (commonly referred to as Indigenous rights) are collective rights of distinctive Indigenous societies flowing from their status as the original peoples (First Nation, Inuit, and Métis) of Canada. These rights are recognized and affirmed by Section 35 of the *Constitution Act, 1982*. Treaty rights are rights set out in either a historic or modern treaty agreement, and are recognized and affirmed by Section 35 of the *Constitution Act, 1982*.

Treaties define specific rights, benefits, and obligations for the signatories that vary from treaty to treaty. In this Action Plan, treaty rights refers to those under Treaty 8 and include rights of First Nations peoples of Treaty 8 to fish, hunt, and trap throughout the area of Treaty 8.

Canada, the Government of Alberta, the Government of British Columbia, the Government of the Northwest Territories, and the stewardship responsibilities of Indigenous governments. The plan includes actions to strengthen relationships with Indigenous peoples in managing the site, specifically through cooperative management processes, actions to facilitate inter-jurisdictional collaboration across a range of thematic areas, and actions to create effective mechanisms required to implement the actions outlined within the plan.

This Action Plan does not address all aspects of the management of WBNP, as it is necessarily focused on actions that aim to ensure the protection of the OUV of the World Heritage Site. There are other park management priorities that will continue to be addressed by the Parks Canada Agency (PCA) in collaboration with its partners. Upcoming reviews of the WBNP management plan (anticipated in coming years) will provide opportunities to ensure that the initiatives described in this Action Plan lend support to ongoing and future park management priorities.



Bison such as this one are a common sight in Wood Buffalo National Park, and are important cultural animals for many local Indigenous peoples.
Parks Canada Photo

2.3 Time Frame

Appendix B presents a detailed implementation schedule for all actions, grouped according to seven themes (see section 6.1).

2.4 Developing the Plan

The Government of Canada has led the collaborative effort to develop this Action Plan with the governments of Alberta, British Columbia, and the Northwest Territories, and with Indigenous partners.

"As WBNP is the homeland of local First Nations and Métis peoples, this Action Plan has been developed in recognition of the cultural significance of the site."



Because the scope of the Action Plan requires commitments and actions by a range of governments with jurisdictional authority both within WBNP and beyond it, existing federal, provincial, and territorial-led planning processes are used to advance actions where this is appropriate. Where necessary, new processes have been, or will be initiated, including the establishment of working groups with federal, provincial, territorial, and Indigenous government representatives.

The Action Plan has been informed by:

- The knowledge, guidance, and perspectives of Indigenous government leadership and Indigenous Knowledge holders
- The knowledge, guidance, and perspectives of the government representatives on a Federal-Provincial-Territorial Coordinating Committee
- The wealth of knowledge generated through previous studies and assessments focused on the condition of the Peace–Athabasca–Slave river system and the Peace–Athabasca Delta
- Information generated by historical and ongoing management and monitoring programs in the area, including community-based monitoring
- Contributions and comments received from government, Indigenous governments, industry, environmental non-governmental organizations, and other stakeholders and the public on draft versions of this plan
- Technical advice received from the IUCN and the WHC, including the RMM report
- The analyses, findings, and recommendations of the Strategic Environmental Assessment, including review comments received from government, Indigenous governments, industry, conservation organizations, and the public



The aurora borealis dances in the night sky over the Salt River Day Use Area in Wood Buffalo National Park. Parks Canada Photo

2.5 Structure

The major sections of the plan are:

- Section 3 – **Indigenous Ways of Life**: a reflection of the lived experiences of Indigenous peoples regarding the state of WBNP.
- Section 4 – **WBNP Management Context**: a brief summary of the role of the Parks Canada Agency (the federal authority that manages WBNP), collaboration with Indigenous governments and with other levels of government and other organizations, and international agreements of relevance to the site.
- Section 5 – **Strategic Environmental Assessment**: a brief overview of the Strategic Environmental Assessment (SEA), including a summary of the desired outcomes for the site’s world heritage values and key findings of the assessment that informed this Action Plan.
- Section 6 – **Action Plan**: the actions that will be taken to protect the OUV of WBNP.
- Section 7 – **Implementation, Reporting, and Review**: a summary of the collaboration and governance required to implement the Action Plan and of the reporting and review process for the Action Plan.



"The Government of Canada has led the collaborative effort to develop this Action Plan with the Governments of Alberta, British Columbia, and the Northwest Territories, and with Indigenous partners."

In section 6, each of the seven themes are addressed with specific actions designed to support broad goals that will ensure the continued maintenance of the OUV of the site. Each theme has been given a short-hand acronym to help identify the relevant actions. The acronyms and number of actions addressed within each theme are shown below:

Theme	Acronym	No. of relevant actions addressed per theme
Strengthening Indigenous Partnerships with WBNP	IP	6
Environmental Assessment	EA	12
Conservation Area Connectivity	CC	19
Tailings Ponds Risk Assessment	TP	10
Environmental Flows and Hydrology	EFH	75
Monitoring and Science	MS	9
Wildlife and Habitat Conservation	WH	11

3.0

Indigenous
Ways of Life

Elder Paul Boucher shares traditional carving skills with a young visitor to Wood Buffalo National Park. Cultural programs like these are an important way to connect visitors to the traditions of local Indigenous people. Photo by Sine Paulette/Parks Canada

This Action Plan draws upon the knowledge of Indigenous people regarding the state of WBNP WHS and the factors impacting it, including external development, climate change, and the site's management and regulatory context. The lived experiences of Indigenous land users and community members have also informed the development of the SEA, which was completed in 2018.

While the experiences and concerns emphasized by different Indigenous governments from different areas of WBNP vary, they can be generally summarized as follows as they relate to the OUV of the site (readers are directed to the Petition, RMM report, and SEA at https://www.pc.gc.ca/en/pn-np/nt/woodbuffalo/info/action/SEA_EES/bulletin for further detail).

3.1 Indigenous Relationship to the Land / Indigenous Ways of Life

First Nations and Métis have occupied and used the lands, waters, and resources of WBNP for generations and continue to do so. They rely upon the site's resources to sustain their livelihoods, way of life, and culture. From the Indigenous perspective, their people are an integral part of the ecosystem within which they live. The presence and health of natural features and wildlife (i.e., the world heritage values), are inseparable from Indigenous ways of life and the ability to exercise Indigenous rights.

Water quantity and quality is fundamental to life and is a top priority and concern for Indigenous people. Indigenous governments also have stewardship responsibilities for taking care of the gift that is water and the life that it supports. Land users in the PAD describe the park as their grocery store, their kitchen, their school, their medicine cabinet, and their photo album. It is the place where they have their happiest memories of family and nature.^{5,6} The PAD has also been referred to as the heart of the park and the region. The idea that “everything is connected” also applies downstream from the PAD, and management of the Peace and Athabasca Rivers and the PAD is also of interest to communities on the Slave River and Great Slave Lake.



“First Nations and Métis people rely upon the lands within Wood Buffalo National Park to sustain their livelihoods, way of life, and culture.”

The following considerations are important to Indigenous people, but are not explicitly included in the site's world heritage values:

- Recognition of Aboriginal and treaty rights;
- Access to healthy lands and resources for the peaceful exercise of rights, including harvesting and cultural use;
- WBNP as a cultural landscape and a homeland to Indigenous people;
- The health and welfare of Indigenous people;
- The role of Indigenous people in ecosystem relationships;

⁵ MCFN, 2018a. Workshop on the development of the SEA with representatives of Mikisew Cree First Nation. Independent Environmental Consultants (IEC) and Parks Canada, February, 2018.

⁶ MCFN, 2018b. Workshop on the development of the SEA with representatives of Mikisew Cree First Nation. Independent Environmental Consultants (IEC) and Parks Canada, March, 2018.

- The role of Indigenous people in the management and stewardship of lands, waters, and resources within their traditional territories to support ecosystem sustainability;
- The role of other species (e.g., vegetation, moose, and caribou) in relation to bison and wolves;
- The role of other areas of WBNP in safeguarding the world heritage values; and
- Interconnections between all species (e.g., vegetation, insects, frogs, mice, bats, birds, etc.), landscapes, and Indigenous people.

3.2 Indigenous Observations of Change / Cumulative Impacts on OUV and Indigenous Ways of Life

Indigenous people are intimately familiar with the site's forests, lakes, rivers, creeks, marshes, fish, and wildlife. They know the seasons and cycles in and around WBNP, including sights, sounds, textures, and tastes. Their detailed personal and collective knowledge of the area, acquired and shared across generations, and their acute observational skills and the time spent travelling, hunting, trapping, and fishing on the land enable them to mark changes as they occur. In many instances, those changes have resulted in a fundamentally altered relationship between Indigenous people and the land, in particular with the Peace–Athabasca Delta system.

Indigenous people note changes in the PAD system that result from cumulative effects, including:

- Athabasca River and PAD water quality has been directly affected by upstream developments, notably by emissions and releases from oil sands developments. Indigenous people are very concerned that the water is no longer safe to drink, and that contaminants are also affecting the abundance and quality of harvested wildlife and the health of the PAD and its people in general.
- Athabasca, Peace, and Slave River flows, and water levels in the PAD, are diminished or altered due to water withdrawals (by oil sands producers and other upstream consumers of water), flow regulation, and the impacts of climate change. In addition to concerns about impacts on aquatic life, Indigenous people maintain that low water levels impede or prevent travel over traditional routes in the PAD to access important harvesting or cultural sites, thereby infringing upon the exercise of their Aboriginal and treaty rights, as well as the ability to remain connected to their lands and culture.
- Flow regulation by the W.A.C. Bennett Dam in BC has affected the seasonality of Peace River and Slave River flows. Indigenous people are very concerned that lower spring and summer water levels and fewer ice jam floods have caused some perched lakes to dry out, and have caused changes to habitat and vegetation (i.e., increasing the extent of thistle). Changes to the Peace River flow regime during fall and winter create a “double pulse” of flows and two freeze-ups. Indigenous people have identified that this results in drowned muskrats and bank-dwelling beavers, that it further reduces the possibility of ice jam floods in the spring. It creates unsafe travel conditions across ice in the winter. Another major dam on the Peace River at Site C (Figure 1) has now been approved and Indigenous people are concerned that it will have similar impacts, not only in the PAD, but in the Slave and Mackenzie River deltas as well.
- Climate change is further altering flow patterns. With warmer and shorter winters, ice thickness is also diminished, reducing the likelihood of the ice jam flooding required to replenish perched basins.
- Forest fires are causing greater harm now in the face of reduced ecosystem resilience. While fire is an integral part of the natural cycle, forest fires in the PAD and WBNP now cause greater harm. Since the land is drier, forest fires are more frequent, more intense, burn deeper into the soil, and cover larger areas.



Elder Henry Beaver of the Salt River First Nation provides cultural programming at a Bioblitz event in Wood Buffalo National Park. Parks Canada Photo

Stressors, pathways of effect and outcomes based on Indigenous Knowledge are further illustrated in Figure 3.

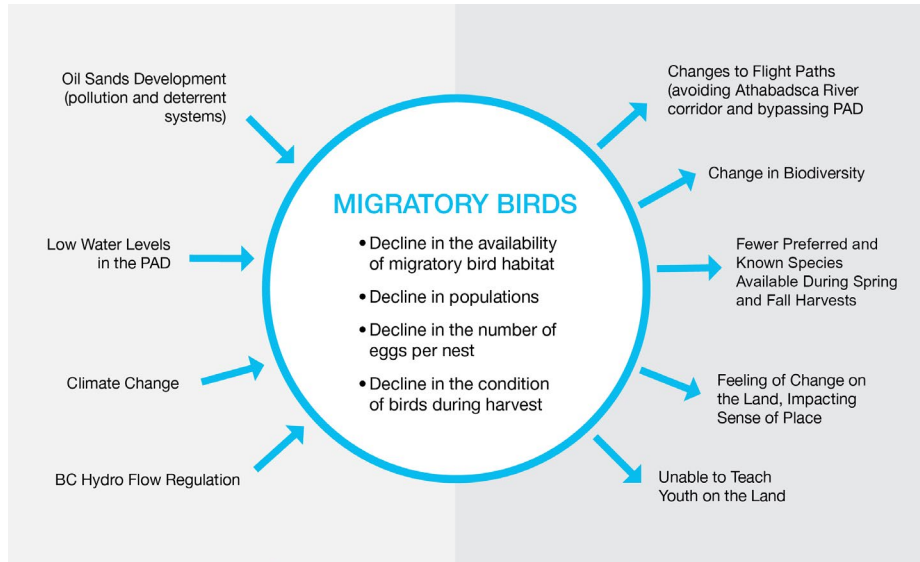


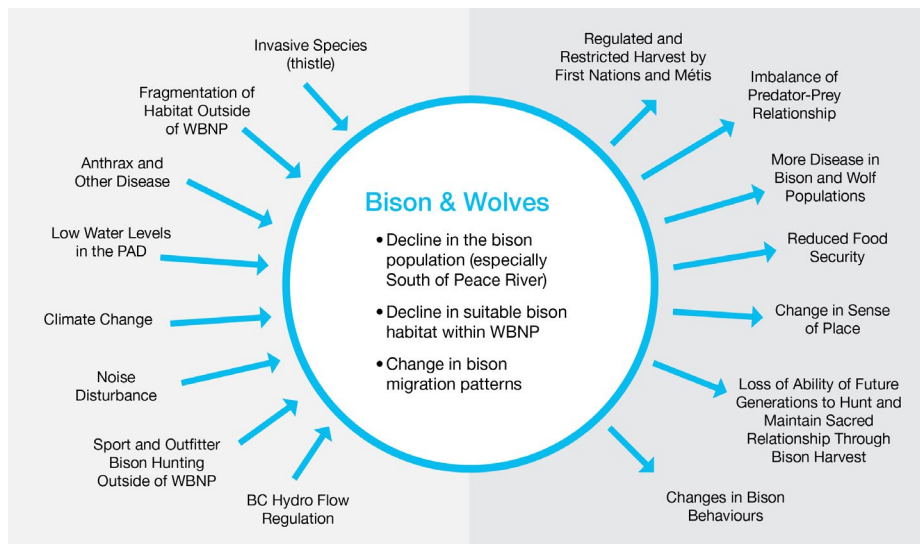
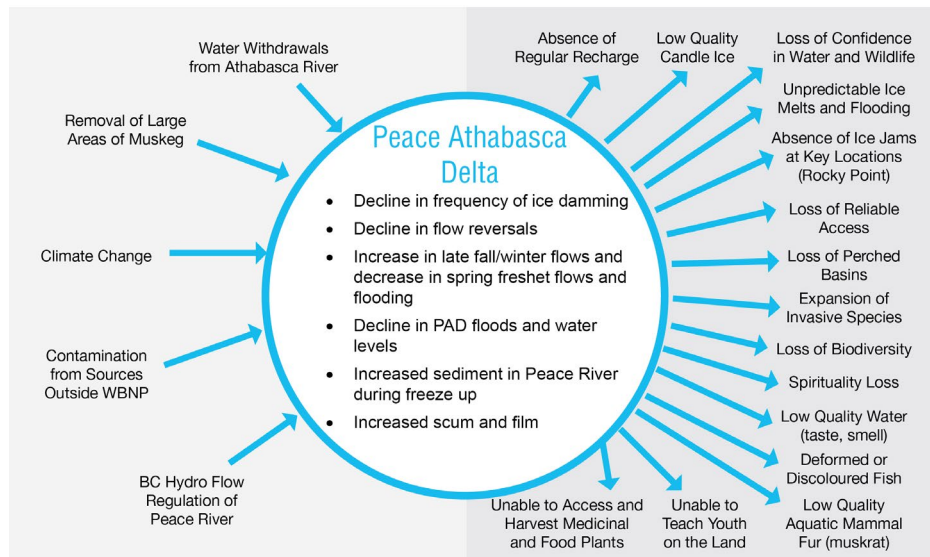
Figure 3: Key Stressors, conditions, and outcomes based on Indigenous Knowledge.⁷

3.3 Indigenous People and the Establishment of Wood Buffalo National Park

Archaeological evidence indicates that Indigenous people have inhabited the region that is now Wood Buffalo National Park for more than 8000 years. The long history of Indigenous people and their relationships to the lands and waters of the region is, of course, fundamental to a fulsome understanding of the impacts of the establishment of national parks and the designation of the world heritage site on the lived experiences of Indigenous people.

First Nations people in the area of WBNP signed Treaty 8 with Canada in 1899 and 1900 with the understanding that they would have the right to continue their traditional lifestyles and livelihoods. This includes the right to hunt, fish, and trap, in perpetuity without interference, not just in their own traditional territory but throughout all of Treaty 8 land.

After Treaty 8 was signed, these treaty rights were constrained by government legislation that regulates harvesting, as the treaty contemplated lands to be “taken up” and also provided for government to regulate the treaty rights granted.



⁷ MCFN, 2018a. Workshop on the development of the SEA with representatives of Mikisew Cree First Nation. Independent Environmental Consultants (IEC) and Parks Canada, February, 2018.



Harvesting goose grass in the Peace–Athabasca Delta is a traditional activity for local Indigenous people in Fort Chipewyan. Photo by Tim Gauthier/Parks Canada

At the time the park was originally established in December, 1922 (north of the Peace River), the government understood that it was not reasonable or appropriate to eliminate harvesting within the park, given its size and importance to the people of the area. Instead, harvesting practices were allowed to continue, under a permit system, but only by First Nations people. The Métis were excluded, and have only recently begun harvesting in the park once again. Traditional harvesting was regulated in the park by issuing permits in limited numbers.

In December, 1926, WBNP was expanded south of the Peace River into the Peace–Athabasca Delta area, largely to accommodate introduced bison herds which were moving beyond the southern boundary of the existing park. As part of this expansion of the park, all persons (both Indigenous and non-Indigenous) who were harvesting in the newly expanded park area at the time were eligible for harvesting permits.

"The Government of Canada recognizes Aboriginal and treaty rights within the park and the importance of First Nations and Métis communities having strong connections to their traditional territories."



In both the original 1922 establishment and the later 1926 expansion of the park, federal government policies led to the exclusion of members within Indigenous communities to harvest, trap, and fish within the park. This exclusionary policy resulted in divisions between and within Indigenous communities.

This history of park establishment, along with harvesting regulation, has been a negative one for First Nations and Métis peoples. They experienced hardship as a result of these policies, which prevented them from maintaining traditional ways of life that have been practiced for generations.

Today, the Government of Canada recognizes Aboriginal and treaty rights within the park and the importance of First Nations and Métis communities having strong connections to their traditional territories. While recognizing efforts by Parks Canada to improve relationships and advance cooperative management of WBNP, First Nations and Métis seek a renewed relationship with park management authorities, one that will support shared decision-making in park management based on recognition of rights, respect, co-operation, and partnership.

4.0

WBNP Management
Context

Salt lends a wintry hue to this summertime scene in the Salt Plains of Wood Buffalo National Park.
Photo by John McKinnon

The division of powers within Canada's federal system allows for distinct, but sometimes overlapping, areas of responsibility between the federal government and the provinces and territories. The federal government, specifically Parks Canada, has the federal mandate and authority to protect and manage WBNP and the WHS. The Government of Alberta and the Government of the Northwest Territories are responsible for land-use planning, environmental and resource management, and protected areas management within their respective jurisdictions outside of WBNP, including on the park boundaries.

The Government of British Columbia has jurisdiction over local works and undertakings (including hydro-electric facilities) in the Province of British Columbia. For an overview of the legislation which applies to WBNP, and of the provincial and territorial legislation that applies to lands outside WBNP boundaries, see Appendix D.

The Government of Canada is a signatory to an array of international agreements; these cover a range of cross-cutting issues including heritage, biodiversity and environmental protection and are addressed domestically through federal and provincial legislation that advances the objectives of the relevant agreements. With respect to the management of WBNP WHS, the most relevant agreements are the *Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)* and the *Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention)*. Canada is also a signatory to many other international agreements pertaining to the conservation of biodiversity and environmental protection which are relevant to national parks in Canada.

4.1 Collaboration

Reconciliation and Collaboration with Indigenous Governments and WBNP

The Crown, alongside all levels of government, is working to overcome the challenges that exist through the history and legacy of colonization. As relationships with Indigenous peoples continue to advance and grow, the governments of Canada, British Columbia, Alberta, and the Northwest Territories are committed to achieving reconciliation with Indigenous peoples and implementing principles and objectives of the United Nations Declaration on the Rights of Indigenous Peoples.

Each jurisdiction is developing ways to renew relationships with Indigenous peoples and achieve reconciliation based on rights, respect, cooperation and partnership. Reconciliation efforts in Canada are guided by the United Nations Declaration on the Rights of Indigenous Peoples,⁸ the Truth and Reconciliation Commission's Calls to Action,⁹ constitutional values, and collaboration with Indigenous peoples.

⁸ www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf

⁹ "The Truth and Reconciliation Commission of Canada (TRC) was officially launched in 2008 as part of the Indian Residential Schools Settlement Agreement (IRSSA). Intended to be a process that would guide Canadians through the difficult discovery of the facts behind the residential school system, the TRC was also meant to lay the foundation for lasting reconciliation across Canada." (www.thecanadianencyclopedia.ca/en/article/truth-and-reconciliation-commission)

At WBNP, park managers work with 11 Indigenous partners both on a collective and bilateral basis. Due to the diverse geography of the park and differing histories of interaction with the park, Indigenous partners have different perspectives. Since 2014 park management has worked collectively with Indigenous partners through the Aboriginal Committee for the Cooperative Management of Wood Buffalo National Park (CMC). Parks Canada and its CMC partners recognize that there is much work to be done in strengthening the cooperative management committee, with a view to increasing engagement of all Indigenous partners in park management, and to providing a more meaningful role in decision-making. These efforts toward shared park management, together with acknowledgement of past wrongs, are steps toward reconciliation based on mutual recognition and respect.

The role of Indigenous governments in land and water governance outside of WBNP varies by jurisdiction. Indigenous governments in the provinces are engaged in provincial land-use planning processes and are consulted about land and water management decisions. In the Northwest Territories, the Northwest Territories Lands and Resources Devolution Agreement,¹⁰ land claim agreements and the *Mackenzie Valley Resource Management Act* enable Indigenous governments to play a more direct role in decision making through membership on land and water boards, environmental review boards and a variety of other formal and informal processes.

Inter-jurisdictional Collaboration

Transboundary Water Management

The Mackenzie River Basin Transboundary Waters Master Agreement commits the Governments of Canada, Saskatchewan, Alberta, British Columbia, Yukon, and Northwest Territories to manage the water resources of the basin in a manner consistent with the maintenance of the ecological integrity of the basin's aquatic ecosystem, including the PAD. The Master Agreement also provides for establishing bilateral water management agreements between provinces and territories that further commit the jurisdictions to work cooperatively to meet this goal. Agreements relevant to WBNP OUV have been completed (Alberta–NWT) and other negotiations are ongoing (Alberta–BC and Alberta–Saskatchewan).

Environmental Assessment

Parks Canada, along with other federal government departments and agencies, participates in joint federal-provincial environmental assessment processes regarding major development proposals that have the potential to impact the park (in particular, hydroelectric and oil sands development projects). In such reviews of major development proposals, Parks Canada provides scientific and technical expertise or knowledge in accordance with its federal departmental mandate.



The nesting ground of the Whooping Crane was a key reason for Wood Buffalo National Park inscription as a World Heritage Site. Photo by Wayne Lynch, Parks Canada



"Each jurisdiction is developing ways to renew relationships with Indigenous peoples and achieve reconciliation based on rights, respect, cooperation and partnership."

The TRC made a number of recommendations ("Calls to Action") to redress the legacy of residential schools and advance the process of Canadian reconciliation. (nctr.ca/assets/reports/Calls_to_Action_English2.pdf)

10 Signed on June 25, 2013, this agreement transferred responsibility for public land, water and resource management in the Northwest Territories from the federal department of Aboriginal Affairs and Northern Development Canada (AANDC) to the GNWT on April 1, 2014.



Left to right (photo credit ECCC, C. Hebert): Jessica Lankshear (PCA), Jason Straka (PCA) Measuring colonial waterbird eggs prior to their collection for laboratory analysis. Egg Island Ecological Reserve, Lake Athabasca, June 2015.

Research and Monitoring

The impacts on WBNP from stressors originating outside the park are studied and monitored by Parks Canada and a range of other organizations, including other federal and provincial government departments and agencies, local Indigenous governments, and academic institutions. Collaborative efforts include the Peace–Athabasca Delta Ecological Monitoring Program (PADEMP). This multi-stakeholder group consists of Indigenous governments, and government and non-governmental organizations whose mandate is to measure, evaluate, and communicate the state of the delta using both science-based and Indigenous Knowledge.

Additionally, the Oil Sands Monitoring Program (OSM) is a comprehensive joint federal-provincial effort to monitor the impact of oil sands development in the Lower Athabasca Region, including aspects of biodiversity, water quality and quantity, and air quality. Two independent advisory panels, the Indigenous Wisdom Panel and the Science Advisory Panel, have also been established in legislation by Alberta to ensure that the scientific integrity of the provincial environmental science program includes Indigenous Knowledge to inform our understanding of the condition of the environment. Both PADEMP and OSM collaborate with the Mikisew Cree First Nation/Athabasca Chipewyan First Nation Community-Based Monitoring (CBM) programs, through which community members use both science-based and Indigenous Knowledge to monitor environmental and traditional use conditions in the PAD. CBM efforts include monitoring water quantity (depth), water quality, ice thickness, snow depth and contaminants in wildlife in the PAD.

4.2 International Agreements

As a State Party to the *Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)*, Canada recognizes its responsibilities related to identifying, protecting, conserving, presenting and transmitting cultural and natural heritage to future generations. Canada is committed to managing WBNP in accordance with its approved Statement of Outstanding Universal Value (see <https://whc.unesco.org/fr/list/256/>) and the guidance provided to countries under the *World Heritage Convention*.

Canada provides regular updates on the state of conservation of WBNP by informing the WHC of any projects that might affect its OUV. Canada also responds to requests made by the WHC, the WH Committee, or both pertaining to state of conservation issues affecting WBNP WHS, as was the case in 1989, 1991, 1992, 2002, 2003, 2004, 2015, 2017, and 2018.



A Whooping Crane tends to its chick in the vast network of wetlands that make up the Whooping Crane's nesting area in northern Wood Buffalo National Park. Photo by Klaus Nigge

5.0

Strategic Environmental Assessment



The Peace–Athabasca Delta. Parks Canada Photo

In 2015, the WH Committee requested that Canada undertake a Strategic Environmental Assessment (SEA) of the cumulative impacts of all developments (including hydroelectric dams, oil sands development, and mining) on the world heritage values (OUV) of WBNP. The SEA was completed in May 2018.

Considering the pace, scale, and complexity of potential threats to WBNP, the overall objective of the SEA was to assess the cumulative impacts of all developments on the world heritage values of WBNP in a way that is inclusive of Indigenous

Knowledge and science. Specific objectives were: 1) to improve the identification, recognition, and management of cumulative effects impacting WBNP; 2) to inform the scope and support the effectiveness of project-level environmental assessments; and 3) to influence the development and implementation of the Action Plan for the protection of the world heritage values of WBNP, by providing recommendations for consideration by the responsible jurisdictional authorities involved in developing the Action Plan.

These objectives were for the related purposes of protecting the world heritage values of the site, maintaining or restoring the ecological integrity of WBNP, and maintaining or restoring Indigenous ways of life. The SEA did not initiate any new studies but rather relied on an extensive review of information and materials provided by experts, including representatives of Indigenous governments (leadership, knowledge holders, land users, and advisors), researchers, industry, stakeholders, and federal and provincial governments.

Key Results

A key result of the SEA was a set of desired outcomes for each element of OUV (Table 1). Action Plan measures will be directed toward supporting the achievement of these desired outcomes.

Table 1: Elements of Outstanding Universal Value and Desired Outcomes (Source: Strategic Environmental Assessment of Wood Buffalo National Park World Heritage Site).

Criterion – OUV Statement (verbatim text)	Listing of Individual OUV Elements for this Criterion	Interpreted Meaning	Desired Outcomes
<i>Criterion (vii): “The great concentrations of migratory wildlife are of world importance and the rare and superlative natural phenomena include a large inland delta, salt plains and gypsum karst that are equally internationally significant.”</i>	i. Great concentrations of migratory wildlife of world importance	<p>Migratory wildlife means migratory waterfowl* populations that make seasonal use of WBNP.</p> <p>Migratory waterfowl from four continental flyways converge in great numbers on the PAD for staging and breeding habitat.</p> <p>*Waterfowl is understood in this context to include water birds, gulls, shorebirds, and cormorants.</p>	<ul style="list-style-type: none"> Great concentrations of viable, healthy populations of migratory waterfowl species continue to use WBNP seasonally. Adequate quantity and quality habitat, unimpaired by contamination, is available for migratory waterfowl to fulfil all key life cycle stages while present in WBNP.



The Salt Plains of Wood Buffalo National Park in summer. Parks Canada photo

Criterion – OUV Statement (verbatim text)	Listing of Individual OUV Elements for this Criterion	Interpreted Meaning	Desired Outcomes
			<ul style="list-style-type: none"> Indigenous governments are able to maintain traditional harvest of waterfowl species and practice their way of life with confidence in healthy, sustainable and accessible populations of waterfowl.
	ii. Large inland delta (Peace–Athabasca Delta (PAD))	Portion of the Peace–Athabasca Delta within WBNP (80%), with consideration of the portion of the PAD outside of the park. The Delta is understood to include the ecological functions and ecosystems it supports, including vegetation, wildlife, and Indigenous communities within the Delta.	<ul style="list-style-type: none"> Flow regimes and water quality into the PAD maintain the ecological function of the ecosystem. Flow regimes and water quality into the PAD sustain vegetation communities and healthy and abundant populations of key ecological and cultural species including waterfowl, muskrat, fish, bison and wolves. Indigenous governments have access to the PAD and are confident enough in the health of the PAD to maintain traditional use and way of life through hunting, fishing, gathering, and cultural activities.
	iii. Salt plains	Salt plains area within WBNP	<ul style="list-style-type: none"> The salt plains remain aesthetically, ecologically and geologically unique in Canada, providing habitat for salt tolerant plants, grazing bison and nesting / staging waterfowl.



Visitors tour the lunar landscape and glacial erratics of Grosbeak Lake. Photo by Charla Jones/Parks Canada

Criterion – OUV Statement (verbatim text)	Listing of Individual OUV Elements for this Criterion	Interpreted Meaning	Desired Outcomes
	iv. Gypsum karst	Gypsum karst topography within WBNP.	<ul style="list-style-type: none"> Gypsum karst topography in WBNP remains intact and functioning within natural parameters. The karst landforms in the park continue to provide some of the finest examples of collapse and pond sinkholes in the world.
<i>Criterion (ix): “Wood Buffalo National Park is the most ecologically complete and largest example of the entire Great Plains–Boreal grassland ecosystem of North America, the only place where the predator-prey relationship between wolves and Wood Bison has continued, unbroken, over time.”</i>	i. Ecologically complete Great Plains – Boreal grassland ecosystem.	The boreal forests and vast sedge meadows of the PAD (the largest undisturbed grasslands in North America) and smaller but numerous meadows north of the Peace River.	<ul style="list-style-type: none"> All species and community representatives of the Great Plains–Boreal grassland are present and functioning. These grasslands continue to provide important grazing and calving areas for Wood Bison.
	i. Intact predator-prey relationship between wolves and Wood Bison.	Intact predator-prey relationship between wolves and Wood Bison. Includes all bison herds that spend time in the park.	<ul style="list-style-type: none"> The predator-prey relationship between wolves and Wood Bison that spend time in the park remains intact and within natural ranges of variation. Populations of both species remain viable, evolve as naturally as possible and support Indigenous traditional use and ways of life.

Criterion – OUV Statement (verbatim text)	Listing of Individual OUV Elements for this Criterion	Interpreted Meaning	Desired Outcomes
<i>Criterion (x): “Wood Buffalo National Park contains the only breeding habitat in the world for the Whooping Crane, an endangered species ... The park’s size (4.5 million ha), complete ecosystems and protection are essential for in-situ conservation of the Whooping Crane.”</i>	1. Whooping Crane breeding habitat	Whooping Crane habitat within the WBNP. Includes habitat and population.	<ul style="list-style-type: none"> Habitat continues to support recovery strategy goals for breeding pairs and demonstrates resilience to climate change impacts. Whooping Crane population reaches the recovery strategy goal. Recovery and down listing from endangered status.

The Action Plan is further informed by the SEA’s evaluation of trends in the desired outcomes for elements of the site’s OUV. Trends for most OUV elements are either positive or stable. This includes the trends for the karst landscape, the salt plains, the Great Plains-Boreal grasslands species and communities, and the Whooping Crane population and habitat (Table 2). The SEA identified areas of concern related mainly to a suite of valued components related to the OUV of the Peace–Athabasca Delta (Table 3), including:

- **Migratory waterfowl populations:** Indigenous Knowledge indicates that populations of waterfowl that have typically stopped in WBNP during migration have shifted their migration routes to other areas. Climate change and changes in the hydrological regime of the PAD have also decreased the quantity and quality of habitat for waterfowl. As a result, the ability of Indigenous governments, people, and communities to practice their traditional way of life is being negatively impacted, and desired outcomes for the world heritage values are not being met.

- **The Wood Bison population and the grasslands in the PAD that support it:** More analysis is needed to understand the current status of the wolf-bison population dynamics and the impacts on bison of habitat changes in the PAD. Nevertheless, bison do not adequately support Indigenous ways of life in the park because bison harvest in the park is prohibited due to the threatened status of the species. For Indigenous people, this results in reduced food security, an altered sense of place, and inability of future generations to maintain sacred relationships through bison harvest.

- **The Peace–Athabasca Delta:** In the PAD, the SEA found that most current stressors and valued components are showing negative trends (Table 3). Seasonal flows in the Athabasca River have declined over the past fifty years, primarily due to the impacts of climate change (with the impact of increasing water withdrawals being a very small contributing factor). Similarly, climate change is affecting ice conditions and flows on the Peace River. Flow regulation by the construction of the W.A.C. Bennett Dam in the 1960s has led to decreased summer flows and increased winter flows on the Peace River. More analysis is required to understand the interaction between altered flows on the Peace River, reduced seasonal flows on the Athabasca, climate change, lower peak water levels, and the extent of open water in the PAD. Indigenous land users in the PAD also report noticeable changes in the quality of surface water in the rivers and lakes of the PAD, and are concerned about contaminant levels in fish, wildlife, and people.



The Salt Plains. Parks Canada Photo



Fall colours on the escarpment overlooking the Salt Plains of Wood Buffalo National Park. Photo by John McKinnon/Parks Canada

Table 2: Summary of evaluation of desired outcomes (Source: Strategic Environmental Assessment of Wood Buffalo National Park World Heritage Site).

Desired Outcome	Trend	Desired Outcome	Trend
Salt Plains: remain aesthetically, ecologically, geologically unique in Canada	→	Indigenous groups able to maintain traditional harvest of waterfowl & way of life with confidence in healthy, sustainable and accessible waterfowl populations.	↓
Gypsum karst topography in WBNP remains intact / functioning within natural parameters.	→	The wolf-bison predator-prey relationship remains intact and within natural ranges of variation.	?
Karst landforms provide some of the world's finest examples of collapse and pond sinkholes.	→	Wolf and bison populations remain viable, evolve naturally and support Indigenous traditional use and ways of life.	→
All Great Plains-Boreal grassland species and communities are present and functioning.	→	Whooping Crane habitat continues to support recovery goals for breeding pairs, demonstrates resilience to climate change.	→
Grasslands continue to provide important grazing and calving areas for Wood Bison.	↓	Whooping Crane population reaches recovery goal / species down-listed	↑
Adequate habitat available for migratory waterfowl life cycle stages while in WBNP.	↓		
Great concentrations of migratory waterfowl continue to use WBNP seasonally.	↓		

Legend: Stable Trend in Condition: → Improving Trend in Condition: ↑ Declining Trend in Condition: ↓

Table 3: Current stressors and trends in the PAD system (Source: Strategic Environmental Assessment of Wood Buffalo National Park World Heritage Site).

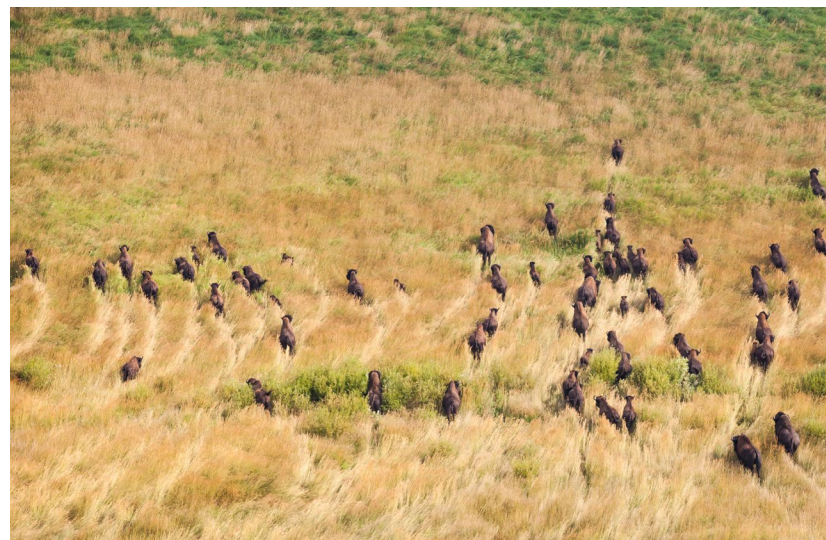
Valued Component	Trend
Peace River Seasonal Flows	↓
Peace River Sedimentation	↓
Ice Jam Recharge	↓
Open Water Recharge	↓
Lake Athabasca Water Levels	↓
Athabasca River – Annual and Seasonal Flows	↓
Central PAD Lake Water Levels	↓
PAD Water Quality	↘ →
Athabasca River Water Quality	↓

Valued Component	Trend
Groundwater Quality and Quantity	?
Air Quality	↓
Sufficient Water for Indigenous People to Exercise Treaty Rights	↓
Indigenous Access and Enjoyment of PAD	↓
Wildlife Quantity and Habitat	↓
Migratory Bird Quantity, Quality and Habitat	↓
Vegetation Quantity and Quality	↓
Fish Quantity, Quality and Habitat	↓

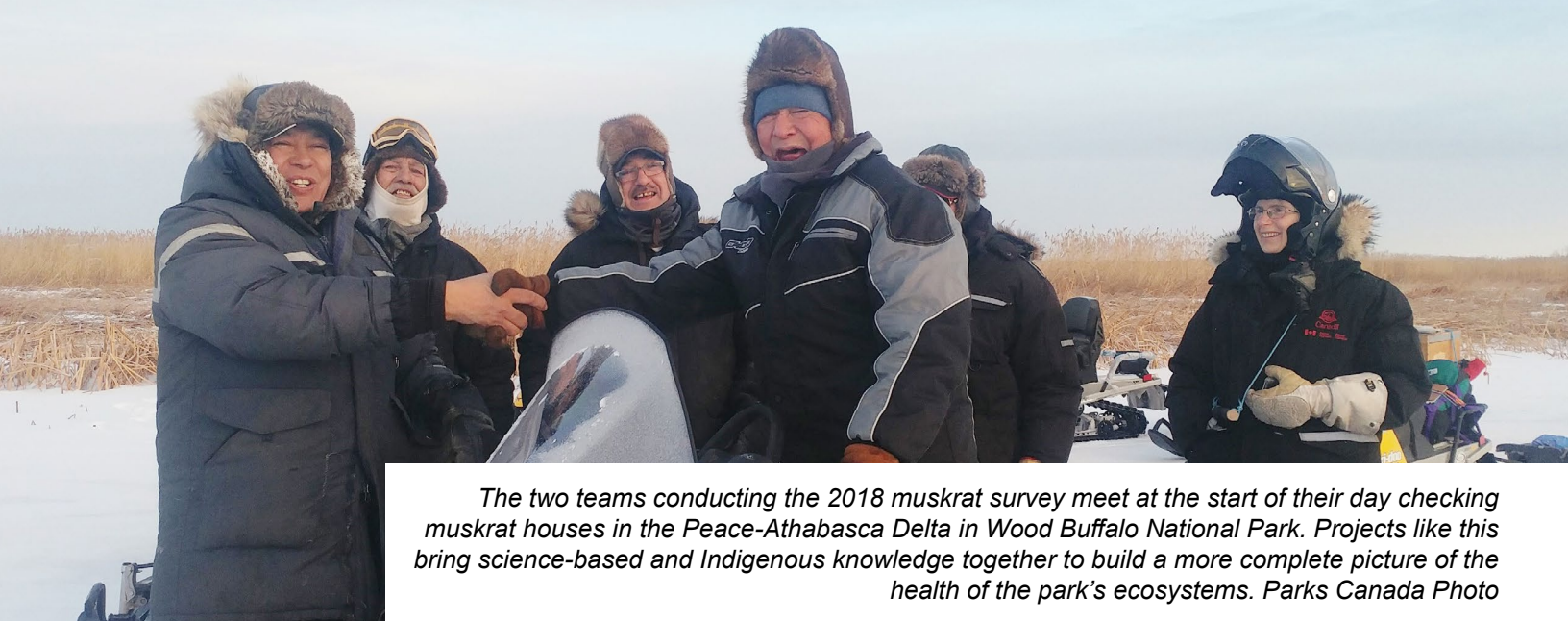
Legend: Stable Trend in Condition: → Improving Trend in Condition: ↑ Declining Trend in Condition: ↓

Further evaluation of the cumulative impact of future development and climate change on the world heritage values was subsequently undertaken. However, this was only possible for migratory waterfowl, the PAD, and Whooping Cranes. With the PAD and migratory waterfowl desired outcomes already not being met and showing negative trends, the predicted future trends of these desired outcomes are also negative. The trend of Whooping Crane population-related desired outcomes were expected to continue to be positive.

Building on these analyses, the SEA provided numerous recommendations (Appendix B) related to research, monitoring, and restoration actions required to meet the desired outcomes for the OUV of the site.



A herd of Wood Bison thunder across the boreal prairie of the Peace–Athabasca Delta. Photo by Charla Jones, Parks Canada



The two teams conducting the 2018 muskrat survey meet at the start of their day checking muskrat houses in the Peace-Athabasca Delta in Wood Buffalo National Park. Projects like this bring science-based and Indigenous knowledge together to build a more complete picture of the health of the park's ecosystems. Parks Canada Photo

6.0 Action Plan

6.1 Action Plan Themes

The Action Plan is organized around seven themes that correspond to specific recommendations from the RMM report (see Appendix A). These seven themes and their associated recommendations are:

- Strengthening Indigenous Partnerships with Wood Buffalo National Park (IP) (recommendations 1, 12, 13, 14)
- Environmental Assessment (EA) (recommendations 4, 5, 8, 9)
- Conservation Area Connectivity (CC) (recommendations 10, 11)
- Tailings Ponds Risk Assessment (TP) (recommendation 6)
- Environmental Flows / Hydrology (EFH) (recommendations 3, 7)
- Monitoring and Science (MS) (recommendations 2, 17)
- Wildlife and Habitat Conservation (WH) (recommendations 15, 16)

Desired outcomes for the OUV of the site were developed through the SEA (Table 1). Actions taken under the Action Plan will contribute to maintaining or, where necessary, improving desired outcomes identified during the SEA process.

6.2 Principles Guiding Action / Adaptive Management

The following principles, co-developed by representatives of federal, provincial, territorial, and Indigenous governments participating in the development of this plan, provide the foundation for identifying and implementing the actions required to protect the OUV of WBNP.

Transparency and Communication: The development and implementation of this Action Plan will be communicated in a genuine, open, and easy to understand manner.

Commitment to Action, Informed by Best Available Knowledge/Data: There is a commitment to take action, not a “plan to plan.” The group recognizes that sufficient knowledge does not necessitate complete knowledge. Wherever sufficient information exists to undertake an on-the-ground action, without causing undue risk or potential hardship, actions will be taken (and impacts monitored). An adaptive management approach will be employed (see below). This is consistent with taking a precautionary approach, such that the lack of scientific certainty regarding the risks posed by any action is not used as a reason to postpone or refrain from taking action.

Braiding of Science-based and Indigenous Knowledge: The equal value and unique contributions from these two ways of knowing are acknowledged. Wherever possible, the intention is to braid together the knowledge systems, acknowledging that *“there is a certain reciprocity amongst strands . . . each strand remains a separate entity, a certain tension is required [to hold the braid together], but all strands come together to form the whole.”*¹¹

Holistic View—“Water must work for all.”¹²: The broad-reaching nature of water necessitates a holistic lens, with a mindfulness of the broader view of the ecosystem, the people, and interconnections across the Mackenzie River Basin, of which the Peace, Athabasca, and Slave rivers are a part.

Cooperation, Unity, and Collaboration: Achieving the desired outcomes identified below will require the cooperation and collaboration of many different partners. Indigenous, federal, and provincial governments that have come together to develop this Action Plan intend to continue in collaboration through implementation, finding common ground, and points of unity.

*“We need to work together as partners. All of us.”*¹³

Reconciliation and Renewal: The Indigenous and federal, provincial and territorial governments are jointly committing toward building a respectful, renewed relationship, in the spirit of reconciliation and with a shared objective of improving the protection and management of the OUV of WBNP WHS.

Responsibility and Accountability:

A governance body will be established that is responsible and accountable for implementation of the environmental flows and hydrology aspects of the plan. The governance body creates a forum for cooperation and collaboration that will leverage the relevant work by partners and members and recommend actions to authorities within their sphere of decision making while not encroaching on their jurisdictional authority.

Adaptive Management

Actions described in this Action Plan will be implemented in the context of an adaptive management approach that allows the iterative application and refinement of strategies to achieve defined outcomes. Management actions are formulated as hypotheses, to ensure that monitoring can assess whether the intervention or action is meeting the need. Adjustments to actions are made as determined by this assessment, and the cycle continues until the desired outcome is achieved.

The relationship between the principles guiding action and the adaptive management approach, in support of achieving broad Action Plan outcomes, is illustrated in Figure 4.



Figure 4: Linkages between principles, adaptive management and Action Plan outcomes.

¹¹ Snively, Gloria and Wanosts'a7 Lorna Williams, 2016. Chapter 1 – Braiding Indigenous Science with Western Science. In *Knowing Home: Braiding Indigenous Science with Western Science*. University of Victoria, Victoria, British Columbia, edited by Drs. Snively and Williams.

¹² EFH Technical Working Group participant, 2018.

¹³ Elder Terry Marten, MCFN, July 31, 2018 to the EFH working group



Representatives of Mikisew Cree First Nation and Parks Canada meet in Fort Chipewyan to discuss the Peace-Athabasca Delta. Photo by Don Aubrey, Parks Canada

6.3 Theme: Strengthening Indigenous Partnerships with Wood Buffalo National Park

That relationship between park management and its 11 Indigenous partners has changed and evolved over time, as has been the case in Canada generally. The relationship continues to change. Work is underway to make the relationship fully reflective of Canada's overall efforts at reconciliation, and to meet the commitments stated most clearly in recommendations 1 and 13 of the RMM report. WBNP is committed to this exciting and challenging work, and to demonstrating that commitment to change by ensuring the Indigenous partners are deeply involved in the process of change, as well as the resulting change itself.

WBNP established a Cooperative Management Committee (CMC) in 2014. While all eleven Indigenous governments with an interest in managing WBNP are invited to participate, not all are fully engaged at this time. Several groups have expressed a preference for engagement through bilateral relationships with Parks Canada.

Early on, Parks Canada determined that improving the CMC process as a first priority (Recommendation 13) would help inform the changes needed to fully implement recommendations 1, 12 and 14 (see Appendix A). To expedite this, a series of meetings with the CMC have been held. Initially, a revised Terms of Reference (TOR) for the CMC was being developed. However, some Indigenous governments in the CMC have recently been questioning the need for a revised TOR and some feel that the focus needs to be on exploring the development of discrete collaborative policies around staffing and procurement. The CMC also wishes to see continued effort by Parks Canada to explore bilateral arrangements with Indigenous partners. Parks Canada and the Indigenous communities are in the early stages of this exploratory work. All parties agree that moving towards a more effective and refreshed CMC will be a priority.

The CMC and bilateral engagement provide greater involvement of all Indigenous partners in management decision making and in policy development. To start, park specific policies will be developed to facilitate greater involvement of Indigenous partners in their identified key interests of human resources and procurement. This work does not have an end date; rather it will proceed on a permanent basis. These new policy initiatives are targeted for completion and implementation in 2019.

Staffing changes flowing from Recommendation 12 are a priority and are underway with the involvement of Indigenous partners. As with the policy review, Parks Canada is committed to achieving these staffing changes within a collaborative process with the Indigenous partners, most notably those residing in Fort Chipewyan. While the broader policy work by the CMC continues on human resources, the Fort Chipewyan Indigenous partners are key members of the staffing boards for these new positions, serving as a tangible and immediate demonstration of WBNP moving towards a true partnership in management decision making.

Recommendation 14 will also be implemented starting in 2019, with guidance from the Indigenous partners. As with the other recommendations, the CMC will play a central role in directing the development of the training program, and will focus on this once the policy work is completed.

GOAL: Improved relationships between WBNP and its Indigenous partners results in improved, cooperative management of the park that meets the interests of all parties.

Actions	Lead	Timeline
IP1: CMC will identify core areas of immediate interest regarding the management of the site, and adjust its process as required to effectively address these areas of interest.	PCA	2018/2019
IP2: CMC will develop and adopt policies to meet the interests of all parties, in particular those related to the staffing of Indigenous persons, as well as a contracting policy to ensure that opportunities for Indigenous persons are enhanced.	PCA	2018/2019
IP3: Increase capacity for park management and staffing in Fort Chipewyan, to respond to the pressures facing the Peace–Athabasca Delta.	PCA	2018/2019
IP4: Develop and implement a training program for Wood Buffalo National Park staff designed to improve the evolving relationship with Indigenous communities.	PCA	2019/2020
IP5: Continue engagement through bilateral processes between First Nations and Métis groups where these have been established	PCA	Ongoing
IP6: Co-develop (with Indigenous partners) options for enhancing the profile of Indigenous content in WBNP and for recognizing Indigenous contributions to WBNP.	PCA	Ongoing

6.4 Theme: Environmental Assessment

The OUV of WBNP may be impacted by project-specific and cumulative effects of development external to the park. Actions related to this theme respond to recommendations 4, 5, 8, and 9 of the RMM report (see Appendix A). These actions also focus on considering the project and cumulative effects on the OUV of WBNP and on developing cumulative effects assessment and management frameworks. Actions related to this theme will occur through federal, provincial, and territorial environmental assessment and regulatory processes.

Environmental and Social Impacts Assessment of Hydropower Projects

The Site C Hydroelectric Project was approved in October 2014 (prior to Decision 39 COM 7B.18) after a cooperative environmental and socioeconomic assessment of the project was completed by the governments of Canada and British Columbia, including a Joint Review Panel. The specific framework for the assessment was set out in the Joint Review Panel Agreement (<http://www.ceaa-acee.gc.ca/050/documents/p63919/81725E.pdf>), and met many of the standards set out in the IUCN World Heritage Advice note referenced. Following its assessment, the Joint Review Panel concluded that “there would be no effects from the Project on any aspect of the environment in the Peace–Athabasca Delta” (JRP Report, page 42.). This conclusion was not supported by many of WBNP’s Indigenous partners.

“Water must work for all”



an authorization and undertake a new environmental assessment for a project that has been approved.

The Canadian Environmental Assessment Agency (CEAA) is active in verifying compliance with the *Canadian Environmental Assessment Act 2012* and conditions set out in the decision statement for a project. CEAA



Wood Buffalo National Park contains one of the world’s largest expanses of gypsum karst landscapes. Sinkhole lakes are a common feature of the park. Parks Canada Photo

There is no legal mechanism under federal legislation to suspend or negate



Salt River Aurora. Photo by John McKinnon

undertakes enforcement actions as necessary when violations arise. Since the Decision Statement for the Site C Project was issued, CEAA has been conducting inspections of the project to verify that BC Hydro is complying with the conditions.

With respect to other hydroelectric developments, Canada referred the proposed Amisk Hydroelectric Project on the Peace River to an independent review panel in 2016. The proponent is not expected to submit its Environmental Impact Statement until 2020. Canada is committed to working with the Government of Alberta and interested parties to amend the Guidelines for the Preparation of the Environmental Impact Statement to provide specific direction to the proponent regarding the consideration of the potential effects of the project on the OUV of the park, including the PAD, in its Environmental Impact Statement.

Canada is committed to ensuring that any future hydroelectric development projects conducted pursuant to federal environmental assessment legislation (CEAA 2012 or its successor) explicitly

consider both the incremental and cumulative impacts of upstream development on the OUV of WBNP. Canada is also committed to ensuring that these projects are aligned with the IUCN World Heritage Advice Note on Environmental Assessment and World Heritage, to the extent possible. In keeping with this commitment, two proposed run-of-the-river hydroelectric projects on the Athabasca River were referred to federal environmental assessment, due in part to the potential for impacts to the OUV. These proposals were later withdrawn by the proponent and are not currently proceeding.

Environmental and Social Impact Assessment of the Proposed Teck Frontier Oil Sands Mine Project

The proposed Frontier Oil Sands Mine Project has been undergoing an environmental assessment by an independent Joint Review Panel since May 2016. On August 24, 2017, together with the Alberta Energy Regulator (AER), the Government of Canada announced an amendment to the Joint Review Panel Agreement. The amendment mandated the independent Joint Review Panel to specifically consider and report on the potential environmental and cumulative effects of the project on the OUV of the WBNP WHS, including the PAD. The amendment was developed in consultation with interested parties. Immediately following the announcement, the Joint Review Panel requested additional information from the project proponent to address the changes to its mandate.

The Joint Review Panel held public hearings for the proposed Frontier project in late 2018. Federal authorities presented scientific and expert information and knowledge in relation to their federal departmental mandates to assist the Joint Review Panel assess the Frontier project. This included information about the OUV of WBNP. Indigenous governments, environmental non-government organizations, and stakeholders participated in these hearings to provide information and knowledge to the Joint Review Panel, and to present their views about the proposed project. The Joint Review Panel is currently preparing a report, for the federal Minister's decision, containing its conclusions and recommendations with respect to the Frontier Project. The Joint Review Panel is expected to submit its report in April 2019. Canada has committed to submitting the Joint Review Panel report to the World Heritage Centre upon receipt.

Consideration of WBNP OUV in Future Assessments

The Government of Canada is committed to ensuring that all current and future environmental assessments conducted pursuant to federal environmental assessment legislation explicitly consider potential specific and cumulative impacts of upstream development on the OUV of WBNP, where appropriate. The Government of Canada will also ensure that environmental assessments are aligned with the IUCN World Heritage Advice Note on Environmental Assessment and World Heritage, to the extent possible (www.iucn.org/sites/dev/files/import/downloads/iucn_advice_note_environmental_assessment_18_11_13_iucn_template.pdf).

GOAL: Ensure that the Outstanding Universal Value of the property is considered in environmental assessments where potential specific or cumulative impacts may occur on the OUV of WBNP, in particular in the Peace–Athabasca Delta.

Actions	Lead	Timeline
EA1: Refer the proposed Amisk Hydroelectric Project to an independent review panel.	CEAA	Completed 2016
EA2: Amend Guidelines for the Preparation of the Environmental Impact Statement for the Amisk Hydroelectric Project to direct consideration of potential effects of the project on the OUV of the park, including the PAD.	CEAA	2019-2020
EA3: Conduct an SEA on the potential of all developments to impact the OUV of the WBNP WHS, and submit to the WH Centre.	PCA	Completed 2018
EA4: Submit the SEA to the Joint Review Panel for the Teck Frontier Oil Sands Mine Project for consideration.	CEAA	Completed 2018
EA5: Amend the Joint Review Panel Agreement for Teck Frontier to mandate the Panel to consider and report on the potential environmental and cumulative effects of the project on the OUV of WBNP, including the PAD.	CEAA Alberta – AER (in consultation with Indigenous communities)	Completed 2017
EA6: Evaluate the potential effects of the Frontier Project on the OUV of the park and provide assessment to the Teck Frontier Joint Review Panel for its consideration in the environmental assessment.	CEAA	Completed 2018
EA7: Ensure that all current and future environmental assessment reviews conducted pursuant to federal legislation consider the specific and cumulative impacts on the OUV of WBNP and are aligned with the IUCN World Heritage Advice Note on Environmental Assessment and World Heritage, to the extent possible.	CEAA	2018-2019, and ongoing

Status of Environmental Assessment Legislation

The Government of Canada has made significant progress on its review of environmental and regulatory processes. In June 2017, the federal government released a discussion paper for public input on its proposed approach to environmental and regulatory processes. The discussion paper took into account input from other levels of government, Indigenous communities, and a wide range of stakeholders, as well as Expert Panel reports and Parliamentary Studies conducted over the previous year. After considering the public input that was received, the Government of Canada introduced proposed legislation (Bill C-69) in February 2018 that would put in place better rules to protect the environment, fish, and waterways. This includes conducting impact assessments on project proposals that may have an impact on national parks. The changes will ensure that decision-making is guided by the following principles:

- Fair, predictable, and transparent impact assessment and regulatory processes;
- Participation of Indigenous people in all phases of the assessment process that advances the Government's commitment to reconciliation and to the United Nations Declaration on the Rights of Indigenous Peoples;
- Inclusive and meaningful public engagement;
- Timely, evidence-based decisions reflecting the best available science and Indigenous Knowledge; and
- Scale of assessment aligned with the scale and potential impacts of the project.



A young Grey Wolf. The wolves of Wood Buffalo National Park are part of an predator-prey relationship with the Wood Bison that has remained unbroken over time. Parks Canada Photo



Placid lakeside settings in Wood Buffalo National Park draw visitors from all over the world. Parks Canada Photo

As Bill C-69 goes through the Parliamentary process, the Government of Canada will continue to listen to Canadians and engage with Indigenous people, provinces and territories, stakeholders, and the broader public.

Regional Planning, including Cumulative Effects Management Frameworks

Under the Land-use Framework, regional-level planning is underway in Alberta through the creation of regional plans for each of Alberta's seven land use regions. Alberta's land use regions are based on major watersheds. WBNP is located in Alberta's Lower Peace Region and is adjacent to the Lower Athabasca Region. The Lower Athabasca Regional Plan (LARP) establishes a 50-year vision by providing a blueprint to manage strong economic growth, decrease cumulative effects of development on the environment, and address social considerations in northeast Alberta.

In Alberta, regional land-use plans created pursuant to the Alberta Land Stewardship Act (ALSA) consider cumulative effects in managing development and growth. Environmental management frameworks established under the LARP are key tools for implementing cumulative effects management in the Lower Athabasca Region of Alberta. Management frameworks have regulatory backing under ALSA, and assist in managing long-term, regional scale cumulative effects by setting thresholds, triggers, limits, and/or targets. The following frameworks have been developed and implemented in the Lower Athabasca Region:

- i. Air Quality Management Framework for Nitrogen Dioxide (NO₂) and Sulphur Dioxide (SO₂)
- ii. Surface Water Quality Management Framework for the Lower Athabasca River
- iii. Surface Water Quantity Management Framework (SWQMF) for the Lower Athabasca River;
- iv. Groundwater Management Framework; and
- v. Tailings Management Framework for the Mineable Athabasca Oil Sands

LARP plays a key role in achieving cumulative effects management for the Lower Athabasca Region. This includes establishing and managing conservation areas and Environmental Management Frameworks (EMFs). Regional plans and EMFs have legislated adaptive management cycles embedded within them.

The LARP Review Panel Report was released in May 20, 2016. The Government of Alberta accepts the underlying principles of the LARP review process and has committed to address concerns raised in the review request process. These actions include implementing Indigenous Working Groups for the LARP. The working group discussions will:

- find ways to incorporate Indigenous Knowledge and information on traditional land use into Government of Alberta planning and environmental management;
- find ways in which the Government of Alberta can continue to meaningfully consult with Indigenous people when implementing the Lower Athabasca Regional Plan; and
- find ways to account for and address resource management/cumulative effects issues from the perspective of Indigenous peoples and the Government of Alberta.

The Indigenous Working Group model is intended to enhance First Nations and Métis consultation and engagement throughout the development, implementation, and ongoing review of Alberta's land-use plans. Best practices from other regions, including the Lower Athabasca Region, will be considered in future collaborations

between Indigenous people and the Government of Alberta on land-use planning and environmental management processes for the Lower Peace Region.

Specific to surface water quantity, the SWQMF's objective is that cumulative water withdrawals will be managed to support human and ecosystem needs, considering an acceptable balance between social, environmental, and economic interests. The SWQMF prescribes the management of cumulative oil sands mine water withdrawals from the river through a set of weekly flow triggers and withdrawal limits. It includes a preliminary Aboriginal Navigation Index (ANI) as one of the Adaptive Management Triggers. These triggers are designed to indicate when river flow or water use conditions are close to or outside of the modelled predictions that were used to develop the framework. The preliminary ANI has been included as recognition of the Athabasca River as an important navigational route.

Since early 2017, the Government of Alberta has been working with the Athabasca Region First Nations (ARFN), which consists of the Fort McKay First Nation, Athabasca Chipewyan First Nation, Mikisew Cree First Nation, and Chipewyan Prairie Dene First Nation, through a Collaborative Working Agreement process. This process is intended to supplement the work being done by the LARP Indigenous Working Groups.

Alberta Environment and Parks (AEP) and ARFN have also held practitioners' discussions on the LARP frameworks, including the preliminary ANI. As part of the implementation of the SWQMF, AEP will continue to work with the ARFN, other Indigenous peoples, and stakeholders to further develop the Aboriginal navigation component of the framework.

The SWQMF identifies a process for developing ecological indicators and triggers, based on additional monitoring and research. Two long-term ecosystem status indicators are under consideration: The Fish Sustainability Index and the Index of Native Fish Integrity. These indicators reflect cumulative effects from multiple stressors and are not solely influenced by water withdrawals. The SWQMF also acknowledges a number of ecological knowledge gaps and the need to address them over time. The SWQMF work will include developing a work plan to address the ecological knowledge gaps, as identified in the SWQMF.

GOAL: Continue work with Indigenous communities and stakeholders on Lower Athabasca Region environmental management frameworks.

Actions	Lead	Timeline
EA8: Continue to work with Indigenous communities and stakeholders on the Aboriginal navigation component of Alberta's Lower Athabasca Region Surface Water Quantity Management Framework for the Lower Athabasca River. This will include further development of the Aboriginal Navigation Index.	Alberta	2019-2020
EA9: Develop a work plan to address ecological knowledge gaps as identified in the Lower Athabasca Region Surface Water Quantity Management Framework for the Lower Athabasca River.	Alberta	2019-2020
EA10: Conduct an analysis of Oil Sands Monitoring Program water quality stations and parameters in the oil sands region. Include, where applicable, the Peace–Athabasca Delta to assess changes in water quality relative to limits of change and consider Indigenous community-based monitoring. This would be conducted for those elements that fall within the program's scope and mandate and respecting its governance structure.	Alberta – AEP; and Canada – ECCC (OSM)	2019-2020
EA 11: Integrate the findings of Oil Sands Water Quality analysis to inform updates to the Surface Water Quality Management Framework	Alberta – AEP	2019-2020
EA 12: Complete development of a cumulative effects environmental monitoring framework for the Oil Sands Monitoring Program under the programs' scope, mandate and governance structure.	Alberta – AEP; and Canada – ECCC (OSM)	2019-2023



Black bears are a common sight in Wood Buffalo National Park. Parks Canada Photo

6.5 Theme: Conservation Area Connectivity

The aim of this theme is to identify actions that collectively promote the functional connectivity and resilience of conservation areas in the Wood Buffalo region. Despite the relatively large size of WBNP, protected areas alone are not sufficient for long-term biodiversity conservation. To be successful, protected areas should be incorporated into regional networks of protected and conserved areas and integrated with landscape-scale land-use planning.¹⁴ Actions outlined in this theme respond to recommendations 10 and 11 of the RMM report. These recommendations refer to the need to ensure WBNP is supported by an ecologically connected landscape through the creation of effective buffer zones and land-use planning (see Appendix A).

Actions associated with this theme are presented in three broad categories related to improved connectivity and landscape integration of WBNP:

- **Establish Protected and Conserved Areas:** identifies actions for establishing buffer zones around WBNP by increasing the amount of protected and conserved areas adjacent to WBNP. These areas provide a key element to buffering the OUV of WBNP from potential stressors and promote regional connectivity.
- **Needs Assessment for an Ecologically Functional Network:** focuses on spatially defining key requirements for protecting representative ecosystems, wildlife populations, supporting habitats, and associated ecological processes (i.e., wildlife movement, predator-prey dynamics). An aim of this assessment is to determine the ecological functional needs of the OUV of WBNP WHS and provide a landscape-scale gap analysis that compares ecosystem requirements with existing and planned protected areas in the region.
- **Options Analysis for Effective Buffer Zones:** applies results for the gap analysis and develops scenarios for buffer zone options surrounding WBNP WHS. A focus of all these categories is to promote the landscape connectivity needs for wildlife represented by the OUV of WBNP WHS. Connectivity needs assessments will guide future conservation planning and/or management. They will target elements of OUV that represent specific species (migratory waterfowl, Wood Bison, Whooping Crane) and elements of OUV that represent major park ecosystems.

For elements that represent the major ecosystems of WBNP (Peace–Athabasca Delta and Great Plains–Boreal Grassland Ecosystem) actions listed below include collaborative workshops with Indigenous and non-Indigenous partners to further scope these OUV elements to identify additional species that should be included in the assessments. These scoping exercises will consider the key ecological and cultural attributes of these ecosystems in determining what additional species should be included.

There is a strong link to the “Monitoring and Science” and “Wildlife and Habitat Conservation” themes of the Action Plan in terms of ensuring world heritage values are protected through enhanced landscape connectivity in a regional network of protected and conserved areas.

Outcomes:

The actions identified below are intended to advance the following outcomes:

1. Improved connectivity for wildlife and supporting ecological processes
2. Increased ecological integrity and resiliency of the OUV of WBNP WHS
3. Improved connectivity for the protection and exercise of Aboriginal and treaty rights in WBNP
4. Strengthened relationships with Indigenous partners through respectful application of science-based and Indigenous Knowledge to conservation planning.

¹⁴ Margules, C. R., and Pressey, R. L. 2000. Systematic conservation planning. *Nature*. 405:243–253.



Tall grass lines the waterways of the Peace-Athabasca Delta, one of the world's largest freshwater deltas and a rich ecological habitat.
Parks Canada Photo

Establish Protected and Conserved Areas

Establishing protected and conservation areas adjacent to WBNP WHS is within the jurisdictional authority of the Government of Alberta and the Government of the Northwest Territories and occurs pursuant to related land-use and protected area planning processes led by these governments.

In Alberta, protected area establishment and landscape integration in the municipality of Wood Buffalo includes the Lower Athabasca Regional Plan (LARP) process supported by the *Alberta Land Stewardship Act*. This process promotes the development of cooperative management arrangements with various Indigenous communities to support Aboriginal rights and cultural values. It addresses RMM recommendations related to Indigenous partnerships. Achievements from LARP that directly support this theme of the Action Plan include:

- Five new or expanded protected areas were legally established in the Lower Athabasca Region in the Spring of 2018, adding 1.36 million hectares to the parks and protected areas system (Figure 5).
- With the remaining LARP commitments, the total conserved land in the region is over 2 million hectares, or 22% of the region.
- Three of the five new protected areas (Birch River Wildland Provincial park, Kazan Wildland Provincial Park, and Richardson Wildland Provincial Park) and the Caribou Mountains Wildland Provincial Park in the Lower Peace Region are directly adjacent to WBNP, and provide significant buffers and landscape connectivity to WBNP. The Birch River Wildland Provincial Park includes part of the Birch River watershed.
- Establishing new wildland provincial parks and expanding existing ones contributes to the conservation of more than 6.7 million hectares of boreal forest, the largest contiguous protected boreal forest in the world, under the guidelines of the International Union for Conservation of Nature.¹⁵



"In 2018, the Government of Alberta announced the establishment of new protected areas in the Lower Athabasca Region in proximity to Wood Buffalo National Park. These additions contribute to the conservation of more than 6.7 million hectares of boreal forest, the largest contiguous protected boreal forest in the world."

In addition, on December 13, 2018 the Government of Alberta announced its intention to establish a proposed Biodiversity Stewardship Area Wildland Provincial Park (BSA WPP) adjacent to and immediately south of WBNP. This innovative agreement between Indigenous communities, energy companies, and federal and provincial governments is expected to conserve more than 166,000 hectares of boreal forest. The proposed Biodiversity Stewardship Area (BSA) would be designated a wildland provincial park. This would conserve natural landscapes and watersheds just south of Wood Buffalo National Park, protecting habitat for caribou, the Ronald Lake Bison Herd, and other wildlife. The idea of a unique BSA was proposed by Mikisew Cree First Nation to safeguard their way of life to address concerns raised during the 2016 Reactive Monitoring Mission on Wood Buffalo National Park.

¹⁵ The news releases can be found at www.alberta.ca/release.cfm?xID=55951F7FBFC21-B342-F69F-2BB2163D213E56F7.

The BSA proposal is intended to achieve the following objectives:

- Support the exercise of treaty rights and traditional uses, and protect Indigenous culture and well-being into the future;
- Provide watershed protection from future development to support the Outstanding Universal Value of WBNP, including the PAD;
- Contribute to a buffer for WBNP UNESCO World Heritage Site; and
- Provide landscape connectivity, as the BSA is directly adjacent to WBNP and Birch River, Kazan, and Richardson Wildland Provincial Parks and protected areas as shown in Figure 5.

Potential conservation areas in the Lower Peace Region have also been identified, reflecting the Government of Alberta's commitment for conservation area planning in that region in alignment with regional planning. Candidate conservation areas in support of caribou range planning were also identified in the Lower Peace Region in Alberta's Draft Provincial Caribou Range Plan.

Healthy Land, Healthy People:
GNWT Priorities for Advancement of Conservation Network Planning 2016-2021 (HLHP) is a five-year work plan outlining how the Government of the Northwest Territories (GNWT) is moving forward collaboratively with conservation network planning in the NWT. Protected areas planning by the GNWT is guided by this document.

Under the auspices of regional land-use planning processes in the NWT, some community-based areas of interest adjacent to WBNP have also been identified, of which some overlap with candidate areas identified in the HLHP. Further progress on these areas and other areas identified for conservation objectives in the future will be accomplished through the coordination of established and future regional land-use planning processes in alignment with HLHP. The GNWT is committed to completing regional land-use planning in the NWT, including the Dehcho and southeastern part of the NWT, which both border WBNP. The GNWT proposes a government-to-government approach to planning with Indigenous Governments and Organizations in this region.

Alberta protected areas adjacent to Wood Buffalo National Park

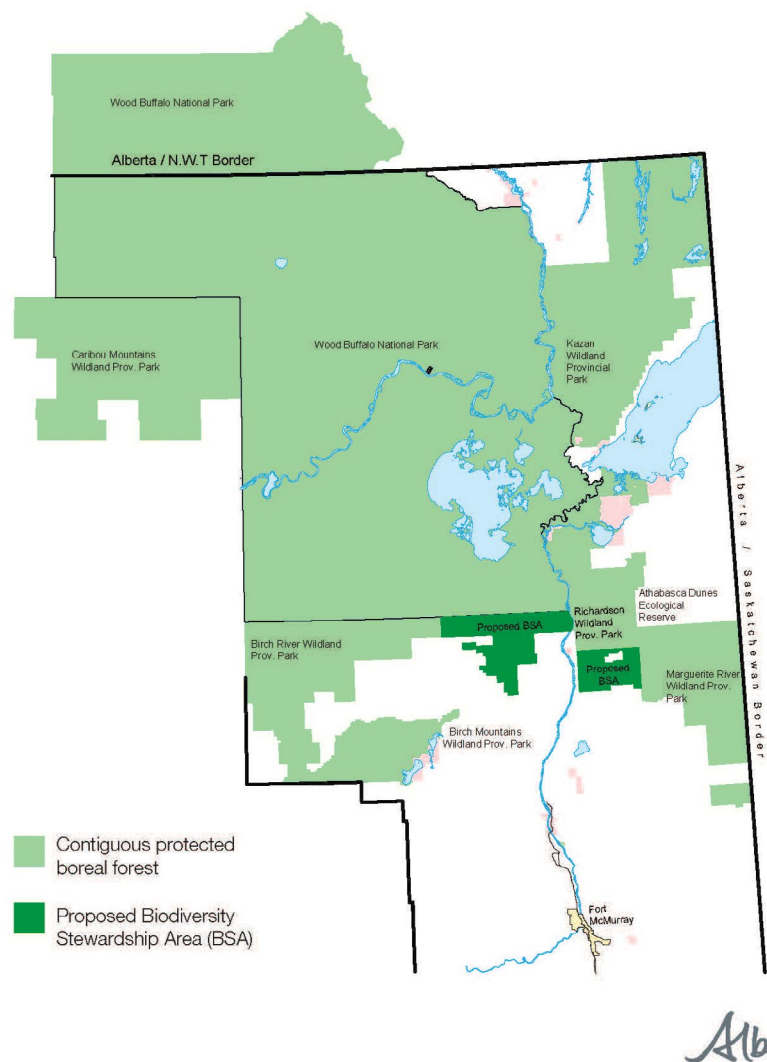


Figure 5: Alberta protected areas adjacent to Wood Buffalo National Park (Government of Alberta, 2019).

Establishing new protected areas throughout the Wood Buffalo region is further supported by the Pathway to Canada Target 1 initiative—a pan-Canadian effort to meet Canada's international commitments under the Convention on Biological Diversity.¹⁶

¹⁶ For information on Pathway to Canada Target 1, refer to: www.conservation2020canada.ca/

Through Canada Target 1, jurisdictions have committed to protect 17% of Canada's terrestrial and inland waters through a coordinated network of protected and conserved areas. This effort directly links, and supports, the efforts of this Action Plan to promote conservation area connectivity in the Wood Buffalo region and to enhance the landscape integration of the WBNP WHS.

GOAL: Within individual jurisdictions, establish buffer zones around WBNP through the establishment of adjacent protected and conserved areas.

Actions	Lead	Timeline
CC1: Establish five new and expanded conservation areas under the Lower Athabasca Regional Plan, adjacent to WBNP, to increase functional connectivity for OUV within WBNP.	Alberta – AEP	Completed 2018
CC2: Develop cooperative management arrangements with Indigenous communities ¹⁷ and organizations to help support traditional land use and cultural values, including the exercise of rights recognized under section 35 of the Constitution Act, 1982, for the five new and expanded wildland provincial parks under the Lower Athabasca Regional Plan.	Alberta – AEP	2019-2020
CC3: Advance (through discussions with Indigenous communities and stakeholders) the proposal for an additional conservation area on the land base known as the Biodiversity Stewardship Area immediately south of WBNP.	Alberta – AEP	Complete
CC4: Following months of collaborative discussions with Indigenous groups, industry, and other stakeholders, the Government of Alberta will consult on the creation of the Biodiversity Stewardship Area, which will designate the area as a wildland provincial park (protected area) from a multiple use land base with industrial tenure. The proposed protected area is about 166,110 hectares located directly south of WBNP.	Alberta – AEP	2018-2019
CC5: Develop cooperative BSA management arrangements with Indigenous communities ¹⁸ that support WBNP OUV (e.g., bison and watershed protection), as well as Indigenous cultural and traditional values, including the exercise of rights recognized under section 35 of the <i>Constitution Act</i> 1982.	Alberta – AEP	2019-2020
CC6: Integrate an Indigenous Guardian Program ¹⁹ to support Indigenous stewardship of the five new and expanded conservation areas under the Lower Athabasca Regional Plan, as well as the Biodiversity Stewardship Area.	Alberta – AEP	2019-2020, and ongoing
CC7: Advance conservation priorities under “ <i>Healthy Lands, Healthy People: Government of Northwest Territories: Priorities for Advancement of Conservation Network Planning – 2016 – 2021.</i> ”	NWT (in consultation with IGOs)	TBD
CC8: Advance regional land-use planning processes in areas surrounding WBNP	Alberta, NWT (in consultation with IGOs)	Ongoing
CC9: Enhance communication and explore opportunities for closer collaboration particularly under the Pathway to Canada Target 1 initiative.	Alberta, NWT, Canada – PCA, ECCC-CWS	2018-2019, and ongoing
CC10: In association with the Pathway to Canada Target 1, support efforts to establish new tools for conservation ²⁰ that contribute to conservation area connectivity in the WBNP region.	Alberta, Canada – PCA, ECCC-CWS	2018-2019, and ongoing

¹⁷ Cooperative management of Wildland Parks is in addition to and does not replace or discharge the Crown's legal duties to consult.

¹⁸ Cooperative management of the BSA is in addition to and does not replace or discharge the Crown's legal duties to consult.

¹⁹ For more information on the Indigenous Guardians Program see: www.ilinationhood.ca/our-work/guardians/

²⁰ New tools for conservation refer to recently developed pan-Canadian standards for protected areas, other effective conservation measures, and Indigenous protected and conserved areas. For more information see: www.scics.ca/en/product-produit/news-release-canadas-natural-legacy/

Needs Assessment for an Ecologically Functional Network:

To ensure that the OUV of WBNP is well buffered from surrounding land use and that conservation areas within the region are sufficiently connected, a landscape-scale needs assessment will be undertaken. This assessment will focus on the habitat and movement needs of key species (including, but not limited, to Whooping Crane and Wood Bison—including the Ronald Lake Bison Herd) that disperse in and out of WBNP into the surrounding region. These efforts will consolidate science-based and Indigenous Knowledge on the local ecology of these species and apply updated habitat suitability models at a landscape scale. The actions listed below will generate important information to support existing land-use planning and management processes, undertaken by the responsible jurisdictions, which will create an effective buffer zone around WBNP WHS and realize better synergies between the property and its immediate vicinity.

GOAL: Determine the ecological functional needs of the elements of OUV of WBNP WHS as they relate to conservation area connectivity.

Actions	Lead	Timeline
CC11: Consolidate Indigenous and scientific information on the habitat and dispersal requirements for key species through extensive literature review and community-based workshops.	PCA	2018-2019
CC12: Acquire existing data related to species occurrence and remote sensing for spatial analysis and mapping.	PCA	2018-2019
CC13: Identify and confirm information gaps through a follow up multi-partner workshop and identify plans to fill these gaps.	PCA	2019
CC14: Analyze assembled data and apply habitat and movement information acquired during workshops to develop a series of species-specific, landscape-scale, habitat suitability and connectivity maps.	PCA	2019-2020
CC15: Peer review and gather feedback on spatial models. Peer review will include follow-up workshops to identify accuracy, strengths, and weaknesses of resulting maps.	PCA	2019-2020
CC16: Generate a series of map packages for subsequent communications and planning purposes that describe the results of the modelling process and highlight habitat and movement needs for key species throughout the WBNP region.	PCA	2019-2020

Options Analysis for Effective Buffer Zones:

In Alberta, province-wide conservation gap analysis is already used to understand the contribution of sites to the current system, and to identify the need to establish new park lands for both conservation and recreation. The conservation gap analysis is based on a scientific framework that uses a coarse filter/fine filter approach. Coarse filter conservation targets have been set for all identified Natural Landscape Types in Alberta. They provide the basis for completing the parks system. The fine filter approach is used to identify gaps for species, communities, and features that are not captured in a coarse filter approach.

One of four priority actions identified in Alberta's Plan for Parks is to conserve landscapes, which includes identifying new parks to meet provincial recreation, tourism, and conservation goals. Through Alberta's Land-use Framework



One of thousands of small wetlands in the Peace-Athabasca Delta. Photo by J.F. Bergeron, Parks Canada

process, new lands are currently being identified to fill gaps in the system. Key criteria for conservation areas identified in regional plans are:

- Areas with little to no industrial activity;
- Areas that support Aboriginal traditional uses;
- Areas that are representative of the biological diversity of the area (e.g., landforms, species, vegetation); and
- Areas of sufficient size.

The previous two sections of this theme describe actions that will establish new protected areas adjacent to WBNP WHS that will contribute to an effective buffer zone and identify the landscape-scale habitat and movement needs of key OUV elements. This section brings these outputs together in a formal gap analysis that can inform future planning and management decisions. Leading edge tools and methods²¹ will be used to identify how the current network of protected and conserved areas can be efficiently augmented to increase the conservation area connectivity of the region, focusing on areas of the WBNP region that have not completed a conservation area planning process (e.g., Lower Peace Region in Alberta).



Whooping Crane. Parks Canada Photo

GOAL: Identify potential gaps in the maintenance of OUV that can guide future conservation planning and/or management.

Actions	Lead	Timeline
CC17: Conduct workshop on spatial priorities for conservation, including objectives for a gap analysis on areas in and adjacent to WBNP.	PCA	2020
CC18: Undertake a landscape gap analysis and spatial conservation prioritization exercise using current methods and tools (i.e., Marxan).	PCA	2020
CC19: Produce maps and communication products that provide the results of the gap analysis and present design options for contributing to a regional network of protected and conserved areas, including a buffer zone adjacent to WBNP.	PCA	2020

Collectively, the actions described across the three categories of the Conservation Area Connectivity theme will:

- establish new protected areas that will create a buffer zone around WBNP WHS,
- provide a comprehensive landscape-scale connectivity needs assessment for OUV, and
- present a gap analysis with potential options to further support integrated land-use planning throughout the region (including the Birch River watershed) through existing jurisdictional processes.

6.6 Theme: Tailings Ponds Risk Assessment

The water used during oil sands mining is managed and stored in tailings ponds. In 2016, more than 1.2 billion cubic metres of fluid tailings were stored in ponds that had a net cumulative footprint of 257 km². Fluid tailings pose a risk to the PAD through potential seepage into the Athabasca River, and through the potential for dam failure. Actions taken to address the environmental risk posed by fluid tailing ponds occur pursuant to the *Tailings Management Framework for the Mineable Athabasca Oil Sands*.

Alberta has a rigorous regulatory program for individual sites to address the environmental risk posed by tailing ponds. This includes regulation of tailings ponds through approvals and compliance programs under various legislation, such as the dam and canal safety regulation under Alberta's *Water Act*, the *Environmental Protection and Enhancement Act*, the *Public Lands Act*, and the *Oil Sands Conservation Act*.

²¹ Conservation planning tools, such as Marxan, are used internationally to inform the design of nature reserve networks. For example, see: Bicknell, J.E. et al. 2017. Designing protected area networks that translate international conservation commitments into national action. *Biological Conservation*. 214: 168-175. Also see: <http://marxan.org/about.html>



*Channel blocked by sediment deposition in the PAD.
Photo by Bruce Maclean*

A description of key regulatory requirements and programs related to tailings ponds is below.

Oil Sands Management and Monitoring:

On March 13, 2015, the Government of Alberta released the *Tailings Management Framework for the Mineable Athabasca Oil Sands* (Tailings Management Framework). By implementing a comprehensive framework for managing fluid fine tailings, Alberta is actively working with oil sands mine operators to reduce the risk and liability of tailings ponds in a proactive manner that emphasizes progressive reclamation and reduced tailings volumes over time. As framework implementation is advanced, the risks of potential seepage or breach are reduced.

- The framework ensures that fluid fine tailings are treated and reclaimed progressively throughout the life of the project. Under the framework, operators must adhere to an approved tailings volume profile.
- Tailings ponds are managed using a threshold management system that sets strict limits on the permitted volume of tailings that can be accumulated.

Various initiatives are being undertaken to support implementation of the Tailings Management Framework and assist in managing risks. These include efforts aimed at advancing an integrated water management system for oil sands mines and work to explore the viability of end pit lakes as functioning and effective landscape features. This implementation work is ongoing and supported through the participation of stakeholders and Indigenous people.

Additional work includes amendments to Water Ministerial Regulation, ensuring major water management infrastructure and tailings dams become even safer:

- Amendments to the Water Ministerial Regulation have been approved by the Government of Alberta, and two new directives have also been put into effect.
- The Dam Safety Directive makes important changes to improve the management and regulatory oversight of tailings dams, in that it classifies all tailings dams as at least a “significant” consequence classification.
- Annual independent inspection requirements are part of the program changes, and will be implemented in a phased approach. In the future, every tailings dam in the province will be subject to an annual inspection by the regulator.
- Dam Safety has reached out to all affected Indigenous groups to offer opportunity for discussion on these changes.

The Oil Sands Monitoring Program (OSM), as referenced under the theme of Monitoring and Science, is a significant commitment of time and money to comprehensive environmental monitoring in northeast Alberta. The program, led jointly through Alberta Environment and Parks and Environment and Climate Change Canada, has conducted monitoring related to tailings ponds to inform a risk assessment. This includes monitoring emissions to the air as well as seepage to the groundwater. In addition, ambient monitoring of air quality and aquatic ecosystem health upstream and downstream of active tailings ponds has occurred since 2012 under the OSM program. Indigenous communities participate in the OSM program, in part through Community-Based Monitoring, and will play a much stronger role in program governance in 2019-2020.

In April 2018, an Oil Sands Process Affected Water Science Team was established to inform government and the Alberta Energy Regulator, using credible scientific information, of any impending release of treated oil sands process affected water before it happens. The Science Team is led by Alberta's Chief Scientist and consists of scientific and Indigenous Knowledge experts and representatives from industry, Indigenous communities, academia, and federal and provincial governments. Alberta Environment and Parks holds the mandate for environmental monitoring in the province and also supports this risk assessment through ongoing monitoring efforts in the region.

Regulatory Requirements and the Regulator

"Water is deeply interconnected with the elements that support the Outstanding Universal Value of Wood Buffalo National Park World Heritage Site."

A suite of regulatory requirements manage tailings ponds and associated seepage. These are designed to ensure that provincial regulators can hold mineable oil sands operators accountable for tailings ponds management. Existing regulatory approvals do not allow any releases of tailings water to land or water bodies.

Most regulatory aspects of oil sands development are implemented by the Alberta Energy Regulator (AER), which is tasked to oversee that oil sands are developed in alignment with government policy, in an environmentally responsible way, and that operators are held accountable for cleaning up infrastructure and associated sites.

■ Directive 085: *Fluid Tailings Management for Oil Sands Mining Projects*

- Establishes management and reporting requirements that operators must meet to demonstrate that all fluid tailings will be ready to be reclaimed within 10 years of the end of mine life, as outlined in the Tailings Management Framework.

■ The *Conservation and Reclamation Regulation (under the Environmental Protection Enhancement Act [EPEA])*

- Requires mine operators to reclaim disturbed lands, including tailings ponds, to an equivalent land capability in accordance with EPEA approval conditions and any other applicable standards, criteria, and guidelines.

■ *The Water Act* and the EPEA

- Ensure requirements are met for geotechnical stability and safety of tailings ponds. (The engineering of tailings ponds typically anticipates some seepage, with efforts to minimize it, depending on local geology.)
- Recognize that newer tailing ponds (1994 to present) naturally seep from their dykes. However, measures must be taken to ensure seepage is intercepted and pumped back to the tailings pond or into a recycle water system to be treated and reused in the production process. Approvals issued under EPEA set out requirements for groundwater recapture systems, monitoring, evaluation, and reporting of groundwater quality.



*A wetland in Wood Buffalo National Park.
Parks Canada Photo*

■ Dam Safety Regulation

- Various laws, policies, and processes regulate dams in Alberta, including those associated with tailings ponds. The purpose of dam safety regulation is to promote safety of the dams and canals in the province, to prevent loss of life, and to minimize economic and environmental losses due to potential failure of these structures.
- The Dam Safety Regulatory Framework consists of the *Alberta Water Act*, the Water (Ministerial) Regulation, Ministerial Orders, and provincial dam safety guidelines.
- Dams in Alberta are built, maintained, operated and decommissioned in a manner that is aligned with provincial, national and international guidelines and best practices.
- The Alberta Energy Regulator Dam Safety Program ensures that tailings ponds are designed, constructed, operated, maintained and decommissioned safely.
- Tailings ponds and their operators undergo dam safety assessments every third year.



GOAL: Tailings ponds are constructed, managed and maintained to limit impacts to the Athabasca River, and new and legacy tailings volumes are reclaimed in a timely manner, so that the risk of tailings ponds to the PAD is minimized.

Actions	Lead	Timeline
TP1: Continue ongoing implementation of the Tailings Management Framework to promote progressive reclamation, accelerate tailings treatment and improve the water management system. Continue to support existing forums for including indigenous perspectives on advancing this work. Consider results of the tailings risk assessment study (TP2) in future review and amendment of the Tailings Management Framework and Directive 085.	Alberta – AEP	Ongoing
TP2: Pursue a systematic tailings risk assessment by collaborating with Indigenous peoples, national/international experts, and industry to develop a landscape model that considers tailings reclamation, hydrology, withdrawals, climate change, seepage, and cumulative effects. This is within the scope of the Oil Sands Monitoring Program and would be conducted through existing work planning and governance processes.	Alberta – AEP; and Canada – ECCC (OSM)	2019-2021, and ongoing
TP3: Amend the Water Ministerial Regulation, ensuring major water management infrastructure and tailings dams are safe.	Alberta – AER	Complete
TP4: Provide regulatory oversight to ensure tailings dams are safe and managed appropriately by operators.	Alberta – AEP	Ongoing
TP5: Minimize fluid tailings accumulation by ensuring that fluid tailings are treated and reclaimed progressively during the life of a project and that all fluid tailings associated with a project are ready to reclaim within 10 years of end-of-mine life of that project. Supported through ongoing work undertaken as part of tailings management implementation.	Alberta – AER	Ongoing
TP6: Establish project-specific target, triggers, and limits for new fluid tailings. Supported through ongoing work undertaken as part of tailings management implementation.	Alberta – AER	Ongoing
TP7: Develop plans to reduce legacy tailing volumes to a ready-to-reclaim state by end-of-mine life.	Alberta – AER	Ongoing
TP8: Tailings ponds are designed, constructed, operated, maintained, and decommissioned safely. Supported through ongoing work undertaken as part of tailings management implementation.	Alberta – AER	Ongoing
TP9: Conduct ongoing ambient environmental monitoring to inform a risk assessment on changes to environmental condition. This is within the scope of the Oil Sands Monitoring Program and would be conducted through existing work planning and governance processes.	Alberta – AEP; and Canada – ECCC (OSM)	Ongoing
TP10: Establish an Oil Sands Process Affected Water Science Team to provide credible scientific information to inform government and regulatory bodies on potential process water treatment and release. Create additional Science Teams as needed to support implementation of the Tailings Management Framework.	Alberta – AEP	2019-2020

6.7 Theme: Environmental Flows and Hydrology

The Environmental Flows and Hydrology (EFH) theme addresses RMM recommendations 3 and 7 (Appendix A). It was informed through a series of workshops in 2018 with representatives from WBNP's 11 Indigenous partners, BC Hydro, Environment and Climate Change Canada (ECCC), Parks Canada Agency (PCA), and the governments of Alberta, British Columbia and Northwest Territories.

There is an opportunity to implement early action to support immediate improvement on the ground in the Peace–Athabasca Delta (PAD), and to inform long-term, broad scale actions.

Through implementation of this Action Plan, SMART (Specific, Measurable, Achievable, Relevant, Time-bound) targets, indicators and specific objectives will be defined and refined to monitor and track progress toward achieving these outcomes. There is a strong link to the Monitoring and Science theme (section 6.9) in undertaking the work to monitor change and the impacts of actions.



Kevin Courtoreille (Community-Based Monitoring Program) undertaking titrations for PAH extraction in the PAD. Photo by Bruce Maclean

Outcomes:

The actions and objectives outlined below are intended to advance three major desired outcomes:

1. **Ecological and Hydrological Integrity** – Water quantity²² improvements, including variability, sustain ecological functioning and integrity of the PAD to support the OUV.
2. **Exercise of Aboriginal and treaty rights** – Water quantity improvements in WBNP sustain healthy and abundant traditional resources, and Indigenous ways of life in the PAD System.²³
3. **Informed Decision-Making** – Improved baseline data/knowledge and comprehensive environmental flows assessments inform decision-making related to the ecological and hydrological integrity of the PAD System.

Water is deeply interconnected with the elements that support the OUV of WBNP WHS. More information is required to better understand many of these interconnections. The EFH drafting team has worked toward identifying actions, shown as categories below, which recognize the complicated connections between actions.

EFH categories:

Actions are grouped into four categories:

1. Partnerships in Governance
2. Water: When, Where, and How Much?
3. Action Toward Outcomes and Informed Decision-making
4. Information Sharing

Many of the actions below are duplicated or overlapping because they support multiple or subsequent actions. However, the guidance of the Federal-Provincial-Territorial-Indigenous (FPTI) Committee and the communication mechanisms that it establishes will ensure that connections are made and that efforts are not duplicated in this process or with previous work. The knowledge hub and proposed integrated PAD research and monitoring program will also support the interconnectedness of these actions within and across relevant themes.

Partnerships in governance:

The actions outlined in this chapter are highly interconnected and require cooperation and oversight to ensure

²² As defined in Glossary.

²³ The Peace–Athabasca Delta, the Athabasca, Peace, and Slave rivers, and Lake Athabasca, as they pertain to the health of the PAD.

coordination and information sharing. To this end, the FPTI committee will be established with a mandate and Terms of Reference to implement these chapter actions. Monitoring the success of these actions and adapting future actions will be a key part of the Committee's role.²⁴

The EFH working group identified a series of factors that should be reflected in the governance structure including: the foundational nature and importance of the identified guiding principles, stability and longevity, sufficient resourcing, shared planning, process and criteria for decision-making, and the equal voice and inclusion of the diverse Indigenous governments and government representatives.

The FPTI committee will be responsible for the EFH work and will connect with related Action Plan processes where relevant and appropriate. ECCC commits to leading the process to establish the FPTI committee and to remain in a convening and coordinating role until the FPTI committee is established. Alberta, British Columbia, Northwest territories, and PCA commit to supporting the establishment of the FPTI committee.

GOAL: To establish renewed and effective partnerships through a cross-jurisdictional and Indigenous governance team to guide and inform management actions for achieving the desired hydrology outcomes for the PAD and WBNP.

Lead: ECCC will take a transitional lead role while the FPTI Committee is established.

Actions			Timeline
EFH1: Convene and resource (in the short term) an FPTI Committee and Secretariat to oversee implementation of the EFH portion of the WBNP Action Plan.			2018-2020
Implementation Detail	Identify key members to develop Terms of Reference.	Complete	
	Confirm resourcing requirements for Indigenous representative participation to draft the Terms of Reference.	Targeted Completion: June 2019	
	Appoint Committee leadership for determined tenure.	April 2019	
	Identify the budgeting requirements from 2020 onward.	June 2019 onward	
EFH2: Develop a Terms of Reference that establishes: <ul style="list-style-type: none"> • Accountability and Reporting • Authority • Roles and Responsibilities, including a clear mandate • Communication to member organizations, decision-makers and invested parties • Criteria for decision-making • Resourcing • Mechanisms to evaluate actions taken and provide for adaptive management 			2018-2019
Implementation Detail	Develop a first draft Terms of Reference based on key governance features identified by the working group.	Complete	
	Convene a governance workshop with the committee member organizations.	Complete	
	Complete a proposed Terms of Reference.	Targeted Completion: February 2019	
	Finalize Terms of Reference.	September 2019	
EFH3: : Establish and task project teams to implement key actions (e.g., structural alternatives project team; target/objective-setting) outlined for the EFH theme. Note that timelines will be variable as the needs for various project teams change.			2019, and ongoing

²⁴ Recommendation 2 from the SEA (p. 7-7) includes "developing a PAD Water Management group" to monitor the success of water control measures. See also Appendix B.

Implementation Detail	Committee to establish and task project teams with representation from FPTI, other stakeholders and subject matter experts.	Targeted Completion February 2019	
	Project teams with identified lead(s) undertake detailed work planning to inform timelines and resourcing needs for the 2020-2021 fiscal year and to complete the project team's assigned mandate.	May 2019	
	Establish linkages to existing processes, progress reporting and communication mechanisms.	May 2019 onward	
	Project teams commence implementation of work plan(s), starting in 2019.	To be determined	
EFH4: Establish clear lines of communication and linkages to existing processes such as the Mackenzie River Basin Board, WBNP Cooperative Management Committee, Alberta–NWT Bilateral Management Committee, Alberta Watershed Planning and Advisory Councils, etc.			2019
EFH5: Implement a progress reporting mechanism to Federal, Provincial, Territorial, and Indigenous governments.			2019-2020
EFH6: Communicate the findings of assessments, research, and modelling to stakeholders and Indigenous communities.			Ongoing

Water: when, where, and how much?

Setting objectives: what does success look like on the ground?

Key geographic areas for immediate intervention will be identified by the EFH working groups using existing information (e.g., MCFN and ACFN Indigenous Knowledge). Key sites that are important to Indigenous people and that are currently undocumented must be identified. Identifying specific objectives to be achieved in the longer term will require additional knowledge gathering.



Wood Bison cow and calf swimming across a lake in Wood Buffalo National Park. Parks Canada Photo

GOAL: Identify and describe the areas and conditions where changes to water quantity would support the achievement of the outcomes for ecological and hydrological integrity and exercise of Aboriginal and treaty rights.

Actions		Lead	Timeline
Identify key sites for early action			
EFH7: Identify priority locations in the PAD (Figure 6) where ecological integrity is impacted and intervention is required, as well as areas from currently documented sites of navigational and/or cultural importance in the PAD. Identify which of these are appropriate for early action and monitoring for trends.		PCA / Indigenous partners	2018-2019
Implementation Detail	Identify geographic coordinates for the locations already identified by the EFH working group as having potential for early restorative action in WBNP: <ul style="list-style-type: none"> • Chenal des Quatres Fourches (Dog Camp) toward increasing water level in Lake Mamawi; with corresponding structure on Cree Creek • Egg Lake adjacent to the Revillon Coupé • Rat Lake • Birch River • PCA muskrat monitoring sites • Off channels of the Peace of navigational importance • Scow channel, near Rocky Point on the Peace River • Twin islands • Big Slough (Peace River) 	Completed	
EFH8: Identify the key objectives for the selected early action locations.		PCA/MCFN/ ACFN/ Ft Chip Métis	Targeted Completion 2019
EFH9: Initiate feasibility studies to assess what actions could be implemented to make progress toward these objectives, as described in actions EFH 32-33 (artificial ice dam) and EFH 56-57 (control structures).		PCA/MCFN/ ACFN/ Ft Chip Métis	2019



Rivière des Rochers submerged outflow weir. Photo by Steve Oates

Complete identification of full set of objectives

<u>Navigation</u> EFH10: Undertake Indigenous use interviews to identify priority navigation routes and pinch points for all communities that travel within WBNP for the exercise of Aboriginal and treaty rights, where not currently documented.	Indigenous partners	2019-2022
<ul style="list-style-type: none"> Identify the conditions required for safe and productive exercise of Aboriginal and treaty rights across the year (e.g., depth of water, connectivity). 	Indigenous partners	2019-2022
<u>Sites of Cultural Importance</u> EFH11: Undertake Indigenous use interviews to identify areas of key contemporary and historic cultural importance and timing of use for practices that include, but are not limited to, medicine, hunting, fishing, gathering, spiritual and cultural practice.	Indigenous partners	2019-2022
<ul style="list-style-type: none"> Describe the requirements of these locations to support these practices (e.g., what plants and animals are there? When are they in high or low abundance? Are there access routes and water quantity conditions required beyond those identified as priority navigation routes?). 	Indigenous partners / PCA	2019-2022
<u>Ecological Integrity</u> EFH12: Identify key areas of WBNP where water quantity changes are required to restore ecological integrity	PCA / Indigenous partners	2019-2020
<ul style="list-style-type: none"> Identify the specific hydro-ecological end points that are necessary to maintain the ecological integrity of these areas (e.g., hydrological regime supports increased muskrat abundance and/or habitat, and reduced thistle or willow encroachment). 	PCA / Indigenous partners	2019-2020
EFH13: Document the information from all above activities and summarize the specific objectives in a final report(s).	PCA	2020-2022
EFH14: Over time, using adaptive management (see section 7.1.2 in the SEA), learn through action, monitoring, and modelling what water quantity change supports achievement of these objectives.	FPTI Committee	Ongoing

Setting objectives: how will we measure progress?

Indicators of some aspects of ecological integrity have been developed in previous works through the Northern Rivers Ecosystem Initiative (NREI),²⁵ the Northern Rivers Basin Study (NRBS),²⁶ and by Indigenous partners and Parks Canada within WBNP. Basin-wide, high-level indicators are in development for the State of the Aquatic Ecosystem Report under the Mackenzie River Basin Board.

Basin-wide, high-level indicators are in development for the State of the Aquatic Ecosystem Report under the Mackenzie River Basin Board.

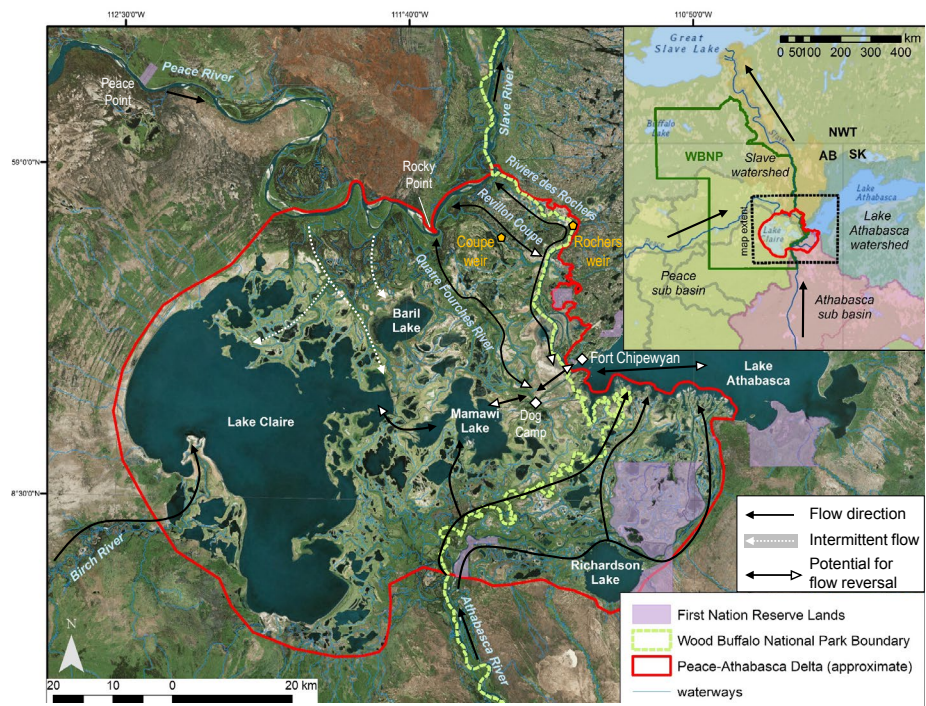


Figure 6: Key locations and flow directions within the Peace-Athabasca Delta.

²⁵ Donald, D., W. Aitken, J. Syrgiannis, N. Glozier, F. Hunter, and M. Gilchrist. 2004. *State of the Aquatic Environment Peace-Athabasca Delta – 2002*. In: Environment Canada, Northern Rivers Ecosystem Initiative: Collective Findings. Compiled by F.M. Conly, Saskatoon, SK (with Alberta Environment).

²⁶ Donald, D., F. Wrona, W. Warwick, W. Aitken, F. Hunter, and J. Syrgiannis. 1996. *Indicators of ecosystem integrity: Peace-Athabasca Delta*. Project Report No. 107, Northern Rivers Basins Study.

GOAL: Set SMART water quantity targets and indicators toward achieving the objectives identified above.

Targets and indicators will indicate progress toward both ecological and Indigenous use objectives and may be qualitative (e.g., feeling of safety during navigation) or quantitative (e.g., depth of water at a particular location). Targets typically include variability, minimums and maximums, thresholds, etc., and will be refined as they are developed.

Actions	Lead	Timeline
EFH15: Assess use of existing indicators developed with Indigenous expertise, such as by the Mackenzie River Basin Board, the NREI and NRBS, those in place in WBNP through Parks Canada and Community-Based Monitoring programs.	ECCC	2019
EFH16: Identify gaps in knowledge for indicators and targets and develop a plan to address these gaps.	ECCC / PCA	2019
EFH17: In conjunction with "objectives" interviews, conduct interviews of elders and land users to inform development of Indigenous SMART targets and rights-based indicators for the Indigenous use objectives identified above (e.g., abundance of harvested species and/or traditional use plants; navigability of priority routes).	Indigenous partners	2019-2022
EFH 18: Informed by the objectives and baseline hydrological conditions identified below, develop SMART targets (or target ranges or thresholds) and indicators to assess: <ul style="list-style-type: none"> • progress toward intermittent high elevation recharge of the PAD's perched basins (including key sites of Indigenous cultural importance within these perched basins, if applicable); • progress toward low elevation recharge and connectivity (including key sites of Indigenous cultural importance); and • navigability of seasonal priority routes. 	PCA	2019-2023
EFH19: Make the targets and indicators available via the Knowledge Hub (see EFH 69-75), with regular reporting.	PCA / Indigenous communities	2020-2023

Monitoring progress to inform adaptive management

This goal will be achieved through significant linkages with the Monitoring and Science theme actions (section 6.8).

GOAL: Establish a monitoring regime that tracks the trend of indicators identified above across the extent of WBNP and the PAD and over time that evaluates the effectiveness of management actions, building on existing monitoring programs where possible.

Actions	Lead	Timeline
EFH20: Assess and inventory the historic and ongoing monitoring within WBNP.	ECCC/PCA/ Community-Based Monitoring (CBM) Program	March 2019
EFH21: In coordination with actions taken pursuant to Monitoring and Science theme, identify gaps in the types and location of monitoring within WBNP required to support monitoring of: <ul style="list-style-type: none"> a. indicators, including navigability, b. baseline / reference parameters, c. parameters required for model operation and validation, and d. water management actions. 	FPTI Committee	2019 Ongoing and adapted through learning and as needed.
EFH22: Make monitoring data available, ²⁷ to local communities and decision-makers in a timely and transparent manner.	FPTI Committee	2018+

²⁷ Some MCFN data from the CBM program are already available on the Mackenzie Data Stream.

Action toward outcomes and informed decision making:

There is sufficient information to take early “on the ground” action toward understanding and improving the ecological and hydrological integrity of the PAD. These early actions include:

- Establishing a protocol to support potential strategic flow releases to enhance ice-jam flooding;
- Creation of ice-dams in strategic locations under appropriate conditions;
- Possible installation of temporary control structures; and
- Targeted ecological restoration through hydrology-related actions.

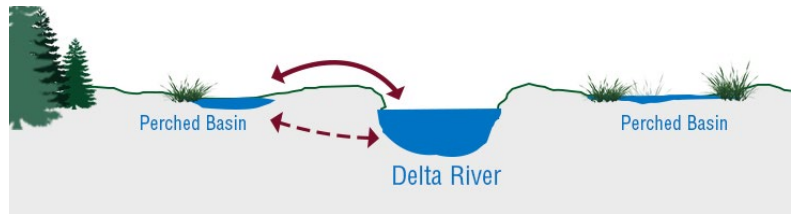


Figure 7: Perched Basins.
(from pademp.com/delta-ecology/hydrology/)

Learnings from these actions will inform and support the development of longer-term options, including a better understanding of the risks and benefits of higher-risk or larger-scale changes. Modelling work will be used to assess the potential outcomes and interactions of options including, but not limited to:

- changes in water withdrawals on the Athabasca River;
- changes to the W.A.C. Bennett Dam operational regime across different seasons (e.g., spring releases; winter, fall, and summer flow regulation) to influence Peace River flows; and
- control structures (e.g., weirs) within the PAD

Early action to improve knowledge of the baseline hydrologic conditions will support decision-making and directly address RMM Recommendation 7. Early actions, including modelling, will also support the development of the environmental flows assessments denoted in RMM Recommendation 3.

Enhance spring flooding in WBNP - strategic flow releases:

One of the unique features of the PAD is the perched basins (Figure 7). Though the delta is fairly flat, these “raised” or perched basins are periodically filled with water during extreme flooding events that occur as a result of ice jam events in the spring.

BC Hydro and Alberta are working to establish a protocol and parameters for BC Hydro to release water (test flow release) to enhance ice jam flooding. The protocol will consider the risks for people and communities upstream of WBNP on the Peace River, downstream on the Slave River and in the PAD. Consultation and communication with these parties is required to assess and manage risk.

This set of actions by BC and Alberta is framed by the commitment made in a letter from British Columbia Minister Bennett to Alberta Minister Fawcett, dated February 4, 2015:

“BC Hydro remains open to a proposal from the Government of Alberta for a test flow to influence an ice jam event in the PAD similar to the 1996 request. Contemplation of a test flow, as indicated, would be considered for opportunities that would not impact BC Hydro ratepayers, existing infrastructure in British Columbia or dam safety.

Under such a test, I trust that the Government of Alberta will continue to evaluate and manage any effects on Alberta’s interests, including those unintended consequences that may arise from flooding.”

Little Red River Cree Nation (upstream of WBNP on the Peace River) and Alberta Environment and Parks are also working with the Mighty Peace Watershed Alliance and Northern Peace Tribal Council to explore the impact of the Peace River flow regime on the Lower Peace Wetlands, including the Peace–Athabasca Delta. This includes risks and possible actions to safeguard communities, farmland, and infrastructure. Learnings from this work as it progresses will be communicated to support the development of this test release protocol.

GOAL: Establish protocols for, and identify circumstances under which, a strategic release of water from the Williston Reservoir behind the W.A.C. Bennett Dam could enhance an ice jam flood event within WBNP to encourage flooding of the PAD, including its perched basins, while minimizing unwanted upstream and downstream risks.

Lead: BC, BC Hydro, AB

Actions	Timeline
EFH23: Create a protocol for a proposal from the Government of Alberta for a test flow (a release of water from the W.A.C. Bennett Dam) to influence an ice jam event in the PAD similar to the 1996 request. The development of the protocol would include consideration of: <ul style="list-style-type: none"> a) By whom and to whom the request would be made; b) what information would be included in the request, c) parameters that would be considered in making the request, d) Consideration of risks and liability regarding consequences for water management decisions that cause harm to the interests of stakeholders and Indigenous people, as well as unintended consequences to the aquatic ecosystem; e) Communication protocols to inform communities upstream and downstream to Great Slave Lake that may be affected and need to be consulted and notified of the request; f) Timelines for assessing conditions, submitting a flow request, and response to the request; and g) Monitoring plan to be ready for implementation. 	2019-2020
EFH24: Assemble currently available data and information that could indicate if a test flow has a reasonable chance of being successful while minimizing the risk of unintended negative consequences.	2018-2019
EFH25: Identify gaps in knowledge, review assembled information, and confirm gaps using a workshop format, and develop plans to fill knowledge gaps.	2018-2019
EFH26: Communicate with all stakeholders about management actions within the Peace–Athabasca Delta System to ensure risks are understood and acceptable.	2019-2021
EFH27: Implement the protocol as opportunities arise, including water release, if supported.	As conditions allow (after the above steps are completed)
EFH28: For each particular test flow, establish assessment criteria and appropriate monitoring	As conditions allow (after the above steps are completed)
EFH29: Conduct analysis, modelling, and monitoring related to addressing knowledge gaps with the purpose of identifying more specific parameters that could be used to inform Alberta's request for a test flow release. (For example, the spring break up in 2018 and other years could be used as a test case to inform the protocol.)	2019-2021, and ongoing
EFH30: Update the protocol for a request from Alberta for a test flow release to influence an ice jam event in the PAD with more specific parameters, or update based on lessons learned from any subsequent ice jams and/or test flows.	2021-2022, and ongoing



Ice jam at confluence of Peace River, Slave River and the Riviere des Rochers. Photo by Stuart Macmillan, Parks Canada

Enhance spring flooding in the PAD – artificial ice damming:

Recognizing the role of ice in spring flooding of the PAD, the Peace–Athabasca Delta Technical Studies (1993-96) investigated the use of an ice dam to retain spring break up flows and inundate local perched basins. The ice dam was constructed over the winter of 1994-1995 at the outlet of Mamawi Lake using spray ice technology. Although above normal winter temperatures and below normal run-off limited the success of the trial that year, the successful installation of an ice dam supports the potential use of this approach at critical hydraulic nodes within the PAD when conditions are predicted to be favourable.

GOAL: To enhance spring flooding using artificial ice damming within WBNP

Actions	Lead	Timeline
EFH31: Establish an artificial ice dam project team.	PCA / Indigenous partners	2019-2020
EFH32: Review the past attempt to create an ice dam and related recommendations, and confirm one or more locations where an ice dam(s) could support the desired outcomes.	Project team	2019-2020
EFH33: Establish goals and objectives and develop a plan (i.e., Terms of Reference) to install an ice dam(s) to meet goals and objectives, including: <ul style="list-style-type: none"> - identify necessary environmental pre-conditions, - create a monitoring plan, - develop a budget, - conduct an impact assessment, - communicate the plan to jurisdictions and stakeholders; and - conduct consultations with all potentially impacted parties. 	Project team	2019-2020
EFH34: Obtain required equipment (spray ice pump(s), monitoring equipment, etc.), establish the field team to implement the plan.	Project team	2019-2020
EFH35: Implement the plan (given necessary environmental pre-conditions are met).	Project team	Dec 2019-May 2020, and ongoing or when conditions allow
EFH36: Monitor/document the implementation and results, assess results against objectives, and refine the plan for implementation in future years. Assess the potential for ice dams to support improved ecological and hydrological integrity in other parts of the PAD.	Project team	Dec 2019-Oct 2020, and ongoing

Establish adequate baseline information:

Recommendation 7 from the RMM is to establish adequate baseline hydrological information for the Peace River and Athabasca River basins. The recommendation indicates doing so in the context of being better able to understand cumulative impacts of hydropower impacts and water withdrawals in light of existing or expected influences from climate change or future projects.²⁸ While the development of this baseline will directly address Recommendation 7, it will also inform the monitoring of actions taken to achieve this Action Plan and will provide a strong basis for environmental flows modelling.



Lakes, rivers, channels and wetlands come together to form the complex hydrology of Wood Buffalo National Park. Photo by J.F. Bergeron, Parks Canada

²⁸ Reactive Monitoring Mission Report, p. 27

GOAL: To enhance monitoring and to improve the assessment of current and future water quantity conditions in the Peace and Athabasca River Basins.

Actions		Lead	Timeline
EFH37: Assess the current state of knowledge and monitoring within the PAD.		ECCC	2018-April 2019
Implementation Detail	Contractor to update the AECOM 2010 report ²⁹ on the state of the PAD		
EFH38: Assess the current state of knowledge and monitoring within the Peace and Athabasca River Basins.		FPTI Committee	2019-2020
EFH39: Develop a common understanding of the complex hydrological function of the Peace and Athabasca River Basins and the PAD.		FPTI Committee	
EFH40: Conduct a water balance assessment of the Athabasca and Peace River basins.		FPTI Committee	
EFH41: Determine the appropriate reference time point and scale to define baseline(s) conditions, including: pre-development, present conditions, naturalized ³⁰ .		FPTI Committee	
EFH42: Determine if appropriate baseline indicators are being monitored and identify gaps.		FPTI Committee	
EFH43: Develop plan to gather information to fill gaps in western and Indigenous Knowledge.		FPTI Committee	
EFH44: Undertake elder interviews (in conjunction with other interviews) to inform the pre-regulation and pre-development state of hydrology within the Peace–Athabasca River Basins and Delta.		Indigenous partners	
EFH45: Ensure identified hydrological indicators are being monitored at appropriate spatial and temporal scales. Integrate with target and indicator monitoring toward objectives wherever possible.		FPTI Committee	2021-2022
EFH46: Communicate findings from the baseline assessment to modelling work and to decision-makers to inform decisions related to future development or management action.		FPTI Committee	2022, and ongoing
EFH47: Periodically review and update baseline(s) as information becomes available and share results.		FPTI Committee	2025, and ongoing

Conduct Environmental Flow Assessments:

The Reactive Monitoring Mission (RMM) report Recommendation 3 suggests that environmental flows assessments be conducted for the Peace, Athabasca, and Slave rivers, as they pertain to the health of the PAD. These assessments should be conducted to identify the water flows needed to sustain the ecological functioning of the PAD under the circumstances of existing and planned future dams and water withdrawals. The report also highlights the need to better understand the interactions between the naturally dynamic high-latitude ecosystem of the PAD and climate change.³¹

Hydrologic and/or hydraulic models exist for the Peace and Athabasca sub-basins and the Mackenzie River Basin, and will be drawn upon to support early actions. Other initiatives have developed, recommended development, or identified technical recommendations that will inform the building of a comprehensive model for the PAD.³²

²⁹ Synthesis of Ecological Information Related to the Peace–Athabasca Delta. 2010. Report prepared for PADEMP by AECOM.

³⁰ For modelling/simulation purposes discussed herein, naturalized is modelled natural flows without regulation or withdrawals on the Peace and Athabasca rivers.

³¹ P.16, Reactive Monitoring Mission Report

³² Such as the Mackenzie River Basin hydraulic model commissioned by the Mackenzie River Basin Board, the Integrated Watershed Management Plan for the Peace and Slave Watersheds by the Mighty Peace Watershed Alliance (www.mightypeacewatershedalliance.org/projects/integrated-watershed-management-plan) and work commissioned by the Athabasca Watershed Council (www.awc-wpac.ca/resources/awc-reports/).

However, all of the existing models have some gaps in understanding and modelling of the hydrology and hydraulics within this complex, cold-weather delta. To address Recommendation 3 from the RMM report, a longer-term modelling effort will work toward building a basin-wide, holistic, inter-jurisdictional model that more fulsomely captures the complex interactions that influence the health of the PAD.

In addition to addressing Recommendation 3, environmental flows assessments and water balance modelling will be used to support near-term actions using existing or readily obtainable information. Near-term modelling work includes assessing the temporary or short-term control structure options and identifying options to achieve Indigenous navigability and ecological outcomes within WBNP.

These assessments will draw on, and be available to inform, work being undertaken in other themes of this Action Plan as they relate to EFH theme actions (i.e., tailings pond management, science and monitoring, environmental assessment) and in other jurisdictional or community processes. In particular, opportunities to leverage the work undertaken by the Oil Sands Monitoring Program will be explored. Models will be made available to decision-makers when contemplating actions that could impact the hydrology of the PAD.

Alberta will continue to work with Indigenous communities and stakeholders on the Aboriginal navigation component of the Surface Water Quantity Management Framework (SWQMF). Refinement of the Surface Water Quantity Management Framework (SWQMF) for the Lower Athabasca River, could help to support the achievement of the desired outcomes for ecological and hydrological integrity and navigability in the PAD. The planned SWQMF work is identified in section 6.4, Environmental Assessment. Complementary supporting actions will be taken through the EFH work.

GOAL: To identify, modify, and, if necessary, produce environmental flows assessment models that incorporate state-of-the-art understanding of localized effects of past, ongoing, and projected climate change, to inform future and ongoing management actions that could impact WBNP.

Actions	Lead	Timeline
EFH48: Hold a workshop on the influence of oil sands withdrawals on Indigenous navigability and OUV.	ECCC / AB / MCFN	2019
Gather information required for both short- and long-term modelling		
EFH49: Inventory and assemble relevant currently available hydrological and geomorphological data, existing models (e.g., Athabasca River Basin Initiative and ongoing work under LARP for the Athabasca River, AEP forecast model of the Peace River, Mackenzie River Basin Hydraulic Model, data from Community-Based Monitoring) and information for the Peace and Athabasca rivers and tributaries, and include this inventory (and data, as appropriate) in the knowledge hub.	ECCC	January-April 2019
EFH50: Hold a workshop(s) with science-based and Indigenous Knowledge experts to scope the variables and data required to produce: a) A simplified (or geographically restricted) model(s) with existing data to predict and understand the effects of the small-scale management options being considered. b) A holistic, basin-wide, multi-jurisdictional environmental flows model.	ECCC	March 2019, and ongoing
EFH51: Review existing models and modelling results to identify options to achieve the identified objectives for Indigenous navigability and ecological outcomes within WBNP.	FPTI Committee	2019-2020

Build a holistic basin-wide environmental flows model

EFH52: Identify gaps and undertake a plan to address these gaps, including potential field studies, and develop finer-scale climate change scenarios for the longer-term holistic model, as requested in Recommendation 3.	ECCC	2019-2023
EFH53: Develop a holistic, basin-wide, multi-jurisdictional model to the highest international standards to understand hydrological, ecological, and Indigenous use relationships in light of current and future climate change and the cumulative effects of withdrawals and regulation.	FPTI Committee	2020-2024
EFH54: Make the model(s) and requisite data available to inform future management actions or decisions in the Mackenzie Basin that could impede or support achievement of the PAD objectives and outcomes.	FPTI Committee	2025
EFH55: Update the model framework as data become available through study and management actions, and share the results.	FPTI Committee	2025, and ongoing

Structural Alternatives:



Peace River in Wood Buffalo National Park. Photo by Sharon Irwin, Parks Canada

The assessment and implementation of water management structures within the PAD began with the installation of a temporary rock-filled dam on the Chenal des Quatre Fourches at the outlet of Mamawi Lake in 1971. The dam was installed to immediately raise water levels, while studies were undertaken to find more permanent, environmentally acceptable solutions to address the low water levels. The dam was damaged in the 1974 flood and removed in 1975 (as planned) following completion of the Rivière des Rochers weir.³³

Following an options assessment, a submerged outflow weir was constructed on the Rivière des Rochers (with fish bypass channel and boat tramway) in 1975. The weir delays the rate of outflow and raises water levels on Lake Athabasca and within the connected system of PAD lakes and channels. A second submerged outflow weir was installed on the Revillon Coupé in 1976 as studies predicted high velocities and erosion on that channel with the

installation of the first weir. The weirs have helped to restore summer peak lake levels, but the amplitude of water levels is less than under the natural regime.³⁴ The weirs do not influence the perched basins flooded by ice jams on the Peace and Athabasca Rivers.

During the Peace–Athabasca Delta Technical Studies (1993-1996), a range of structural alternatives to manage water levels in the PAD were assessed.³⁵ These options included both temporary and permanent structures of both large and small scale.

³³ Peace–Athabasca Delta Implementation Committee, 1987. *Peace–Athabasca Delta Water Management Works Evaluation*.

A report prepared under the Peace–Athabasca Delta Implementation Agreement. 63pp.

³⁴ De Boer, 1996, as reproduced in the *Strategic Environmental Assessment* p 5-21.

³⁵ DDeBoer, A. 1996. *Structural Alternatives. Task G.0 – Structural Alternatives. Peace–Athabasca Delta Technical Studies*. 1996. 46 pp.

GOAL: Strategically-placed short- and/or long-term water management control structure(s) within the PAD create a local hydrological regime that supports the ecological functioning and Indigenous use in identified target areas

Actions		Lead	Timeline
Small-scale and/or temporary control structures			
EFH56: Assemble and review overview of the existing data and information related to past, current, or potential control structures in the PAD: <ul style="list-style-type: none"> state of the weirs currently in place; alternatives considered, rationale for chosen options, design criteria, and effectiveness of the weirs currently in place (including past modelling exercises). new alternatives that were not considered or available at time of construction (e.g., inflatable rubber dams); previous weir/dam experiments in the PAD (e.g., ice dam at Dog Camp and small trench/weirs on perched basins in Athabasca Delta); and Weirs and dams that have been considered in the past but not implemented and why not (e.g., Big Egg Lake). 		FPTI Committee	Targeted Completion: Summer 2019
EFH57: Obtain new information related to possible short-term or small-scale options to improve the hydrological regime in the PAD		FPTI Committee	2019-2020
Implementation Detail	Employ a contractor to assess the effectiveness of the two existing weirs (Rivière des Rochers and Revillon Coupé) and identify any maintenance required to ensure that the weirs operate as originally designed.	PCA (Coupé weir) / AB (Rochers weir)	2019-2020
	Undertake a feasibility assessment on the potential use of one or more temporary control structures to meet specific water level objectives in the Lake Claire and Mamawi Lake area of the Peace–Athabasca Delta, including simple modelling of potential outcomes.	ECCC	Targeted Completion March 2020
	Consult with Indigenous partners and potentially affected parties	Indigenous partners / AB / PCA	2019-2020
EFH58: Pending feasibility assessment results and consultation with local communities, select the most appropriate action and complete the full design for one or more pilot control structures. <ul style="list-style-type: none"> Determine appropriate Indigenous and hydro-ecological indicators and monitor for the effects of the control structure(s). Learning from monitoring of implementation results, adjust timing and length of installation and/or site of installation. 		FPTI Committee	2020-2021
EFH59: Install one or more pilot control structures and/or repair existing weirs, as designed.		PCA and/or AB	2021-2024
EFH60: Monitor and adapt installation as required to progress toward objectives.		FPTI committee	2021, and ongoing

Longer-term structural options

EFH61: Identify remaining gaps in knowledge, including linkages between PAD and current or future structural scenarios, varying flow input, and impacts upstream and downstream.	FPTI Committee	2021
EFH62: Assess longer-term structural options in the cumulative framework to test interactions with other management options. Continued monitoring of pilot structures, existing structures and ice damming efforts will provide key information.	FPTI Committee	2021-2024

Longer-term Peace–Athabasca Delta System Management Options — Holistic Perspective (Cumulative lens):

Early actions, knowledge-gathering and modelling work will inform the knowledge base required to fully assess the potential of larger-scale actions to achieve the desired outcomes for the WBNP in balance with upstream and downstream impacts.

GOAL: Identify and assess the risk of alternative management options to provide recommendations for achieving desired flows and water levels

Actions	Lead	Timeline
EFH63: Using or adapting models built and knowledge obtained from environmental flows assessments and early actions, assess the predicted impacts of potential management options, singly or in combination. Options to consider include, but are not limited to: <ul style="list-style-type: none"> • changes in water withdrawals on Athabasca River (see actions in 6.4 Environmental Assessment) • changes to W.A.C. Bennett Dam water release regime across different seasons (e.g., spring releases; winter, fall, and summer flow regulation) to influence Peace River flows • control structures (e.g., weirs) within the PAD. 	FPTI Committee	2020-2021
EFH64: Select a set of priority scenarios to undertake more detailed evaluation including assessing what impact each has on the achievement of key selected ecological and traditional use objectives/outcomes (using indicators as identified above, such as muskrat).	FPTI Committee	2021-2023
EFH65: Assess the impact of priority scenarios on interests upstream and downstream of the PAD.	FPTI Committee	2022-2023
EFH66: Assess the impact and conduct detailed analyses of desired management options.	Jurisdictional authority	2024
EFH67: Recommend the preferred management approach(es) to the relevant jurisdictional authorities that could support achieving the ecological and traditional use EFH objectives.	FPTI Committee	2024
EFH68: Continue to monitor and adapt toward achieving the desired outcomes.	FPTI Committee	2024, and ongoing

Information sharing

GOAL: To establish a Knowledge Hub to make the Peace–Athabasca Delta information and data from science-based and Indigenous Knowledge sources more easily accessible.

(Create a single window to access information related to the PAD hydrology, both at a plain language and a technical level)

Actions	Lead	Timeline
EFH69: Complete a user-needs survey to assess what type of information and presentation the various users require or want.	ECCC	April 2019
EFH70: Establish an appropriate knowledge hub platform, informed by similar existing resources (e.g., Mackenzie Data Stream) that targets needs without creating redundancies. • Ensure that the platform and data storage are supported through time, including archival information.	ECCC	2018-2020
EFH71: Establish data sharing protocols.	FPTI Committee	As needed
EFH72: Develop a basic ethics and data sharing agreement that can be adapted as needed.	MCFN	2019
EFH73: Update knowledge hub routinely with monitoring and study data from within WBNP.	FPTI Committee	Ongoing
EFH74: Establish communication mechanisms and frequency to exchange information with (a) communities, (b) jurisdictions and governments, and (c) stakeholders and the general public.	ECCC / FPTI Committee / All	2019-2020
EFH75: Regularly review and evaluate the effectiveness of the Knowledge Hub and ensure links are up to date.	FPTI Committee	2020, and ongoing

6.8 Theme: Monitoring and Science



The shallow ponds of the Whooping Crane nesting area in the northern part of Wood Buffalo National Park. Photo by R.D. Muir, Parks Canada.

The nature of the current challenges and development pressures on the ecological integrity of WBNP requires inter-jurisdictional collaboration and coordination to better understand and assess potential impacts and to inform decision-making. There are numerous scientific and monitoring initiatives underway in and around WBNP, and specifically in the PAD. However, there are ongoing challenges to ensure that these initiatives are appropriately networked, and that results that arise are communicated in an accessible manner. There will, by necessity, be overlap between actions taken in support of this theme, which respond to recommendations 2 and 17 of the RMM report (see Appendix A) and those related to other themes such as Environmental Flows and Hydrology, and Wildlife and Habitat Conservation.

An integrated PAD research and monitoring program

The PAD is the primary element of OUV of concern with regard to the specific and cumulative impacts of development external to the park. Several initiatives include research and monitoring activities in the PAD and have specific mandates and program objectives. Some key initiatives are described below.

Peace–Athabasca Delta Ecological Monitoring Program (PADEMP): Parks Canada has been leading PADEMP since 2008, with the goal of developing an integrated ecological monitoring program for the delta that can measure, evaluate, and communicate the state of the Peace–Athabasca Delta ecosystem. This includes any



*Mikisew Cree First Nation Government and Industry Relations and Community Based Monitoring staff tour the PAD with members of the Oil Sands Monitoring Program.
Photo by Bruce Maclean*

changes resulting from cumulative regional development and climate change. The program is being developed using both science-based and Indigenous Knowledge. It is directed by a steering committee with representation from federal, provincial, territorial, and Indigenous governments. To date, PADEMP has:

- collected and synthesized available information on the delta;
- developed a draft Vulnerability Assessment;
- identified key monitoring questions and information gaps;
- initiated the PADEMP muskrat survey, to address local concerns regarding this ecological and cultural key-stone species, and to serve as a model of how to bring together science-based and Indigenous Knowledge in monitoring programs;
- coordinated four annual PADEMP forums in Ft. Chipewyan, to bring those engaged in local and regional research and monitoring together with local Indigenous Knowledge holders and community members to discuss key concerns and questions, and to stimulate collaboration and communication; and
- communicated through PADEMP newsletters and its website (pademp.com).

WBNP Ecological Integrity (EI) Monitoring Program: WBNP implements a monitoring program to evaluate the ecological integrity of the park. Following a nationally standardized approach, the program consists of a small suite of approved EI indicators and supporting measures that are carefully selected to represent the biodiversity and biophysical processes of the park's ecosystems in the context of the larger-scale natural processes. Several of WBNP's monitoring measures are primarily related to the PAD, including water birds, water extent, wetland type, muskrat abundance, vegetation change, contaminants in colonial water bird eggs, river discharge, and water quality. The results of the program are presented in the State of the Park Report and inform park management planning.

Parks Canada is updating its ecological monitoring policy to explicitly include Indigenous Knowledge in the description of the condition of each National Park. WBNP will serve as a mentor and example to other parks as it engages and collaborates with Indigenous Knowledge holders.

Mikisew Cree First Nation / Athabasca Chipewyan First Nation Community-based Monitoring Programs: Since 2008, these Community-based Monitoring (CBM) programs have been using scientific methods and local Indigenous Knowledge to watch, listen, understand and report on activities that may harm their traditional lands and resources in the PAD. The programs measure water depth, water quality, ice thickness, and snow depth. CBM staff collaborate with other federal, provincial, territorial, and university researchers to examine contaminants in wildlife. The CBM programs also collect information on water levels related to navigation, and a fish monitoring component is in development. The results of their studies are used to inform community members about the state of the traditional territory, to assist the leadership in establishment of Indigenous policies and to inform consultation processes surrounding the impacts of resource development.

Oil Sands Monitoring Program (OSM): The Governments of Canada and Alberta cooperate to lead the OSM Program – a comprehensive environmental monitoring program aimed at improving understanding of the long-term cumulative effects of oil sands development throughout the oil sands region of Alberta including the Lower Athabasca River and the PAD.



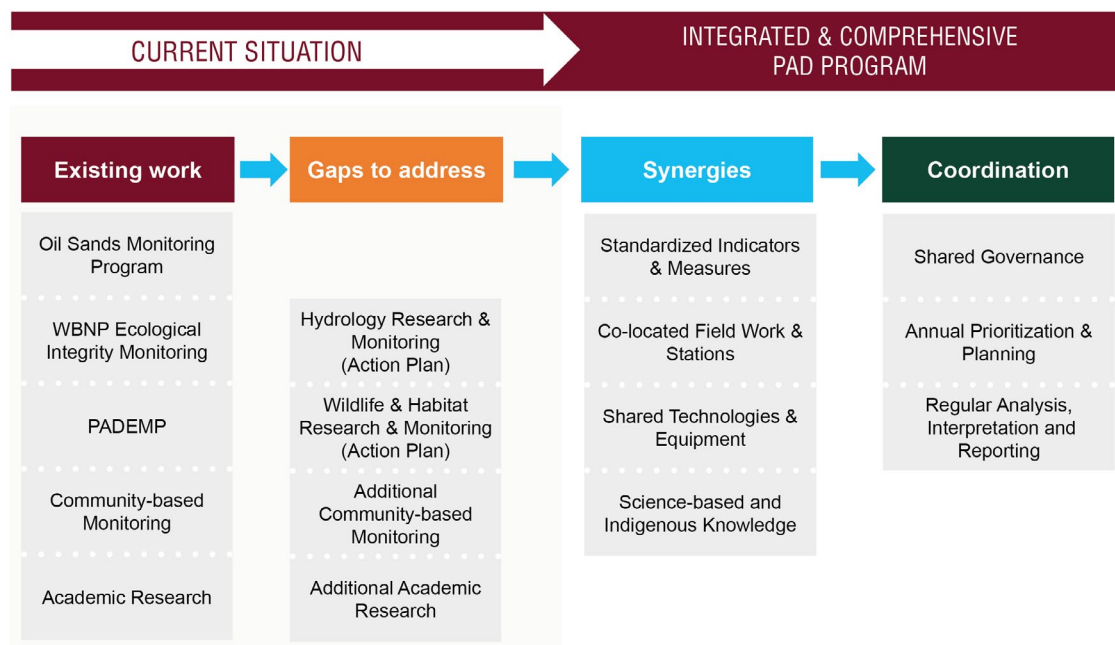
Parks Canada team members Jason Straka, left, and Jessica Lankshear conduct survey work on Egg island. Parks Canada Photo

The OSM program monitors surface water quality and quantity, groundwater quantity and quality, biodiversity, air quality, wildlife, and deposition across many indicators and relative to different limits of change. Critical to the program is reporting on environmental conditions by environmental theme area but also in an integrated manner across themes in the interest of understanding where cumulative effects are occurring relative to oil sands development. This effort includes collecting, managing and assessing data and knowledge, measuring change, developing limits of change, determining adequate baselines, and ensuring all is conducted to the highest standards of science and inclusive of and informed by Indigenous Knowledge.

Many factors and stressors (natural and man-made) influence environmental conditions in the PAD. Oil sands development is only one of these factors and is the focus of the OSM program. Examining factors beyond oil sands development

and associated environmental monitoring is outside of the scope of the OSM program. However, with a \$50 M annual funding commitment under the Oil Sands Monitoring Program Regulation, the OSM program provides significant contributions towards the actions in this plan where the actions are in-scope for the program. The OSM program work planning and governance includes representatives from Canada, Alberta, and regional First Nations and Métis.

In December of 2017, a Memorandum of Understanding (MOU) renewed commitments by the governments of Alberta and Canada to monitor oil sands development. The agreement also recognized and affirmed treaty and Aboriginal rights of Indigenous peoples as per section 35 of the Constitution Act, 1982. Indigenous communities are involved in many aspects of monitoring under the program, which is evolving and maturing to be more inclusive of Indigenous Knowledge and expertise, including indicators important to Indigenous communities. Program governance involves Indigenous communities in the region through an Operational Framework Agreement that has been co-developed with communities and endorsed by them. Industry has also formally supported the Operational Framework Agreement. Under the new MOU, the Government of Canada will also invest up to an additional \$2 million annually to assist local Indigenous communities — including some of those whose traditional territory includes Wood Buffalo National Park — to develop and implement community-based environmental monitoring projects.



Despite the efforts above, there remains no integrated PAD research and monitoring network that brings together these existing efforts, using both science-based and Indigenous Knowledge, to identify and address information gaps and comprehensively assess cumulative effects on the PAD (Figure 8).

The Government of Canada is committed to working with the governments of Alberta, British Columbia, and Northwest Territories,

Figure 8: Desired evolution of integrated PAD research and monitoring program.



WBNP staff and Fort Chipewyan Metis Local 125 member check ice thickness during PAD muskrat survey. Parks Canada Photo

as well as Indigenous partners, to develop and implement an integrated program of research and monitoring for the PAD that may include, among other attributes, a community-based research and monitoring hub in the PAD. This program will be informed, in part, by the findings and recommendations of the Strategic Environmental Assessment. To support implementation of this Action Plan, Parks Canada will lead the development of targets, indicators, and specific objectives (using both science-based and Indigenous knowledge) to monitor and track progress toward achieving the desired outcomes for each element of OUV.

Such a program must have strong community involvement to ensure community concerns are addressed, to ensure data and findings/results are accessible to community members, and to engender trust. To facilitate the development and implementation

of the program, a community-based research and monitoring hub is envisioned that:

- supports Indigenous involvement in the integration and coordination of PAD-related research and monitoring activities, and the synthesis of research and monitoring results;
- identifies community concerns, key questions, and areas where additional research and monitoring is required;
- connects researchers with the community, Indigenous governments, and PAD research and monitoring priorities;
- informs research and monitoring goals, supports research and monitoring activities (including Community-based Monitoring programs), and collects and mobilizes knowledge to inform decision-making relevant to the health of the site's OUV;
- connects Indigenous elders and youth to ensure cultural retention and the intergenerational transfer of Indigenous Knowledge; and
- develops and implements education/training programs and provides local employment opportunities.

Other supporting commitments related to this theme and scheduled for early implementation include:

- **PAD Research and Monitoring Workshop** to support the development of an integrated PAD research and monitoring program by identifying key questions and concerns, identifying gaps in knowledge, selecting appropriate indicators, creating linkages to existing/emerging science and monitoring programs, and stimulating new research and monitoring activities.
- **PAD Annual Symposium** to encourage information sharing, collaboration, and engagement to improve PAD research and monitoring and mobilize knowledge in support of improved decision making.
- **Develop targets, indicators, and objectives for each element of OUV of WBNP** to help evaluate the status and trend of each element of OUV.
- **Wetland Classification of PAD and Park** to support ecological assessments of PAD, Whooping Crane nesting area, and other park wetlands (using classification methodology employed in Alberta and NWT).
- **High-resolution digital terrain imagery of the PAD** to support development of a high-resolution digital elevation model of the delta required to facilitate hydrological assessments/modelling.
- **Invasive species monitoring** currently incorporated into the PAD vegetation monitoring program and expanded in 2018 to the Salt Plains.



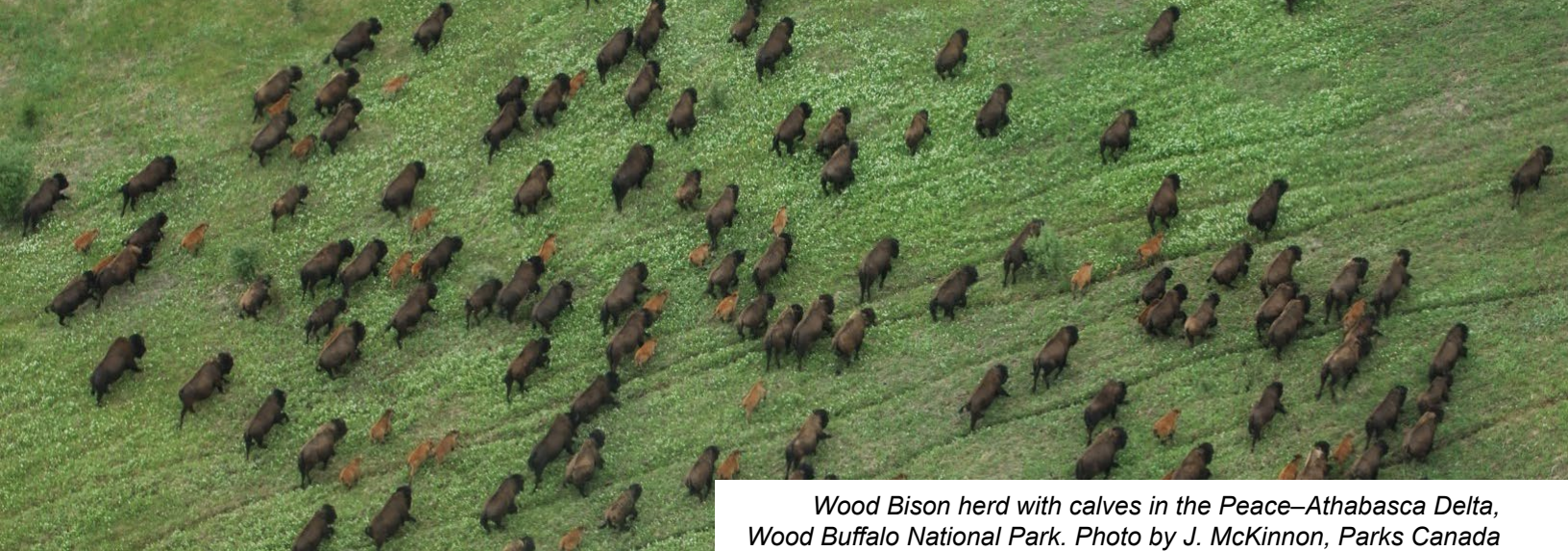
"The nature of the current challenges and development pressures on the ecological integrity of WBNP requires inter-jurisdictional collaboration and coordination to better understand and assess potential impacts and to inform decision-making."

GOAL: An Integrated PAD Research and Monitoring program (using both science-based and Indigenous Knowledge), supported by a community-based research and monitoring hub, is implemented to detect cumulative effects on the PAD and to generate information that informs land-use management and regulatory decision making.

Actions	Lead	Timeline
MS1: Coordinate PAD Research and Monitoring Workshop(s); develop and implement an integrated PAD Research and Monitoring Program.	PCA (including OSM, where required)	2018-2019, 2019-2020, and ongoing
MS2: Initiate annual PAD Symposium to share findings of PAD-related science and monitoring work underway by various organizations.	PCA	2019-2020
MS3: Develop targets, indicators and specific objectives (using science-based and Indigenous Knowledge) required to evaluate the status and trend of the elements of OUV of WBNP.	PCA (including OSM, where required)	2019-2020
MS4: Undertake Wetland Classification of the PAD and of WBNP to support ecological assessments of the PAD and other wetlands within WBNP.	PCA	2018-2019
MS5: Obtain high-resolution digital terrain imagery of the PAD.	ECCC (including OSM, where required)	2019-2020
MS6: Advance the potential development of a monitoring and research hub in the PAD and Fort Chipewyan to support the delivery of a PAD monitoring plan and Indigenous leadership in the gathering and integration of science-based and Indigenous Knowledge of the PAD by: <ul style="list-style-type: none"> • informing/integrating/coordinating research and monitoring goals and activities; • identifying community concerns and key questions; • connecting researchers / community / Indigenous governments; • collecting and mobilizing knowledge to inform decision making; • connecting Indigenous Elders and youth; • developing and implementing education and training programs, and • providing local employment opportunities. 	ECCC	2019-2020
MS7: Develop periodic State of the PAD reports.	PCA (including OSM, where required)	TBD
MS8: Expand invasive species monitoring and management to the Salt Plains as part of ongoing vegetation monitoring in WBNP WHS.	PCA	2018-2019
MS9: Continue to monitor environmental indicators in the PAD through the Oil Sands Monitoring Program for those elements that fall within the program scope and mandate and respecting the program's governance structure. Ensure this monitoring and reporting is coordinated with and leveraged as needed with the actions above throughout this plan.	AEP and ECCC (OSM)	Ongoing



Core sample training delivered by Environment and Climate Change Canada staff at WBNP office in Fort Chipewyan, with Mikisew Cree First Nation and Athabasca Chipewyan First Nation Community-Based Monitoring Program staff.



Wood Bison herd with calves in the Peace–Athabasca Delta, Wood Buffalo National Park. Photo by J. McKinnon, Parks Canada

6.9 Theme: Wildlife and Habitat Conservation

Actions outlined in this theme respond to recommendations 15 and 16 of the RMM report (see Appendix A). They are focused on Wood Bison and Whooping Cranes, two of the key elements of the Outstanding Universal Value of Wood Buffalo National Park. These species are also species at risk in Canada. Actions identified here are being undertaken in the context of species recovery planning, as outlined in the specific approved Recovery Strategies.

Wood Bison Recovery Strategy

The final *Recovery Strategy for the Wood Bison (*Bison bison athabasca*) in Canada* (Recovery Strategy)³⁶ was completed and publically posted in September, 2018. The Recovery Strategy outlines four broad strategic directions for the recovery of the species including:

1. Contain and prevent the spread of bovine tuberculosis and brucellosis from diseased local Wood Bison populations to disease-free local populations, cattle, and ranched bison, and evaluate current disease management options.
2. Maintain at least 90% of the genetic diversity, as measured by allelic diversity, within the Wood Bison subspecies and local recovery populations for the next 200 years;
3. Increase the potential for connectivity among isolated local free-ranging, disease-free populations, and for population expansion;
4. Increase public awareness and acceptance of Wood Bison, which includes acknowledging and augmenting social, cultural, ecological, and economic relationships among Wood Bison and Indigenous people and local communities.

In 2014, the Government of Alberta initiated a species status re-assessment process for Wood Bison in Alberta. This scientific assessment by the provincial Endangered Species Conservation Committee is currently under review by the province. The committee provided recommendations on the legal designation under the Wildlife Regulation, protection, and recovery of species at risk in the province. If a species is listed as Endangered or Threatened, a recovery planning process is typically initiated.

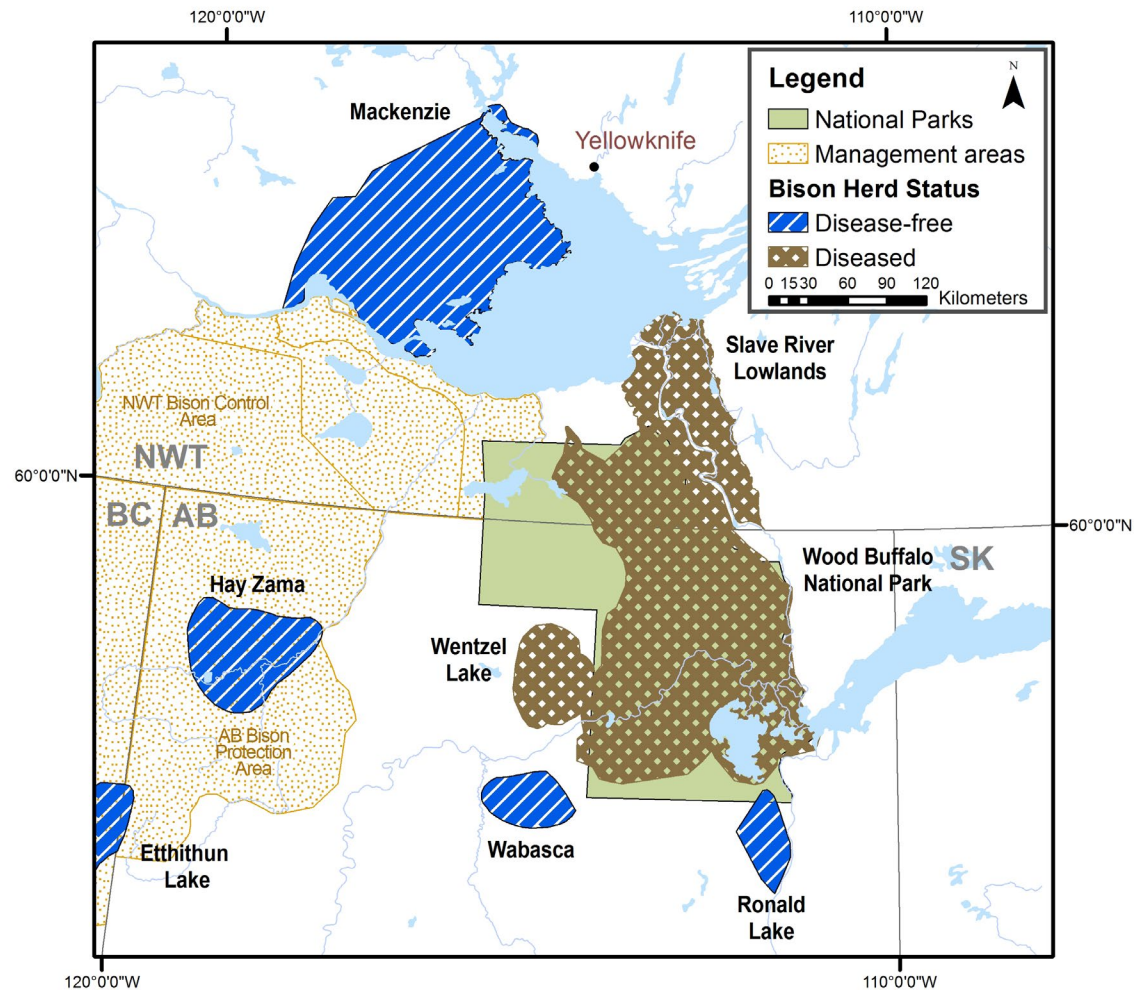
Only two naturally founded (i.e., not translocated by humans) disease-free Wood Bison local populations are known: the Ronald Lake Bison local population and the Wabasca Wood Bison local population (Figure 9). With approximately 200 and 40 Wood Bison respectively, these herds are small in size, but are culturally important to Indigenous people and may be important to species recovery because:

- they may harbour genetic diversity not represented in the human-translocated local populations; and
- they contribute to the population and distribution objectives outlined in the Recovery Strategy.

³⁶ Environment and Climate Change Canada, 2018. *Recovery Strategy for the Wood Bison (*Bison bison athabasca*) in Canada*. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada. Ottawa. viii + 59 pp.

Figure 9: Wood Bison herds in and around Wood Buffalo National Park.³⁷

Wood Bison control and management areas in Northwest Territories, British Columbia, and Alberta are indicated by the light brown stippled areas. Disease status indicates the presence or absence of bovine brucellosis and tuberculosis. In Alberta, bison are not protected from unregulated hunting on non-federal lands outside the AB Bison Protection Area, except for the area surrounding the Ronald Lake local population, where bison are considered a Subject Animal and non-Indigenous hunting is restricted under Alberta's Wildlife Act. In the Northwest Territories, bison hunting is unregulated within the NWT Bison Control Area to reduce the risk of disease transmission from the Wood Buffalo National Park area to disease-free herds.



The Ronald Lake Bison Herd (RLBH), whose range includes the southern end of WBNP, has been determined to be disease-free (bovine tuberculosis and brucellosis) and to be genetically differentiated from the other Wood Bison herds in the greater WBNP ecosystem. This suggests that gene flow between the RLBH and WBNP herds has been minimal since the 1920s when diseased plains bison were introduced to WBNP. As such, the RLBH is evolving independently of WBNP herds and has high conservation importance as one of only two naturally founded, disease-free Wood Bison herds.

While the Recovery Strategy recognizes that the RLBH is vulnerable to mine development impacts and to disease transmission from diseased Wood Bison in the greater WBNP region, much remains unknown about the status of this herd. The Government of Alberta, which has jurisdictional authority for managing the RLBH, is undertaking a series of actions to support its management. This includes establishing the RLBH Technical Team (Technical Team) in 2014³⁸ to direct independent studies to better inform regulatory and management decisions which could affect the herd's viability on the landscape. A multi-year program of study is underway to better understand the status of the herd, including the collection of information on the herd's range and distribution, habitat quality and quantity, disturbance impacts, herd population parameters and predation impacts.

"The Whooping Crane population is continuing on its path to recovery."

In addition, the Government of Alberta has been working with Indigenous communities to establish an Indigenous Knowledge Research Process (IKRP) parallel to the Technical Team to inform regulatory decisions and

³⁷ Modified from: Environment and Climate Change Canada, 2018. Recovery Strategy for the Wood Bison (*Bison bison athabasca*) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada. Ottawa. viii + 59 pp.

³⁸ Members of the RLBHTT include Government of Alberta, Parks Canada, Environment and Climate Change Canada, Mikisew Cree First Nation, Athabasca Chipewyan First Nation, Fort McKay First Nation, Fort McMurray Métis, Fort McKay Métis, Teck Resources Ltd., CNRL, and Northland Forest Products.



Wood Bison calf. Parks Canada Photo

management of the RLBH. In March 2016, Alberta Environment and Parks also invited Indigenous communities to participate in a cooperative management initiative with the goal of developing and implementing a long-term management strategy for the RLBH.

To better protect the herd, and to respond to concerns expressed by Indigenous communities about the cumulative impacts of sport hunting and industrial development on herd viability, the Alberta government designated the Ronald Lake Wood Bison as a “subject animal” under its Wildlife Act in March 2016, meaning these animals can only be hunted for subsistence by Indigenous people. In WBNP, the Wood Bison remains a protected species and cannot be hunted.

The largest single threat faced by the Wabasca Wood Bison herd, whose range is outside of WBNP, is likely hunting. Unlike

the Ronald Lake herd, the Wabasca herd has not been designated as a “subject animal” under Alberta’s *Wildlife Act*, so the hunting of the herd is unregulated. Currently, the hunting pressure on the local population is unknown. However, animals have been taken by both Indigenous and non-Indigenous hunters, as well as by the province for management purposes (related to reducing the risk of disease transmission in the greater WBNP Wood Bison population, or disease-testing the herd).

The Canadian Wildlife Service is currently undertaking an Imminent Threat Assessment (ITA) for Wood Bison in response to requests for Canada’s Species at Risk Act emergency orders from two First Nations. The assessment focuses on both the Ronald Lake and Wabasca Wood Bison herds. The objective of the ITA is to determine if there is an imminent threat to the survival or recovery of the species. The ITA process will also provide useful information regarding the importance of the herds to Wood Bison conservation, especially in regards to the Indigenous Knowledge gathered during the ITA process. Consultations on the ITA are currently underway with 11 Indigenous communities whose traditional territories overlap the ranges of the Ronald Lake and Wabasca Wood Bison herds. If it is determined by the Minister of Environment and Climate Change Canada that an imminent threat exists, Canada has discretion to issue an emergency protection order under section 80 of the *Species at Risk Act*.

Further to managing the risk of disease transmission to disease-free Wood Bison or cattle herds, the *Recovery Strategy for the Wood Bison (Bison bison athabascaae)* in Canada identifies, as an action item, a collaborative multi-stakeholder bison disease management planning group. The group will examine options and coordinate activities aimed at eliminating the risk of bovine brucellosis and tuberculosis transmission.

Whooping Crane Recovery Strategy

The Recovery Strategy for the *Whooping Crane (Grus americana)* in Canada³⁹ was released in 2007 and the Whooping Crane population is continuing on its path to recovery.

The Canadian Wildlife Service and Parks Canada continue to closely monitor the nesting area of the Whooping Crane within the greater WBNP ecosystem. This work involves annual aerial monitoring of habitat conditions, nest establishment, and recruitment of young Whooping Cranes into the population. Current and proposed research efforts include satellite tracking to learn more about threats to the population and high-resolution remote sensing to assess the extent and use of breeding habitat. In addition, monitoring under the OSM program is identifying landing and stopover sites in the oil sands region for Whooping Cranes during migration, with the intent of eventually delineating key areas or habitats and providing guidance on land-use management within those areas.

Critical habitat for Whooping Cranes is currently identified within WBNP WHS. As the population continues to grow and more nests are established both inside and outside the park, monitoring results will be used to further identify and manage the critical habitat required to support population recovery.

³⁹ Environment Canada. 2007. *Recovery Strategy for the Whooping Crane (Grus americana) in Canada. Species at Risk Act Recovery Strategy Series*. Environment Canada, Ottawa. vii + 27 pp.

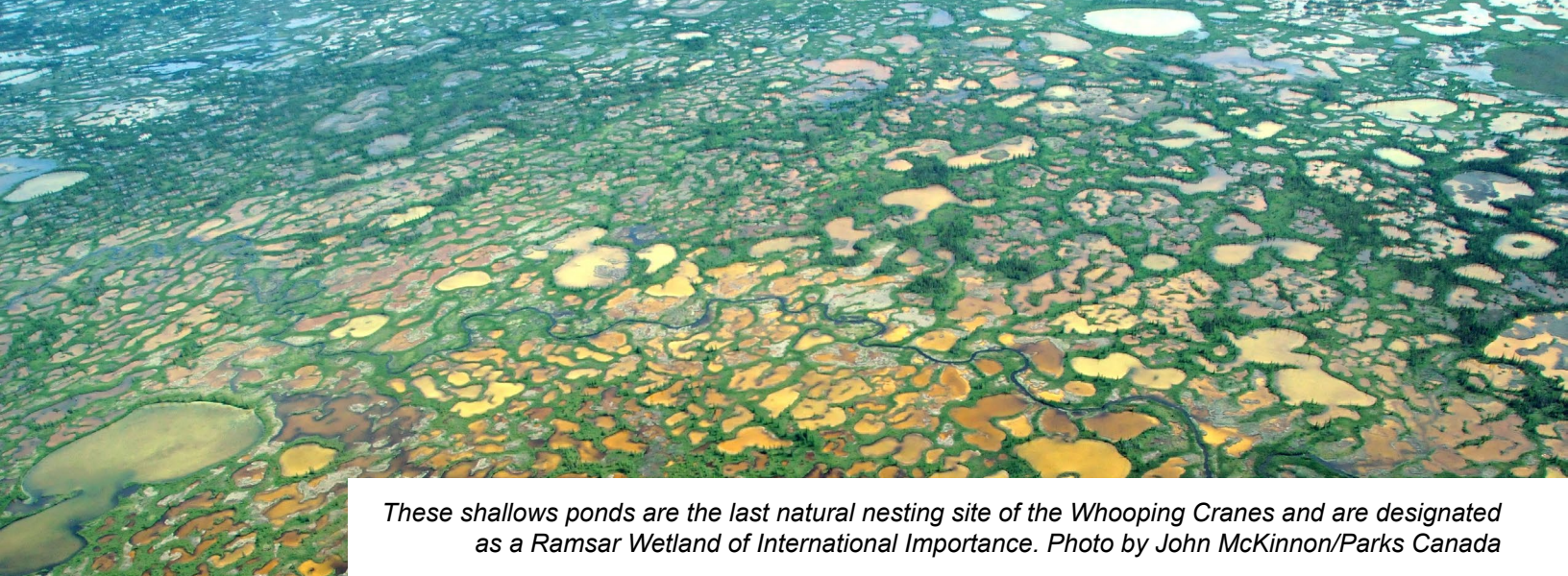
GOAL: Support the recovery of Wood Bison and Whooping Crane within and beyond WBNP through the implementation of recovery actions and species management in collaboration with Indigenous groups and using Indigenous Knowledge.

Actions	Lead	Year
WH1: Complete the Recovery Strategy for Wood Bison	ECCC	Completed
WH2: Undertake an Imminent Threat Assessment for Ronald Lake and Wabasca Wood Bison Herds	ECCC	2018-2019
WH3: Launch a collaborative multi-stakeholder bison disease management planning group to examine options and coordinate activities aimed at eliminating the risk of bovine brucellosis and tuberculosis transmission	PCA / Provincial co-leads	TBD
WH4: Develop one or more Action Plans for Wood Bison	ECCC	2022
WH5: Begin work to identify critical habitat for Wood Bison	ECCC	2018
WH6: Develop a cooperative management arrangement with Indigenous communities, ⁴⁰ to help support traditional land use and cultural values, including the exercise of rights recognized under section 35 of the Constitution Act 1982, on the management of the Ronald Lake Bison Herd in conjunction with the BSA and adjacent conservation areas.	AEP	Ongoing
WH7: Develop an Indigenous Knowledge Research Process to complement the Ronald Lake Bison Herd Technical Team	AEP	Ongoing
WH8: Continue to monitor the nesting area of the Whooping Crane within the WBNP and its wider ecosystem	ECCC / PCA	Ongoing
WH9: Conduct high-resolution remote sensing to assess the extent and use of Whooping Crane breeding habitat.	ECCC / PCA	2018-2019
WH10: Update critical habitat identification for Whooping Cranes.	ECCC / PCA	2022
WH11: Identify landing and stopover sites used by Whooping Cranes within the oil sands region during migration.	ECCC / AEP	2019



A visitor takes pictures of Wood Bison.

⁴⁰ Cooperative management of the Ronald Lake Bison herd is in addition to and does not replace or discharge, the Crown's legal duties to consult.



These shallows ponds are the last natural nesting site of the Whooping Cranes and are designated as a Ramsar Wetland of International Importance. Photo by John McKinnon/Parks Canada

7.0 Implementation, Reporting and Review

7.1 Implementation of the Action Plan

This Action Plan aims to increase collaboration between federal, provincial and territorial governments, which have jurisdictional authorities and responsibilities for actions outlined in this Action Plan, and with Indigenous governments which have stewardship responsibilities of their traditional territories.

A Federal-Provincial-Territorial Senior Management Committee, consisting of senior management officials from the governments of Canada, Alberta, British Columbia, and the Northwest Territories was established to provide oversight and direction in the development of this Action Plan. The committee also ensures that relevant jurisdictional processes and initiatives are leveraged to support the development of actions to address the RMM recommendations. This committee of senior managers was supported by a Federal-Provincial-Territorial Directors Committee that was responsible for ensuring collaboration and engagement between governments and with Indigenous partners and stakeholders to develop the Action Plan. As implementation of the Action Plan advances, various governance mechanisms will be leveraged and/or developed, where appropriate, to advance actions identified in this plan. Actions identified in this Action Plan related to environmental flows and hydrology require the cooperative efforts of federal, provincial, and territorial governments that have jurisdictional authorities for water and Indigenous communities that have stewardship responsibilities over their traditional lands. To this end, the proposed Federal-Provincial-Territorial-Indigenous (FPTI) committee (outlined in section 6.7) will be key to supporting collaboration through implementation of the EFH actions. The EFH working group identified a series of factors that should be reflected in such a governance mechanism. This includes the foundational nature and importance of the identified guiding principles, stability and longevity, sufficient resourcing, shared planning, process and criteria for decision-making, and the equal voice and inclusion of the diverse Indigenous groups and government representatives.



"In 2018, the Government of Canada announced \$27.5 million dollars (CAD) to support the development of this Action Plan and to ensure early implementation of the outlined priority actions."

For several Action Plan thematic areas, and the actions contained within it, mechanisms to support implementation are already in existence. For example, the Cooperative Management Committee of WBNP, which includes representatives of Indigenous partners and Parks Canada, will be the primary forum through which Indigenous groups and Parks Canada will collaborate to strengthen relationships in support of the cooperative management of WBNP. However, bilateral relationships between Canada and First Nations and Métis are also key to supporting collaboration in specific areas of the park and its management. Additionally, the land-use planning process led by

the governments of Alberta and the Northwest Territories will support the implementation of actions described in section 6.5. As implementation of the Action Plan advances, coordination and communication linkages with the proposed FPTI committee for environmental flows/hydrology and the CMC will be developed.

In 2018, the Government of Canada announced \$27.5 million dollars (CAD) to support the development of this Action Plan and to ensure early implementation of the outlined priority actions. This new investment in the actions identified in this plan is underway and is focused on early and immediate priorities of enhancing the operational and scientific capacity of WBNP to improve understanding, monitoring, and managing the OUV of WBNP. Collaborative processes with Indigenous partners in support of staffing for the Fort Chipewyan office are underway, and increased investment in the operations of WBNP will support the strengthened management of the Peace–Athabasca Delta in particular. Priority scientific baseline studies, increased capacity for OUV monitoring, environmental assessment, aquatic science, and wildlife management are part of this early investment. Increased investment to support enhanced Indigenous partner participation in the Cooperative Management Committee and a working group on hydrology/environmental flows have occurred. Additional priorities for investment will occur as implementation of the Action Plan continues and strategies to seek new resources will be developed in 2019.

7.2 Review of the Action Plan

Parks Canada Agency (Parks Canada), which has the mandate and legislative responsibility to protect and manage Wood Buffalo National Park World Heritage Site, and which also acts as the State Party representative of Canada to the World Heritage Convention, will lead the reporting on implementation of this Action Plan. Recognizing the range of jurisdictional authorities and roles of different levels of government for implementation of the actions outlined in the Action Plan, Parks Canada will lead this reporting in collaboration with other federal government departments, with the governments of Alberta, British Columbia, and the Northwest Territories, and with Indigenous partners of Wood Buffalo National Park.

The Action Plan will be regularly updated and reviewed to respond to new information, changing circumstances, and emerging issues. It is anticipated that the Action Plan will be updated following each review process, and adapted as implementation advances. It is also expected that the Action Plan will inform park management planning reviews. An initial review assessing progress in implementing the Action Plan will be undertaken in 2021, after which a full review of the Action Plan will occur every 5 years. This 5 year review period will be aligned with the federal commitment to undertake a review of the Wood Buffalo Management Plan every five years.

Reports outlining the findings of these reviews will be submitted to the World Heritage Centre and made publicly available.



Visitors looking at salt plains.

Appendix A: Reactive Monitoring Mission Report Recommendations (by theme)

#	RMM Recommendation By Theme
Strengthening Indigenous Partnerships with Wood Buffalo National Park (IP)	
1	Adopt a clear and coherent policy and guidance to enable the transition to a genuine partnership with First Nations and Métis communities in the governance and management of the property.
12	Consolidate the management resources and capacity to a standard commensurate with World Heritage status and adequately respond to the challenges facing the property by: a) Reinstating a year round status and staffing of WBNP; b) Recruiting a full-time Superintendent exclusively in charge of WBNP; c) Ensuring an adequate Parks Canada presence in Fort Chipewyan, part of the critical PAD area and a major ecological region of WBNP.
13	Further develop the existing Cooperative Management Committee established by the State Party, and consolidate a functional and effective mechanism to involve Aboriginal Peoples in the management of the property.
14	Ensure that the preparation and skills of involved governmental staff correspond to the requirements inherent in the evolving relationship with First Nations and Métis communities.
Environmental Assessment (EA)	
4	Conduct, in line with the IUCN World Heritage Advice Note on Environmental Assessment, an environmental and social impact assessment of the Site C project and, if moved forward, any other hydropower projects potentially affecting the Outstanding Universal Value of the property.
5	Conduct an environmental and social impact assessment of the proposed Teck Frontier Oil Sands Mine Project in line with the IUCN World Heritage Advice Note on Environmental Assessment, fully taking into account the Outstanding Universal Value of the property, including the PAD.
8	Expand the scope of the SEA, which was requested by the Committee in its Decision 39 COM 7B.18, so that it adequately reflects the scale, pace and complexity of industrial development, land use changes and river flow manipulations in the Peace and Athabasca River watersheds, both in terms of individual and cumulative impacts.
9	Expand the scope of monitoring and project assessments to encompass possible individual and cumulative impacts on the Outstanding Universal Value of the property and in particular the PAD.
Conservation Area Connectivity (CC)	
10	Conduct a comprehensive assessment of options, in order to underpin decision-making to put in place an effective buffer zone, as defined in the Operational Guidelines. The Birch River deserves particular attention as the only relatively intact major watershed of the PAD.
11	Conduct a systematic assessment of options to better realize synergies between the property and land-use planning in its immediate vicinity, including the existing and planned provincial protected areas.

Tailings Ponds Risk Assessment (TP)

- | | |
|---|---|
| 6 | Conduct a systematic risk assessment of the tailings ponds of the Alberta Oil Sands region with a focus on risks to the Peace–Athabasca Delta, and submit the report of this assessment to the World Heritage Centre, for review by IUCN, in accordance with Paragraph 172 of the Operational Guidelines. |
|---|---|

Environmental Flows and Hydrology (EFH)

- | | |
|---|---|
| 3 | To enable informed decision-making, conduct environmental flows assessments to the highest international standards for the Peace, Athabasca and Slave Rivers as they pertain to the health of the PAD, in order to identify water flows needed to sustain the ecological functioning of the PAD under the circumstances of existing and planned future dams and water withdrawals. These assessments should incorporate projections of climate change and should determine the cumulative effects on the PAD and the property of flow regulation of all existing and proposed dams on all three rivers. |
| 7 | Establish adequate baseline hydrological information of the Peace and Athabasca River Basins to enhance the reference for monitoring and assessing current and future hydrological conditions. |

Monitoring and Science (MS)

- | | |
|----|---|
| 2 | Considering the increasing pressures on the property at this time, prioritize conservation and ensure that the State Party's science capacity enables Parks Canada's legal obligation to maintain and restore the ecological integrity of the property. |
| 17 | Incorporate invasive alien species (IAS) into the overall monitoring of the property and the PAD based on science and local and Indigenous Knowledge, and based on monitoring results, develop an appropriate management response to control the spread of IAS. |

Wildlife and Habitat Conservation (WH)

- | | |
|----|--|
| 15 | <p>Further harmonize and adopt the Species Recovery Strategy for Wood Bison throughout its range, including but not limited to the greater WBNP Ecosystem, and specifically:</p> <ul style="list-style-type: none"> a) Urgently invest in comprehensive and independent analysis of the conservation importance and status of the Ronald Lake Bison Herd (RLBH), including threats to it posed by proposed development, within a broader Species Recovery Strategy; b) Dedicate, in full cooperation with Aboriginal Peoples, adequate attention and funding to the management of Wood Bison, including as regards the development of disease management options other than culling. |
| 16 | Continue to closely monitor the entire used and potential nesting area of the Whooping Crane within the greater WBNP Ecosystem so as to be able to respond to possible changing management requirements. |

Appendix B: Implementation Schedule (by theme)

Action	Lead Organization	Inside / Outside WBNP	Timeline (+ = ongoing, • = completed)				
			2019	2020	2021	2022	2023 +
THEME: Strengthening Indigenous Partnerships with Wood Buffalo National Park (RMM Recommendations 1, 12, 13, 14)							
OUTCOME: Improved relationships between WBNP and its Indigenous partners results in improved, cooperative management of the park that meets the interests of all parties.							
IP1: CMC will identify core areas of immediate interest regarding the management of the site, and adjust its process as required to effectively address these areas of interest.	PCA	Inside					
IP2: CMC will develop and adopt policies to meet the interests of all parties, in particular related to the staffing of Indigenous persons and a contracting policy to ensure that opportunities for Indigenous persons are enhanced.	PCA	Inside					
IP3: Increase capacity for park management and staffing in Fort Chipewyan, to respond to the pressures facing the the Peace–Athabasca Delta.	PCA	Inside					
IP4: Develop and implement a training program for Wood Buffalo National Park staff designed to improve the evolving relationship with Indigenous communities.	PCA	Inside					
IP5: Continue engagement through bilateral processes between First Nations and Métis groups where these have been established.	PCA	Inside					
IP6: Co-develop (with Indigenous groups) options for enhancing the profile of Indigenous content in WBNP and for recognizing Indigenous contributions to WBNP.	PCA	Inside					
THEME: Environmental Assessment (RMM Recommendations 4, 5, 8, 9)							
OUTCOME: Ensure that the Outstanding Universal Value of the property is considered in environmental assessments where potential specific or cumulative impacts may occur on the OUV of WBNP, in particular in the Peace–Athabasca Delta.							
EA1: Refer the proposed Amisk Hydroelectric Project to an independent review panel.	CEAA	Outside	•				

EA2: Amend Guidelines for the Preparation of the Environmental Impact Statement for the Amisk Hydroelectric Project to direct consideration of potential effects of the project on the OUV of the park, including the PAD.	CEAA	Outside					
EA3: Conduct an SEA on the potential of all developments to impact the Outstanding Universal Value of the Wood Buffalo National Park World Heritage Site, and submit to the World Heritage Centre.	PCA	Outside	•				
EA4: Submit the SEA to the Joint Review Panel for the Teck Frontier Oil Sands Mine Project for consideration.	CEAA	Outside	•				
EA5: Amend the Joint Review Panel Agreement for Teck Frontier to mandate the Panel to consider and report on the potential environmental and cumulative effects of the project on the OUV of the World Heritage Site, including the PAD.	CEAA	Outside	•				
EA6: Evaluate the potential effects of the Frontier Project on the OUV of the park and provide assessment to the Teck Frontier Joint Review Panel for its consideration in the environmental assessment.	CEAA	Outside	•				
EA7: Ensure that all current and future environmental assessment reviews conducted pursuant to federal legislation consider the specific and cumulative impacts on the OUV of WBNP and are aligned with the IUCN World Heritage Advice Note on Environmental Assessment and World Heritage, to the extent possible.	CEAA	Outside					
GOAL: Continue to work with Indigenous communities and stakeholders on Lower Athabasca Region environmental management frameworks.							
EA8: Continue to work with Indigenous communities and stakeholders on the Aboriginal navigation component of the Alberta's Lower Athabasca Region Surface Water Quantity Management Framework for the Lower Athabasca River. This will include further development of the Aboriginal Navigation Index.	AB	Outside					
EA9: Develop a work plan to address ecological knowledge gaps as identified in the Lower Athabasca Region Surface Water Quantity Management Framework for the Lower Athabasca River.	AB	Outside					
EA10: Conduct an analysis of Oil Sands Monitoring Program water quality stations and parameters in the oil sands region and including, where applicable, the Peace–Athabasca Delta to assess changes in water quality relative to limits of change and considering Indigenous community-based monitoring. This would be conducted for those elements that fall within the programs' scope and mandate and respecting the program's governance structure.	Alberta – AEP; and Canada – ECCC (OSM) AB	Outside					

EA11: Integrate the findings of Oil Sands Water Quality analysis to inform updates to the Surface Water Quality Management Framework.	AEP					
EA12: Complete development of a cumulative effects environmental monitoring framework for the Oil Sands Monitoring Program under the programs' scope, mandate and governance structure.	Alberta – AEP; and Canada – ECCC (OSM)					
THEME: Conservation Area Connectivity (RMM Recommendations 10, 11)						
OUTCOMES: Improved connectivity for wildlife and supporting processes. Increased ecological integrity and resiliency of the Outstanding Universal Value of Wood Buffalo National Park World Heritage Site. Improved connectivity for the protection and exercise of Aboriginal and treaty rights. Strengthened relationships with Indigenous partners through respectful application of science-based and Indigenous Knowledge to conservation planning and management.						
GOAL: Within individual jurisdictions, establish buffer zones around WBNP through the establishment of adjacent protected and conserved areas.						
CC1: Establish five new and expanded conservation areas under the Lower Athabasca Regional Plan, adjacent to WBNP, to increase functional connectivity for OUV within WBNP.	AEP	Outside	•			
CC2: Develop cooperative management arrangements with Indigenous communities ⁴¹ and organizations to help support traditional land use and cultural values, including the exercise of rights recognized under section 35 of the Constitution Act, 1982, for the five new and expanded wildland provincial parks under the Lower Athabasca Regional Plan.	AEP	Outside				
CC3: Advance (through discussions with Indigenous communities and stakeholders) the proposal for an additional conservation area on the land base known as the Biodiversity Stewardship Area immediately south of WBNP.	AEP	Outside	•			
CC4: Following months of collaborative discussions with Indigenous groups, industry and other stakeholders, the Government of Alberta to consult on the creation of the Biodiversity Stewardship Area, which will designate the area as a wildland provincial park (protected area) from a multiple use land base with industrial tenure. The proposed protected area is about 166,110 hectares located directly south of WBNP.	AEP	Outside				

⁴¹ Cooperative management of Wildland Parks is in addition to and does not replace or discharge the Crown's legal duties to consult.

CC5: Develop cooperative management arrangements with Indigenous communities ⁴² for management of the BSA that supports WBNP OUV (e.g., bison and watershed protection), as well as Indigenous cultural and traditional values, including the exercise of rights recognized under section 35 of the Constitution Act 1982.	AEP	Outside					
CC6: Integrate an Indigenous Guardian Program ⁴³ to support Indigenous stewardship of the five new and expanded conservation areas under the Lower Athabasca Regional Plan, as well as the Biodiversity Stewardship Area.	AEP						
CC7: Advance conservation priorities under “ <i>Healthy Lands, Healthy People: Government of Northwest Territories: Priorities for Advancement of Conservation Network Planning – 2016 – 2021</i> ”.	NWT- ENR	Outside	TBD				
CC8: Advance regional land use planning processes in areas surrounding WBNP.	AB, NWT- ENR	Outside					
CC9: Enhance communication and explore opportunities for closer collaboration particularly under the Pathway to Canada Target 1 initiative.	Canada, AB., NWT	Both					
CC10: In association with the Pathway to Canada Target 1 support efforts to establish new tools for conservation ⁴⁴ that contribute to conservation area connectivity in the WBNP region.	Canada, AB., NWT	Both					
GOAL: Determine the ecological functional needs of the elements of OUV of WBNP WHS as they relate to conservation area connectivity.							
CC11: Consolidate Indigenous and scientific information on the habitat and dispersal requirements for key species through extensive literature review and community led workshops.	PCA	Both					
CC12: Acquire existing data related to species occurrence and remote sensing for spatial analysis and mapping.	PCA	Both					
CC13: Identify and confirm information gaps and identify plans to fill these gaps.	PCA	Both					
CC14: Conduct analysis of assembled data and apply habitat and movement information acquired during workshops to develop a series of species-specific, landscape-scale, habitat suitability and connectivity maps.	PCA	Both					
CC15: Peer review and gather feedback on spatial models. Peer review will include follow-up workshops to identify accuracy, strengths and weaknesses of resulting maps.	PCA	Both					

⁴² Cooperative management of the BSA is in addition to and does not replace or discharge the Crown's legal duties to consult.

⁴³ For more information on the Indigenous Guardians Program see: www.ilinationhood.ca/our-work/guardians/

⁴⁴ New tools for conservation refer to recently developed pan-Canadian standards for protected areas, other effective conservation measures, and Indigenous protected and conserved areas. For more information see: <http://www.scics.ca/en/product-produit/news-release-canadas-natural-legacy/>

CC16: Generate a series of map packages for subsequent communications and planning purposes that describe the results of the modelling process and highlight habitat and movement needs for key species throughout the WBNP region.	PCA	Both					
GOAL: Identify potential gaps necessary for the maintenance of OUV that can guide future conservation planning and/or management.							
CC17: Conduct workshop on spatial priorities for conservation including objectives for a gap analysis on areas in and adjacent to WBNP.	PCA	Both					
CC18: Undertake landscape gap analysis and spatial conservation prioritization exercise using current methods and tools (i.e., Marxan).	PCA	Both					
CC19: Produce maps and communication products that provide results of gap analysis and present design options for contributing to a regional network of protected and conserved areas, including a buffer zone adjacent to WBNP.	PCA	Both					
THEME: Tailings Ponds Risk Assessment (RMM Recommendation 6)							
OUTCOME: Tailings ponds are constructed, managed and maintained to limit impacts to the Athabasca River, and new and legacy tailings volumes are reclaimed in a timely manner, so that the risk of tailings ponds to the PAD is minimized.							
TP1: Ongoing implementation of the Tailings Management Framework to promote progressive reclamation, accelerate tailings treatment and improve the water management system. Continue to support existing forums for including indigenous perspectives on advancement of this work. Consider results of the tailings risk assessment study (TP2) in future review and amendment of the Tailings Management Framework and Directive 085.	AEP	Outside					
TP2: Pursue a systematic tailings risk assessment by collaborating with Indigenous peoples, national/international experts, and industry to develop a landscape model considering tailings reclamation, hydrology, withdrawals, climate change, seepage, and cumulative effects. This is within the scope of the Oil Sands Monitoring Program and would be conducted through existing work planning and governance processes.	AEP and Canada – ECCO (OSM)	Outside				+	
TP3: Amend the Water Ministerial Regulation, ensuring major water management infrastructure and tailings dams are safe.	AEP	Outside	•				
TP4: Provide regulatory oversight to ensure tailings dams are safe and managed appropriately by operators.	AEP	Outside					

TP5: Minimize fluid tailings accumulation by ensuring that fluid tailings are treated and reclaimed progressively during the life of a project and all fluid tailings associated with a project are ready to reclaim within 10 years of end of the mine life of that project. Supported through ongoing work undertaken as part of tailings management implementation.	AER	Outside					
TP6: Establish project-specific target, triggers and limit for new fluid tailings. Supported through ongoing work undertaken as part of tailings management implementation.	AER	Outside					
TP7: Develop plans to reduce legacy tailing volumes to a ready-to-reclaim state by end of mine life.	AER	Outside					
TP8: Tailings ponds are designed, constructed, operated, maintained, and decommissioned safely. Supported through ongoing work undertaken as part of tailings management implementation.	AER	Outside					
TP9: Conduct ambient environmental monitoring to inform a risk assessment on changes to environmental condition. This is within the scope of the Oil Sands Monitoring Program and would be conducted through existing work planning and governance processes.	Alberta — AEP; and Canada — ECCC (OSM)	Outside					
TP10: Establish Oil Sands Process Affected Water Science Team to provide credible scientific information to inform government and regulatory bodies on potential process water treatment and release. Create additional Science Teams as needed to support implementation of the Tailings Management Framework.	AEP	Outside					

**THEME: Environmental Flows and Hydrology
(Recommendations 3, 7)**

OUTCOMES:

Ecological and Hydrological Integrity – Water quantity improvements, including variability, sustain ecological functioning and integrity of the PAD to support the OUV.

Exercise of Aboriginal and treaty rights – Water quantity improvements sustain healthy and abundant traditional resources and Indigenous ways of life in the PAD.

Informed Decision-Making – Improved baseline data/knowledge and comprehensive environmental flows assessments inform decision-making related to the ecological and hydrological integrity of the PAD.

GOAL: To establish renewed and effective partnerships through a cross-jurisdictional and Indigenous governance team to guide and inform management actions toward achieving the desired hydrology outcomes for the PAD and WBNP.

EFH1: Convene and resource an FPTI Committee and Secretariat to oversee implementation of the EFH portion of the WBNP Action Plan.	ECCC	Both					
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EFH2: Develop a Terms of Reference that establishes: <ul style="list-style-type: none"> • Accountability and reporting • Authority • Roles and responsibilities, including a clear mandate • Communication to member organizations, decision-makers and invested parties • Criteria for decision making • Resourcing • Mechanisms to evaluate actions taken and provide for adaptive management 	ECCC	Both					
EFH3: Establish and task project teams to implement key actions (e.g., structural alternatives project team; target/objective-setting) outlined for the EFH theme. Note that timelines will be variable as the needs for various project teams change.	ECCC	Both					
EFH4: Establish clear lines of communication and linkages to existing processes such as the Mackenzie River Basin Board, WBNP Cooperative Management Committee, Alberta–NWT Bilateral Management Committee, Alberta Watershed Planning and Advisory Councils, etc.	ECCC	Both					
EFH5: Implement a progress reporting mechanism to Federal, Provincial, Territorial, and Indigenous governments.	ECCC	Both					
EFH6: Communicate the findings of assessments, research, and modelling with stakeholders and Indigenous communities.	ECCC	Both					
GOAL: Identify and describe the areas and conditions where changes to water quantity would support the achievement of the outcomes for ecological and hydrological integrity & exercise of Aboriginal and treaty rights							
EFH7: Document priority locations in the PAD (Figure 6) where ecological integrity is impacted and intervention is required, as well as areas from currently documented sites of navigational and/or cultural importance in the PAD, and identify which of these is appropriate for early action and monitoring for trends.	PCA / Indigenous partners	Inside					
EFH8: Identify the key objectives for the selected early action locations.	PCA / MCFN / ACFN / Ft. Chip Métis	Inside					
EFH9: Initiate feasibility studies to assess what actions could be implemented to make progress toward these objectives, as described in actions EFH 32-33 (artificial ice dam) and EFH 56-57 (control structures).	PCA / Indigenous partners	Inside					
EFH10: Undertake Indigenous use interviews to identify priority navigation routes and pinch points for all communities that travel within WBNP for the exercise of Aboriginal and treaty rights, where not currently documented.	Indigenous partners	Inside					

EFH11: Undertake Indigenous use interviews to identify areas and timing of key contemporary and historic cultural importance including, but not limited to, medicine, hunting, fishing, gathering, spiritual and cultural practice.	Indigenous partners	Inside					
EFH12: Identify key areas of WBNP where water quantity changes are required to restore ecological integrity.	PCA / Indigenous partners	Inside					
EFH13: Document the information from all above activities and summarize the specific objectives in a final report(s).	PCA	Inside					
EFH14: Over time, using adaptive management (see section 7.1.2 in the SEA), learn through action, monitoring, and modelling what water quantity change supports achievement of these objectives.	FPTI Committee	Inside					
GOAL: Set SMART water quantity targets and indicators toward achieving the objectives identified above.							
EFH15: Assess use of existing indicators developed with Indigenous expertise, such as by the Mackenzie River Basin Board, the NREI and NRBS, those in place in WBNP through Parks Canada and Community-Based Monitoring programs.	ECCC	Inside					
EFH16: Identify gaps in knowledge for indicators and targets and develop a plan to address these gaps.	ECCC / PCA	Inside					
EFH17: In conjunction with 'objectives' interviews, conduct interviews of elders and land users to inform development of Indigenous SMART targets and rights-based indicators for Indigenous use objectives identified above (e.g., abundance of harvested species and/or traditional use plants; navigability of priority routes).	Indigenous Partners	Inside					
EFH18: Informed by the objectives and baseline hydrological conditions identified below, develop SMART targets (or target ranges or thresholds) and indicators to assess: <ul style="list-style-type: none"> • progress toward intermittent high elevation recharge of the PAD's perched basins (including key sites of Indigenous cultural importance within these perched basins, if applicable) • progress toward low elevation recharge and connectivity (including key sites of Indigenous cultural importance) • navigability of seasonal priority routes. 	PCA	Inside					
EFH19: Make the targets and indicators available via the Knowledge Hub (see EFH 69-75), with regular reporting.	PCA / Indigenous communities	Inside					

GOAL: Establish a monitoring regime that tracks the trend of indicators identified above across the extent of WBNP and the PAD and over time that evaluates the effectiveness of management actions, building on existing monitoring programs where possible.

EFH20: Assess and inventory the historic and ongoing monitoring within WBNP.	ECCC / PCA / CBM programs	Inside					
EFH21: In coordination with actions taken pursuant to Monitoring and Science theme, identify gaps in the types and location of monitoring within WBNP required to support monitoring of: a. indicators, including navigability, b. baseline / reference parameters, c. parameters required for model operation and validation, and d. water management actions.	FPTI Committee	Inside					
EFH22: Make monitoring data available, to local communities and decision-makers in a timely and transparent manner.	FPTI Committee	Inside					
GOAL: Establish protocols for, and identify circumstances under which, a strategic release of water from the Williston Reservoir behind the W.A.C. Bennett Dam could enhance an ice jam flood event within WBNP to encourage flooding of the PAD, including its perched basins, while minimizing unwanted upstream and downstream risks.							
EFH23: Create a protocol for a proposal from the Government of Alberta for a test flow (a release of water from the W.A.C. Bennett Dam) to influence an ice jam event in the PAD similar to the 1996 request.	AB/ BC / BC Hydro	Outside					
EFH24: Assemble currently available data and information that could indicate if a test flow has a reasonable chance of being successful while minimizing the risk of unintended negative consequences.	AB/ BC / BC Hydro	Outside					
EFH25: Identify gaps in knowledge, review assembled information and confirm gaps using a workshop format, and develop plans to fill knowledge gaps.	AB/ BC / BC Hydro	Outside					
EFH26: Communicate with all stakeholders about management actions within the Peace–Athabasca Delta System to ensure risks are understood and acceptable.	AB / BC / BC Hydro	Both					
EFH27: Implement the protocol as opportunities arise, including water release, if supported.	AB / BC / BC Hydro	Outside					
EFH28: For each particular test flow, establish assessment criteria and appropriate monitoring.	AB / BC / BC Hydro	Both					
EFH29: Conduct analysis, modelling, and monitoring related to addressing knowledge gaps with the purpose of identifying more specific parameters that could be used to inform Alberta's request for a test flow release.	AB / BC / BC Hydro	Both					

EFH30: Update the protocol for a request from Alberta for a test flow release to influence an ice jam event in the PAD with more specific parameters, or update based on lessons learned from any subsequent ice jams and/or test flows.	AB / BC / BC Hydro	Outside					
GOAL: To enhance spring flooding using artificial ice damming within WBNP.							
EFH31: Establish ice dam project team.	PCA / Indigenous Partners	Inside					
EFH32: Review past attempt to create an ice dam and related recommendations, and confirm one or more locations where an ice dam(s) could support the desired outcomes.	Project team	Inside					
EFH33: Establish goals and objectives and develop a plan (i.e., Terms of Reference) to install an ice dam(s) to meet goals and objectives.	Project team	Inside					
EFH34: Obtain required equipment (spray ice pump(s), monitoring equipment, etc.), establish field team to implement plan.	Project team	Inside					
EFH35: Implement plan (given necessary environmental pre-conditions are met).	Project team	Inside					
EFH36: Monitor / document implementation and results, assess results against objectives, refine plan for implementation in future years. Assess the potential for ice dams to support improved ecological and hydrological integrity in other parts of the PAD.	Project team	Inside					
GOAL: To enhance monitoring and to improve the assessment of current and future water quantity conditions in the Peace and Athabasca River Basins.							
EFH37: Assess the current state of knowledge and monitoring within the PAD.	ECCC	Inside					
EFH38: Assess the current state of knowledge and monitoring within the Peace and Athabasca River Basins.	FPTI Committee	Both					
EFH39: Develop a common understanding of the complex hydrological function of the Peace and Athabasca River Basins and the PAD.	FPTI Committee	Both					
EFH40: Conduct a water balance assessment of the Athabasca and Peace River basins.	FPTI Committee	Both					
EFH41: Determine the appropriate reference time point and scale to define baseline(s) conditions, including: pre-development, present conditions, naturalized ⁴⁵ .	FPTI Committee	Both					

⁴⁵ For modelling/simulation purposes discussed herein, naturalized is modelled natural flows without regulation or withdrawals on the Peace and Athabasca rivers.

EFH42: Determine if appropriate baseline indicators are being monitored and identify gaps.	FPTI Committee	Both					
EFH43: Develop plan to gather information to fill gaps in western and Indigenous Knowledge.	FPTI Committee	Both					
EFH44: Undertake elder interviews (in conjunction with other interviews) to inform the pre-regulation and pre-development state of hydrology within the Peace–Athabasca River Basins and Delta.	Indigenous Partners	Both					
EFH45: Ensure identified hydrological indicators are being monitored at appropriate spatial and temporal scale. Integrate with target and indicator monitoring toward objectives wherever possible.	FPTI Committee	Both					
EFH46: Communicate findings from baseline assessment to modelling work and to decision-makers to inform decisions related to future development or management action.	FPTI Committee	Both					
EFH47: Periodically review and update baseline(s) as information becomes available and share results.	FPTI Committee	Both					2025 +
GOAL: To identify, modify and, if necessary, produce environmental flows assessment models that incorporate state-of-the-art understanding of localized effects of the past, ongoing, and projected climate changes, to inform future and ongoing management actions that could impact WBNP.							
EFH48: Hold a workshop to facilitate a common understanding of the influence of oil sands withdrawals on Indigenous navigability.	ECCC Alberta, MCFN	Both					
EFH49: Inventory and assemble relevant currently available hydrological and geomorphological data, existing models (e.g., Athabasca River Basin Initiative and ongoing work under LARP for the Athabasca River, AEP forecast model of the Peace River, Mackenzie River Basin Hydraulic Model, data from Community-Based Monitoring) and information for the Peace and Athabasca Rivers and tributaries and include this inventory (and data, as appropriate) in the knowledge hub.	ECCC	Both					
EFH50: Hold a workshop(s) with Science-based and Indigenous Knowledge experts to scope the variables and data required to produce: 1) a simplified (or geographically restricted) model(s) with existing data to predict and understand the effects of small-scale management options being considered. 2) a holistic, basin-wide, multi-jurisdictional environmental flows model.	ECCC	Both					
EFH51: Review existing models and modelling results to identify options to achieve the identified objectives for Indigenous navigability and ecological outcomes in WBNP.	FPTI Committee	Inside					

EFH52: Identify gaps and undertake a plan to address these gaps, including potential field studies, and develop finer-scale climate change scenarios for the longer-term holistic model, as requested in Recommendation 3.	ECCC	Both					
EFH53: Develop a holistic, basin-wide, multi-jurisdictional model to the highest international standards to understand hydrological, ecological, and Indigenous use relationships in light of current and future climate change and cumulative effects of withdrawals and regulation.	FPTI Committee	Both					
EFH54: Make the model(s) and requisite data available to inform future management actions or decisions in the Mackenzie basin that could impede or support the achievement of the PAD objectives and outcomes.	FPTI Committee	Both					2025
EFH55: Update the model framework as data become available through study and management actions and share results.	FPTI Committee	Both					2025 +
GOAL: Strategically-placed short- and/or long-term water management control structure(s) within the PAD create a local hydrological regime that supports the ecological functioning and Indigenous use in identified target areas.							
EFH56: Assemble and review overview of the existing data and information related to past, current, or potential control structures in the PAD.	FPTI Committee	Inside					
EFH57: Obtain new information related to possible short-term or small-scale options to improve the hydrological regime in the PAD.	FPTI Committee	Both					
EFH58: Pending feasibility assessment results and consultation with local communities, select the most appropriate action and complete the full design for one or more pilot control structures. <ul style="list-style-type: none"> • Determine appropriate Indigenous and hydro-ecological indicators and monitor for effects of the control structure(s) • Learning from monitoring and implementation results, adjust timing and length of installation and/or site of installation 	FPTI Committee	Inside					
EFH59: Install one or more pilot control structures and/or repair existing weirs, as designed.	PCA or AEP	Inside					
EFH60: Monitor and adapt installation as required to progress toward objectives.	FPTI Committee	Inside					
EFH61: Identify remaining gaps in knowledge, including linkages between PAD with current or future structural scenarios, varying flow input, and impacts upstream and downstream.	FPTI Committee	Both					

EFH62: Longer-term structural options will be assessed in the cumulative framework to test interactions with other management options. Continued monitoring of pilot structures, existing structures and ice damming efforts will provide key information.	FPTI Committee	Inside					
GOAL: Identify and assess the risk of alternative management options to provide recommendations toward achieving desired flows and water levels							
EFH63: Using or adapting models built and knowledge obtained from environmental flows assessments and early actions, assess the predicted impacts of potential management options, singly or in combination.	FPTI Committee	Both					
EFH64: Select a set of priority scenarios to undertake more detailed evaluation including assessing what impact each has on the achievement of key selected ecological and traditional use objectives/outcomes (using indicators as identified above, such as muskrat).	FPTI Committee	Both					
EFH65: Assess the impact of priority scenarios on interests upstream and downstream of the PAD.	FPTI Committee	Both					
EFH66: Impact assessment and detailed analyses of desired management options.	Jurisdictional authority	Both					2024
EFH67: Recommend the preferred management approach(es) to the relevant jurisdictional authorities that could support achieving the ecological and traditional use EFH objectives.	FPTI Committee	Both					2024
EFH68: Continue to monitor and adapt toward achieving the desired outcomes.	FPTI Committee	Both					2024 +
GOAL: To establish a Knowledge Hub to make Peace–Athabasca Delta information and data from science-based and Indigenous Knowledge sources more easily accessible.							
EFH69: Complete a user-needs survey to assess what type of information and presentation the various users require or want.	ECCC	Both					
EFH70: Establish an appropriate knowledge hub platform, informed by similar existing resources (e.g., Mackenzie Data Stream) that targets needs without creating redundancies.	ECCC	Both					
EFH71: Establish data sharing protocols.	FPTI Committee	Both					
EFH72: Develop a basic ethics and data sharing agreement that can be adapted as needed.	FPTI Committee	Both					

EFH73: Update knowledge hub routinely with monitoring and study data from within WBNP.	FPTI Committee	Both					
EFH74: Establish communication mechanisms and frequency to exchange information with (a) communities, (b) jurisdictions and governments, and (c) stakeholders and the general public.	FPTI Committee	Both					
EFH75: Regularly review and evaluate the effectiveness of the Knowledge Hub and ensure links are up to date.	FPTI Committee	Both					
THEME: Monitoring and Science (RMM Recommendations 2, 7)							
OUTCOME: An Integrated PAD Research and Monitoring program (using science-based and Indigenous Knowledge), supported by a community-based research and monitoring hub, is implemented to detect cumulative effects on the PAD and to generate information that informs land-use management and regulatory decision making.							
MS1: Coordinate PAD Research and Monitoring Workshops; develop and implement integrated PAD Research and Monitoring Program.	PCA (including OSM, where required)	Both					
MS2: Initiate annual PAD Symposium to share findings of PAD-related science and monitoring work underway by various organizations.	PCA	Both					
MS3: Develop targets, indicators and specific objectives (using science-based and Indigenous Knowledge) required to evaluate the status and trend of the elements of OUV of WBNP.	PCA (including OSM, where required)	Inside					
MS4: Undertake Wetland Classification of the PAD and of WBNP to support ecological assessments of the PAD and other wetlands within WBNP.	PCA	Inside					
MS5: Obtain high-resolution digital terrain imagery of the PAD.	ECCC (including OSM, where required)	Inside					
MS6: Advance the concept of a PAD monitoring hub to support better integration of science-based and Indigenous Knowledge of the PAD.	ECCC	Inside					
MS7: Develop periodic State of the PAD reports.	PCA (including OSM, where required)	Both	TBD				
MS8: Expand invasive species monitoring and management to the Salt Plains as part of ongoing vegetation monitoring in WBNP WHS.	PCA	Inside					
MS9: Continue to monitor environmental indicators in the PAD through the Oil Sands Monitoring Program under the programs' scope, mandate and governance structure. Ensure this monitoring and reporting is coordinated with and leveraged as needed with the actions throughout this plan.	AEP and ECCC (OSM)	Both					

**THEME: Wildlife and Habitat Conservation
(RMM Recommendations 15, 16)**

OUTCOME: Support the recovery of Wood Bison and Whooping Crane within and beyond WBNP through the implementation of recovery actions and species management in collaboration with Indigenous groups and using Indigenous Knowledge.

WH1: Complete the Recovery Strategy for Wood Bison.	ECCC	Both	•				
WH2: Undertake an Imminent Threat Assessment for Ronald Lake and Wabasca Wood Bison Herds.	ECCC	Outside					
WH3: Launch a collaborative multi-stakeholder bison disease management planning group to examine options and coordinate activities aimed at eliminating the risk of bovine brucellosis and tuberculosis transmission.	PCA / Provincial co-lead	Both	TBD				
WH4: Develop one or more Action Plans for Wood Bison.	ECCC	Both					
WH5: Begin work to identify critical habitat for Wood Bison.	ECCC	Both					
WH6: Develop a cooperative management arrangement with Indigenous communities, ⁴⁶ to help support traditional land use and cultural values, including the exercise of rights recognized under section 35 of the Constitution Act 1982, on the management of the Ronald Lake Bison Herd in conjunction with the BSA and adjacent conservation areas.	AEP	Outside					
WH7: Develop an Indigenous Knowledge Research Process to complement the Ronald Lake Bison Herd Technical Team.	AEP	Outside					
WH8: Continue to monitor the nesting area of the Whooping Crane within the WBNP and its wider ecosystem.	ECCC / PCA	Both					
WH9: Conduct high-resolution remote sensing to assess the extent and use of Whooping Crane breeding habitat.	ECCC / PCA	Both					
WH10: Update critical habitat identification for Whooping Crane.	ECCC / PCA	Both					
WH11: Identify landing and stopover sites used by Whooping Cranes within the oil sands region during migration.	ECCC / AEP	Outside					

⁴⁶ Cooperative management of the Ronald Lake Bison herd is in addition to and does not replace or discharge the Crown's legal duties to consult.

Appendix C : Strategic Environmental Assessment Recommendations (by theme)

Environmental Assessment

- Submit this SEA to the Joint Review Panel for the Teck Frontier Oil Sands Mine Project for consideration.
- Revise the Guidelines for the Preparation of an Environmental Impact Statement for the Amisk Hydroelectric Project to include a requirement to evaluate the effects on the Outstanding Universal Values of WBNP and the effects the project would have on the ability to restore the PAD.
- Refer projects under the Canadian Environmental Assessment Act, 2012 (or subsequent legislation) and Mackenzie Valley Resource Management Act for environmental assessment when they might have significant adverse environmental effects on the World Heritage Values of WBNP world heritage site and evaluate those potential impacts as part of the assessment.
- Include an analysis of the impacts of projects within WBNP on the World Heritage Values of WBNP proportionate to the risk of the project to the World Heritage Values.
- Build on the experience of this SEA by including Indigenous Knowledge (IK) related to WBNP in project assessments.

Conservation Area Connectivity

- When conducting the systematic assessment of options required by RMM Recommendation 11, consider:
 - Protection of Whooping Crane habitat and supporting hydrology beyond the WBNP boundary
 - Protection of hydrology supporting karst within WBNP
 - Habitat protection for bison herds ranging beyond the WBNP boundary
 - Implications for changes to other species that may affect the wolf-bison relationship such as deer, moose and caribou
 - Opportunities to reduce the risk to water quality
- A number of the forest management agreements bordering WBNP are held by Indigenous governments. These agreements present opportunities for management to address the issues identified in SEA Recommendation 18 either through long-term conservation forest management agreements, protected areas that permit timber harvesting (permitted in some IUCN category VI parks), Indigenous protected and conserved areas or other effective area-based conservation measures.

Tailings Ponds Risk Assessment

- The evaluation of the risk of the tailings ponds on the PAD and OUV objectives should include an evaluation of the probability and consequence of catastrophic failure as well as risks from seepage, VOCs, GHG emissions and bird impacts.
- Ensure active involvement of relevant Indigenous governments in the risk assessment process so that Indigenous views and perspectives are represented and taken into account to support trust in the restoration of resource quality.
- Ensure that the risk assessment captures the cumulative impact of both existing and future tailings ponds facilities within the Athabasca River basin.

Wildlife and Habitat Conservation

- Analyze bison population data in light of the end of wolf control to better understand the population's natural range of variability.
- Complete the identification and protection of Whooping Crane critical habitat to meet desired outcomes.
- Implement additional measures to protect the Wabasca Bison herd and the entire Ronald Lake Bison Herd range from non-Indigenous hunting.
- While maintaining or restoring the ecological integrity of WBNP, minimize the risk of disease and parasite transmission to or from cattle. Proactively consider implementing management actions that support the Wood Bison recovery goal of the local population levels being sufficient "to sustain traditional Aboriginal harvesting activities, consistent with existing Aboriginal and Treaty rights of Aboriginal peoples of Canada".

Environmental Flows / hydrology

- Implement cross-jurisdictional (including Indigenous governments) cooperation in order to achieve the world heritage desired outcomes for the PAD and the national park by:
 - Recognizing the fact that water releases are complex hydrological events with potential negative consequences, consult with communities upstream and downstream of the PAD to ensure intervention risks are understood and acceptable.
 - Providing major water releases from the Bennett Dam at appropriate opportunities during the early freshet to encourage ice-jam events capable of flooding the PAD's perched basins.
 - Investigating and implementing strategies to promote favourable flooding conditions on the Peace River, involving reducing water flow in late fall to promote lower and thicker ice cover freeze up, as well as increasing water flow during spring freshet and summer open water season.
 - Reviewing the relative success of past attempts to restore flood conditions in the PAD, including the following releases of water from the W.A.C. Bennett Dam to inform above work.
- Consider options for strategically placed water management/control structures within the PAD, recognizing flow regulation, water withdrawals, and projected climate change impacts on available water resources and implement using an adaptive management approach, including:
 - Reviewing past attempts to control outflow on the PAD, conducting modelling analyses of interventions in Recommendation 1 and climate change, identifying appropriate feasible objectives and evaluating implications of any options for the downstream.
 - Developing options for constructing ice dams, improvement to or additional rockfill weirs, inflatable/gated weirs, and/or retentive/flexible flow barriers at strategic points within the PAD to restore water levels in the PAD in the short term and long term.
 - Establishing a monitoring system in the PAD to measure ice conditions (thickness and quality), water levels, advise on water release measures, and to verify the effectiveness of physical interventions measures (flow releases and flow barriers) on an ongoing basis.
 - Developing a PAD water management group to monitor the success of implementing water release/control measures.
- Work with Alberta's Climate Change office and federal climate change specialists to determine more precise climate change model projections for the Athabasca and Peace River basins. Surface Water Quantity Management Framework (SWQMF) to incorporate all three world heritage desired outcomes for the PAD.
- Update the SWQMF to incorporate all three world heritage desired outcomes for the PAD, including:
 - Completing the work required to address gaps in knowledge related to impacts to the PAD identified in SWQMF.
 - Including a mechanism that provides mitigation for navigation and access by Indigenous people.

- Install additional monitoring capability at the hydrological stations on the Athabasca River below the Fort McMurray oil sands area, including:
 - Investigating options for the Embarras, Old Fort and/or 27th Baseline stations.
 - Investigating the ability to measure water depths to provide data for navigational studies on the Athabasca River.
 - Assessing water quality in terms of flow rates (AECOM, 2010).
 - Estimating sediment and nutrient loads to the PAD.
- Install a hydrometric monitoring station on the Peace River at the 5th meridian.
- Develop a hydrologic and hydraulic model of the watershed for the Peace, Athabasca, Lake Athabasca and PAD system that could be used to understand the cumulative impacts of upstream developments and activities and assess restoration options.
- Conduct a water balance of the entire lower Athabasca River basin or, alternately, Fort McMurray downstream to the PAD, and Peace River basin considering:
 - Weekly surface water demand (m³/s) for oil sands facilities from the mainstem Athabasca River
 - Weekly surface water withdrawals from tributary rivers of the Athabasca River (i.e., not the main stem as measured at the Fort McMurray station)
 - Municipal and other non-industrial water withdrawals
 - Projected weekly start up surface water demand for the three new conventional mine projects coming online (mainstem AR and tributary)
 - Weekly groundwater demand for in-situ oil sands facilities
 - Projected groundwater demand for reasonably foreseeable in-situ projects coming online
 - Annual volume of surface water being diverted by conventional and in-situ oil sands facilities from rain/snow and muskeg/peat water
 - Weekly peak demand for surface water for the oil sands (mainstem and tributary)
 - Weekly low flow surface water demand during the winter (if any)
 - Annual volume of in-situ process water being injected into deep formations (and the depth of injection)
 - Groundwater discharge rate into the Athabasca River downstream of the oil sands
 - Water volumes entering the PAD from the Athabasca River
 - Annual estimate of total volume of surface water being removed by conventional oil sands facilities
 - Annual estimate of total volume of groundwater being removed by in-situ oil sands facilities
- In order to determine the difference between climate variability and anthropogenic effects on the Athabasca River over the past fifty years, investigate the naturalized flows (flow conditions that would have existed without the effect of industrial, agricultural, and municipal water withdrawals) below the Fort McMurray hydrometric station.

Monitoring and Science

- Opportunistically include monitoring and research on karst and salt plains in other research and monitoring programs.
- If Pine Point Mine becomes closer to an application for full mine operation, conduct research on hydrological connectivity between the mine site and the karst and Whooping Crane habitat.
- Analyze breeding waterfowl data for the PAD to better define the quantitative objectives of breeding bird populations in the PAD and to better understand the relationship between breeding waterfowl population trends in the PAD and elsewhere in North America.

- Develop a multi-partner project to understand changes in waterfowl migration around WBNP. A key element of this project should be a more detailed exploration of IK about changes in waterfowl migration. During the SEA discussions, Indigenous land users discussed in much greater detail the changes they had seen by species and differences in spring and fall migration patterns etc. It wasn't possible to explore all this detail in the SEA, but it would be helpful in the context of this project.
- Establish an approach to monitoring and understanding waterfowl migration numbers and routes.
- Complete the WBNP fire management plan including consideration of climate change.
- Support IK studies that can feed into the Action Plan implementation. A robust monitoring program will be essential as the Action Plan is implemented.
- Implement approaches to monitoring for all monitoring recommendations that integrate IK and science and engage local land users, including Community-Based Monitoring programs. The Peace–Athabasca Delta Ecological Monitoring Program provides an example of the approach that could be used.
- Ensure monitoring information and hydrological data is provided by regulatory and industry bodies in a transparent and easily accessible format.
- Ensure data collected by researchers on world heritage values is shared in a manner that it can benefit broader ongoing work.
- Use integrated monitoring approaches, particularly in the PAD, to support understanding in this very complex ecosystem. For example, monitor sediment, groundwater, fish, water, snow, wildlife and air in an interconnected manner. This approach can help with understanding the linkages between biota and the dynamic abiotic processes that are characteristic of the PAD.
- Develop and implement objectives to maintain/restore traditional resources (such as bison, muskrat, moose, migratory waterfowl, fish and traditional plants) and biodiversity in the PAD.
- Develop and implement adaptive management approaches for managing invasive species (such as thistle) using science and IK.
- Develop and implement site specific guidelines for water and sediment quality in the Athabasca and Peace Rivers and Athabasca River estuary in Lake Athabasca, including:
 - Referring to CCME 2003 for published approaches;
 - Providing a better information about water quality concerns, particularly for parameters which are associated with the commonly occurring highly suspended sediments, such as total metals, total petroleum hydrocarbons (TPH) including F1-F2 fractions and nutrients.
- Implement a large-scale monitoring program for PACs and PAHs in the PAD, including:
 - Expanding the scope of the current JOSM PAH water monitoring program to snow sampling, spring run-off sampling, and an expanded water sampling within PAD water bodies and tributary rivers;
 - Implement an air quality monitoring program for PAHs and RCSs in Fort Chipewyan;
 - Distinguishing between petrogenic versus pyrogenic PAHs in PAD.
- Update and expand the Surface Water Quality Management Framework for the Lower Athabasca Region to include monitoring stations in the Peace–Athabasca Delta, a more comprehensive selection of oil sands related contaminants and guidelines or thresholds relevant to the desired outcomes for the PAD.
- Implement a fish monitoring program for western Lake Athabasca and the PAD
- Develop life-cycle assessment (LCA) for major pollutants such as Hg including global sources when applicable.

- Initiate a study of natural sources of pollutants originating from bitumen deposits through which the Athabasca River and its tributaries are incised, or other sources responsible for loading of PAD sediments
 - Propose measures how to manage natural pollution from bitumen and groundwater in order to manage cumulative effects on the PAD
 - Quantify contribution of tributaries to the mass balance of contaminants of potential concern (COPC'-s) that influence water quality in PAD
 - Assess Birch Mountain contribution to PAD pollution from its natural Black Shale deposits and propose measures to control it

Water Quality

- Consider implementing a water quality improvement plan for each watershed draining into the PAD using inspiration from similar plans from other places with sensitive receiving waters from multiple drainages.

Appendix D: Key Federal, Provincial and Territorial Legislation

Federal Legislation

Parks Canada decisions and actions in protecting, managing and operating a national park are guided by the *Canada National Parks Act* (2000) and by park management plans. The Act provides legal protection for WBNP and also prescribes that the “maintenance or restoration of ecological integrity, ... shall be the first priority of the Minister when considering all aspects of the management of parks.” Park management plans are prepared every 5 years in consultation with Indigenous governments, stakeholders and the general public, and identify key management issues and challenges along with a framework for addressing them.

There are a number of other relevant federal acts that also support the protection of the park including, among others: *Navigation Protection Act*; *Canada Water Act*; *Fisheries Act*; *Species at Risk Act*; *Migratory Birds Convention Act, 1994*; *Canadian Environmental Protection Act, 1999*; *Canadian Environmental Assessment Act, 2012*; *Mackenzie Valley Resource Management Act* and *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act*. Parks Canada collaborates closely with other federal, provincial and territorial departments regarding the application of federal legislation in and around the park.

Provincial and Territorial Legislation

Alberta:

- *The Alberta Land Stewardship Act* provides the legal basis for Alberta’s Land-use Framework, including the development of regional plans. The Lower Athabasca Regional Plan (LARP) is the first regional plan developed in Alberta. Five environmental management frameworks are established under LARP (air quality, groundwater, surface water quality, surface water quantity, and tailings) and a biodiversity management framework is under development. The environmental management frameworks support the management of cumulative effects of development on the environment. A regional plan for the Lower Peace Region will be developed and will include environmental management frameworks.
- *The Water Act* and the *Environmental Protection and Enhancement Act (EPEA)* and their associated regulations are the primary legislation governing water quality and quantity in Alberta. EPEA is the primary legislation governing water quality in Alberta. Approvals for point source discharges such as municipal and industrial releases into rivers in Alberta, and other types of releases, are issued under EPEA. Any proposed new municipal or industrial releases require the proponent to assess the potential effects of the project on water quality as part of environmental impact assessments and/or applications for operating approvals. *The Water Act* primarily regulates allocation, diversion and uses of surface water and groundwater, including disturbance within water bodies and watercourses. In addition, Codes of Practice are enabled as regulation under both EPEA and the *Water Act*, and define required practices for specified activities.
- The Chief Scientist, Alberta Environment and Parks, has a legislated mandate under EPEA to monitor, evaluate and report on the condition of Alberta’s environment. Two independent advisory panels, the Indigenous Wisdom Panel and the Science Advisory Panel, have also been established in legislation to ensure the scientific integrity of the environmental science program, inclusive of Indigenous Knowledge, to inform our understanding of the condition of the environment.
- The Alberta *Provincial Parks Act* is three pieces of legislation that provides legal direction and guidance for managing Alberta’s provincial parks system. The *Provincial Parks Act* has a number of regulations that provide guidance around specific activities and restrictions in provincial parks, wildland provincial parks and provincial recreation areas.

British Columbia:

- The *Water Sustainability Act*- governs water stewardship, including water allocation planning, water management planning, drought management, licenses to divert and use water, and licenses to construct works or make other changes in and about a watercourse.
- The *Water Protection Act* protects BC's water by reconfirming the Province's ownership of surface and groundwater, clearly defining limits for bulk water removal, and prohibiting the large-scale diversion of water between major provincial watersheds and/or to locations outside of the province.
(<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/laws-rules/water-protection-act>)

Northwest Territories:

- In the Northwest Territories, lands and waters are managed through an integrated system of legislation including the *Waters Act*, the *Northwest Territories Lands Act* and the federal *Mackenzie Valley Resource Management Act*.

Glossary

Aboriginal Base Flow: Flow on the Athabasca River and adjacent streams required for MCFN and ACFN members to be able to practice their rights, and access their territories fully.

Aboriginal Extreme Flow: Flow at which widespread and extreme disruption of treaty and Aboriginal rights occurs along the Athabasca River, delta, and tributaries due to a loss of access related to low waters.

Cumulative environmental effects / impacts: effects on the environment which are caused by the combined results of past, current and future activities.

Ecological Integrity: With respect to a national park, "...a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes."⁴⁷

Environmental flows: A term that describes the quantity, timing, and quality of freshwater flows and levels necessary to sustain aquatic ecosystems which, in turn, support human cultures, economies, sustainable livelihoods, and well-being. In this definition, aquatic ecosystems include rivers, streams, springs, riparian, floodplain and other wetlands, lakes, coastal waterbodies, including lagoons and estuaries, and groundwater-dependent ecosystems.⁴⁸

Hydrology: the scientific study of the quantity, movement, storage, and distribution of water on Earth.

Indigenous Knowledge (IK): Knowledge of Indigenous traditional and cultural activities, as well as knowledge of the natural world including physical environments, the cosmos, and the spirit world, and the values and principles governing Indigenous persons' conduct and interactions with one another, the natural world, the cosmos, and the spirit world, transmitted through oral tradition, ceremonies, song, mnemonic devices, laws and stories and by conducting and observing Indigenous traditional and cultural practices.

Outstanding Universal Value (OUV): Outstanding Universal Value is one of the central ideas underpinning the World Heritage Convention. Broadly, its meaning follows the common sense interpretation of each word:

- Outstanding: properties should be exceptional or superlative - they should be the most remarkable places on Earth
- Universal: properties need to be outstanding from a global perspective
- Value: the natural and/or cultural value of a property

PAD System: the Peace–Athabasca-Delta and the Peace, Athabasca and Slave Rivers as they pertain to the health of the PAD.

Reactive Monitoring: the reporting by the World Heritage Centre, other sectors of UNESCO and the Advisory Bodies to the World Heritage Committee on the state of conservation of specific World Heritage properties that are under threat

Reactive Monitoring Mission: the verification of the source and contents of information received (from a source other than a State Party) that a World Heritage site has seriously deteriorated.

Science-based Knowledge: Knowledge derived through the application of the scientific method, a trial and error process focused on testing hypotheses through observation, measurement, and experiment.

Water Quantity is characterized by the magnitude and timing of flow (cubic metres per second), water level (metre) and/or water depth (metre). It can be influenced by precipitation, evaporation, land cover, transpiration, weirs, dams and diversions in or out of the watershed and will vary annually and seasonally.

⁴⁷ Canada National Parks Act (2000)

⁴⁸ Arthington et al. 2018. *The Brisbane Declaration and Global Action Agenda on Environmental Flows* (2018). *Frontiers in Environmental Science* DOI:10.3389/fenvs.201800045

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Web links

Athabasca Watershed Council - State of Watershed reports:
awc-wpac.ca/resources/awc-reports/

Constitution Act (Canada):
Constitution Act, 1982
Section 35

Government of Alberta News Release - World's Largest Boreal Forest:
www.alberta.ca/release.cfm?xID=55951F7FBFC21-B342-F69F-2BB2163D213E56F7

Indigenous Guardians Program:
www.ilinationhood.ca/our-work/guardians/

Integrated Watershed Management Plan – Peace and Slave watersheds:
mightypeacewatershedalliance.org/projects/integrated-watershed-management-plan

IUCN Advice Note on Environmental Assessment:
iucn.org/sites/dev/files/import/downloads/iucn_advice_note_environmental_assessment_18_11_13_iucn_template.pdf

Marxan conservation planning tool:
marxan.org/about.html

MCFN Petition, RMM report, SEA and Action Plan:
pc.gc.ca/en/pn-np/nt/woodbuffalo/info/SEA_EES

Pathway to Canada Target 1:
www.conservation2020canada.ca/
www.scics.ca/en/product-produit/news-release-canadas-natural-legacy/

Site C Joint Review Panel Agreement:
ceaa-acee.gc.ca/050/documents/p63919/81725E.pdf

Truth and Reconciliation Commission:
nctr.ca/assets/reports/Calls_to_Action_English2.pdf
thecanadianencyclopedia.ca/en/article/truth-and-reconciliation-commission

World Heritage Committee Decision, 2015: Wood Buffalo National Park World Heritage Site:
World Heritage Committee Decision 39 Com 7B.18, 2015

World Heritage Committee Decision, 2017: Wood Buffalo National Park World Heritage Site:
World Heritage Committee Decision 41 Com 7B.2, 2017

World Heritage List - Wood Buffalo National Park World Heritage Site:
whc.unesco.org/en/list/256/