# REPORT ON THE
# JOINT WORLD HERITAGE CENTRE/IUCN REACTIVE MONITORING MISSION TO THE WORLD HERITAGE PROPERTY WOOD BUFFALO NATIONAL PARK (CANADA)
## From 18 to 26 AUGUST 2022

*Image 1: Lakes and wetlands of the Peace-Athabasca Delta. © UNESCO/Stephen Davis*

**TABLE OF CONTENTS**

## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ACFN | Athabasca Chipewyan First Nation |
| ACO | Aboriginal Consultation Office |
| AER | Alberta Energy Regulator |
| BC | Province of British Columbia |
| CAD | Canadian Dollar |
| CBM | Community Based Monitoring |
| CEC | Commission for Environmental Cooperation |
| CEO | Chief Executive Officer |
| CIWG | Crown-Indigenous Working Group |
| CMC | Cooperative Management Committee |
| CNRL | Canadian Natural Resources limited |
| CPAWS | Canadian Parks and Wilderness Society |
| DKFN | Deninu K'ue First Nation |
| ECCC | Environment and Climate Change Canada |
| EFH | Environmental Flows and Hydrology |
| ELOHA | Ecological Limits Of Hydrologic Alteration |
| EPEA | Environmental Protection and Enhancement Act |
| ESIA | Environmental and Social Impact Assessment |
| FPT | Federal-Provincial-Territorial |
| IAAC | Impact Assessment Agency of Canada |
| IAS | Invasive Alien Species |
| IC | Indigenous Caucus |
| IPCA | Indigenous Protection and Conservation Area |
| IRMP | Integrated Research and Monitoring Programme |
| IUCN | International Union for Conservation of Nature |
| JOSM | Joint Canada-Alberta Oil Sands Monitoring Program |
| KFN | K'atl'odeeche First Nation |
| KN | Kitaskino Nuwenëné |
| KNWPP | Kitaskino Nuwenëné Wildland Provincial Park |
| LARP | Lower Athabasca Regional Plan |
| LRRCN | Little Red River Cree Nation |
| MCFN | Mikisew Cree First Nation |
| NGO | Non-governmental organisation |
| NWT | Northwest Territories |
| OSCA | Oil Sands Conservation Act |
| OSM | Oil Sands Monitoring |
| OSPW | Oil Sands Process-affected Water |
| OUV | Outstanding Universal Value |
| PAC(s) | Polycyclic Aromatic Compounds |
| PAD | Peace-Athabasca Delta |
| PC(A) | Parks Canada (Agency) |
| REDA | Responsible Energy Development Act |
| SEA | Strategic Environmental Assessment |
| SLFN | Smith's Landing First Nation |
| SOC | State of Conservation |
| SRFN | Salt River First Nation |
| TMF | Tailings Management Framework |
| ToR | Term(s) of Reference |
| UN | United Nations |
| UNDRIP | United Nations Declaration on the Rights of Indigenous Peoples |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| WBNP | Wood Buffalo National Park |
| WHC | World Heritage Centre |
| WPP | Wildland Provincial Park |

## TABLE OF FIGURES

## TABLE OF IMAGES

**ACKNOWLEDGEMENTS**

The mission team would like to express its sincere gratitude to the Governments of Canada, Alberta and Northwest Territories, and the Indigenous Governments and rightsholders for their kind hospitality and for the arrangements put in place to ensure the smooth running of the mission.

The federal site manager of the property, Parks Canada Agency, in particular Ms Christine Loth-Bown and her team, made every effort to organize and successfully host the mission. The mission team especially welcomes the significant efforts by the State Party to involve a wide range of indigenous rightsholders and other stakeholders in the preparation of the mission and throughout its programme.

The mission team was privileged to be accompanied through all its meetings and visits at the various locations by representatives of Environment and Climate Change Canada, Alberta Environment and Parks (now Alberta Environment and Protected Areas), and BC Hydro as well as representatives of the indigenous rightsholders.

The mission team would like to convey its deepest gratitude to the indigenous rightsholders who organized field visits and feels particularly honoured to have been warmly welcomed by the communities in Fort Chipewyan and Fort Smith. The wide participation of indigenous rightsholders allowed the mission team to get in-depth insights into the Park's history, the difficult legacy for the indigenous rightsholders linked to its creation and the subsequent ongoing challenges and unresolved conflicts related to its governance.

The mission team would like to convey its special thanks to the Federal Minister of Environment and Climate Change, the Honourable Steven Guilbeault, and the Parliamentary Secretary to the Minister, Terry Duguid, who took the time to virtually meet the mission team for a valuable exchange on the ongoing challenges and the progress made since the last joint World Heritage Centre/IUCN Reactive Monitoring mission in 2016 and to Ron Hallman, CEO of Parks Canada Agency.

Lastly, the mission team thanks moreover all community members, Elders, land users, representatives of NGOs and civil society, all of whom contributed valuable comments and support, and which have shared their stories, sorrows and hopes with the mission team. Our thanks also go to all other stakeholders of Wood Buffalo National Park for their sincere engagement, and highly commendable work, and shared commitment to working together towards the safeguarding of this magnificent World Heritage property.

## EXECUTIVE SUMMARY AND LIST OF RECOMMENDATIONS

Inscribed on the World Heritage List in 1983, “Wood Buffalo National Park” (WBNP) encompasses 4.5 million ha of forests, grasslands, wetlands, and prairies, including the majority of the Peace-Athabasca Delta (PAD) located on the plains in the north-central region of Canada. The property is recognized as being the most ecologically complete and largest example of the entire Great Plains-Boreal grassland ecosystem of North America, with a great concentration of migratory wildlife, the most important breeding ground of the only naturally occurring population of whooping crane in the world and home to North America’s largest population of wood bison. The property includes exceptional salt plains and gypsum karst and protects the world’s largest boreal inland delta, the PAD, located at the mouth of the Peace and Athabasca Rivers, an area crucial for much of its exceptional wildlife, that further add to its uniqueness.

In response to Decision **44 COM 7B.190**, a joint World Heritage Centre/IUCN Reactive Monitoring mission (hereafter “the mission”) was undertaken from 18 to 26 August 2022 to assess the state of conservation of the property in relation to the different threats identified in the previous Reactive Monitoring mission undertaken in 2016, to review the progress in addressing the 2016 mission recommendations and previous Committee decisions and to assess progress in the implementation and outlook for long-term funding of the Action Plan, developed by the State Party in response to the 2016 mission recommendations. The mission was also tasked to assess whether the property meets the conditions for inscription on the List of World Heritage in Danger and recommend measures to address the threats to the Outstanding Universal Value (OUV).

The mission concludes that most threats to the OUV of the property as identified by the 2016 remain valid today, in particular:

- The existing longstanding and unresolved conflicts and tensions between indigenous rightsholders and governmental and private sector actors which impact on the management of the property;
- Changes in the hydrology of the PAD as a result of hydropower development along the upper Peace River and climate change affecting its biodiversity, productivity and navigability;
- Potential impacts caused by the oil sands projects situated along the Athabasca River south of the property, including potential impacts associated with seepage from the massive tailings ponds related to the oil sands projects and the lack of a clear strategy to reclaim these areas and treat the large volumes of toxic oil sands process-affected water (OSPW) accumulated over decades of oil sands development;
- Cumulative effects of industrial developments on the property;
- Absence of a buffer zone for the property and issues related to land use in the overall landscape;
- The long-term future of the wood bison population.

Evidence from the Strategic Environmental Assessment (SEA) conducted in 2018 indicated that trends for key attributes show a continued negative trend and that the state of conservation of the PAD, which underpins many of the attributes justifying the OUV of the property, remains of particular concern.

To address the recommendations of the 2016 mission, the State Party has developed and is currently implementing a structured Action Plan, which recognizes the multi-jurisdictional nature of the conservation challenges facing the property and benefits from a strong joint commitment of different actors involved, in particular PCA, ECCC, Alberta Environment and Protected Areas, indigenous rightsholders as well as BC Hydro. Implementation only started in 2019 and since 2020 was further hampered by the COVID pandemic. The mission therefore

acknowledges that the State Party acted swiftly on the 2017 Decision of the Committee but considering that only three years have elapsed since the start of its implementation, it is unrealistic to expect a reversal of trends in the desired outcomes in this short timeframe.

Important progress has been made in the implementation of some parts of the Action Plan, in particular efforts to strengthen indigenous partnerships and on-going efforts to move towards co-management of the property with the indigenous rightsholders, integrating indigenous knowledge with western science, the creation of additional protected areas to the south of the property to act as a buffer and better protect the values of the property, measures taken to improve the conservation of the Ronald Lake Bison herd and work on the development of an Integrated Research and Monitoring Programme, using both western science and indigenous knowledge.

Significant efforts and investments are also being made to develop a hydrodynamic model to allow for an understanding of flows needed to deliver environmental benefits to the PAD, through flow releases from the W.A.C. Bennett Dam and existing and future water control structures. However, a functional modelling platform, which can inform decision-making, will not be available before 2024. The mission notes the disappointment expressed by the indigenous rightsholders at the slow progress in addressing this main threat to the OUV of the property, while also noting the complexity of developing these tools and the importance of basing the required decisions on sound modelling informed by both western science and indigenous knowledge. BC Hydro's commitment to implement flow releases if requested is encouraging, but the mission was not informed about any operational strategies or protocols that are in place or under development to implement potential water releases or control structures that could be proposed based on the outcomes of the hydrodynamic model. The progress made in developing the hydrodynamic model which can inform decision-making on required flow releases from the W.A.C. Bennett Dam and decision making on potential water control structures has so far not resulted in concrete measures to restore the ecological and hydrological integrity of the PAD. The mission reiterates the importance that this work leads to firm decisions on concrete measures to address this major issue before 2026, including a decision on environmental flow releases, and the establishment of a sound decision-making mechanism to allow for these flow releases to happen.

Major concerns remain about the lack of progress in addressing cumulative impacts from industrial developments around the property. The decision by Teck Resources Ltd. not to pursue the Teck Frontier oil sands mine project is welcome and will at this stage avoid advancement of the development frontier significantly closer to the southern boundary of the property.

At the same time, expansion of existing oil sands projects has continued without full consideration of the potential impacts on the OUV of the property. While federal legislation on impact assessments significantly improved in 2019, not all oil sands extension projects being considered since the 2016 mission have met the threshold to undergo federal impact assessment. For impact assessments at the level of Alberta, indigenous rightsholders continue to point out that their concerns are systematically ignored. They expressed concern that in their view impact assessments are limited in scope and often only consider the direct footprint of the projects and most of the objections they raise are refused on that ground. While the Action Plan includes some measures to adjust the management frameworks included in the Lower Athabasca Regional Plan (LARP) (EA8, EA9, EA10, EA11), little progress seems to have been made on these actions. At the same time, the mission remains concerned that the management frameworks remain insufficient to ensure the protection of the OUV of the property. A systematic risk assessment of the tailing ponds of the Alberta Oil Sands region with a focus on the PAD, a key recommendation of the 2016 mission, is foreseen in the Action Plan but so far, its implementation has not started and the mission notes with concern that

some representatives from Alberta continue to question the need for such an assessment arguing that the current management systems to address impacts are sufficient.

Current proposals to allow for the release of treated OSPW into the Athabasca River are extremely concerning. The mission welcomes the assurances given by the Federal Minister of Environment and Climate Change in the meeting with the mission team that such a decision would require changes in the federal legislation and that OSPW releases would only be allowed if the released water would be treated to a standard of "drinking water quality". The Minister also noted that other options are also being considered. While it was later clarified that the release of treated OSPW is being considered as one of the potential options, the Alberta Director of Water Quality Policy presented a timeline to the mission showing that such releases into the Athabasca River could become a reality in 2025, indicating that he considered this to be the preferred and realistic way forward to dispose of OSPW accumulated over decades of oil sands development.

The current Action Plan runs until 2026 but the mission considers that this timeframe will likely not be sufficient to allow for all necessary action to be undertaken to reverse the trend of degradation of the PAD and hence the OUV of the property. While it is crucial that by 2026 the first tangible results are visible, actions will have to be sustained over time. This is especially the case given that concrete results of the work on environmental flows, which will be informing decisions on environmental flow releases and further water control structures, will only be available by 2024 and that little progress has been made so far in addressing cumulative impacts of oil sands developments and in identifying a solution to address the tailings pond reclamation which can guarantee the ecological integrity of the PAD.

The mission considers that while the current budget allocation by Parks Canada for the Action Plan is significant in terms of its budget, it is likely to be insufficient to ensure its full implementation. In particular, the planned construction and rehabilitation of water control structures in the PAD will likely be very costly, especially considering the remote location of the property. While appreciating that budget allocations are made based on annual budgets and that further budget allocations are likely to be provided in future budgets if the Action Plan yields positive results, the uncertainty of long-term funding to achieve the required impacts is a major concern to the indigenous rightsholders.

The mission concludes that the State Party has developed and is currently implementing a structured Action Plan responding to the recommendations of the 2016 mission with the objective to reverse the current downward trend of key attributes and achieve the desired outcomes linked to the OUV. Considering that the implementation of the Action Plan only started in 2019, it is too early to assess how far the Action Plan will succeed in reversing the current negative trend of key attributes and achieve the desired outcomes in restoring the OUV of the property, including the ecological integrity of the PAD. The mission notes efforts to address the issues will need to be sustained beyond 2026 and that more substantial funding will be needed going beyond the current time horizon of the Plan to achieve its objectives. While the Action Plan is ambitious in certain aspects, the mission considers it needs to be strengthened in other areas. The mission proposes a number of priority recommendations listed below to improve certain areas of the Action Plan and address current weaknesses.

**Recommendation 1**
Strengthen efforts to transition to a genuine partnership with indigenous rightsholders in the governance and management of the property, in particular by:

a. supporting the Indigenous Caucus in developing an indigenous led vision for a shared governance model for WBNP, based on the values of respect and equity, which focuses on commonalities and respects differences by including both park-wide and locally tailored components;

b. operationalizing the Cooperative Management Committee by jointly developing the Terms of Reference agreed by all indigenous rightsholders and PCA and ensure that effective decision-making mechanisms are in place;
c. supporting indigenous communities' initiatives of interpreting and valorising the values of WBNP reflecting holistic indigenous worldviews and cultural elements of indigenous ways of life.

**Recommendation 2**
Complete hydrodynamic modelling and ELOHA (environmental flows assessment) tools that are essential to understanding the current hydrology (i.e., existing condition) of the Peace River and the PAD, the natural, pre-Bennett Dam baseline condition, the impact of climate change, and the feasibility of benefits to be derived from proposed water control structures and strategic flow releases on the OUV of the property.

**Recommendation 3**
Construct and repair water control structures in the PAD (such as the planned weir at Dog Camp) only after modelling and environmental flows tools have been completed, allowing an understanding of the benefits to the PAD, potential interactive effects and downstream impacts.

**Recommendation 4**
Ensure that no further dam projects on the Peace River are approved, including the proposed Amisk Project, until sufficient tools are in place to evaluate impacts on the hydrology of the PAD.

**Recommendation 5**
Urgently establish a sound decision-making mechanism allowing for key corrective actions to be taken in terms of ecological flow releases and potentially water control structures to protect the OUV of the property.

**Recommendation 6**
Before 2026, decide on a set of concrete mitigation measures including ecological flow releases and the construction of required water control structures to correct the impacts of the W.A.C. Bennett Dam and other alterations of the hydrology of the PAD, including increased impacts from climate change, and agree on operational strategies and interjurisdictional protocols for the implementation of the adopted mitigation measures as well as a budget sufficient for their implementation.

**Recommendation 7**
Urgently and before the end of 2024, conduct an independent systematic risk assessment of the tailings ponds of the Alberta Oil Sands region with a focus on risks to the PAD, 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.

**Recommendation 8**
Re-evaluate and adapt (as needed) collaborative, systematic, science-based monitoring of oil sands impacts on the Athabasca River and PAD to ensure sufficient parameters, sampling design, and protocols are employed to detect impacts. Long-term monitoring and syntheses of long-term data will be essential to establishing baselines, detecting changes, and communicating impacts.

**Recommendation 9**
Before 2026, develop a clear, consensus-based strategy consistent with precautionary principles for the reclamation of tailing ponds, including the treatment and disposal of OSPW,

which guarantees protection of the Athabasca River's and PAD's water quality and avoids any impacts on the OUV of the property.

**Recommendation 10**
Ensure that all major development projects in the PAD watershed, including all oil sands mining extension projects, are designated for federal impact assessments and specifically address potential impacts on the OUV of the property, in line with the Guidance and Toolkit for Impact Assessments in a World Heritage Context and submit these Environmental and Social Impact Assessments (ESIAs) to the World Heritage Centre.

**Recommendation 11**
Ensure that all impact assessments of other projects in the larger landscape around the property not undergoing federal impact assessment and under the responsibility of the Government of Alberta fully consider the OUV of the property and the concerns of indigenous rightsholders beyond the direct footprint of the project.

**Recommendation 12**
Expedite the preparation of a land use plan for the Lower Peace, building on lessons learned from the LARP and use the ongoing review process to address the weaknesses in the LARP identified by the 2015 Review Panel, taking into account the increased understanding on cumulative impacts as documented in the SEA, including from climate change. The revised LARP should include indicators and thresholds to support decision-making and approvals and require a biocultural approach to ensure that cumulative effects management fully considers the OUV of the property and in particular impacts of the desired outcomes identified in the SEA and the Action Plan for the PAD.

**Recommendation 13**
Ensure that the innovative Integrated Research and Monitoring Programme developed under the Action Plan, which is integrating indigenous knowledge with western science, is standardized and sustained over time in order to understand trends and dynamics in response to various pulse (e.g., ice-jam flooding) and press (e.g., climate change) disturbances that affect the OUV of the PAD and across WBNP.

**Recommendation 14**
Further strengthen the monitoring of flagship species, in particular by:

a. establishing a programme for enhanced monitoring of whooping cranes that have come into contact with OSPW to clarify the potential impacts on the population;
b. continuing to improve methods for generating more frequent population estimates of wood bison in WBNP and in the disease-free, genetically-distinct Ronald Lake Bison Herd;
c. continuing research to develop disease assays and vaccination as needed to reduce risk of spread to the disease-free Ronald Lake Bison herd.

**Recommendation 15**
Continue efforts to create a buffer zone around the property, as recommended by the *Operational Guidelines for the Implementation of the World Heritage Convention*, in particular by:

a. further extending Kitaskino Nuwenëné Wildland Provincial Park by including the missing blocks identified by Mikisew Cree Frist Nation around the Athabasca River as well as the area in the south still covered by a forest concession license;
b. putting in place urgently a co-management system for the newly created Kitaskino Nuwenëné Wildland in cooperation with the indigenous rightsholders, with appropriate resourcing and with clear management objectives which take into account the protection of the OUV;

c. further extending the network of protected areas adjacent to the property in particular in the Lower Peace region, including by considering options for the forest leases situated between the Birch River Wildland Provincial Park and the Caribou Mountains Wildland Provincial Park;
d. formally designating a buffer zone according to paragraphs 103–107 of the *Operational Guidelines for the Implementation of the World Heritage Convention*.

**Recommendation 16**
Revise the 10-year Management Plan based on an agreed indigenous-led vision for a shared governance model for WBNP and integrating strategies to address the key conservation concerns for the property as resulting from the SEA and the Action Plan.

**Recommendation 17**
Further streamline the implementation of the Action Plan by:
a. organize a bi-annual review of the overall implementation of the Action Plan, involving senior management officials from the Governments of Canada, Alberta, British Columbia and Northwest Territories as well as representatives of indigenous rightsholders and civil society to assess if the planned actions are yielding the required impact and allow for adaptive management;
b. before the end of 2023, update the Action Plan to consider the recommendations of the current Reactive Monitoring mission;
c. develop for each theme of the Action Plan clear impact indicators to complement the colour coded tracking mechanism currently in place;
d. ensure long-term and multiannual support and funding for capacity building for indigenous rightsholders to allow for effective, informed and full participation in the various Action Plan Task teams and working groups and the meaningful inclusion of indigenous knowledge in its implementation;
e. develop a clear multi-year budget estimate for the full implementation of the Action Plan, specifying the required budget allocations from both federal and provincial levels and ensure that the budget allocations are foreseen for full implementation of the Action Plan also beyond 2026.

The mission concludes that the OUV of the property continues to face important ascertained and potential threats, in particular as a result of changes to the hydrology of the PAD exacerbated by the impacts of climate change and the impacts of the industrial developments adjacent to the property. The State Party, through the Action Plan it developed in response to the recommendations of the 2016 mission, has begun a process aimed at reversing the current downward trend, but its concrete impacts in the desired outcomes of the attributes of the OUV are not yet visible. Considerable effort and resources are invested in the implementation of the Action Plan, although progress has been hampered due to COVID-19. The hydrodynamic model will not be available before March 2024. The modelling is crucial to allow the development of corrective actions as an underpinning requirement to protect the ecological integrity of the PAD. At the same time, the decision-making process on a long-term solution to reclaim the oil sands process-affected water without impacting the integrity of the property needs to be completed.

The mission does not consider that the property should be recommended for inscription on the List of World Heritage in Danger at this stage. The mission recommends that the World Heritage Committee continues to closely monitor the implementation of the Action Plan and the implementation of the above recommendations. The mission further recommends that a new World Heritage Centre/IUCN Reactive Monitoring mission is invited in 2026 to evaluate if sufficient progress has been made in the implementation of the Action Plan and of the above recommendations to avert further degradation of the OUV of the property and to assess if the property meets the conditions for inscription on the List of World Heritage in Danger.

# 1. THE PROPERTY

The World Heritage property “Wood Buffalo National Park” (WBNP) encompasses 4.5 million ha of forests, grasslands, wetlands, and prairies, including the majority of the Peace-Athabasca Delta (PAD) located on the plains in the north-central region of Canada (Alberta and the Northwest Territories). The property is a remarkable model of ongoing ecological and biological processes and was inscribed on the List of World Heritage in 1983 (Decision **07 COM VIII**) under criteria (vii), (ix) and (x). The property is recognized as being the most ecologically complete and largest example of the entire Great Plains-Boreal grassland ecosystem of North America, with a great concentration of migratory wildlife, and the most important breeding ground of the only naturally occurring population of whooping crane (*Grus americana*) in the world. It is moreover home to North America’s largest population of wood bison (*Bison bison athabascae*). The property protects the world’s largest boreal inland delta, the PAD, located at the mouth of the Peace and Athabasca Rivers, an area crucial for much of its exceptional wildlife. Salt plains and gypsum karst further add to its uniqueness.

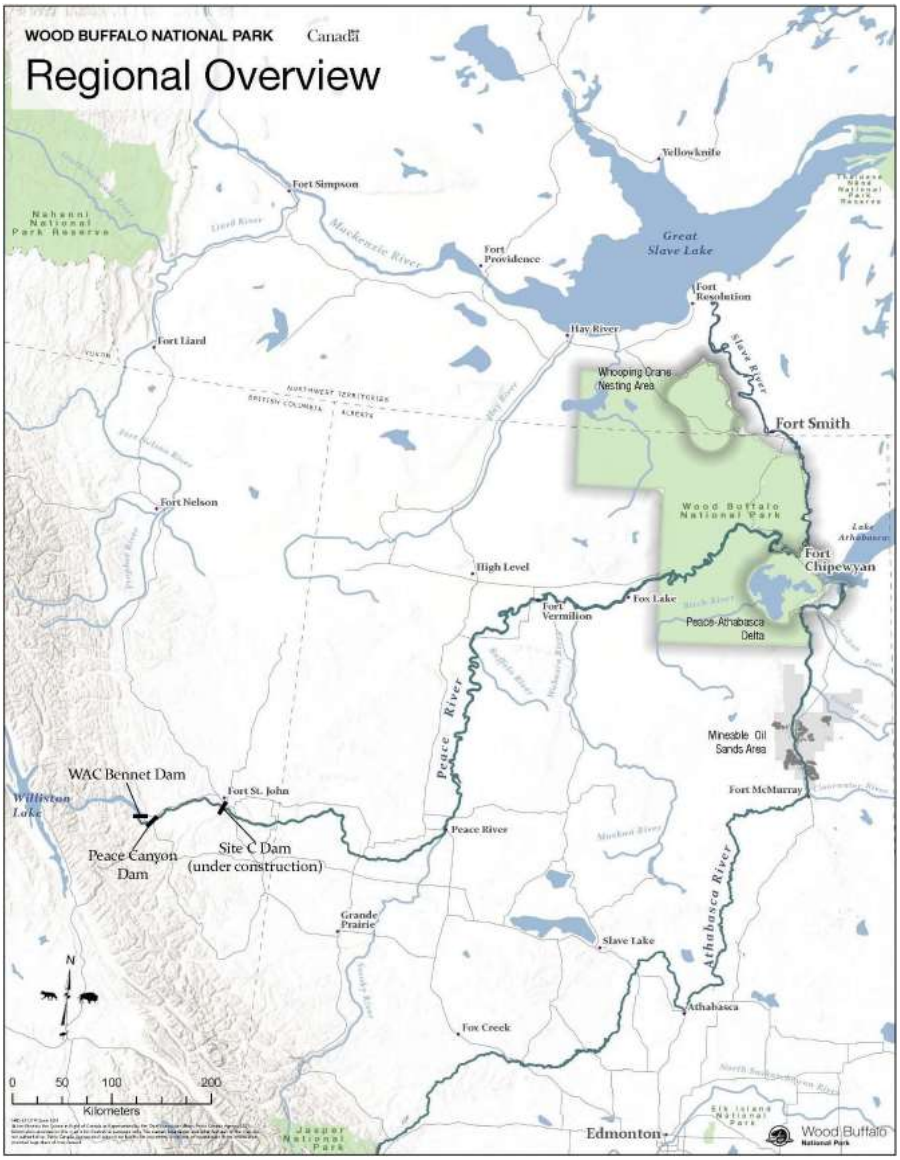



*Figure 1: Regional overview of Wood Buffalo National Park, map provided by Parks Canada Agency, including in: Wood Buffalo National Park Reactive Monitoring Mission Pre-mission information package, page 12.*

The property's Statement of Outstanding Universal Value (OUV) was retrospectively adopted by the World Heritage Committee in 2015 (Decision **39 COM 8E**) and its full text can be found in Annex 1. In the process of the development of a Strategic Environmental Assessment (SEA) for the property in 2018, the Statement of OUV was further broken down into the key values and attributes which can also be found in Annex 2. This also allowed for the interpretation of the natural values for which the property was inscribed linked to the traditional way of life and cultural practices of indigenous peoples who call WBNP home, and which has not been reflected in the Statement of OUV adopted by the World Heritage Committee.

WBNP was established as a national park in 1922 and extended in 1926 south of the Peace River into the PAD, to its vast present surface area. Located on traditional territory of several indigenous peoples, the creation of the park led to the expulsion of members or whole communities from the park and the interdiction or limitation of harvesting rights. These exclusionary policies have also resulted in divisions between and within indigenous communities and hardships with continued effects until today. Although the Government of Canada now recognizes Aboriginal and treaty rights within the park, indigenous rightsholders continue to advocate for a better recognition of their rights and traditional ways of life, for eye-to-eye level partnerships and decision-making powers in the management of the park.

Most of the threats faced by the World Heritage property today date back several decades and have been noted by the World Heritage Committee or the Bureau early after inscription of the site. In its evaluation of the nomination dossier, IUCN noted that "*the Athabasca Delta is subject to water level fluctuations due to existing dams upstream and future dams could cause greater perturbations*". However, the evaluation did not recognize that the alterations to the hydrological regime as a result of the construction of the W.A.C. Bennett Dam in 1968 had already set in motion a process which would negatively affect the ecological integrity of the property.

At the time of inscription in 1983, the Committee further "*drew attention to the harmful consequences that the eventual construction of a dam on the Slave River could have on those natural characteristics which make the property of outstanding universal value*". In 1985, when the state of conservation of the property was examined by the World Heritage Committee for the first time, the Committee noted that the plans for a dam on the Slave River had been definitively cancelled and expressed its satisfaction to both the Provincial and National Canadian authorities (Decision **CONF 008 XIII.C**). The state of conservation of the property was consequently reviewed by the World Heritage Committee and the Bureau in 1989 (Decision **CONF 004 VIII.16**), 1990 (Decision **CONF 004 IX**), 1991 (Decision **CONF 002 VIII**), and 1992 (Decision **CONF 003 V.17**). The factors affecting the property mentioned in the reports presented to the Committee in these four years consisted of the disease-infected bison herd, logging operations, proposed industrial developments outside the property, such as expansion of pulp mills, which in "*in sum may be a cause of concern*"[1] resulting in cumulative impacts. It was noted that the Bennett Dam was affecting the hydrological system of the park and led to less frequent periodic floods of the PAD and its gradual drying-up all, resulting in a "*longer term threat to the integrity of the site*". In 1991, the Bureau noted that a number of NGOs had suggested that the World Heritage property merited consideration for inclusion in the List of World Heritage in Danger. However, the Bureau acknowledged that the Canadian government was taking appropriate measures to preserve the integrity of the property (Decision **CONF 001 VI.31-34**) and acknowledged the "*fact that safeguarding the World Heritage values of this site requires continuous action over the long-term*" (Decision **CONF 003 V.17**).

[1] State of conservation report, presented to the 14th session of the World Heritage Committee in 1990, see https://whc.unesco.org/en/soc/1628/.

The potential construction of an all season road through the property was considered by the Committee in 2002 (Decision **CONF 202 21B.4**), 2003 (Decision **27 COM 7B.17**) and 2004 (Decision **28 COM 15B.25**). The NGO Canadian Parks and Wilderness Society (CPAWS) and the Mikisew Cree First Nation (MCFN) filed separate applications in the Federal Court of Canada seeking to prevent construction of the all season road on the basis that it would impact the ecological integrity of the park and infringe upon the First Nation's treaty rights to hunt and trap in the park. CPAWS and indigenous rightsholders including MCFN continue to raise their concerns on the state of conservation of the property to this day.

Most recently, the state of conservation of the property has been examined in 2015 (Decision **39 COM 7B.18**), 2017 (Decision **41 COM 7B.2**), 2019 (Decision **43 COM 7B.15**) and 2021 (Decision **44 COM 7B.190**) following the submission of a petition by MCFN in December 2014 to inscribe the property on the List of the World Heritage in Danger. As a result, the Committee requested the State Party to undertake a SEA to assess the potential cumulative impacts of all developments on the OUV of the property, including hydroelectric dams, oil sands development, and mining, and to invite a joint World Heritage Centre/IUCN Reactive Monitoring mission 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, the petitioning First Nation, and other stakeholders. The requested mission was undertaken from 25 September to 4 October 2016 and recommended that the State Party should be given one opportunity under the World Heritage Convention to immediately develop **a structured and adequately funded Action Plan** guided by 17 mission recommendations (see Annex 3). It considered that "*an absence of a major and coherent response would constitute a case for recommending inscription of WBNP on the List of World Heritage in Danger*."

The recommendations formed the basis for the subsequent completion of the SEA in 2018 and the development of the Action Plan of 2019, all of which are the main reference documents informing this mission report. Chapter 4 of this report on the assessment of the state of conservation will further elaborate on the various issues in line with the Terms of Reference of the 2022 joint World Heritage Centre/IUCN Reactive Monitoring mission.

Further concerns raised in more recent Committee decisions since the 2016 mission relate to the issues of inter-jurisdictional water governance and risk assessment of the oil sands region, two major subjects of discussions during the 2022 mission and which occupy main parts of Chapter 4 of this report. The Committee in particular expressed its concerns about the continued threat that the Site C hydropower project and other major dams on the Peace River pose on the OUV of the property (2019), the potential and current cumulative impacts of 47 oil sands projects being considered besides the 37 already operating facilities (2019), and the intention to consider releasing oil sands processed water (OSPW) into the Athabasca River (2021). The Committee has further encouraged the State Party to consider the designation of a buffer zone for the property, in particular view of the increasing footprint of oil sands developments south of the property.

In 2019, the Committee found that the *"deterioration of the OUV could eventually constitute a case for inscription of the property on the List of World Heritage in Danger, in line with Paragraph 180 of the Operational Guidelines".* In 2021, the Committee requested the State Party to submit an updated report on the state of conservation of the property *"for examination by the World Heritage Committee at its 45th session, with a view to considering, in case of confirmation of potential or ascertained danger to its OUV, the possible inscription of the property on the List of World Heritage in Danger"*.

The World Heritage Committee further has expressed its concern in different decisions about the *"lack of engagement with indigenous communities"* as well as *"the insufficient consideration of traditional ecological knowledge"* (2015) and requested the State Party to *"ensure a process enabling fair, transparent and meaningful involvement of all legitimate*

*stakeholders and rights-holders, including First Nations and Métis, based on mechanisms agreed by these stakeholders and rights-holders"* (2017). The request to *"adopt a clear and coherent policy and guidance to enable the transition to a genuine partnership with First Nations and Métis communities"* has been reiterated in the Committee's latest decision (2021).

In 2021, the Committee requested the State Party to invite, as soon as possible, a joint World Heritage Centre/IUCN Reactive Monitoring mission to the property to assess its state of conservation, in relation to the above-mentioned threats, and to confirm whether the property meets the conditions for inscription on the List of World Heritage in Danger, and to recommend the measures necessary to address the threats to its OUV.

# 2. SUMMARY OF THE NATIONAL MANAGEMENT SYSTEM FOR THE PRESERVATION AND MANAGEMENT OF THE WORLD HERITAGE PROPERTY

WBNP was first created as a national park in 1922 and further extended in 1926. Twenty percent of the park's landmass is located along the southern border of the Northwest Territories, with the remainder of the park located in the north-east corner of Alberta. Since 1969, the park has been administered by the Parks Canada Agency (PCA), then known as the National Parks Branch, and the **federal mandate and authority to protect and manage WBNP** resides with the federal government.

PCA was established in 1998 through passage of the *Parks Canada Agency Act*, under the Minister of Canadian Heritage. Currently, the federal Minister of Environment and Climate Change Canada is also the Minister responsible for Parks Canada. WBNP is administered by the Southwest Northwest Territories Field Unit, which manages 30% of PCA's total protected area surface, including WBNP, Thaidene Nene National Park Reserve, Nahanni National Park Reserve (also a designated World Heritage property), and Nááts'įhch'oh National Park Reserve. On a day-to-day basis, WBNP is managed by a PCA Park Superintendent based in Fort Smith, one of the two main settlements around the park. A second administrative unit of PCA is located in Fort Chipewyan.

PCA's decisions and actions in protecting, managing and operating a national park are guided by the Canada National Parks Act (revised in 2000) and by park management plans. The Act provides legal protection for WBNP and 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...*'. The Wood Buffalo National Park Management Plan (2010) provides a guiding framework for the management of the park. Other supporting documents for the management of WBNP include Parks Canada Guiding Principles and Operational Policies (1994), Parks Canada Corporate Plans (annual), the Parks Canada Guide to Management Planning (2008), as well as the 1978 WBNP Game Regulations. Relevant federal legislation that also support the protection of the park includes, the Canadian Navigable Waters Act (1985) (formerly the Navigation Protection Act), the Canada Water Act (1970), the Fisheries Act (1985), the Species at Risk Act (2002), the Migratory Birds Convention Act (1994), the Canadian Environmental Protection Act (1999), Impact Assessment Act (2019), Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (1992).

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 along the park boundaries. The World Heritage Committee has noted that the main threats to the World Heritage property stem from outside the park. Consequently, a robust legislative framework to protect the park through the efficient inter-jurisdictional cooperation involving all stakeholder and the joint accountability to ensure preservation of the property in line with the provisions of the World Heritage Convention is essential.

The areas of jurisdiction of the federal government and provincial and territorial governments are defined in the Constitution Acts (1867 to 1982) and **protection of the environment and water** is a shared responsibility, involving multiple departments and agencies. For example, on the federal level, more than 20 departments and agencies have freshwater-related responsibilities. The Canada Water Act provides a Framework for Federal-Provincial-Territorial (FPT) cooperation on water development and use.

The Governments of Canada, Saskatchewan, Alberta, British Columbia, Yukon, and Northwest Territories adopted the Mackenzie River Basin Transboundary Waters Master Agreement 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. The Master Agreement also provides for establishing bilateral water management agreements between provinces and territories. Of the agreements relevant to the property, the most downstream agreement between Alberta and the Northwest Territories was completed in 2015. However, the remaining two agreements for upstream areas in BC and Saskatchewan are still under negotiation. Especially the agreement with BC is of particular relevance as it would cover the Peace River on which the W.A.C. Bennett dam and Site C dam are situated. The Mackenzie River Basin Board[2] aims to support water resource management that maintains ecological integrity of the aquatic ecosystem, while respecting jurisdictional authorities.

Federal responsibilities include Fish and Fisheries, governed by the above-mentioned Fisheries Act, water on federal lands, including National Parks and First Nations Reserves and navigation, governed by the above-mentioned Navigable Water Act. The Federal Government is currently working to establish the Canada Water Agency aiming to work together with provinces, territories, Indigenous communities, local authorities, scientists, and others to find the best ways to keep Canada's fresh water safe, clean and well-managed.

Provinces and Territories are responsible for the water resources within their own borders, including flow regulation, water allocation, drinking water, waste water and thermal and hydroelectric power development. At the level of the Province of Alberta, the Water Act includes provisions for decisions on water allocation, the authorization for water diversions or disturbances to water bodies and requirements for water management structures. Releases into the environment (air and water) are regulated through the Environmental Protection and Enhancement Act (EPEA).

The existing **management system for oil sands tailings** spans across jurisdictions and involves several legislative instruments, policies, frameworks and programmes. At the federal level, the Fisheries Act, the Impact Assessment Act and the National Pollution Release Inventory are of relevance. At the provincial level and under the Alberta Land Stewardship Act, the 2012 Lower Athabasca Regional Plan (LARP) the Tailings Management Framework (2015), the Surface Water Quantity Management Framework (2015) and the Surface Water Quality Management Framework (2012) are of relevance. Key legislation and regulations that apply for individual project approval include the Environmental Protection and Enhancement Act, Oil Sands Conservation Act (OSCA), Fluid Tailings Management for Oil Sands Mining Projects (Directive 85), and the Alberta Dam and Canal Safety Directive (Water Act).

More details on the legislation related to **environmental impact assessments** are provided in chapter 4.5.

Other legislative frameworks that protect and guide the management of other attributes of OUV such as the **wood bison** are the above-mentioned Species at Risk Act under which the Recovery Strategy that supports the protection of the park includes, the Canadian Navigable Waters Act (1985) (formerly the Navigation Protection Act), the Canada Water Act (1970), the Fisheries Act (1985), for wood bison in Canada was adopted in 2018. In the provincial regulatory context Alberta's Wildlife Act and Regulation set the standards for the protection of wood bison on provincial Crown lands. The governments of Canada and Alberta recently negotiated a draft conservation agreement under the federal Species at Risk Act which underwent review by the public and indigenous peoples in 2021. Canada and Alberta are currently negotiating an updated agreement that considers comments received during the comment period.

[2] More information can be found on the website of the MRBB, here: https://www.mrbb.ca/about-us.

Policy frameworks related to the topic of **Climate Change** and thus relevant for the protection of the OUV of the World Heritage property are the 2016 Pan-Canadian Framework on Clean Growth and Climate Change, adopted in 2016 by the federal, provincial, and territorial governments and the 2021 Canadian Net-Zero Emissions Accountability Act which legislates Canada's enhanced 2030 target of 40-45% below 2005 levels and net-zero emissions by 2050, and introduces new requirements to ensure transparency, accountability, and certainty on the road to net-zero. A 2030 Emissions Reduction Plan was tabled to the Parliament in March 2022.

The governments of Canada, British Columbia, Alberta, and the Northwest Territories have noted their commitment to reconciliation efforts with indigenous people in compliance with the United Nations Declaration on the Rights of Indigenous Peoples, the Truth and Reconciliation Commission's Calls to Action[3] and constitutional values.

Lastly, the Government of Canada is a signatory to many **international agreements** pertaining to the conservation of biodiversity and environmental protection which are relevant to national parks in Canada. As for the management of WBNP, the most relevant agreements, in addition to the World Heritage Convention, are the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) and the Migratory Bird Convention of 1916. In 1982, the park's two largest wetlands (the PAD and the whooping crane Summer Range) were also declared Wetlands of International Importance under the Ramsar Convention.

[3] More information can be found on the website of the Government of Canada, see here: https://www.rcaanc-cirnac.gc.ca/eng/1524494530110/1557511412801.

# 3. THE MISSION

The World Heritage Committee at its extended 44th session (Fuzhou/online, July 2021), requested the State Party in Decision **44 COM 7B.190** to invite a joint World Heritage Centre/IUCN Reactive Monitoring mission (hereafter "the mission") to the property to assess its state of conservation in relation to the different threats discussed at this and previous sessions (see also Chapter 1), to confirm whether the property meets the conditions for inscription on the List of World Heritage in Danger and recommend measures to address the threats to the OUV.

In this context, the mission was tasked to review the progress in addressing the 2016 joint WHC/IUCN Reactive Monitoring mission recommendations and previous Committee decisions as well as progress in the implementation and outlook for long-term funding of the Action Plan, a set of 138 actions developed by the State Party following the 2016 mission to tackle the threats faced by the property.

The mission took place from 18 to 26 August 2022 and the team was composed of Guy Debonnet and Stefanie Grüssinger (both UNESCO World Heritage Centre) and Stephen Davis (IUCN).

The Terms of Reference of the mission (Annex 4), which were elaborated in consultation with the State Party with the engagement of indigenous rightsholders, provide further details about the objectives of the mission. The comprehensive mission programme (Annex 5) allowed for a mix of meetings with federal and provincial / territorial authorities and indigenous governments and leadership, Elders, land users and community members, site visits by boat and plane, as well as discussions with civil society and NGOs in the capital of Alberta (Edmonton), as well as in two locations adjacent to the national park (Fort Chipewyan and Fort Smith), traditional territory of indigenous peoples under Treaty 8. For further impressions, this report is accompanied by several photographs taken during the mission (Annex 12).

# 4. ASSESSMENT OF THE STATE OF CONSERVATION OF THE PROPERTY

## 4.1 Key issues reviewed by the mission

The 2016 mission to the property undertook an in-depth review of the different threats and conservation challenges to the property, including documenting the historic context to some of the issues and reviewing the relevant scientific literature. The report of the mission is available on the website of the UNESCO World Heritage Centre.[4]

The 2016 mission identified the following overarching concerns:

- longstanding and unresolved conflicts and tensions between Aboriginal Peoples and governmental and private sector actors which call for a coherent management response in line with the legal framework and unambiguous political commitments to reconciliation;
- governance deficiencies, including but not limited to water management across jurisdictions, impact assessment and environmental monitoring;
- the effects of observable and anticipated climate change affecting the property's high-latitude ecosystems.

The 2016 mission further remarked that the scale, pace, and complexity of industrial development along the critical corridors of the Peace and Athabasca Rivers was exceptional and did not appear to be subject to adequate analysis to underpin informed-decision-making and the development of matching policy, governance and management responses. In particular, the mission expressed concern on the impacts of large-scale industrial developments on the critically important Peace and Athabasca Rivers and the direct and indirect impacts of these developments to the PAD.

The 2016 mission expressed concern that hydropower development along the upper Peace River as a result of the W.A.C. Bennett Dam, constructed in the late 1960s in British Columbia (BC), was having profound impacts on flooding of the PAD, thereby affecting its biodiversity, productivity and navigability and that these impacts could be further exacerbated by the additionally planned hydropower projects on the Peace River, such as the Site C project in BC and the proposed Amisk project in Alberta. The mission further expressed major concerns about the potential impacts caused by the oil sands projects situated along the Athabasca River south of the property as a result of atmospheric and water pollution, including potential impacts associated with seepage from the massive tailings ponds related to the oil sands projects. Moreover, the 2016 mission considered the impacts of a proposed new oil sands project by Teck Frontier, which would have advanced the oil sands footprint significantly closer to the southern boundary of the property.[5]

The 2016 mission identified additional concerns, in particular the absence of a buffer zone for the property, the limited staffing and investment for the management of the property as well as concerns related to the long-term future of the property's two most iconic species, wood bison and whooping crane.

The 2016 mission proposed 17 recommendations (Annex 3) to address the identified threats and issues and recommended the State Party to immediately develop a structured and adequately funded response.

[4] https://whc.unesco.org/en/documents/156893.
[5] On 25 February 2020, the environmental assessment for this project was terminated.

A key recommendation of the mission was to enlarge the scope of the SEA already requested by the Committee in its Decision **39 COM 7B.18** to adequately reflect the scale, pace and complexity of industrial development, land use changes and river flow manipulations in the Peace and Athabasca Rivers watersheds, both in terms of individual and cumulative impacts. This SEA, published in April 2018[6], provides a detailed analysis on the status of the values that underpin the OUV of the property and proposes desired outcomes for these values (see also chapter 5 of this report). It identifies the trends and stressors on these desired outcomes as well as the trend direction based on existing scientific evidence. The SEA also recognizes traditional knowledge of the indigenous rightsholders and considers the status of the PAD system, again identifying stressors and trends as well as trend directions. The SEA further attempts to identify the cumulative impacts on the OUV of the property from the main industrial developments (hydropower and oil sands projects along the Peace and Athabasca Rivers, forestry and pulp and paper mills as well as mining) but also considers climate change effects on the PAD and, on the basis of this analysis, proposes projected future trends for the desired outcomes which were identified for each of the values underpinning the OUV. The SEA concludes that predicted trends for the desired outcomes for the PAD are negative.

To significantly reduce the future risks to the desired outcomes to the values underpinning the OUV, the SEA proposes 44 recommendations. It also recommends 4 guiding principles to ensure an efficient implementation: using both a precautionary approach and an adaptive management approach, ensuring a partnership with indigenous peoples and ensuring a robust collaboration across jurisdictional responsibilities.

On the basis of the conclusions and recommendations of the SEA[7], the State Party developed an Action Plan[8] as requested in Decision **41 COM 7B.2**. Efforts were made to engage all the different government institutions at the federal level (in particular PCA and ECCC), at the provincial / territorial level (Alberta, British Columbia and Northwest Territories) as well as representation from the 11 First Nations and Métis communities as rightsholders and other players like BC Hydro. The Action Plan was tabled in the Canadian Parliament on 1 March 2019 and includes 138[9] actions regrouped under 7 different themes:

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

*The mission concludes that the SEA confirms the threats and issues identified by the 2016 mission and that these threats remain valid today. The mission notes that the SEA provides an in-depth analysis of these threats to the property and represents a significant advancement toward understanding the status of the values underpinning the OUV of the property, taking*

[6] For more information, see website of Parks Canada Agency, here: https://www.pc.gc.ca/en/pn-np/nt/woodbuffalo/info/action/strategie-env-assessment.
[7] On 11 April 2023 the State Party submitted documents from Alberta and BC Hydro in which it is stated that they did not support the findings of the SEA. The mission notes the SEA was officially submitted by the State Party to the World Heritage Centre in response to the recommendations of the 2016 Reactive Monitoring mission and considers this as an important resource document for the mission.
[8] Available at https://www.pc.gc.ca/en/pn-np/nt/woodbuffalo/info/action/SEA_EES.
[9] Originally the Action Plan included 142 actions. However, in the State Party's 2022 State of Conservation report (February 2022) it was reported that 4 of these actions have been discontinued.

*into account indigenous knowledge and the scientific consensus on some of the major threats to the OUV, while also highlighting remaining uncertainties and areas of scientific debate. It details pathways of effect and delivers the first assessment of cumulative impacts on the OUV of the property. The mission considers that the SEA provided a sound basis for the development of the "structured and adequately funded response" called for by the 2016 mission.*

*The main focus of this report will be on the assessment of the actions which were proposed in the Action Plan to address these threats and issues, the adequacy of the proposed response and the progress made in the implementation of these actions, in line with the Terms of Reference of the mission.*

### 4.2 Relationship with the indigenous rightsholders and their involvement in the management of the property

Indigenous peoples have inhabited the region of today's Wood Buffalo National Park for more than 8000 years according to archaeological evidence and long before fur traders arrived in the early 1700s. The communities around the park today are mostly made up of Cree, Dene, Métis, and non-indigenous people. A total of eleven First Nations and Métis live in and around WBNP[10] and within the scope of this report these eleven First Nations and Métis are referred to as indigenous rightsholders.[11] Métis are organized as Hay River Métis Government Council, Fort Chipewyan Métis Nation, Fort Resolution Métis Government, and Fort Smith Métis Council. First Nations include the Athabasca Chipewyan First Nation (ACFN), Deninu K'ue First Nation (DKFN), K'atl'odeeche First Nation (KFN), Little Red River Cree Nation (LRRCN), Mikisew Cree First Nation (MCFN), Salt River First Nation (SRFN), and Smith's Landing First Nation (SLFN).


*Figure 2: Indigenous rightsholders of Wood Buffalo National Park, image provided to the mission team by Parks Canada Agency .*

[10] These are the 11 indigenous communities who had traditionally been in the park area when the park was created. There are no outstanding requests from other indigenous groups or governments to be added as partners.

[11] Noting that there is no authoritative definition of indigenous peoples under international law and policies and the United Nations Declaration on the Rights of Indigenous Peoples does not set out any definition, the eleven First Nations and Métis in and around WBNP are referred to as 'indigenous rightsholders' who hold various and far-reaching rights, in line with Section 35 of Canada's Constitution Act (1982) which recognizes and affirms existing Aboriginal rights as well as different Treaty rights, and in line with various international law and policy documents.

Canada has recognized that the establishment of WBNP negatively impacted the indigenous rightsholders, affecting their way of life and leading to loss of livelihoods and hardships, with negative effects continuing today. Several indigenous communities in and around WBNP are currently engaged in bilateral negotiations with Canada with the aim to work towards reconciliation.

The 2022 mission team met with representatives of 10 out of the 11 First Nations and Métis through either bilateral meetings or during the session of the Cooperative Management Committee (CMC) and Indigenous Caucus (IC). Indigenous perspectives were highlighted to the mission team thanks to the active indigenous participation in nearly all sessions of the programme and in informal discussions. The mission was particularly honoured to have been welcomed by the communities in Fort Chipewyan and Fort Smith. While the mission only spent a few days with and in these communities, it learned a lot about their perspectives on the historical context and the conservation of the property. Debates were emotional and representatives of indigenous governments as well as community members spoke of a history of colonization and how it affected their way of life, assimilation, mistrust toward federal, provincial, and territorial governments, environmental NGOs which campaigned against the fur trade and the United Nations. Several representatives of indigenous leadership stressed that for a meaningful dialogue and real reconciliation, the systematic reappraisal of history must be completed, a truth process established, facts provided, and official apologies issued. Some indigenous rightsholders therefore consider that the development of a co-governance model for the management of WBNP between PCA and indigenous rightsholders is conditioned by the above.

In February 2021, indigenous rightsholders met with Canada's Minister responsible for PCA, as well as its President and CEO, to identify actions regarding the management of the property. The Minister supported the pursuit of a model of shared governance for the park. This commitment for a joint management of WBNP was confirmed by the new Minister in June 2022. The State Party's February 2022 State of Conservation report submitted to the World Heritage Centre was prepared together with input from indigenous rightsholders and included indigenous perspectives, explicitly acknowledging the hardship the establishment of the park caused to indigenous rightsholders.

While recognizing the intergenerational trauma and hardships that indigenous rightsholders have experienced, the mission team notes that the historical reappraisal of Canada's colonial past is beyond its mandate and the scope of the World Heritage Convention. This section of the mission report will focus on progress made and the concrete steps undertaken in terms of governance and management of WBNP since the 2016 mission and in line with the *Operational Guidelines for the Implementation of the World Heritage Convention* requiring effective management systems involving all concerned stakeholders for the preservation of the values for which a World Heritage property is inscribed. The 2022 mission team appreciated that PCA and the indigenous rightsholders expressed a clear commitment to improve relationships amongst themselves. All concerned agreed that concrete progress has been achieved, while noting that the way to healing is long.

The 2016 mission already identified tensions and conflicts between indigenous rightsholders and governmental institutions linked to access restrictions to natural resources, limited or lacking consultation and underlined the significant gap between the political commitments and reality experienced by indigenous rightsholders. The 2016 mission provided several recommendations regarding an improved relationship and partnership with indigenous groups in its recommendations 1, 13 and 14 (see Annex 3).

The SEA endeavoured to consider indigenous knowledge in addition to western science. However, representatives of a few communities noted that more capacity support, more time for planning meetings and reviewing documents, more visuals and better use of plain language

in writing would have been needed to enable meaningful participation. Some indigenous rightsholders considered that, in their view, the SEA did not include a process for the proper, respectful collection of indigenous knowledge. Indigenous rightsholders also noted that the values for which WBNP was inscribed on the World Heritage List do not relate well to the more holistic indigenous perspective. In particular, they consider that the recognition of treaty and Aboriginal rights, the access to healthy lands and resources for the peaceful exercise of rights, the consideration of WBNP as cultural landscape and a homeland to indigenous peoples, and the role of indigenous peoples in the ecosystem relationship has not been considered properly. The SEA also noted that there are limitations of WBNP's approach to cooperative management, and that, at times, each indigenous group would need bi-lateral relations with PCA and may need to act according to its own vision and principles for its territory, activities, and history within WBNP.

The Action Plan was developed in recognition of the cultural significance of WBNP and has been informed by the knowledge, guidance, and perspectives of indigenous government leadership and indigenous knowledge holders in the spirit of two-eyed seeing, braiding western science with indigenous knowledge. The Action Plan defines "Strengthening Indigenous Partnerships with Wood Buffalo National Park" (IP) as one of its seven themes in response to recommendations 1, 12, 13 and 14 of the 2016 mission. Its goal is that the improved relationships between WBNP and its indigenous partners would result in improved, cooperative management of the park that meets the interests of all parties. Six concrete actions are identified, all led by PCA.

The Action Plan aims to develop Indigenous Knowledge Sharing and Use Agreements to guide the incorporation of Indigenous Knowledge into its specific programmes and projects. Indigenous Knowledge coordinators support work with knowledge holders, where requested. In exchanges with the mission team, indigenous rightsholders identified the Integrated Research and Monitoring Programme (IRMP) as the best practice for their cooperation with PCA. In the future, it is envisaged that the IRMP will be led by the Peace Athabasca Delta Institute[12] in collaboration with PCA and others (see also 4.6).

*The 2022 mission welcomes the fact that the lead organization for the Action Plan activities on engagement through bilateral processes, and the co-developing of enhancing the profile of indigenous content in WBNP was changed from PCA to 'Indigenous Partners' and considers this presents an opportunity for more ownership of these actions.*

Efforts have focused on improving the **Aboriginal Committee for the Cooperative Management of Wood Buffalo National Park (CMC)** process. In 2006, at the request of the indigenous rightsholders, a Game Regulations consultation process was undertaken which marked the first step in rebuilding relationships for shared management of WBNP. Since 2014, park management has worked collectively with indigenous rightsholders through the CMC towards a shared governance approach. Actions include the elaboration of a shared vision for the future of the park, co-development of the next 10-year Management Plan, and agreeing on a meaningful role in planning and implementing the WBNP Action Plan.

Results so far have been the development of a new Human Resources Policy and a new Procurement Policy, which generally received positive remarks from indigenous rightsholders during the mission. However, some indigenous representatives noted that these policies are not yet being fully implemented and that more efforts must be made to employ and contract indigenous peoples. The CMC currently operates under draft Terms of Reference and in the mission's view PCA and indigenous rightsholders should prioritize agreeing on clear Terms of

[12] In their submission of 11 April 2023 of the factual errors' check of this mission report before its publication, indigenous rightsholders informed the mission team about the change of name to 'Nipîy Tu Research and Knowledge Centre' since the mission took place.

Reference. Some indigenous rightsholders considered that the CMC is too slow and inefficient and pointed out that communication efforts by PCA should be enhanced. Some representatives also wish to see PCA in the role of facilitator between the heterogenous groups of indigenous rightsholders.

The mission team has learned that PCA works with more than 300 indigenous communities across Canada and 68% of the PCA administered lands are managed under formal or informal indigenous advisory relationships. Recent examples of success brought to the attention to the 2022 mission by indigenous leadership, are the Thaidene Nene Agreement and Strategy, Torngat Mountains National Park or the proposed National Park Reserve in the South Okanagan-Similkameen, all of which are structured as indigenous partnerships and supportive of reconciliation and could serve as models to inspire the future governance arrangements of WBNP.

Most recently, the **Indigenous Caucus** has been established which has the same composition as the CMC but without participation of PCA. As a completely indigenous-led body, the IC has been working on a joint vision for WBNP and developing proposals for a shared governance model. The IC is supported by PCA and under the Action Plan, financial means are provided to all 11 communities. The 2022 mission participated in one of the IC meetings in which its representatives provided an outline on the work ahead and the timeline for the next steps in defining a governance model in a three-phased approach. Currently, each community is separately working on initial community-based assessments. Before the end of 2022, it is foreseen for the communities to bring their ideas and visions for WBNP together through the IC and build on commonalities while respecting differences. The proposals for a shared governance model are planned to be presented to PCA in spring 2023. The IC envisages consensus-based practices that will result in shared ownership of decisions with both park-wide and local approaches within a shared governance framework.

Indigenous rightsholders informed the 2022 mission team that they appreciate the efforts made by PCA to work towards a shared governance model, in particular the time, space and funding that has been provided to conduct community consultations to work on a vision for WBNP and to understand what such a governance model could look like. PCA is providing funding for Community Engagement Officers for each indigenous group. However, indigenous rightsholders pointed out that funding is only provided on a one-year basis and that longer-term, multiannual funding will be needed to ensure continuity, truly build the communities' capacities, and allow for their involvement and ownership in the development of the vision. The IC also expressed a desire for the development of a Strategic Reconciliation Mandate for bilateral challenges and opportunities including all required ministries.

The Action Plan also includes activities to increase cultural interpretation and programming at WBNP. However, the impacts of COVID-19, in the beginning of March 2020, resulted in a halt to almost all visitor programming. While PCA reaffirmed its continued commitment and support for indigenous cultural content and interpretation at WBNP, many community members pointed out to the 2022 mission that much more needs to be done in this respect. Indigenous rightsholders are of the opinion that the cultural relationship of indigenous peoples to the environment is not fully being understood, taken into account, or taken seriously. This point has also been raised in particular in the context of impact assessment processes of planned development projects located in Alberta and is covered further in this report (see also 4.5).

*The mission concludes that the IC is an appropriate platform to allow for dialogue-based approach to find common ground and to develop a vision for WBNP that allows for ownership by indigenous rightsholders. The mission encourages PCA to continue and enhance support to indigenous rightsholders to allow for meaningful engagement*.

*The mission team is of the view that the approach of joint governance must be based on the principle of equal participation, respect, and recognition of aboriginal rights of all indigenous rightsholders of WBNP. Given the number of indigenous rightsholders and the geographical range of the park, one approach could be to augment involvement of indigenous rightsholders depending on their area of interest, resulting in specific area-based approaches that facilitate involvement of people with particular interests.*

**Recommendation:**

1. ***Strengthen efforts to transition to a genuine partnership with indigenous rightsholders in the governance and management of the property, in particular by:***
   a. ***supporting the Indigenous Caucus in developing an indigenous led vision for a shared governance model for WBNP, based on the values of respect and equity, which focuses on commonalities and respects differences by including both park-wide and locally tailored components;***
   b. ***operationalizing the Cooperative Management Committee by jointly developing the Terms of Reference agreed by all indigenous rightsholders and PCA and ensure that effective decision-making mechanisms are in place;***
   c. ***supporting indigenous communities' initiatives of interpreting and valorising the values of WBNP reflecting holistic indigenous worldviews and cultural elements of indigenous ways of life.***

### 4.3 Changes in the hydrology of the PAD as a result of hydropower development and climate change

The most significant driver of the PAD pertains to hydrology, more specifically the timing and volume of flows from the Peace and Athabasca Rivers and the extent of ice-jam floods that force water out into the PAD and lead to flooding of perched basins and habitat conditions that are more suitable to key species like muskrat. This assertion is not just based on western science. In fact, in meetings with indigenous rightsholders, government and NGO representatives, these observations were echoed again and again as statements to the effect of water and its importance to the PAD and communities around the PAD:

- Water is boss;
- Wildlife returns to the PAD with high water;
- We need more water on the Peace River;
- Ice needs to be blue; they are now thin and crumbly;
- Flooding was a blessing;
- Water structures would help our delta come back to life.

The 2016 mission report discussed at length the importance of hydrology and ice jam flooding to the PAD, the impacts of the W.A.C. Bennett Dam, and threats posed by climate change and further river regulation. These same issues were expanded and documented in the SEA, which demonstrated that all trends and stressors on various valued components in the PAD observed over the past sixty years are showing a negative trend, as reported by researchers, scientists and indigenous knowledge holders (list of stressors and trends in the PAD as determined by SEA in Annex 6 and as included in the Action Plan in Annex 7). As a result, none of the 3 desired outcomes, which were identified for the OUV elements linked to the PAD (see Table 1 of the Action Plan in Annex 2) are currently being achieved. The SEA concludes that the PAD depends on the recharge of its lakes and perched basins in order to retain its World Heritage values as an internationally significant rare and superlative natural phenomenon. Timoney (2022) showed that flooding along the Peace River declined over much of the 20$^{th}$ century after peaking around 1900. However, recent flooding years have provided some relief for the PAD. Still, concerns remain over the long-term health of the PAD

and whether sufficient tools (e.g., water control structures) and actions (e.g., strategic flow releases) will be available to protect the World Heritage values of the PAD in the future.

The importance of addressing this key issue is also reflected in the Action Plan and actions under the theme “Environmental Flows and Hydrology” account for the bulk of actions included in the plan (75 EFH actions out of a total of 138 actions foreseen).

Climate change exerts an overarching control on the PAD ecosystem, but impacts can be seen across a variety of spatial and temporal scales. Climate models predict that the increase in mean annual temperature at WBNP from 1961–1990 to 2040–2069 could be 4 to 5°C, well above global averages (see Figure 3). The previous mission report discussed the significance of climate change to WBNP, and the science pre-dating the 2016 mission pointed to the potential impacts of climate change on local-regional scale water budget and temperature trends (e.g., Peters et al. 2006), future trends in ice jam flooding along the Peace River (e.g., Beltaos et al. 2006), and the hydrology of the PAD and perched basins (e.g., Prowse et al. 2006, Peters et al. 2006). These studies highlighted the region’s vulnerability to rising temperatures that affect ice jam formation and persistence, and the timing and duration of the persistence of water across the PAD ecosystem. Since the 2016 mission, more recent science and monitoring have brought these issues into more clarity; however, knowledge gaps remain with regard to the effect of climate change on the greater PAD ecosystem (D.L. Peters and presentations by ECCC staff). However, recent modelling by Lamontagne et al. (2021) has shown that climate change will further reduce the frequency of ice jam flooding in the PAD.

Also noteworthy, the impacts of warming and changes in precipitation or regional water budgets on biological resources (i.e., fish, wildlife, and plants) and ecological systems were not considered as part of this mission, but these changes could be equally significant, exerting bottom-up impacts on the greater PAD ecosystem. Heat-related impacts on physiological processes in organisms, dissolved oxygen dynamics in aquatic ecosystems, biogeochemical processing of elements and materials exchange, and net ecosystem fluxes of carbon and soil carbon balances are unknown as to their states of change and implications in WBNP. They are just a few of the many fundamental processes at scales ranging from organisms to ecosystems that collectively serve to structure and maintain some of the OUV elements linked to the PAD and the property.

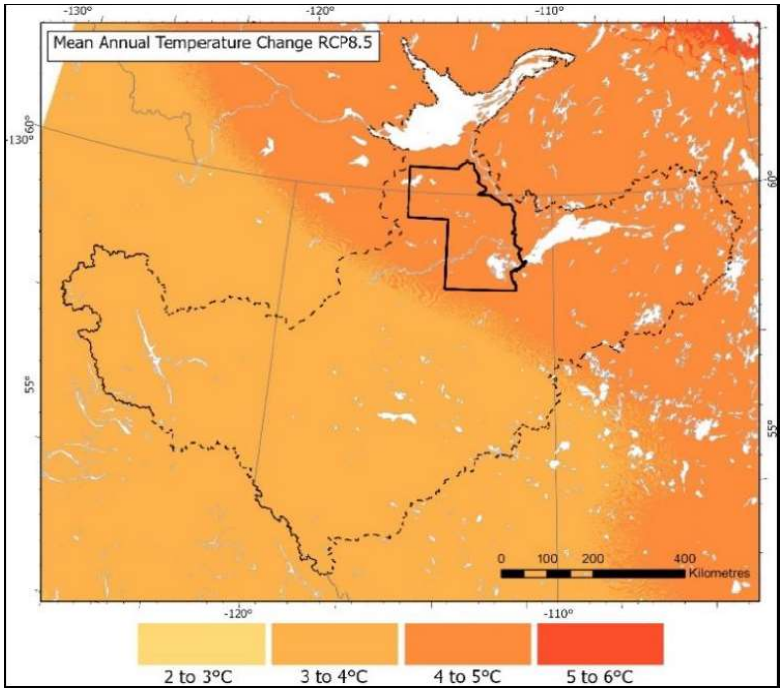
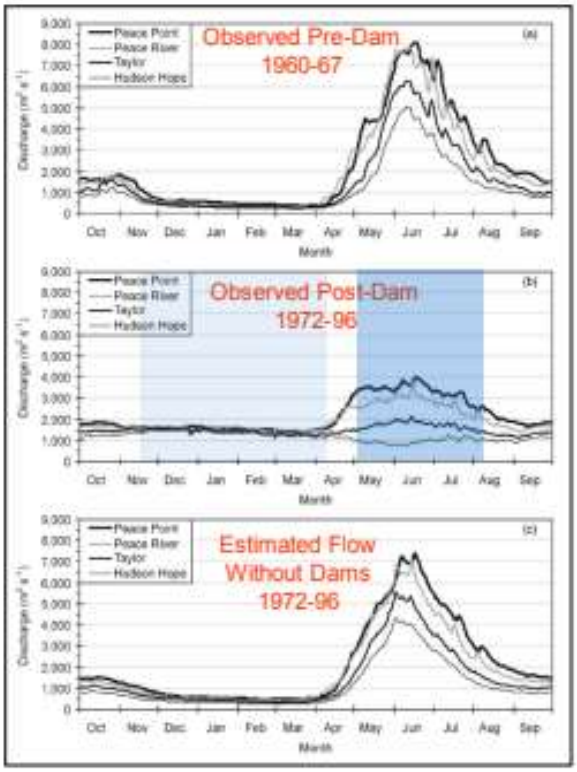



*Figure 3: Predicted change in mean annual temperature at Wood Buffalo National Park from 1961–1990 to 2040–2069 from the Composite RCP 8.5 climate model. Source: Canadian Center for Climate Services, Wood Buffalo National Park Climate Projections, 2021. climatedata.ca, included as Figure 10 on page 18 in the State Party’s State of Conservation report of 2022.*

## Environmental Flows Assessment and Modelling

One of the key recommendations of the 2016 mission report was for the State Party to develop an environmental flows assessment tool for the PAD and its contributing basins. More specifically, Recommendation 3 stated: "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."

The peer-reviewed body of literature as summarized in the SEA and in presentations to the mission team make clear that baseline hydrologic conditions in WBNP have shifted with the W.A.C. Bennett Dam leading to a 250% increase in winter flows along the Peace River and a 35% reduction in peak spring flows (see Figure 4).[13]




Peters and Prowse 2001 & Peters et al. 2006

*Figure 4: Illustrations of major flow regime changes pre-W.A.C. Bennett Dam, post-dam and estimated flow without dams, presented to the mission team by ECCC on 19 August 2022.*

Conditions will continue to shift with climate change and further river regulation (e.g., Site C). This speaks to the importance of a system-wide hydrodynamic model that can simulate the implications of alterations in flow due to inter-annual climatic variability or alterations associated with hydrologic modifications (structural or operational) that erode flows and levels or are designed as restorative operational or structural features that benefit conditions in the PAD. Regardless of the application, a modelling tool is essential, whether hindcasting natural conditions, the existing condition, or some future projected condition.

[13] On 11 April 2023 the State Party submitted a document from BC Hydro in which it is stated that they consider, per findings of Peters et al. (2006), the weirs on the Des Rochers and Coupe channels have largely mitigated the effects of this change on average peak lake levels.

Coupled with the recommended environmental flows assessment tool, these key modelled reference points would allow for an understanding of flows needed to deliver environmental benefits to the PAD—benefits that can potentially be delivered from the Bennett Dam as strategic flow releases or water levels that can be enhanced in the PAD through existing and proposed water control structures. Despite these options that are in consideration or are moving forward (see below), the mission notes that questions remain about whether we can even steer the PAD system back to a "pre-Bennett Dam" state.

This modelling is currently in progress, and the mission team was impressed by the tools presented by ECCC such as the animation of historical PAD flooding that reflects significant impacts from the Bennett Dam and climate variability/change. A phased approach is being used to develop these tools, including a hydrodynamic model. PCA and ECCC will utilize these tools in collaboration with partners to understand potential management interventions such as strategic flow releases to enhance ice jamming and water control structures in support of a sustainable and healthy PAD under future climate change. This work will also help to understand how close a future PAD will resemble that of the past once these corrective actions have been undertaken.

Environmental flows have been defined as: "The quantity, timing, and quality of freshwater flows and levels necessary to sustain ecosystems, cultures, economies, sustainable livelihoods, and well-being," as adapted from Arthington et al. (2018). The environmental flows framework adopted by ECCC is based on a methodology called *Ecological Limits Of Hydrologic Alteration* (or simplified by the acronym *ELOHA*), which is an internationally-recognized approach to establishing environmental flow criteria based on needs from ecological, geomorphological, and traditional values and cultural activities components (Poff et al., 2010). Environmental flow recommendations for this project will be co-developed by drawing on knowledge, information and data from indigenous partners, as well as science.

In the case of the PAD, the ELOHA process is a multi-scale approach expanding from the local scale of perched basins to the entire PAD, and ultimately to its contributing basins. Importantly, the ongoing ELOHA approach is intended to be a co-development between western scientists and indigenous knowledge holders. Working in concert with the in-situ and remotely sensed historical observation and developing hydrodynamic modelling tool, this ELOHA process will allow for the establishment of flow benchmarks through hindcasting (i.e., to understand natural, pre-river regulation conditions) and forecasting of conditions with climate change. The same approach can also yield understanding of future river regulation (e.g., Site C hydropower dam or other proposed hydropower projects). Ultimately, this process will lead to the development of hydrological, geomorphological, ecological and social-cultural indicators of success for the PAD, which will serve as important assessment tools.

The environmental flows process is being co-developed through a "two-roads approach" using braided knowledge coming from both indigenous knowledge and western science. Information, data and knowledge are shared through the two-roads approach, where each knowledge system (indigenous and science) can share its understanding and connect by "bridges" during the project.

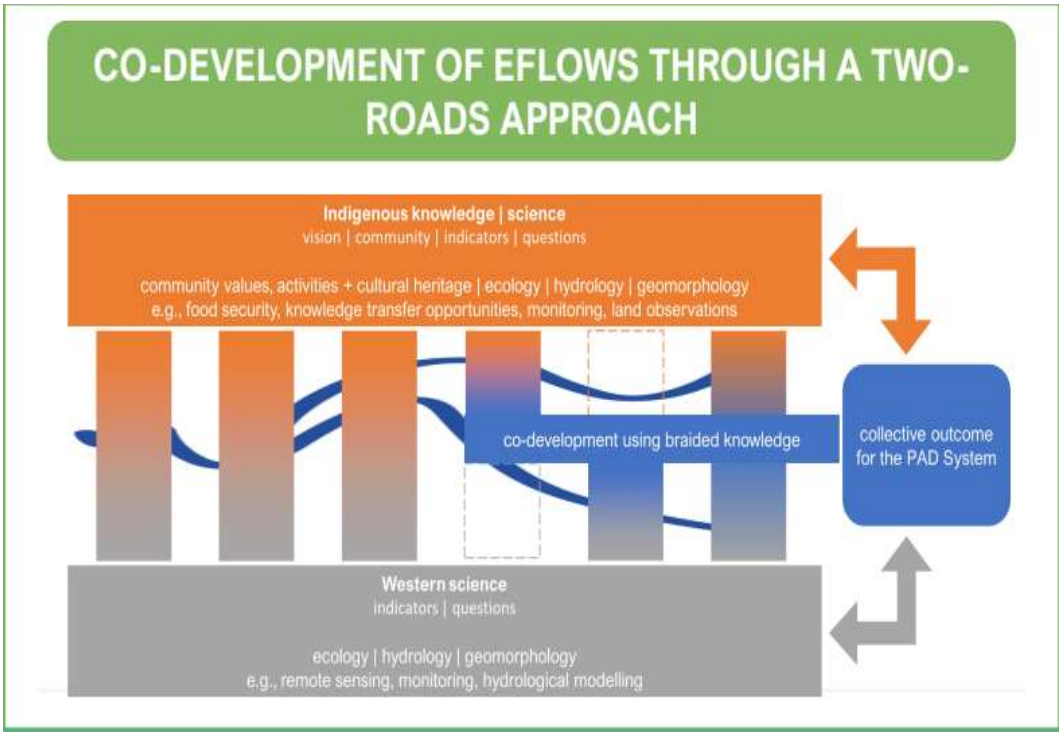



*Figure 5: Co-development of environmental flow through a two-roads approach, presented to the mission team by* ECCC *on 19 August 2022.*

The current timing foresees that initial water recommendations based on indigenous knowledge and western science linked to water condition scenarios and monitoring plans, which can inform corrective actions, will be available by March 2024 (see fig. 6, stage C). Initial water recommendations from the environmental flows framework will be with respect to the Dog Camp water control structure, as the e-flows process for this potential management action is currently being facilitated through a structured decision making process[14], which allows for collaborative decision-making involving indigenous partners and jurisdictions to determine the design and operation of the structure. Key indicators for monitoring would also be available at that time. The development of a concrete proposal for mitigative water actions (stage D) based on the initial water condition recommendations and linked to the observed monitoring responses can only be developed after this. No estimate was provided when this would be achievable. Proposed actions will be adaptive and based on observations and additional information provided over time. Indigenous rightsholders expressed concern to the mission that there are no clear steps that will follow once the initial environmental flows model is developed in 2024 relating to interjurisdictional commitments or implementing actions.

[14] The structured decision-making process for Dog Camp along with early, geographically limited versions of hydrodynamic modeling, geomorphic assessments, and other environmental flows components are being advanced specifically for the water control structures work and will be completed prior to decisions made on the structures' design and operation. That work will then support the broader environmental flows framework.

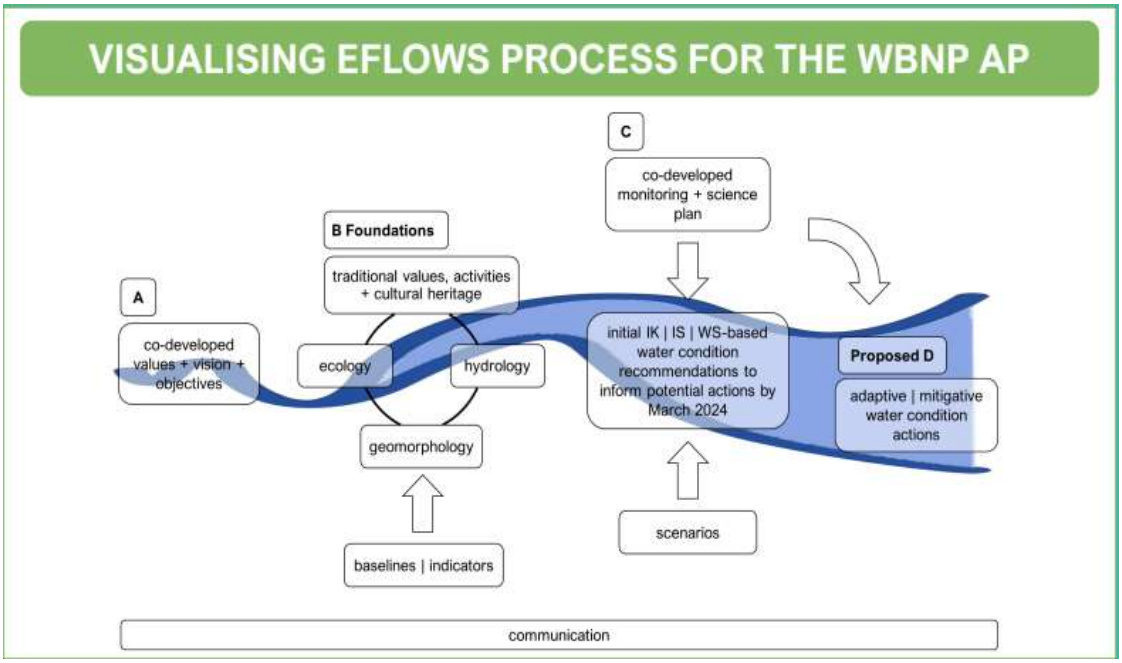



*Figure 6: Visualization of the environmental flows process for the Wood Buffalo National Park Action Plan, presented to the mission team by* ECCC *on 19 August 2022.*

Regarding future river regulation, the 2016 mission noted the position by the developers of Site C and the proposed Amisk hydroelectric project that Peace Point, upstream of the PAD, was the furthest reach of any potential impact of these projects and considered this to be scientifically indefensible given that the existing large hydropower projects along the upper Peace appear to have effects on the PAD and given the high likelihood of cumulative impacts of additional flow regulation on Peace River flow and altered timing of water delivery to the PAD. The 2016 mission therefore recommended (Recommendation 4) to "Conduct, in line with the IUCN World Heritage Advice Note on Environmental Assessment, an environmental and social impact assessment of the Site C hydroelectric project and, if moved forward, any other hydropower projects potentially affecting the Outstanding Universal Value of the property." This is the only mission recommendation which was explicitly rejected by the State Party. In its 2017 State of Conservation report in response to Decision **39 COM 7B.18**, Canada stated that the Site C hydroelectric project was approved in October 2014 prior to this decision and was under construction. It was further stressed that there was no legal mechanism in Canada to suspend or negate an authorization and undertake a new environmental assessment for a project that has been approved.

The 1100 MW Site C project by BC Hydro, located 125 km downstream from the Bennett Dam on the Peace River, is now almost completed and the earliest filling of the reservoir could occur is in the fall of 2023. No new presentation or documents were provided to the mission team as to the impact of Site C, and the additional information submitted by BC Hydro after the mission merely referred to existing documents from the 2013 EIA, repeating its position as presented to the 2016 mission that Site C would result in no change in the seasonal timing of flow releases and will have no noticeable effect on PAD water levels. Also, during the mission, BC Hydro and PCA commented that Site C was expected to have no impact on flow conditions in the Peace River, as this is a run-of-river structure. However, a quick review of the EIS by the mission team did not find any clear evidence for these claims. Indigenous rightsholders also pointed out that the BC Hydro's position was also not accepted by the Joint Review Panel tasked with reviewing the EIS for Site C.

A presentation of this work by BC Hydro or summaries of simulated flows and levels with (and without) Site C operation would have been a benefit to the mission team. It is worth mentioning that Site C is being built downstream of a dam that has exerted a long-term impact on Peace River flows and ice-jam formation. The mission stresses that even minor shifts in the timing and magnitude of flows caused by Site C could add to cumulative impacts of an already compromised system.

In addition to the impacts of the Bennett Dam and the Site C project that is currently under construction, the proposed 370 MW Amisk hydropower project remains a potential project that will further impact the hydrology of the Peace River. The mission was informed that the project is currently not moving forward, but more information on its exact status was not provided. The mission notes that the website of the project[15] is not giving any indications that the project is no longer being considered. On the contrary, a letter from the project proponent dated 25 October 2022 is available on the website of the Impact Assessment Agency of Canada, stating that they "*hope to see the conditions necessary to advance the project to the next stage of development in the near term*"[16]. The mission stresses that modelling scenarios and environmental flow assessments should consider it as a possibility to understand its impact on high pulse flows and ice jam flooding of the PAD.

No new information was provided during the mission on other potential hydropower projects such as the 100 MW Glacier Power Dunvegan Hydroelectric Project, as well as other potential projects on the Athabasca and the Slave Rivers mentioned in the SEA.[17]

Echoing recommendations of the 2016 mission report, environmental flows and modelling are also a key component of the Action Plan, and the mission team welcomes the progress that has been made on recommendation 3. Still, initial environmental flows recommendations are not anticipated until March 2024. Recognizing this delay, concern was raised by indigenous rightsholders during the mission that the environmental flows assessment is not advancing fast enough and that models are not being developed that will produce simplified communications tools for decision-makers.

Indigenous rightsholders also reiterated that hydrological changes in the Peace, Athabasca and Slave system is not only affecting the ecosystem but also impacting the navigability of the PAD, the lower Athabasca and Slave rivers, limiting their access to harvesting areas. Data collected by indigenous rightsholders indicate that Elders harvesting today will have 10-12 more days when they have difficulties accessing hunting areas during the critical late summer-fall hunting window compared to the period pre-Bennett Dam. Winter access is also impeded because of changing ice conditions. A 2021 publication of recent community based monitoring (CBM) findings (Maclean et al. 2021) co-validated Elders' information that there have been negative changes to ice conditions in the PAD, with average monthly ice thickness decreased in January while average monthly snow depth increased in January and February. An ice thickness model developed from CBM data to predict ice thickness growth from weather data shows that regional maximum ice thickness and the number of days when travel on ice is safe have been decreasing during the last 100 years, reflective of Elders' experiences.

Indigenous rightsholders also pointed out that "*they had been there before*", pointing to the 1986 commitment by Canada to take action to address man-induced changes to the water levels in the PAD and the 1996 Northern River Basins Study, which recommended that the Bennett Dam's operating regime be modified to help rehabilitate the PAD and the riparian and aquatic conditions of the Peace River system and concluded that economic considerations of

[15] http://www.amiskhydro.com/home-.html.
[16] See https://iaac-aeic.gc.ca/050/evaluations/proj/80112/contributions/id/58865.
[17] In its submissions of 11 April 2023 of the factual errors' check of this mission report before its publication, the State Party clarified that "no other projects are known to be proposed on these rivers in any way."

power production should not take precedence over the environmental stability and natural ecosystem of the PAD. Indigenous rightsholders repeatedly pointed out that these recommendations until today have not been followed by any concrete actions. The State Party however pointed out that the recommendations served as a foundation for the activities foreseen under the Action Plan. Some representatives of indigenous rightsholders consider that the current knowledge is sufficient to justify already certain interventions, advocating for further experimenting with spring releases to augment break-up flows in the PAD, constructing of certain water control structures like at Big Egg Lake (see below) and taking a more aggressive “learning while doing” approach.

Indigenous rightsholders also expressed concern on water abstractions from the Athabasca River linked to the oil sands projects, which could affect the lower Athabasca and also the PAD. Alberta Government officials stated that water withdrawals for oil sands processing were small (0.2% to 2.73% of measured flow) relative to instream flows and suggested that this low level of withdrawal was environmentally insignificant. However, even modest water withdrawals can result in downstream impacts to the PAD, especially during the dry season, during drought years, or when considering cumulative impacts of climate change, continued development in the Athabasca watershed, etc.

Given the importance of establishing flow and hydrologic needs for the PAD, the mission stresses the need to complete necessary tool development and the ELOHA process so that hydrologic evaluations and benchmarks can be used to understand the environmental lift provided by existing and proposed water control structures as well as strategic flow releases by BC Hydro along the Peace River. These are described in more detail below.

**Strategic Flow Releases and Water Control Structures**

One of the goals of the Action Plan is to improve water management and hydrologic conditions in the PAD. This is to be achieved primarily through strategic flow releases from the Bennett Dam (in collaboration with BC Hydro) and water control structures (described in subsequent paragraphs). Further changes to the Bennett Dam water release regime across different seasons (e.g., winter, fall, and summer flow regulation) are also being considered under the Action Plan. Conceptually, strategic flow releases would be made to enhance ice jam flooding to enable flooding of perched basins in the PAD. The term “conceptually” is emphasized, as there were no specific operational protocols or strategies discussed during the mission for achieving this aspect of the Action Plan goal to improve hydrologic conditions in the PAD.

The team heard multiple references to strategic flow releases in presentations throughout the mission and had conversations with PCA and BC Hydro representatives about the topic. It even appeared that this has been opportunistically attempted in the past, but without input from or notification of communities. An example was given that a release was made and representatives of MCFN were only made aware by another First Nation community or newspaper that “water was coming.” As presented, releases would be consensus-based with inter-agency and broad community input, particularly in Fort Vermillion where flood impacts may occur and potential compensation needed. However, no specifics were provided with respect to the feasibility of releases, the volumes and timing of those releases, the processes or operational protocols that would help guide releases, the downstream targets, or the performance measures to be tracked. Instead, the idea seemed very preliminary and fraught with multiple socio-economic and political trip wires that could undermine the potential for delivering any real benefit.

The mission team had specific questions about the windows of opportunity for such releases, (i.e., when would strategic flow releases be possible or optimal from an intra-annual or inter-annual timeframe, what are feasible flows and volumes (i.e., how much water in Williston Reservoir) could be made available for strategic flow releases and what duration would be

necessary to facilitate ice jam formation), or performance metrics (i.e., how will benefits of strategic flow releases be evaluated downstream in the Peace River or in the PAD from hydrological or ecological perspectives). The mission was provided with a memo from BC Hydro nearly two months after the mission; however, there was no additional technical information provided in response to the mission's questions regarding strategic flow releases. BC Hydro's contribution instead was focused on technical disagreement with consultants retained by indigenous rightsholders, science indicating that the PAD's water issues were more related to multi-decadal cycles of drying and wetting than river regulation, and the position that Site C will have no impact on the PAD (see above).

Water control structures considered for the PAD are engineered water management structures that are either passive (e.g., a weir) or operable (e.g., a gated or inflatable structure) and are designed to extend hydroperiods throughout the PAD more regionally or more locally in specific perched basins. The mission team received presentations and joined site visits for two planned water control structures—Big Egg Lake and Dog Camp—and a third water control structure, the Rivière des Rochers weir, that was constructed in 1975. The latter was designed to improve hydrologic conditions in Lake Athabasca and remains mostly intact and delivering some regional benefits. Nearly 50 years since construction, this impressive structure still helps retain water in the PAD for longer. However, the trade off for this type of passive structure is a limitation on navigation and potential downstream impacts that were neither presented nor discussed with the mission team.

Another water control structure similar in age to the Rivière des Rochers weir, the Revillon Coupé weir, was built in 1976, but it has eroded to the point where 25% more water passes across this structure than the design specifications allowed. The mission team did not visit this site; however, this structure seems of lesser importance given that only a small fraction of Lake Athabasca outflows passes through the Revillon Coupé. Both existing weirs are being evaluated as to their level of function and whether they would benefit from repairs (estimated at just over $1 million CAD) that would improve performance to original design specifications (NHC 2020a).

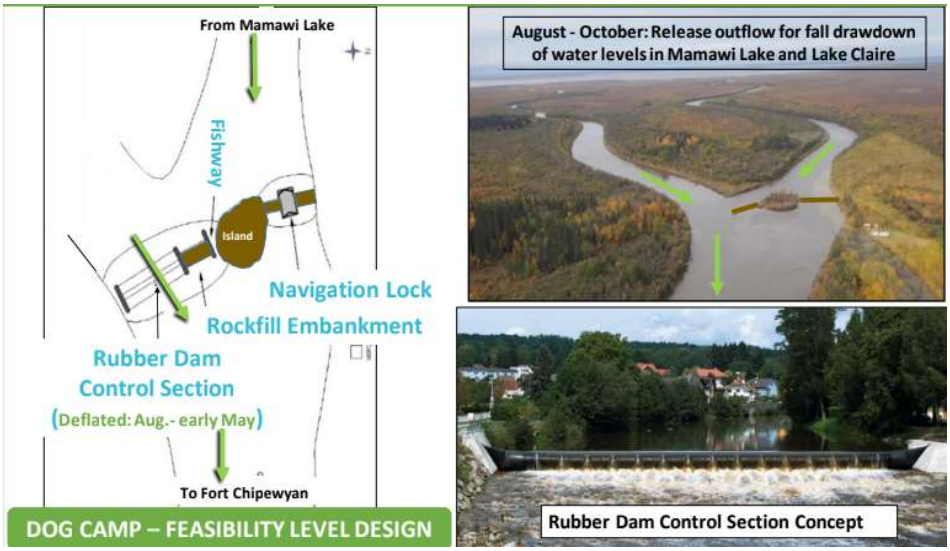



*Figure 7: Dog Camp Water control structure, Feasibility level design presented to the mission by Parks Canada Agency on 19 August 2022.*

Proposed water control structures at Big Egg Lake and Dog Camp exemplify attempts to deliver local hydrologic improvements (e.g., Big Egg Lake) and more regional PAD benefits (e.g., Dog Camp). The “Dog Camp” structure would be constructed on the west arm of the Chenal des Quatre Fourches at Dog Camp and would serve to increase water levels in Mamawi Lake and Lake Claire and increase hydroperiods across connected areas of the PAD, including associated perched basins. Presentations on these two structures were more conceptual in terms of design and operability, construction timeline and anticipated cost, and hydrologic targets. Likewise, metrics needed to evaluate project performance were lacking.
Feasibility studies from 2020 on both structures were provided to the team after the mission, and they revealed the potential for significant hydrologic improvements. For instance, the Dog Camp structure would be expected to increase water levels in an average year in Mamawi Lake and Lake Claire by 0.8 and 0.5 meters, respectively, resulting in a 179-km$^2$ increase of flooding of low-lying lands and perched basins around the PAD. During wet years, the potential benefits are even greater. The estimated cost for this structure, depending on operability, range from $5.7 to $9.4 million CAD, although the mission team expects that actual costs are likely to exceed $10 million CAD based on remoteness and contingencies (NHC 2020b).

Big Egg Lake is a large, perched basin on the ACFN Jackfish reserve and is hydrologically connected to ice jam flooding or high flow flooding conditions associated with the Athabasca River. An operable or removable structure at the East connection channel to Big Egg Lake has been conceived to restore water levels to historical conditions that are more optimal for muskrats. According to First Nation and Métis knowledge holders, that hydrologic target for Big Egg Lake should be a minimum water depth of 8 feet, which would equate to a flooded area of about 900 hectares. A feasibility assessment of the operation of this proposed structure suggested it could entail construction of a sheet pile framed wall near the mouth of the connection channel with removal of stoplogs for water level management. Along with channel excavation, this project was proposed to cost $446,200 CAD (NHC 2020c); however further design work is underway in collaboration with ACFN members to determine the detailed design and proposed operation.

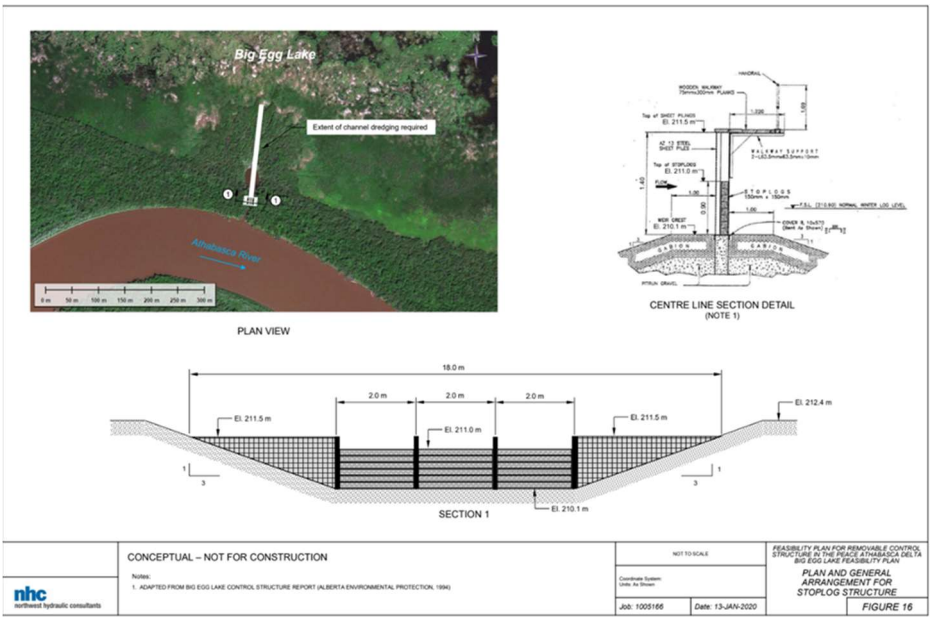



*Figure 8: Big Egg Lake, conceptual design of planned water structure, in: 2020 Feasibility Study, p.42.*

For both proposed structures, it is not clear what the interactions would be with adjacent or downstream areas or how they would be influenced (if at all) by other existing structures or proposed strategic flow releases. Some indigenous rightsholders wondered if these structures might make things worse, expressing concern about impacts downstream, including on water

levels in the Slave River. This speaks to the need to incorporate these structures (and possibly strategic flow releases) as modelled scenarios to understand performance and interactions with each other as well as downstream impacts[18]. Likewise, these forecasts can be used to determine respective contributions of water control structures and strategic flow releases to supplementing environmental flows and levels. Indigenous knowledge holders generally agreed that water control structures would help restore the health of the PAD, but they expressed concerns that construction was taking too long, that an inflatable structure might retain toxic water in the PAD, and that money would be needed for long-term maintenance. Related to this final point, the original weir structure constructed at Quatre Fourches was described by an Elder as being "designed to fail." This structure was built in 1971. It failed due to ice jam and flooding in 1974, and it was subsequently removed in 1975. Given this and the maintenance needed for existing structures, engineering of new structures should pay special attention to anticipated project life span and anticipated operations and maintenance costs.

**Interjurisdictional Water Governance**

The fact that the management of water is a shared responsibility between federal and provincial / territorial level was already mentioned in chapter 2. This fragmented legal landscape means that many issues relating to water governance, in particular the management of transboundary rivers, frequently lack the kind of clear framework that would be required to address water management problems quickly and holistically. The 2016 mission also pointed to the apparent disconnect between water management decisions made at provincial level and the management of federal resources such as WBNP. The absence of effective inter-jurisdictional water governance was also raised as a major concern in different Decisions of the World Heritage Committee on WBNP.

Reference was also made to the Mackenzie River Basin Transboundary Waters Master Agreement, concluded in 1997 between the Governments of Canada, Saskatchewan, Alberta, British Columbia, Yukon, and Northwest Territories. While this agreement also foresees the establishment of bilateral water management agreements between provinces and territories, such a bilateral agreement between British Columbia and Alberta, which would have particular relevance to the property as it would cover the Peace River, is still under negotiation.

Indigenous rightsholders and NGO's have criticized the fact that the interjurisdictional boards have limited authority to regulate resource use and to take concrete actions to protect its waters, because they lack the legal and policy basis to do so. Indigenous rightsholders consider that the Canadian water governance landscape excludes indigenous peoples. The Canada Water Act, for example, precludes indigenous involvement in interjurisdictional water governance because the frameworks set out in the Act are limited to agreements between federal, provincial, and territorial governments and not Indigenous ones. Indigenous rightsholders further expressed concern to the mission that the bilateral water management agreement that will include the Peace River may exclude the PAD.

To address the challenges of interjurisdictional coordination in the implementation of the environmental flows and hydrology activities of the Action Plan, an EFH working group (referred to as the Federal - Provincial – Territorial - Indigenous Committee in the Action Plan), composed of representatives of the 11 WBNP indigenous rightsholders, ECCC, PCA, the

[18] In their submission of 11 April 2023 of the factual errors' check of this mission report before its publication, MCFN noted that, "while a hydrologic model being developed by ECCC by 2024, in a parallel process to move the proposed water control structures forward, an interim model has been created based on earlier ECCC work. This interim model has been updated with recent LiDAR and ground-truthed bathymetry (conducted by MCFN and ACFN CBMs and Stantec). This model is being used to inform the planning of the future water control structures and understand what benefits and risks construction and operation will bring to the PAD. The updated model will in turn be shared with ECCC and will inform future versions of the full PAD hydrologic model."

governments of BC, Alberta and the Northwest Territories as well as BC Hydro was established. However, indigenous rightsholders pointed out that, at this stage, the ToR have still not been established. Several task teams and working groups were established to deal with specific themes such as the water control structures or the strategic flow release protocol. Methodologically, structured decision making has applied to Environmental Flows and Hydrology actions. Some representatives of indigenous rightsholders expressed the view that the EFH process is dysfunctional, as no technical capacity is provided to allow for effective braiding of knowledge systems and limited practical progress is evident. Indigenous rightsholders expressed concern that the EFH work is disconnected from upstream decision-making and policy development which an environmental flows assessment is meant to inform, creating a risk that this work will end up, as with earlier assessments and models from the last 3+ decades, as an exercise that sits on a shelf while the condition of the PAD continues to deteriorate. While they welcome the important efforts to develop the environmental flows model, they consider it continues to be de-linked from upstream decision-making and governance. It was also noted that there is no legal or policy impediment to interjurisdictional water governance in Canada, but there is a need for bold commitments, backed with necessary resources, capacity and a clear process that has OUV protection at its core.

*The mission concludes that changes to the hydrology of the PAD as a result of flow regulations on the Peace River combined with impacts of climate change continue to constitute an important threat to the OUV of the property. As demonstrated in the SEA, the hydrologic recharge of the PAD has decreased without intervention and this trend is likely to continue, resulting in a further degradation and ultimately loss of World Heritage values.*

*The mission remains concerned about the additional impacts the Site C hydropower development might have on the PAD, noting that even minor shifts in the timing and magnitude of flows caused by the project could add to cumulative impacts of an already compromised system. The mission regrets that the construction went ahead without further assessment of the potential impact of the project on the PAD as recommended by the 2016 mission. It further concludes that no additional water regulating structures on the Peace River should be approved until sufficient tools are in place to evaluate impacts on the PAD hydrology and the OUV of the property.*

*The mission welcomes the important work undertaken to develop the hydrodynamic modelling and environmental flows assessment tools that are essential to better understanding the hydrology of the PAD and the impacts of existing and already developed hydropower facilities, water control structures as well as impacts from climate change. The mission notes that since the 2016 mission, the implementation of the Action Plan has not yet resulted in concrete mitigating actions which could improve the hydrologic recharge of the PAD but considers the development of these models as a crucial and necessary step to be able to design these mitigating measures.*

*The mission wants to stress the importance of this modelling work leading as soon as possible to the adoption by all actors across jurisdictional boundaries of a set of concrete mitigation actions through ecological flow releases and potentially water control structures in order to reverse the current negative trends in the PAD. While the mission believes that water control structures can play a role in mitigation, it considers that positive and negative impacts should be evaluated through a modelling framework before taking significant actions that would be difficult to reverse, such as the proposed structure at Dog Camp. As a small-scale, locally beneficial project without potential larger-scale impacts on the overall hydrology, the Big Egg Lake structure may be able to proceed without these regional modelling tools in place.*

*The mission notes that progress on effective interjurisdictional water governance is critical to address the major threats from upstream activities on the Peace and Athabasca Rivers as well as climate change that impair the natural and necessary recharge of the PAD. The*

*mission considers that an interjurisdictional mechanism for effective water governance needs to be established, which will allow for critical decision-making on key corrective actions in terms of ecological flow releases and potentially water control structures that have the best potential to protect the OUV of the property. Key elements of such an interjurisdictional mechanism would include effective strategies, policies and regulatory frameworks to guide upstream decision-making, capacity, finances and incentive structures for implementing governance or corrective actions and clear accountability mechanisms.*

**Recommendations:**

2. ***Complete hydrodynamic modelling and ELOHA (environmental flows assessment) tools that are essential to understanding the current hydrology (i.e., existing condition) of the Peace River and the PAD, the natural, pre-Bennett Dam baseline condition, the impact of climate change, and the feasibility of benefits to be derived from proposed water control structures and strategic flow releases on the OUV of the property.***

3. ***Construct and repair water control structures in the PAD such as the planned weir at Dog Camp only after modelling and environmental flows tools have been completed, allowing an understanding of the benefits to the PAD, potential interactive effects and downstream impacts.***

4. ***Ensure that no further dam projects on the Peace River are approved, including the proposed Amisk Project, until sufficient tools are in place to evaluate impacts on the hydrology of the PAD.***

5. ***Urgently establish a sound decision-making mechanism allowing for key corrective actions to be taken in terms of ecological flow releases and potentially water control structures to protect the OUV of the property.***

6. ***Before 2026, decide on a set of concrete mitigation measures including ecological flow releases and the construction of required water control structures to correct the impacts of the W.A.C. Bennett Dam and other alterations of the hydrology of the PAD, including increased impacts from climate change, and agree on operational strategies and interjurisdictional protocols for the implementation of the adopted mitigation measures as well as a budget sufficient for their implementation.***

### 4.4 Impact of the Oil Sands Industry

The Alberta Oil Sands are described in the 2016 mission report with respect to their location along the Athabasca River and potential for air and water quality impacts in the PAD as well as impacts to migratory birds (including the endangered whooping crane) that traverse this area. Since the 2016 mission, Teck Resources Ltd. withdrew its application to expand the area of oil sands development by an additional 30,000 ha, moving this area in closer proximity (i.e., within 80 km) of the southern boundary of WBNP and hence the project has been terminated. The mission welcomes this positive development as a result of the decision by the company.

The mission further notes that the OUV was considered in the environmental assessment of the proposed Frontier project, in line with Recommendation 5 of the 2016 Reactive Monitoring mission report. However, the mission also notes with concern that the Joint Review Panel found, in its report, that the proposed Frontier project would not impact the OUV of WBNP in spite of the acknowledgment of significant adverse environmental effects if the project were to proceed, including on the Ronald Lake Bison herd south of WBNP. Although statements were

made to the mission team that the project was "*off the table and would not come back*", it remains possible in theory that the project could be revived in the future. The mission further notes with concern that further expansions to existing oil sands mining projects have been approved since the 2016 mission or are under review[19].

Recommendation 6 of the 2016 mission report called on PCA and Alberta to "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*." To date, this recommendation has not yet been initiated. In fact, representatives from Alberta government in their presentations to the mission called into question the importance of this risk assessment given that a monitoring program is in place.

The mission reiterates the importance of this systematic risk assessment which increasingly urgent given the continued expansion of tailings ponds area and volume. The most recent inventory in 2020 shows that tailings ponds cover 220 km$^2$ (up from 176 km$^2$ during the previous mission) and contain 1.4 trillion litres of fluid tailings and about 479 billion litres of ponded water.

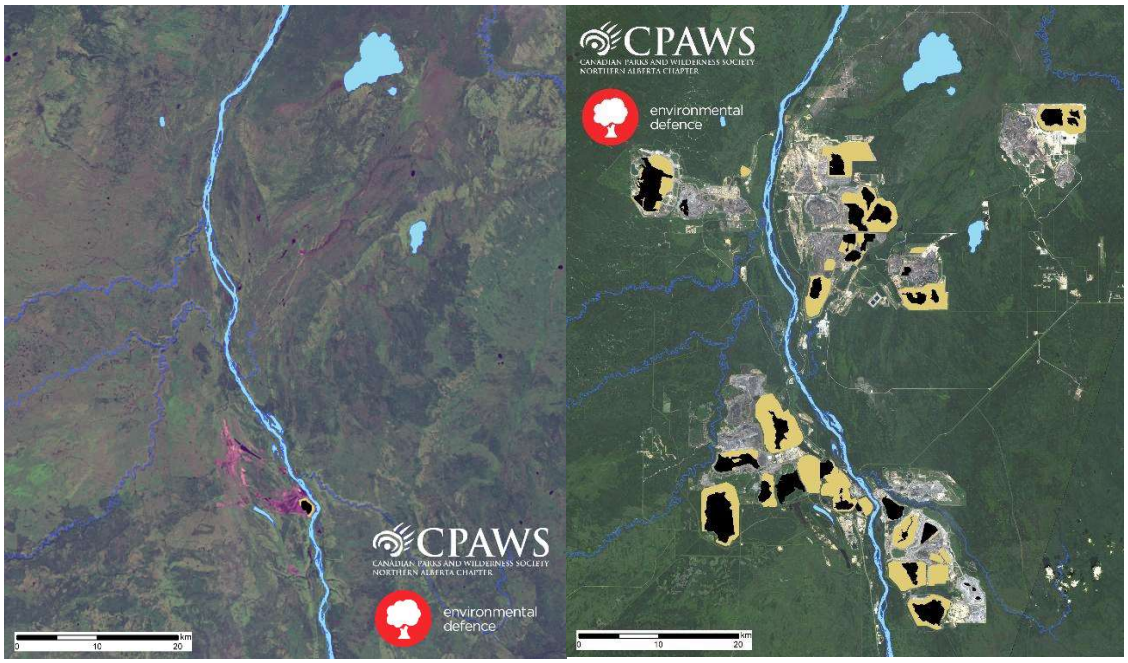



*Figure 9: Extent of fluid tailings area (black) in 1975 (left) and* 2020 (right)*, presented to the mission team by the NGO CPAWS on 22 August 2022.*

With increasing potential for extreme weather events associated with climate change and the continued expansion of the tailings ponds area and volume, this recommendation remains a priority for the mission team.

Oil sands process-affected water (OSPW) is water that has come into contact with bitumen and is the result of oil sands processing. The water is shown to be toxic with high concentrations of toxic metals, Polycyclic Aromatic Compounds (PAC), and organic derivatives such as dibenziothiophene, among others. These contaminants can be transmitted to the PAD through the atmosphere, through inadvertent groundwater (e.g., seepage) or direct surface water exchanges. Contaminants can then potentially be transmitted downstream

[19] Approval of the Syncrude Mildred Lake Extension project; CNRL Horizon North Pit Extension and Suncor Base mine Extension under consideration.

through sediment or in biota (fish and invertebrates) via biomagnification. Birds, especially those that may come into direct contact with a tailings pond, are also vulnerable, including the endangered whooping crane. The SEA cites examples of these modes of exchange that have been documented in the Athabasca River and even in the PAD (see pages 4-13 and 5-42 in the SEA). While Alberta representatives noted that "these substances are also naturally present in groundwater and surface water contributions to the river outside of tailings areas (i.e. non-anthropogenic input)", the mission team was not made aware of approaches used to differentiate a signal of contamination from a natural background level of bitumen-related constituents.

In 2020, the Secretariat of the Commission for Environmental Cooperation (CEC) concluded in a report[20] that peer-reviewed scientific literature and non-peer reviewed industry reports show that, based on scientific analytical methods available today, in certain situations there is scientifically valid evidence of OSPW seepage into near-field groundwater around tailings ponds. Reviews of recent published science also have shown that OSPW has infiltrated into groundwater and that this is common around tailings ponds (Fennell & Arciszewski 2019; Arciszewski et al. 2021)[21]. This speaks directly to the potential risk for seepage of OSPW (and its concomitant load of contaminants) into surface water bodies like the Athabasca River. This has been an ongoing concern, and certainly a risk that must be addressed as these systems age. In addition to documentation of incidents of atmospheric spread of PACs from tailings ponds, there are published studies indicating that seepage of OSPW has occurred in some areas (Schindler 2014; Arens et al. 2017; Fennell & Arciszewski 2019), and a recent review of research indicates that while the problem of seepage may not be widespread the detection may be limited by methodologies that could detect human-related impacts from natural background sources (Arciszewski et al. 2021). Sampling frequency, periodicity, and the distribution of sampling sites relative to potential sources of contaminants may also lead to incorrect misinterpretation of results as showing no impact.

The identification of sources and fates of OSPW and OSPW-derived contaminants is challenging in part due to the vast area and distances under consideration as well as the attenuation of a signal with distance. Also, the likely pulsed nature of documented and undocumented releases necessitates a monitoring program that captures event-driven changes in water (and sediment) quality. Overlaying all of this is the challenge of differentiating OSPW and its associated toxic organic compounds and elements from the natural (i.e., background) signatures of bitumen throughout this region of the Lower Athabasca. Schindler (2014) referred to this as a "fingerprint" represented by sampling for multiple PACs. Although some published studies claim no downstream effect of OSPW on the PAD (examples from Hall and others, e.g., Klemt et al. 2020), other studies have documented the potential for such impacts (e.g., Ferguson et al. 2009, Frank et al. 2014 cited in 2018 SEA).

The difference between these studies may be attributable to the assumptions or sensitivity of the methods being employed. Specific sediment core studies from Hall and others assume that OSPW indicators are preserved in a stable particulate or particle-associated form in the

[20] See: http://www.cec.org/media/media-releases/cec-secretariat-releases-report-on-alberta-canada-oil-sands-tailings-ponds/.

[21] In February 2023, whilst the report of the mission was being finalized, the World Heritage Centre was informed that in May 2022, Imperial Oil workers discovered that tailings fluid was leaking from the company's Kearl oil sands mine, roughly 75 kilometers upstream of Wood Buffalo National Park. The mission team was not informed about this incident during the field visit. On February 4, 2023, a further 5.3 million liters spilled from a drainage pond next to the tailings area. On February 6, the AER issued an Environmental Protection Order (EPO) to Imperial Oil to immediately contain and remediate the spill and leak. The incident clearly demonstrates that seepage is occurring at the tailing ponds. Following the news, indigenous rightsholders expressed concern that they were not informed about the incident until February 2023 by AER, 9 months after the incident, in spite of the potential health risks. On 6 April 2023, Parks Canada informed the World Heritage Centre that it was monitoring the situation and, if it is determined there are potential impacts to the Outstanding Universal Value of Wood Buffalo National Park, the World Heritage Centre would be informed.

sediments and have applied a standardized historical/pre-impact benchmark by which impacts are evaluated. However, it is not clear how stable some indicators such as vanadium are over time and how they may be transformed and mobilized from a biogeochemical perspective in response to changing physio-chemical conditions downcore. Their methods assume stable concentrations downcore (i.e., over time) that may be used to quantify potential accumulation of an indicator like vanadium and therefore determine impacts of OSPW relative to that in more recent sedimentary layers.

Recent published science summarizing vanadium chemistry in these types of environments suggests that in variable redox, pH, and in the presence of dissolved aromatic carbon compounds—all conditions that would vary over time, distance, and downcore in aquatic sediments like those in the PAD—vanadium can vary between dissolved and solid/particle-bound states that are somewhat mobile within sediments and between sediments and overlying water column (Shaheen et al. 2016, Telfeyan et al. 2017, Shaheen et al. 2020). The consequence of this is that vanadium concentrations in PAD sediments may not be stable and, in fact, may be dynamic (with concentrations either increasing or decreasing over time) in response to physio-chemical conditions in the sediment. Therefore, concentrations downcore may not reflect the assumed, preserved historical/pre-impact condition. Additional field work and modelling may be needed for research that employs these and other methodologies to account for dissolution, mobilization, and potential diffusive fluxes of vanadium into or out of PAD sediments.

**Oil Sands Monitoring Program**

The government of Alberta has been primarily responsible for coordinating monitoring of impacts around the Alberta Oil Sands area. Following concerns raised about OSPW and the efforts of a diverse group of local and regional monitoring efforts to document impacts, the Joint Oil Sands Monitoring (JOSM) program was a well-funded (as much as $50 million CAD per year) program that was launched in 2012 (Dubé et al. 2021). Numerous concerns raised by indigenous groups and expert reviewers challenged JOSM's rigor, transparency, and goals for monitoring (Cronmiller & Noble 2019 in Dubé et al. 2021). A 2017 memorandum of understanding between Alberta and ECCC led to a reformulated Oil Sands Monitoring (OSM) program that was deemed more inclusive with respect to indigenous groups and shared knowledge and responsibility across provincial and federal agencies. Although a step in the right direction, Dubé et al. (2021) points to issues that remain, including access to data, integration, data management, documenting cumulative effects, and leadership. Data synthesis is also lacking. In fact, the paper and Special Issue of *Integrated Environmental Assessment and Management* led by Dubé et al. (2021) represents the first rigorous attempt to synthesize and communicate a decade of data collected from the oil sands region.

The Lower Athabasca Regional Plan 2012-2022 (LARP) calls for a cumulative effects management approach to air, water, and biodiversity. However, it is unclear how cumulative effects are evaluated through the existing monitoring framework. Although the LARP is currently under its mandated 10-year review, the same document has been in effect for the period spanning both missions. The current review of LARP should not only prioritize a risk assessment of fluid tailings and reclamation strategies. It should also make clear how monitoring of air, water, and biodiversity will detect changes in these attributes across scales of space and time sufficiently to quantify cumulative effects. A risk assessment would aid in the identification of areas (e.g., older tailings ponds) and events (e.g., extreme rainfall event) of concern that may warrant expansion of monitoring, deployment of a localized, intensive spatial sampling, or consideration of high-frequency, event-based sampling that can be implemented at a moment's notice. At present, the mission considers that the LARP does not

consider such basic monitoring needs that would be more effective in minimizing cumulative impacts to air, water, and biodiversity.[22]

During the 2022 mission, the team heard concerns about what to do with increased volumes of OSPW in the tailings ponds and that the area of tailings ponds continues to grow with no near-term or long-term solution. The mission team learned that operators have been working to develop a new option to treat and release OSPW from tailings ponds into adjacent aquatic ecosystems such as the Athabasca River. Basically, the industry seeks to reclaim tailings ponds and create new capacity for continued production without the need for additional land and tailings pond area. However, any such releases are currently prohibited under the federal *Fisheries Act* and would require federal authorizing regulations.

According to information presented by Alberta representatives, provincial guidance for oil sands mine water release is expected in 2023 with the potential for application submissions by operators in 2024, and with pending provincial decision on releases possible in 2025. Notwithstanding a provincial decision, releases would remain prohibited in the absence of federal authorizing regulations. According to the plans presented by Alberta representatives, provincial level regulatory development is guided in part by an Oil Sands Mine Water Science Team that is working to fill gaps to inform regulatory guidance, including modelling water and sediment quality, treated effluent toxicity, human and ecological risk assessment, effluent limits based on treatment technology, and enhanced monitoring needed before and after release. This group includes representation from indigenous communities, academia, Alberta government agencies, federal agencies, and industry.

The Crown-Indigenous Working Group (CIWG) was established in January 2021 “to work with indigenous communities to explore options to manage the accumulation of effluent from oil sands operations in the existing tailings ponds; one of the options being potential regulations for oil sands mining effluent.” The CIWG includes 9 First Nations and Métis communities located in the Alberta Oil Sands Region but will engage bilaterally with other potentially affected groups outside the region. In early 2023 ECCC is expected to release a white paper co-authored with CIWG on the CIWG collaborative process, including discussion of potential federal regulations and assessment of alternatives to release.

Representatives of the Federal Government recognized the policy constraints and technological challenges to the “treat and release” proposal for dealing with OSPW. Canada’s Fisheries Act prohibits discharge of harmful substances into waterways that may affect the health of fish, unless authorized by federal regulation. From a technological perspective, treating tailings water, especially to a standard that would not violate the Fisheries Act, could be quite costly, especially if reverse osmosis was needed. Following the presentations by Alberta and ECCC, the mission team raised concerns about the potential environmental impacts of treated tailings water releases to waterways like the Athabasca River. In a virtual meeting with the mission team, the Minister of Environment and Climate Change reiterated that OSPW releases into surface water could only be considered if they could be treated to a standard of “drinking water quality” and noted that other options for disposing OSPW were also mentioned, including deep well injection that would entail some treatment followed by injection into a confined/semi-confined geologic zone, presumably well below and occluded from drinking water aquifers.

[22] On 11 April 2023 the State Party submitted a document from Alberta, which noted the following: “Monitoring for environmental management frameworks under LARP complements the monitoring conducted under approval conditions and the Oil Sands Monitoring Program. Environmental monitoring in proximity to tailings structures is governed by site- specific operating approvals issued by the Alberta Energy Regulator (AER). Tailings dam design, construction, performance, and inspections are governed by the Dam Safety Framework and implemented by the AER.”

The Tailings Management Framework (2015) recognizes "that responsible development of the oil sands includes managing both long-term liability and environmental risk associated with fluid tailings" and has the objective "to manage fluid tailings volumes to reduce environmental risk and liability." This suggests a recognized need to reduce risk. However, the risk assessment recommended by the previous mission has not been conducted.

The TMF recognizes:

- The challenges of excess mine water (approximately 1.5 barrels of contaminated water is generated as OSPW for every 1 barrel of bitumen);
- Sets limits on accumulation of fluid tailings volumes;
- Preferred options for dealing with mine water presented as "reduce, recycle, re-use, regional sharing and release," which suggests that *release* is an end-point in this sequence of OSPW management;
- The potential release of treated oil sands tailings water with stipulations as guided by federal and provincial policy; and
- That innovation is also an option (i.e., new technology such as "water capping").

The TMF also states that "lowering fluid tailings volumes and/or minimizing accumulation can reduce the risk of seepage, reduce risks to wildlife that may come into contact with tailings ponds, contribute to dam safety, and lower the footprint of tailings—especially fluid tailings on the landscape." This suggests that the risk of existing fluid tailings is already understood and will be reduced through reclamation actions that treat and release OSPW back to the environment.

At this stage, no decision has been made on the proposal to reclaim tailings ponds by treating and releasing OSPW into adjacent waterways and the mission considers the proposal seems premature, especially when no cost-effective solutions have been identified to meet water quality standards necessary to protect waterways under Canada's Fisheries Act. Without such a plan, the volume and area of tailings ponds will continue to grow, increasing the risk of leakage, potential for impacts, and growing threats to the OUV of the PAD and WBNP.

Indigenous rightsholders reiterated that they remain very concerned about the risks of contaminants in the PAD and that their Elders and land users see impacts on the ecosystem they attribute to oil sands activities. They consider that the Action Plan so far has not resulted in any improvement to approach to tailings risks, which they consider inadequate. They note that their experience with Alberta tailings initiatives has been consistently negative and that Alberta's myriad of processes relating to tailings do not allow for their meaningful participation and do not consider OUV of the property. They consider that Alberta's primary consideration for tailings management has become prioritizing low-cost measures for industry, contrary to the intent behind TMF. Concerns were also expressed about the Mine Financial Security Program which was reported to be criticized since 2015 by the Alberta Office of the Auditor General for not having sufficient financial security to cover the costs of reclamation.

Indigenous rightsholders also voiced their opposition to any proposal which would result in the release of OSPW into the Athabasca River. They consider this proposal would violate their rights and have the potential to alter their relationship with ecosystems in the property. They note that technically feasible alternatives to effluent release are currently being investigated and call on the federal authorities to support those measures over effluent release.

*The mission concludes that the potential impacts of the oil sands developments continue to be a potential threat to the OUV of the property. While welcoming the withdrawal of the Teck Frontier Oil Sands Mine Project, which would have expanded the area of oil sands in closer proximity to the southern boundary of WBNP, the mission notes with concern that the expansion of tailings ponds area and volume has continued to grow since the 2016 mission.*

*The mission notes that the existing monitoring mechanisms for oil sands monitoring and the monitoring of cumulative impacts under LARP continue to present weaknesses.*

*The mission regrets that the systematic risk assessment of the tailings ponds of the Alberta Oil Sands Region with a focus on risks to the PAD, as recommended by the 2016 mission, has not been conducted. The mission stresses that it is impossible to manage risk if it is not identified, categorized and vulnerabilities understood. Risk assessment identifies and quantitatively assesses the impacts of low probability, highly damaging events. Without this knowledge, the impacts associated with myriad spatial and temporal elements of fluid tailings including the existing tailings pond area and volume, the aging infrastructure supporting and maintaining oil sands process-affected water (OSPW), future expansion of tailings area and volume, and extreme climatic events are unknown.*

*The mission is very concerned about proposals to reclaim tailings ponds by treating and releasing OSPW into adjacent waterways and considers that this reclamation process will entail substantial risk to the Athabasca River, the PAD, and human health. The mission reiterates that the Precautionary Principle should be fundamental to regulatory processes addressing oil sands reclamation and ensure that water quality of Athabasca River does not degrade. Tailings pond reclamation actions should not proceed until existing risk is assessed and understood. Only after an independent risk assessment is completed should these reclamation options be considered for implementation. This also points to the need for an additional independent risk assessment for the various proposed tailings pond reclamation options (e.g., treatment and release, deep well injection, water capping, etc.) that should, ideally, reduce risk in the future.*

*The mission concludes that gaps in oil sands tailings management need to be addressed urgently, including enforcement and compliance, assessment of risk of reclamation technologies, transparency, and environmentally-driven reclamation criteria.*

**Recommendations:**

7. ***Urgently and before the end of 2024, conduct an independent systematic risk assessment of the tailings ponds of the Alberta Oil Sands region with a focus on risks to the PAD, 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.***

8. ***Re-evaluate and adapt (as needed) collaborative, systematic, science-based monitoring of oil sands impacts on the Athabasca River and PAD to ensure sufficient parameters, sampling design, and protocols are employed to detect impacts. Long-term monitoring and syntheses of long-term data will be essential to establishing baselines, detecting changes, and communicating impacts.***

9. ***Before 2026, develop a clear, consensus-based strategy based on precautionary principles for the reclamation of tailing ponds, including the treatment and disposal of OSPW, which guarantees protection of the Athabasca River's and PAD's water quality and avoids any impacts on the OUV of the property.***

### 4.5 Cumulative effects of industrial developments and impact assessments

The 2016 mission noted that the cumulative impacts of the threats to the property appeared to be far more complex and severe than previously understood and recommended to expand the scope of the SEA 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 (Recommendation 8).

The SEA lists an impressive number of existing, proposed and reasonably foreseeable activities with the potential to affect the OUV of the property, including existing, approved and proposed hydropower projects on the Peace River, 38 existing and 47 proposed oil sands projects in the Athabasca River basin and 25 in the Peace River basin, 11 pulp and paper mills, 3 limestone mines and 1 silica mine, 4 decommissioned uranium mines around Lake Athabasca, 3 active timber concessions in Alberta as well as planned timber harvest areas in NWT. At the time of inscription, the property's integrity was considered to be guaranteed by "*the park's size, remoteness, very low human population density and the absence of resource extraction activities which minimize human-related stress within the property*" (see SOUV in Annex 1) While some of the activities cited in the SEA are situated at significant distance from the property and others are currently not active or have been abandoned since the SEA was conducted, the above list clearly documents that the statement regarding integrity no longer reflects the current situation. The SEA further documents that specifically the PAD is likely to be impacted by climate change, exacerbating other current and future impacts (see also 4.3).

The SEA studied how the primary pathways of effect would be impacted by the existing and reasonably foreseeable developments and climate change, affecting the desired outcomes for the 16 identified attributes of the OUV (see table 6-9 of the SEA in Annex 8). It concluded that the likely future trend for 7 of these desired outcomes was negative, including all the desired outcomes linked to the PAD. Only for two desired outcomes related to the whooping crane the future trend is expected to be positive. For the remaining 7 desired outcomes, the SEA concluded that the future trend of the desired outcome was not possible to predict. The SEA therefore recommended that the government at all levels, indigenous communities and industry apply the precautionary approach to avoid irreversible impacts on the World Heritage values.

*The mission considers that the SEA provided a significant contribution to better understand how the different existing, proposed and reasonably foreseeable activities together with the expected increasing impacts of climate change will impact the primary pathways of effect and will likely result in further impacts on the OUV of the property, especially on the desired outcomes linked to the attributes of the PAD. The mission therefore reiterates the importance of addressing existing cumulative impacts identified in the SEA and ensuring that cumulative impacts on the OUV of the property are fully considered when planning and approving further development projects in the wider landscape around the property and in particular upstream of the PAD.*

The Action Plan is not referring to the precautionary principle as one of the principles guiding its implementation. It has the objective to address some of the cumulative impacts, in particular to the hydrology and oil sands activities and includes a specific theme on environmental assessments. In addition to the development of the SEA (activity EA3), most of the actions under this heading are directly related to the 2016 mission recommendations with regard to the Teck Frontier Oil Development (EA4-6) or the proposed Amisk hydroelectric project (EA1-2), which were covered under previous chapters. One action (EA7) seeks to ensure that all current and future environmental assessments reviews consider specific and cumulative impacts on the OUV of the property and are aligned with the IUCN World Heritage Advice note on Environmental assessments and World Heritage "*to the extent possible"*.

To address cumulative effects, the Action Plan further refers to the Cumulative Effects Management Frameworks for air quality, surface water quality and quantity, ground water and tailings management (see also 4.4), which under the Alberta Land Stewardship Act, are included in regional land use plans for each of the major watersheds (EA8-12). For the property, the two relevant regions are the Lower Peace Region which includes the property,

and the Lower Athabasca Region, adjacent to the property. LARP was approved in 2012 and it excludes the most of the PAD (which the exception of small part of the PAD which is included in the Richardson Wildland Provincial Park because it is considered to be part of the regional plan for the Lower Peace River Region. So far, no regional land use plan has been developed for the Lower Peace.

As already noted by the 2016 mission, scientists, conservationists, and indigenous rightsholders consistently have criticized that LARP is prioritizing industrial development before environmental concerns, nature conservation or the rights of indigenous rightsholders. Six First Nations one Métis organization submitted Applications for Review under a provision in Albertan law after LARP was approved, because they considered it was affecting Treaty rights, and identified a number of other concerns. A government-appointed Panel reviewed the Applications in 2015 and concluded that the submitting First Nations were directly and adversely affected by aspects of the LARP. The mission considers that the Review Panel pointed to important deficiencies in the LARP, such issues with its approach to cumulative effects management, the environmental management programme and recommended that an equalization must be achieved to find a balance between industrial activity and the "constitutionally-protected rights" of the First Nations Applicants. Indigenous rightsholders informed the mission that in 2018, four First Nations proposed amendments to the LARP to address gaps introduced by the interpretation of LARP in the regulatory and approvals process, suggestions on the development of a Cultural Framework to protect Rights, and recommendations for improvements to existing frameworks.

Indigenous rightsholders informed the mission that they consider little progress has been made in relation to the Actions regarding the provincial environmental management frameworks. Representatives noted that until today, neither their concerns nor the recommendations of the 2015 review or the proposed amendments published in 2018 have led to changes in the LARP. The Alberta Land Stewardship Act requires each regional plan to be reviewed at least once every 10 years, to assess its ongoing relevancy and effectiveness. The 10-year review of the LARP commenced on 26 August 2022, prior to the requirement under the Alberta Land Stewardship Act (September 1, 2022), immediately after the mission. According to the website announcing the review, the 2015 panel recommendations will be considered as part of this process. The website also states that the 10-year review will result in a report from the Land Use Secretariat to the Stewardship Minister of Alberta on the ongoing relevancy and effectiveness of the regional plan, which remains in effect.

*The mission considers that the current instruments put in place by Alberta remain insufficient to avoid or mitigate cumulative impacts on the OUV of the property, taking into account that the LARP has been criticized as insufficient to address cumulative impacts and does not consider the property nor the PAD. The mission also notes that the impacts of climate change have not been considered in LARP. The mission is also concerned that a regional land use plan for the Lower Peace River, fully considering the property, is not yet in preparation. The mission considers that the Action Plan does not include sufficient specific measures to address the weaknesses of the LARP, nor foresees preparing a land use plan for the Lower Peace.*

*The mission recommends that the current review process of LARP is used to recommend a revision in order to address the weaknesses in the LARP identified by the 2015 Review Panel, taking into account the increased understanding on cumulative impacts as documented in the SEA, including from climate change, and the 2018 proposal for amendments by the First Nations. The recommended revision should ensure that cumulative effects management fully considers the OUV of the property and in particular impacts of the desired outcomes identified in the SEA for the PAD. The current review should guarantee full participation of all affected indigenous rightsholders (including affected indigenous communities located in NWT) and other stakeholders. The mission further recommends that the preparation of a land use plan for the Lower Peace is expedited, building on lessons learned from LARP.*

Since the 2016 mission, Canada adopted a new federal Impact Assessment Act (Bill C-69 adopted on 21 July 2019[23]). The revised impact legislation followed the 2017 Expert Panel Report which proposed a new vision for impact assessments in Canada[24]. The new Act addresses some broadly acknowledged shortcomings of the 2012 Canadian Environmental Assessment Act and foresees a number of innovations such as the introduction of a planning phase to support early engagement with the public and indigenous communities regarding designated projects, the consideration of social, economic and health impacts in addition to environmental impacts and the consideration of indigenous knowledge in addition to scientific information, including through indigenous-led assessments. A new federal agency, the Impact Assessment Agency of Canada (IAAC) was created to be responsible for all federal impact assessments. All projects on federal lands including national parks automatically trigger federal assessments of environmental effects. In addition, *the Physical Activities Regulations* lists the types of projects subject to the Impact Assessment Act including many oil and gas projects, mining projects, linear and transport infrastructure projects, water projects including hydropower projects. The Federal Minister of Environment and Climate Change has discretionary authority to designate a proposed project that is not on the Project List. The Minister may exercise this authority if the carrying out of the project may cause adverse effects within federal jurisdiction or adverse direct or incidental effects, or public concerns related to those effects warrant the designation. The impact assessment decision for a designated project is made by the Minister of Environment and Climate Change. In reaching this decision, the Minister may also consider potential impacts of the project on indigenous peoples, impacts on rights, and the extent that the project's effects may hinder or contribute to Canada's environmental obligations and climate change commitments. The Minister may refer the decision to Governor in Council to determine whether the project is in the public interest. The 2019 Impact Assessment Act has been recognized by stakeholders and scientists as an important improvement compared to the 2012 Act, although scholars have considered it is not fully meeting the high standards set out by the 2017 Expert Panel[25].

The mission team was informed that MCFN provided submissions and testimony to a parliamentary committee discussing the draft bill requesting that "impacts to OUV" be a mandatory trigger for a federal impact assessment, but that this submission was rejected. Indigenous rightsholders further highlighted that many of the projects which could potentially affect the OUV of the property do not trigger federal impact assessments. This is for example the case for extensions of an existing oil sands mine, the CNRL Horizon North Pit extension project which is currently going through provincial assessment. A quick review by the mission of the ToR of EIA of the Horizon North Pit extension project showed that the ToR did not include any specific requirement to assess the potential impacts on the OUV of the property[26] and makes no specific reference to the PAD[27].

Indigenous rightsholders further expressed disappointment that their request for a federal environmental assessment of the Horizon North Pit extension, was rejected based on the existence of a provincial regulatory process. Indigenous representatives further noted with

[23] The Impact Assessment Act is available at https://www.parl.ca/DocumentViewer/en/42-1/bill/c-69/royal-assent.
[24] Building Common Ground: A New Vision for Impact Assessment in Canada available at https://www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews/environmental-assessment-processes/building-common-ground.html.
[25] See for example the analysis by Hunsberger, C., Froese, S., & Hoberg, G. (2020). Toward 'good process' in regulatory reviews: Is Canada's new system any better than the old? Environmental Impact Assessment Review, 82. https://doi.org/10.1016/j.eiar.2020.106379.
[26] Para 118bis of the Operational Guidelines requires impact assessments to identify potential positive and negative impacts on the Outstanding Universal Value of projects on the property. The "*Guidance and Toolkit for Impact Assessments in a World Heritage Context"* notes that the impacts on the OUV of World Heritage properties should be assessed specifically within the broader impact assessments required under national legislation.
[27] The EIA report includes a sub-chapter looking at potential impacts of the project on water quality in the PAD, but no further reference to the potential impacts on the OUV of the property.

concern that, in their opinion, with the exception of the impact assessment of the Teck Frontier project, not a single impact assessment conducted since the 2016 mission had specifically addressed potential impacts to the OUV of the property.[28]

Projects not falling under the Federal Legislation are subject to impact assessments by the Province of Alberta as regulated through the Environmental Protection and Enhancement Act. The Alberta Energy Regulator (AER) is responsible for regulating the life cycle of oil, oil sands, natural gas, and coal projects in Alberta from application and construction to production, abandonment, and reclamation. To ensure consultation with the indigenous communities, the Aboriginal Consultation Office (ACO) was established in 2013 to provide consultation management services to meet the needs of Alberta's ministries, indigenous communities, industry proponents, and the Alberta Energy Regulator.

Indigenous rightsholders in Alberta consider that the consultation mechanism under ACO is not working properly and noted that all submissions they made in the last decade had been rejected because they were considered not to address site specific impacts, thereby excluding them from further participation in the provincial impact assessment process. The noted that ACO interprets "site specific impacts" as limited to the direct footprint of the proposed development. Furthermore, indigenous representatives also informed the mission of their view that AER determines that all cumulative effects that are not prohibited under a regional plan, such as LARP, are permissible, given the cumulative effects management in place under LARP.

In addition, it has been pointed out that indigenous rightsholders located in the Northwest Territories which could be affected by developments in Alberta are not consulted by the ACO. In the view of indigenous peoples, cooperation on assessments of impacts on their traditional lands must be treaty-based and in line with the UN Declaration on the Rights of Indigenous Peoples which requires free, prior, and informed consent.

*The mission welcomes the significant improvements in federal impact assessment resulting from the 2019 legislation although it regrets that the proposal to include potential impacts to OUV of a World Heritage property as a mandatory trigger for a federal impact assessment was not retained. While noting the confirmation by the State Party that all oil sands projects subject to the Impact Assessment Act in the oil sands area, and which have the potential to impact OUV of the property, will be specifically required to consider the OUV of WBNP, the mission notes with concern that indigenous rightsholders consider that impact assessments for development projects upstream of the property, oil sands mine extension projects, continue to fail to consider potential impacts on the OUV of the property. The mission is further concerned about the reported weaknesses in the impact assessment processes in Alberta and in particular the apparent dysfunctional mechanisms to ensure cooperation with and consideration of the legitimate concerns of indigenous rightsholders.*

**Recommendations:**

10. ***Ensure that all major development projects, including all oil sands mining extension projects in the PAD watershed, are designated for federal impact assessments and specifically address potential impacts on the OUV of the property, in line with the Guidance and Toolkit for Impact Assessments in a World Heritage Context[29] and submit these Environmental and Social Impact Assessments (ESIAs) to the World Heritage Centre.***

[28] In its submission of 11 April 2023 of the factual errors' check of this mission report before its publication, the State Party considered this statement by representatives of the indigenous rightsholders to be incorrect.
[29] The new Guidance was published in 2022 and is available at https://whc.unesco.org/en/guidance-toolkit-impact-assessments/. It replaces the IUCN World Heritage Advice Note on Environmental Assessment and World Heritage (2013).

11. ***Ensure that all impact assessments of other projects in the larger landscape around the property not undergoing federal impact assessment and under the responsibility of the Government of Alberta fully consider the OUV of the property and the concerns of indigenous rightsholders beyond the direct footprint of the project.***

12. ***Expedite the preparation of a land use plan for the Lower Peace, building on lessons learned from the LARP and use the ongoing review process to address the weaknesses in the LARP identified by the 2015 Review Panel, taking into account the increased understanding on cumulative impacts as documented in the SEA, including from climate change. The revised LARP should include indicators and thresholds to support decision-making and approvals and require a biocultural approach to ensure that cumulative effects management fully considers the OUV of the property and in particular impacts of the desired outcomes identified in the SEA and the Action Plan for the PAD.***

### 4.6 Ecological monitoring and research

Recommendation 9 from the 2016 mission report called for expanding "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." In response to this recommendation, the Action Plan foresees a number of activities to develop an integrated PAD research and monitoring programme (IRMP) to detect cumulative impacts on the PAD (Theme Monitoring and Science, activities MS1 – MS9).

Coincident with hydrologic and water quality monitoring programs to assess environmental flow needs and track impacts of oil sands development (see also 4.3 and 4.4), monitoring of ecological conditions have expanded throughout WBNP since the 2016 mission, particularly in the PAD. This is in part due to additional staffing and enhanced resources resulting from the Action Plan. It is also a result of expanded indigenous-led monitoring efforts such as the Community Based Monitoring program focused on monitoring indicators of PAD health with measurements tied to parameters such as contaminants, fisheries and wildlife, and hydrology. The resulting IRMP was said to be launched in 2023. Indigenous rightsholders at different occasions welcomed the efforts undertaken by PCA to develop an IRMP which fully involves the communities.

The Peace Athabasca Delta Institute has been proposed as an indigenous-led knowledge centre for the PAD that would also function as a research and monitoring centre. This Institute, and the proposed IRMP, would potentially oversee and coordinate long-term monitoring in the PAD. It could help guide park management building from desired outcomes in the SEA and could also function in facilitating and collaborating with agency and academic scientists conducting research in this area. Having a local, indigenous-led program of this nature would be of great value in tracking the impacts of river regulation, oil sands impacts, climate change, and mitigative measures such as strategic flow releases and water control structures on PAD health. It could also collaborate with PCA and Alberta in documenting and identifying threats of invasive and alien species throughout WBNP and surrounding provincial parks.

*The mission welcomes that important efforts made to develop an innovative IRMP using both western science and indigenous knowledge and supported by community-based monitoring but considers that to be effective, these ecological monitoring programs must be standardized and sustained over time in order to understand trends and dynamics in response to various pulse (e.g., ice-jam flooding) and press (e.g., climate change) disturbances that affect the OUV of the PAD and across WBNP.*

*The mission furthers considers that a locally based Delta Institute would help build capacity locally and inspire, educate, and empower communities to address current and future threats to the health of the PAD but notes it would need to be aligned with quality assurance and quality control standards of western monitoring and science programmes and its products subject to peer review. It would also require substantial resources that may compete with successful implementation of the Action Plan.*

Recommendations 16 and 17, respectively, from the 2016 mission report recommended the State Party to "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 possibly changing management requirements" and "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."

One of WBNP's most iconic species, the endangered **whooping crane** (*Grus americana*) has made a remarkable recovery from near extinction over the past century. Recent monitoring revealed a record 102 nests in 2021 and a 2021-2022 population of 543, and long-term monitoring indicates a 4.4% annual population growth rate. Aerial surveys in and around WBNP and Aransas National Wildlife Refuge in coastal Texas, USA, have been essential in tracking population dynamics. Coupled with an older banding program, GPS-tracking of birds, and recent high-resolution satellite image analysis, surveys of whooping cranes have been critical in understanding threats and rates of mortality at both locations and along their migration route. With the recent growth of this population, a recovery goal of 1000 birds and 250 breeding pairs seems increasingly possible. However, threats to whooping cranes still remain.

It is unknown as to how climate change may impact whooping crane nesting habitat at WBNP (a 1.7 million-hectare Ramsar Site), their nearly 4,000-km migration route, or their wintering grounds in Texas. Their migration route also traverses the Alberta oil sands region, and landings are known to have occurred in the oil sands area. In fact, data from 340 migrations by 93 GPS-tracked whooping cranes from 2010-2020 showed that 97% of migrations transited the larger oil sands region and 85% of those also transited the surface minable area. Per year, roughly 61% (up to 87%) of marked cranes landed in the oil sands region and 23% (up to 44%) landed in the surface minable area. The potential for exposure to tailings water or other toxins in this highly industrialized region raises the concern for chronic impacts beyond immediate, acute mortality, including impacts to behaviour and reproduction or delayed mortality.

*The mission therefore considers there is a need for enhanced monitoring of birds that have come into contact with oil sands process-affected water. This enhanced monitoring would effectively serve as a long-term "contact tracing" of behaviour, reproduction, and lifespan to understand potential deviations from normal trends. As part of this enhanced tracing, these birds should also be subject to an autopsy to understand the cause of death and to identify potential indicators of contamination.*

**Wood bison** are considered threatened as per Canada's Species at Risk Act, and the WBNP population is protected under the Canadian National Parks Act. Following the 2016 RMM, a recovery strategy for wood bison was adopted in 2018. Bison numbers in WBNP have remained fairly stable, following a significant drop in the population estimate between 2009 and 2014. Some indigenous elders expressed concern over the health of the park's bison population, suggesting that the actual numbers are still declining. The variability in bison population estimates is still quite large, and recent population estimates (i.e., since 2019) were not presented to the mission team. The status of bison was presented as "stable and healthy",

although recent estimates were not presented, and, even with the 2018 Recovery Strategy, it is not clear what the actual carrying capacity is for bison in WBNP.

Data presented to the mission suggest that calf production and yearling survival in WBNP are at a rate that supports population growth. However, disease threats from bovine tuberculosis, brucellosis and anthrax remain throughout the population in WBNP. The mission team was introduced to recent studies that incorporate bison genomics and genetics-based approaches to diagnosing and potentially treating infected individuals. The Bison Integrated Genomics study is a collaborative effort between Parks Canada, the universities of Saskatchewan and Alberta, and a variety of other partners to advance development of a disease assay for bovine tuberculosis, a combined vaccination for bovine tuberculosis and brucellosis, a test to distinguish subspecies and determine the degree of mixing or hybridization among the different subspecies, and, finally, to develop a bison genome biobank. The mission team was delighted to see this important work advancing to potentially diagnose and treat infected bison, leading to improved management and conservation of these genetically-distinct (sub) populations of wood bison.

Also improving management of wood bison and various other species that reside or migrate through WBNP, a wetland/habitat mapping tool co-developed by PCA and Ducks Unlimited shows potential for tracking habitat changes over time, including the cover of Canada thistle and sow thistle—invasive species that many think has a negative impact on bison. However, the science related to understanding the impacts of thistle on wood bison still appears to be inconclusive, although the 2018 Wood Bison Recovery Strategy includes thistle as having medium-to-low impact in the threat assessment table (see table 4 of 2018 Wood Bison Recovery Strategy in Annex 9). A study to investigate the interaction between bison use and flooding of thistle sites, incorporating long-term exclosure/isolation plots, was described to the team, but the status of this project is unknown to the mission team. Studies such as this will help address the question regarding impacts of thistle on bison and could be coupled with long-term observation data from the field and the new habitat mapping tool.

Recent expansion of wildland provincial parks to the south of WBNP (see also 4.7) provide additional buffering for the park, protecting habitat for wildlife such as elk, wolves, and bison such as the disease-free Ronald Lake Bison Herd. Recent genetics data presented during this mission indicate that the Ronald Lake Bison Herd is a genetically distinct population. The population estimate for 2021 was 272 bison with “good” calf recruitment. This population is free of brucellosis and tuberculosis, as confirmed by sustained testing since 2013. However, in 2020, ECCC determined that the herd faced imminent threats to its recovery under the Species at Risk Act, leading to a draft conservation agreement between Canada and Alberta. The Kitaskino Nuwenëné Wildland Provincial Park (KNWPP), spanning 161,880 hectares, was established in 2019 and spans a large portion of the Ronald Lake Bison Herd range. This park was expanded by an additional 152,000 hectares in 2022, encompassing much of the divide between WBNP and the oil sands region. Although it does not span the entire range, long-term monitoring of movement has revealed that KNWPP does encompass a 90 km2 calving range that is repeatedly used by cows during the calving period (late May to late June). At this stage, a 38,000-hectare gap remains unprotected in this area that spans habitat used by the Ronald Lake Bison Herd Federal and provincial authorities should work to protect these lands that would help ensure protection of this disease-free bison herd and ensure protection of lands as close as 10 km to WBNP’s southern border along the Athabasca (see also 4.7).

**Recommendations:**

13. ***Ensure that the innovative Integrated Research and Monitoring Programme developed under the Action Plan, which is integrating indigenous knowledge with western science, is standardized and sustained over time in order to understand trends and dynamics in response to various pulse (e.g., ice-jam flooding) and***

***press (e.g., climate change) disturbances that affect the OUV of the PAD and across WBNP.***

14. ***Further strengthen the monitoring of flagship species, in particular by:***
    a. ***establishing a programme for enhanced monitoring of whooping cranes that have come into contact with OSPW to clarify the potential impacts on the population;***
    b. ***continuing to improve methods for generating more frequent population estimates of wood bison in WBNP and in the disease-free, genetically-distinct Ronald Lake Bison Herd;***
    c. ***continuing research to develop disease assays and vaccination as needed to reduce risk of spread to the disease-free Ronald Lake Bison herd.***

### 4.7 Land use planning in the wider WBNP landscape

The 2016 mission noted that in spite of the large size of WBNP, its boundaries are not optimized for the protection of the OUV of the property. For example, only 80 % of the critically important PAD lies within the park's boundaries and a large part of the range of the important Ronald Lake Bison Herd is outside the property (see 4.6). The management of the property therefore has to consider the Greater WBNP ecosystem. A key instrument to do so in the World Heritage context is the official designation of a buffer zone. The 2016 mission also looked into the land use planning around the property, in particular the area between the oil sands region and the property and recommended to conduct a comprehensive assessment of options, in order to underpin decision-making to put in place an effective buffer zone (Recommendation 10) and to 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 (Recommendation 11).

The SEA noted that the existing and planned industrial developments could further add to increase linear corridor density and habitat changes surrounding WBNP and recommended to consider the opportunities presented by forest management agreements held by indigenous groups and bordering the property to establish a functional buffer zone.

The Action Plan foresees the further establishment of protected areas and conservation areas around the property to act as functional buffer zones (Conservation Area Connectivity CC1–CC10), a needs assessment for an ecological network (CC11–CC16) as well as looking at remaining gaps in the maintenance of OUV to guide further decisions on establishing a buffer zone (CC17–CC19).

#### Establishment of new protected areas around the property

As part of LARP (2012) implementation, Alberta designated, under the *Provincial Parks Act*, 3 new protected areas adjacent to the property in 2018: the Birch River (331,832 ha), Kazan (659,397 ha) and Richardson (312,068 ha) Wildlands Provincial Parks and further expanded the Birch Mountains Wildlands Provincial Park with an additional 2,704 ha. This created 1,36 million ha of newly protected lands to the east and south of the property (see Figure 10). WPPs are managed under the Alberta *Provincial Parks Act* and are "*undeveloped natural landscapes that retain their primeval character established for the conservation of nature and associated cultural features*". Industrial activities such as oil and gas developments, mining, or forestry activities are not permitted but they do allow for nature-based recreation opportunities which focus on wilderness recreation experiences, including hunting and fishing, as well as the traditional use activities by indigenous rightsholders.

While these WPPs have put large areas adjacent to the property under protection, indigenous rightsholders have argued that they have not been identified based on ecological needs or have taken into account the areas they use for their traditional activities but were selected based on considerations of avoiding conflicts with oil sands and other leases. In particular, an area immediately south of the property, and including important headwaters for the PAD as well as habitat of the Ronald Lake Bison herd, was not originally foreseen to be established as a WPP under the LARP. Alberta representatives noted that the selection criteria for potential WPP included areas with little to no industrial activity but also areas that support Aboriginal traditional uses, that are representative of the biodiversity and of sufficient size.

The idea of a unique Biodiversity Stewardship Area was proposed by Mikisew Cree First Nation following the 2016 monitoring mission. After long discussions between indigenous rightsholders, with the governments of Alberta and Canada and a consortium of industry stakeholders, the Government of Alberta in December 2018 announced its intention to establish a new Biodiversity Stewardship Area Wildland Provincial Park, leading in in 2019 to the establishment of the 161,880 ha Kitaskino Nuwenëné Wildland Provincial Park (KNWPP). A further extension was approved in 2022, adding an additional 160,000 ha to the park. KNWPP is situated south of the property and protects the Birch, McIvor and Buckton River watersheds upstream of Lake Claire as well as critical habitat for caribou and the important Ronald Lake Bison herd (see 4.6). It is also an important traditional use area for the indigenous rightsholders.

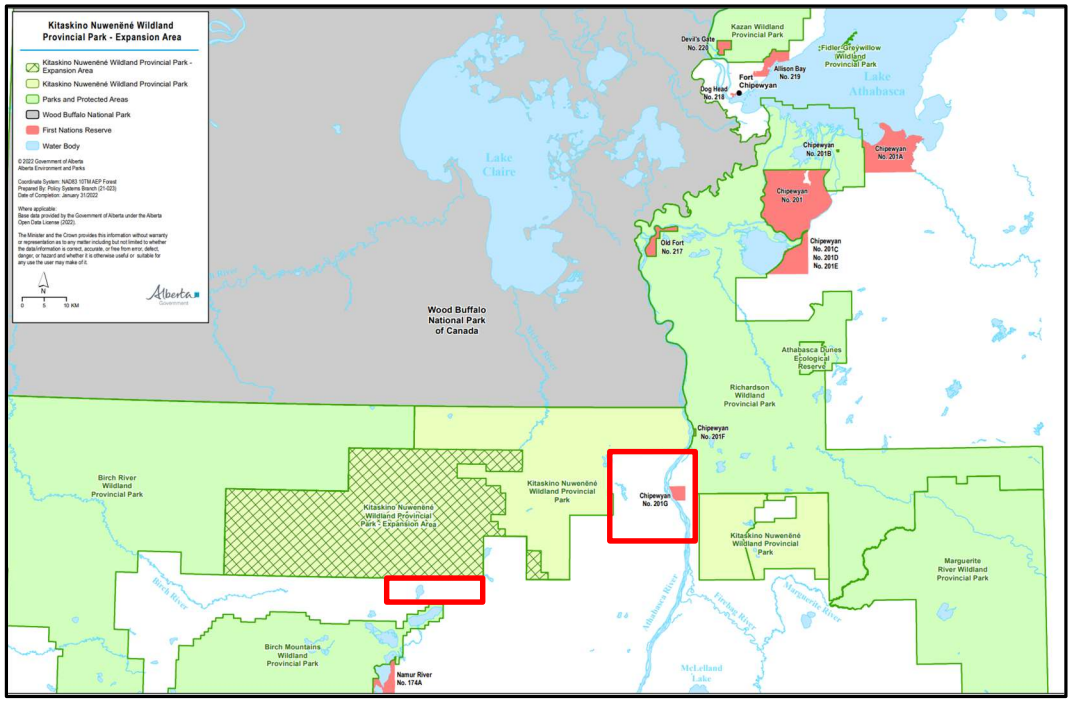



*Figure 10: Map illustrating position of the Kitaskino Nuwenëné Wildland Provincial Park and the LARP conservation areas: Wildland Provincial Parks (Birch Mountains (expansion), Kazan, Richardson) and Public Land Use Zone (Birch River), presented to the mission team by Alberta Environment and Protected Areas on 21 August 2022, "Missing areas" in red (Presentation MCFN, 21 August 2022).*

The creation of KNWPP was primarily initiated as an indigenous-led initiative by MCFN together with ACFN and other indigenous groups. Their vision was to develop a protected and conserved area co-managed by the indigenous communities and consistent with Indigenous Protection and Conservation Area (IPCA) principles. The initiative involved cooperation between the involved indigenous communities and Alberta and relevant federal authorities as well as oil and forest companies. Several oil sands leases and forestry leases had to be relinquished to create the park.

However, the original objective to create a contiguous area on both sites of the Athabasca River, free of development, including oil sands developments, stretching 30 km south of the boundary of the property, has not yet been achieved. As shown on the map, a key area around the Athabasca River could not yet be included because of an existing oil lease held by the company CNRL in the area, which has not yet been relinquished. Another area in the McIvor watershed was not yet included, because of existing forestry interests, although an existing oil lease was relinquished (areas indicated with red outline in Figure 10). The mission was informed by representatives of Alberta that discussions with CNRL were on-going but had not yet resulted in return of the oil lease. Indigenous groups however pointed out that Alberta renewed the CNRL 10-year lease agreement recently and considered this a missed opportunity to relinquish the lease. It was also pointed out that a provincial Crown land reservation continues to be applied to the area, identifying the area as a potential future conservation area.

The mission was informed that the newly created KNWPP will be managed through a cooperative management approach with indigenous communities. Terms of Reference for cooperative management are being developed with 23 First Nations and Métis organizations for five wildland provincial parks in northeast Alberta, but a cooperative management board for the KNWPP has not yet been established. Indigenous representatives noted that work on the development of a Management Plan and an indigenous-led monitoring system for KNWPP had not started. However, there is a commitment on behalf of the province to fund this work once initiated. Indigenous rightsholders consider that progress in putting in place a cooperative management system for the WPP has been too slow.

In contrast to the LARP, the planned regional plan for the Lower Peace River region is still not available. In addition to the existing Caribou Mountains WPP (created in 2002), the Action Plan mentions that further potential conservation areas have been identified as part of Alberta's Draft Provincial Caribou Range Plan. The mission was informed about the opportunity to further ensure the conservation of forest areas adjacent to the property in the Lower Peace region. In particular, the 10000 ha F 23 Forest Management Unit, which is part of the homeland of the Little Red River Cree First Nation (LRRCFN) and is situated south of the Caribou Mountains WPP and on the western boundary of the property is considered to be of high biodiversity value. The area contains High Conservation Value Forests, including substantial unfragmented old growth forest areas and is important habitat for caribou and wood bison. With the exception of a small area in the south, F 23 is also said to be free of oil leases. The mission was informed of the interest of LRRCFN to manage F 23 as an IPCA, where commercial timber harvest would be eliminated within seventy percent of the concession and the footprint of logging within the remaining area would be reduced to facilitate conservation of old growth forest areas, wetlands, and critical habitat for woodland caribou and wood bison. The mission was informed of LRRCFN's proposal to compensate the foregone income from forestry activities through biodiversity offsets, for example by the oil industry.

The Action Plan also mentions the potential for developing community based conservation areas adjacent to WBNP to the north of the property as part of the Healthy Land, Healthy People policy of Northwest Territories, but no further information on progress made was provided to the mission.

*The mission welcomes the important efforts which have been made since 2016 to further designate provincial protected areas around the property. In particular, the creation of a series of WPP at the southern boundary of the property is an important step forward to create a functional buffer between the property and the advancing oil sands developments in these areas and will support the protection of the OUV of the property. The creation of KNWPP is in that respect especially significant as it protects headwaters for the PAD as well as part of the*

*habitat of the Ronald Lake Bison Herd. The fact that KNWPP was created as a result of a close cooperation between the relevant indigenous rightsholders and Alberta and with the support of other stakeholders further adds to the significance of this achievement. The mission however notes that this remains a work in progress and that further efforts are needed in particular to include the "missing blocks" around the Athabasca River into KNWPP. The mission also stresses the importance of urgently putting in place a management system for all newly created WPP which fully involves the indigenous rightsholders, with appropriate resourcing. A management plan with clear management objectives, which takes into account the protection of the OUV of the property as well as an appropriate monitoring system also needs to be put in place urgently.*

*The mission also considers further efforts are needed to enlarge this functional buffer zone around the property in particular in the Lower Peace region, including by considering options for the forest leases situated between the Birch River WPP and the Caribou Mountains WPP. The development of a land use plan for the Lower Peace River should therefore be considered as a priority.*

**Establishment of a World Heritage Buffer Zone**

The mission was informed that data collection to determine the ecological functional needs of elements of the OUV is underway but work to identify potential gaps necessary for the maintenance of the OUV, which would guide options for further development of the regional network of protected and conserved areas, including the consideration of a buffer zone have not yet started.

*The mission notes that current efforts have been focused on the creation of the WPPs foreseen under the LARP and the establishment of the additional KTN WPP, which act as functional buffer zones between the property and the oil sand region. While these are very important achievements, the recommended comprehensive assessment of options for establishing a formal buffer zone and to better realize synergies between the property and land use planning in its immediate vicinity have not yet started. The current Action Plan foresees activities to look at ecological needs of the OUV related to connectivity (CC12-16) as well as the identification of gaps to maintain the OUV (CC17-19) but falls short of providing actions to address these gaps and of a commitment to designate a formal buffer zone under the World Heritage Convention as foreseen under paragraphs 103-107 of the Operational Guidelines. It can be argued that at the time of inscription, a buffer zone was not needed because of the fact that it was embedded in a larger intact and relatively undisturbed forest landscape. However, this situation has changed significantly as a result of the large expansion of industrial developments south of the property since the time it was inscribed. The mission therefore considers the formalization of a buffer zone an important tool to preserve the OUV of the property in the long-term. Such a formal designation could also provide a mechanism to ensure that the management of the WPPs is aligned with the objectives of the OUV of the property and facilitate synergies and cooperation between the federally managed property and the provincial WPPs.*

**Recommendation:**

15. ***Continue efforts to create a buffer zone around the property, as recommended by the Operational Guidelines for the Implementation of the World Heritage Convention, in particular by:***
    a. ***further extending Kitaskino Nuwenëné Wildland Provincial Park by including the missing blocks identified by Mikisew Cree First Nation around the Athabasca River as well as the area in the south still covered by a forest concession license;***

b. ***putting in place urgently a co-management system for the newly created Kitaskino Nuwenëné Wildland in cooperation with the indigenous rightsholders, with appropriate resourcing and with clear management objectives which take into account the protection of the OUV;***
c. ***further extending the network of protected areas adjacent to the property in particular in the Lower Peace region, including by considering options for forest leases situated between the Birch River WPP and the Caribou Mountains WPP;***
d. ***formally designating a buffer zone according to paragraphs 103–107 of the Operational Guidelines for the Implementation of the World Heritage Convention.***

### 4.8 Park management capacity, office presence and Management Plan

The 2016 mission found PCA's "*leadership and staff in WBNP to be fully committed to the institutional mandate, highly motivated, experienced, and skilled*" but expressed concerns about the apparent cuts in staffing and resourcing in 2012, the restriction to a seasonal operations status of WBNP, the limited presence of PCA staff in Fort Chipewyan and the fact that there was no full-time Superintendent in charge of WBNP. The mission therefore advised the State Party to consolidate the management resources and capacity to a standard commensurate with World Heritage status and adequately respond to the challenges facing the property by reinstating a year round status and staffing of WBNP, by recruiting a full-time Superintendent exclusively in charge of WBNP, and by ensuring an adequate Parks Canada presence in Fort Chipewyan, as part of the critical PAD area and a major ecological region of WBNP (Recommendation 12).

The Action Plan addresses this recommendation by defining one action to increase capacity for park management and staffing in Fort Chipewyan, to respond to the pressures facing the Peace–Athabasca Delta.

The 2022 mission was informed that PCA created 27 new positions since the 2016 mission, increasing management capacities in Fort Chipewyan by 60% and in Fort Smith by 40%. Following the 2016 mission, a full-term Superintendent in charge for WBNP was appointed and a few months before the implementation of the 2022 mission, an indigenous full-time acting Superintendent for WBNP based in Fort Smith took office.

*The mission considers that the 2016 mission's recommendation has been addressed and would like to highlight the personal and professional dedication and commitment of all PCA staff of WBNP and applaud their efforts to preserve the OUV of the property and work together with all indigenous rightsholders and other stakeholders.*

PCA is also providing intercultural training to its staff to improve the evolving relationship with indigenous communities. Indigenous rightsholders however mentionned to the 2022 mission that they only see limited impacts of these trainings and that further efforts must be made to improve communication with the indigenous communities and to better appreciate their rights. While the mission team notes the continued mistrust in the relationship of indigenous rightsholders with the PCA, it would like to highlight the efforts of WBNP staff to rebuild that trust and develop a genuine partnership with indigenous rightsholders for the conservation of the property. However, the mission believes that it would be useful to continue the training opportunities to enhance the intercultural, legal and communication capacities of staff involved in the management of WBNP.

One of the main upcoming tasks and priorities for the CMC will be the revision of the **Management Plan**. As per the Canada National Parks Act, management plans are a legal requirement for all national parks and are developed with the involvement of the Canadian

public. The current Management Plan[30] for WBNP dates back to 2010 and is in need of revision. Indigenous representatives presented several priorities to the mission team that could potentially be dealt with in the revision of the Management Plan such as the Human Resource Strategy, Procurement Strategy, Fire Management, Infrastructure Management, Tourism Development, and Cabin Allocation Policy.

*The mission welcomes the progress made in improving the management capacity of the property, in particular its staffing and the efforts made to provide intercultural training to WBNP staff. The mission considers that the revision of the Management Plan is absolutely key to ensure the effective management of the World Heritage property but acknowledges that the work on the Management Plan can only start once a vision for a shared governance model for WBNP has been agreed on, which will allow for ownership of indigenous rightsholders for the management of the property and will support building of trust between all parties.*

**Recommendation:**

16. ***Revise the 10-year Management Plan based on an agreed indigenous-led vision for a shared governance model for WBNP and integrating strategies to address the key conservation concerns for the property as resulting from the SEA and the Action Plan.***

Other Recommendations:

- PCA should further enhance the intercultural, legal and communication capacities of staff involved in the management of WBNP.
- PCA should provide training and mentorship opportunities aimed at increasing indigenous representation in WBNP's staffing and workforce, including all levels of the park's administration and management and at increasing opportunities for indigenous participation in procurement.

### 4.9 Implementation of the Action Plan

The Action Plan was developed as a multi-jurisdictional collaboration between Federal Authorities (mainly ECCC and PCA), the provincial Governments of Alberta, NWT, BC Hydro and indigenous partners. The Action Plan respects the jurisdictional authorities of governments and the stewardship responsibilities of indigenous partners. Each of the 7 thematic areas is led by a different entity at federal or provincial level but involves different entities or indigenous partners, who are assigned the responsibility for the implementation of the different actions.

[30] The 2010 Management Plan for WBNP can be found here: https://www.pc.gc.ca/en/pn-np/nt/woodbuffalo/info/plan/plan1.

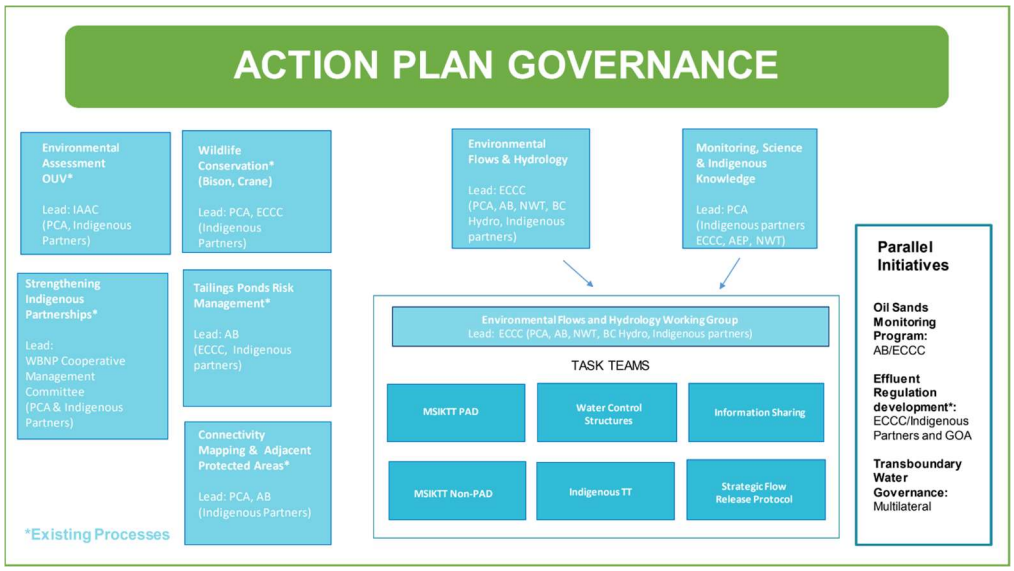



*Figure 11: Action Plan governance, presented to the mission team by Parks Canada on 18 August 2022.*

For the theme on Environmental Flows and Hydrology, which covers more than half of the actions included in the plan, a Federal, Provincial, Territorial, Indigenous Working Group was established (also called the EFH Working Group) and several task teams have been set up. The level of coordination and the involvement of indigenous rightsholders seems to be dependent on the different themes. While for certain themes, coordination seems very active with regular meetings and exchanges (for example the theme on Monitoring, Science and Indigenous Knowledge), for other themes (for example Tailing Ponds Risk Management) this seems much less to be the case. It is acknowledged that the pandemic has made coordination more difficult as in person meetings had to be moved online in 2020 and 2021, making it more difficult to have a constructive exchange in a large group.

The mechanism for the overall **coordination** of the implementation of the Action Plan is not entirely clear. The Action Plans mentions that a Federal-Provincial-Territorial Senior Management Committee, consisting of senior management officials from the Governments of Canada, Alberta, British Columbia and Northwest Territories was established to provide oversight and direction in the development of the Action Plan, but it is not clear if this Committee is still in place and has an oversight role in the overall implementation. The Action Plan mentions that an initial review of the Action Plan is foreseen in 2021 after which a full review will occur every 5 years. The State of Conservation report submitted to the World Heritage Centre in February 2022 includes an overview of the implementation of the Action Plan to date and was prepared with inputs from all actors, including the indigenous communities.

The Action Plan does not include a **budget** estimation and so the total budgetary requirements for its implementation are not clear. An initial budget allocation of $27.5 million CAD (over 5 years) was provided to PCA in 2018 from the federal budget. This investment was used to engage and mobilize government partners, engage with indigenous partners and key stakeholders and to enhance program and scientific capacity for WBNP. In the 2021 budget an additional allocation of $59.9 million CAD (over 3 years) was provided to PCA and ECCC. This investment is being used to advance implementation of the Action Plan across all its thematic areas and allows further investments in key actions in establishing mechanisms and taking action to support improved water management in the PAD, in particular the development of the Environmental Flows Framework and hydrodynamic modelling. The budget increase also includes a provision for the assessment and design and if determined, construction of proposed water control structures for the PAD, budgeted at approximately CAD

$17 million. The mission was informed that Alberta has made resourcing commitments to specific actions under its authority, but no further details were provided.

It is not entirely clear what further investment is foreseen beyond 2024, when the current budget will expire. The State Party representatives noted that further funding could be approved if the Action Plan is yielding the required results. Indigenous rightsholders expressed concern to the mission about the uncertainty of long-term sustained future funding. They also noted that they were receiving funding for their involvement on a year-by-year basis, making it difficult to plan longer term activities.

**Monitoring** of the implementation of the Action Plan is tracked through a colour-coded system which aids in tracking which activities have been completed, have started, have not started (and have been delayed) or are not yet due to begin. According to the data presented to the mission, 25% of the actions have been completed, 42% have started, 10% have not yet started and 23% are not yet due. It is therefore concluded that two thirds of the identified actions are either completed or are underway.

Two key recommendations of the SEA were to use the precautionary principle and an adaptive management approach for the design and implementation of the Action Plan. While these principles are not clearly mentioned in the Action Plan, the mission considers both principles key to guarantee success in the implementation. To allow for adaptive management, the mission considers it is necessary that a regular review of the overall implementation of the Action Plan is done which focuses on reviewing not only if actions are underway according to the time frame, but also if they are yielding the required impact and if there is a need to adapt them. The mission considers that such a review should happen at least on a bi-annual basis and should involve senior management officials from the Governments of Canada, Alberta, British Columbia and Northwest Territories as well as representatives of the indigenous rightsholders and civil society. It is recommended that such a review is organized before the end of 2023 to consider the recommendations of the current Reactive Monitoring mission.

*The mission welcomes the inclusive approach which was followed in the design of the Action Plan, ensuring the participation of the different federal and provincial authorities as well as the indigenous rightsholders. The complexity of the coordination and implementation of the Action Plan is acknowledged given the diversity of actions and the large number of institutions and stakeholders involved. The substantial differences in the level of coordination and the involvement of the indigenous rightsholders between the different themes are of concern. It is also not clear how the overall coordination of activities across the Action Plan is ensured and what mechanisms are in place to address delays in certain themes. An example is the tailings pond risk assessment, which was a key recommendation of the 2016 mission and has not yet started.*

*The mission further notes that the tracking system which is used is not giving a clear picture of the rate of implementation of the Action Plan, as the category "underway" shows that some work has started, but it does not give a clear idea of its status of implementation. It also provides no information on the impact of the actions implemented so far. The mission recommends that for each theme some clear impact indicators are agreed to complement the colour-coded tracking mechanism currently in place.*

*The mission further considers that continued efforts will be needed beyond the timeframe of the current Action Plan, foreseen to be completed by 2026. In fact, for many themes of the Action Plan, such as the Environmental Flows and Hydrology theme, the current actions to a large extent aim at designing corrective actions such as ecological flow releases and water control structures, and implementation of these will only be able to start towards the end of the current timeframe and may need to continue into perpetuity (e.g., strategic flow releases).*

*The mission considers that the fact that the Action Plan does not include a clear view on the approximate budget requirements needed for its implementation is an important shortcoming. While the mission acknowledges the significant budgetary effort made through the 2018 and 2021 allocations, financial allocations will be needed to allow for the Action Plan to be fully implemented. In this regard, it would be important to develop a clear multi-year budget estimate for the full implementation of the plan, specifying the required budget allocations from both federal and provincial levels. While budgetary commitments can only be made in line with the different governmental budgetary cycles, such as a multi-year budget would provide clear indications on which future commitments would be needed.*

**Recommendation:**

***17. Further streamline the implementation of the Action Plan by:***

- ***a. organize a bi-annual review of the overall implementation of the Action Plan, involving senior management officials from the Governments of Canada, Alberta, British Columbia and Northwest Territories as well as representatives of indigenous rightsholders and civil society to assess if the planned actions are yielding the required impact and allow for adaptive management;***
- ***b. before the end of 2023, update the Action Plan to consider the recommendations of the current Reactive Monitoring mission;***
- ***c. develop for each theme of the Action Plan clear impact indicators to complement the colour coded tracking mechanism currently in place;***
- ***d. ensure long-term and multiannual support and funding for capacity building for indigenous rightsholders to allow for effective, informed and full participation in the various Action Plan Task teams and working groups and the meaningful inclusion of indigenous knowledge in its implementation;***
- ***e. develop a clear multi-year budget estimate for the full implementation of the Action Plan, specifying the required budget allocations from both federal and provincial levels and ensure that the budget allocations are foreseen for full implementation of the Action Plan also beyond 2026.***

# 5. CONCLUSIONS AND RECOMMENDATIONS

The SEA provides a detailed assessment of the status and trends of the OUV of the property. Based on the Statement of OUV, it identifies key attributes for each of the criterion under which the property is inscribed and further developed desired outcomes for each of these attributes (see Table 1 of the Action Plan in Annex 2). It identifies the trends and stressors on these desired outcomes as well as the trend direction based on existing scientific evidence but also traditional knowledge of the indigenous communities. The results show that while trends are positive for the desired outcomes linked to the whooping crane, and stable for a series of other desired outcomes, they are negative for 7 of other key desired outcomes, all of which are directly or indirectly related to health of the PAD. Moreover, the projected cumulative effects trends on the desired outcomes for WBNP is also negative for the desired outcomes linked to the PAD (see also 4.5).

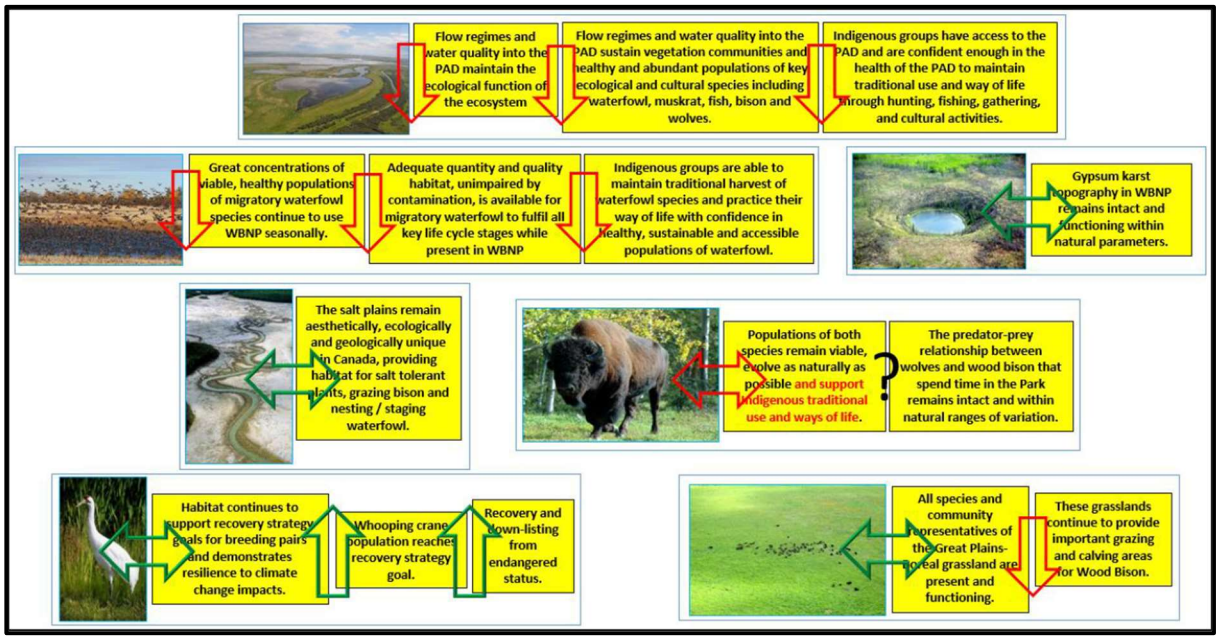



*Figure 12: Desired outcomes and trends for OUV of Wood Buffalo National Park World Heritage Site. Source: SEA, 2018, included as figure 2 on page 10 in State Party's State of Conservation report of 2022.*

The analysis in the SEA largely supports the assessment by the 2016 mission which concluded that while the overall state of conservation of larger parts of WBNP seemed not of concern, the state and future of the PAD was uncertain at best. The 2016 mission concluded that a case for inscription of WBNP on the List of World Heritage in Danger could be made according to paragraph 180, referring to "potential danger". The mission also noted that one of the main drivers of the degradation of the PAD and hence the OUV of the property was the results of the impacts of the W.A.C. Bennett Dam, which predates the World Heritage inscription and that the scale, pace and complexity of these impacts had not been recognized during the evaluation process. It considered it was very challenging to define an exact threshold for the inscription of WBNP on the List of World Heritage in Danger and similarly challenging to define a desired state of conservation for the eventual removal of WBNP from the List of World Heritage in Danger. The 2016 mission concluded that the State Party should be given one opportunity under the World Heritage Convention to immediately develop **a structured and adequately funded Action Plan guided by the mission recommendations**, in effect amounting to "major operations" in the sense of paragraph 177 and that that *an absence of a major and coherent response would constitute a case for recommending inscription of WBNP on the List of World Heritage in Danger due to the then*

*combination of credible and major concerns combined with an inadequate State Party response to World Heritage Committee existing and recommended requests*.

The 2022 mission team considers that the threats to the OUV of the property as identified by the 2016 mission and as documented in the SEA remain valid today and that the OUV of the property remains highly threatened, with continued negative trends for key attributes. The state of conservation of the PAD, which underpins many of the attributes justifying the OUV of the property, hence remains of particular concern. The mission acknowledges that the condition of the PAD compared to the situation at the time of the 2016 mission has improved as a result of the spring and summer 2020 floods, which produced a positive but likely short-term improvement in the PAD hydrology and associated desired outcomes. Indigenous rightsholders noted that they see indications that the PAD is again drying.

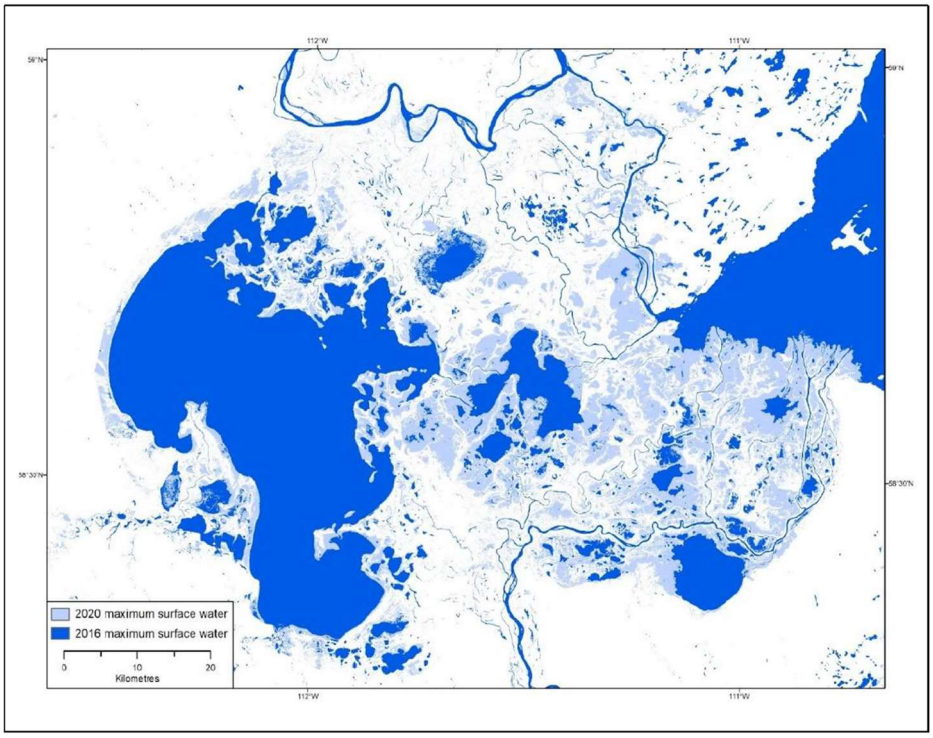



*Figure 13: Preliminary comparison of PAD surface water extent, 2016 and 2020 (post-flood). 2020 flood waters detected with PLANET Scope satellite (3 m resolution; light blue) and the seasonal maximum surface water from 2016 using Global Surface Water (Landsat 30 m resolution; dark blue) - PLANET Scope not available in 2016. Source: Parks Canada, included as figure 4 on page 12 in the State Party's State of Conservation report of 2022.*

However, the mission notes that 2020 flooding was linked to natural variability in the system and not a result of any corrective measures taken to address the root causes which led to the progressive drying of the PAD. Indigenous rightsholders confirmed to the mission that the 2020 flooding had been a welcome and positive event but clarified that it had not been sufficient to reach all the perched basins and considered it had not been able to address impacts of years of dryer conditions on habitat loss. They pointed out that water levels are again receding, and drying trends are ongoing.

The mission acknowledges that the State Party has developed and is currently implementing a structured Action Plan to address the recommendations of the 2016 mission. The Action Plan recognizes the multi-jurisdictional nature of the conservation challenges facing the property and the mission was impressed by the strong joint commitment of different actors involved, in particular PCA, ECCC, Alberta Environment and Protected Areas, indigenous rightsholders as well as BC Hydro. The SEA which forms the basis of the Action Plan was completed in May 2018. The Action Plan was submitted to the World Heritage Centre in

February 2019. Implementation of the Action Plan therefore only started in 2019 and since 2020 was further hampered by the COVID-19 pandemic, which made field visits more difficult and made it impossible to organize face to face meetings and workshops. The mission therefore acknowledges that the State Party acted swiftly on the 2017 Decision of the Committee and that only three years have elapsed between the start of its implementation and the current mission, making it unrealistic to expect a reversal of trends in the desired outcomes which are negative.

Important progress has been made in the implementation of some parts of the Action Plan, in particular efforts to strengthen indigenous partnerships and on-going efforts to move towards co-management of the property with the indigenous rightsholders, integrating indigenous knowledge with western science, the creation of additional protected areas to the south of the property to act as a buffer and better protect the values of the property, measures taken to improve the conservation of the Ronald Lake Bison herd and work on the development of an IRMP, using both western science and indigenous knowledge.

Significant efforts and investments are also being made to develop a hydrodynamic model to allow for an understanding of flows needed to deliver environmental benefits to the PAD, through flow releases from the W.A.C. Bennett Dam and existing and future water control structures. The mission was informed that a functional modelling platform, which can inform decision-making, will not be available before 2024. While noting the disappointment expressed by the indigenous rightsholders at the slow progress in addressing this main threat to the OUV of the property, the mission also notes the complexity of developing these tools and the importance of basing the required decision on a sound modelling informed by both western science and indigenous knowledge. The mission welcomes the commitment expressed by BC Hydro to implement flow releases if requested but the mission was not informed about any operational strategies or protocols that are in place or under development to implement potential water releases or control structures that could be proposed based on the outcomes of the hydrodynamic model. The mission concludes that progress has been made in developing the environmental flow model which can inform decision making on required flow releases from the W.A.C. Bennett Dam and decision making on potential water control structures but that this work has so far not resulted in concrete measures to restore the ecological and hydrological integrity of the PAD. It considers that this work leads to firm decisions on concrete measures to address this major issue before 2026, including a decision on environmental flow releases. The mission considers that urgent efforts are needed to establish a sound decision-making mechanism to allow for these flow releases to happen.

The mission is however very concerned about the lack of progress on addressing cumulative impacts from industrial developments around the property. The decision by Teck Resources Ltd. not to pursue the Teck Frontier oil sands mine project is welcome and will at this stage avoid advancement of the development frontier significantly closer to the southern boundary of the property. While the interlocutors to the mission all expressed confidence that the proposal for the Frontier mine would not be revived, this seems still theoretically a possibility.

At the same time, expansion of existing oil sands projects has continued without full consideration of the potential impacts on the OUV of the property. While federal legislation on impact assessments significantly improved in 2019, not all oil sands extension projects being considered since the 2016 mission have met the threshold to undergo federal impact assessment. For impact assessments at the level of Alberta, indigenous rightsholders continue to point out that their concerns are systematically ignored. They expressed concern that in their view impact assessments are limited in scope, often to the direct footprint of the projects. The SEA considered that management systems included in the LARP were insufficient to protect the OUV of the property. While the Action Plan includes some measures to adjust the management frameworks included in the Lower Athabasca Regional Plan (LARP) (EA8, EA9, EA10, EA11), little progress seems to have been made on these actions.

At the same time, the mission remains concerned that that the management frameworks remain insufficient to ensure the protection of the OUV of the property. The mission is also very concerned that the systematic risk assessment of the tailing ponds of the Alberta Oil Sands region with a focus on the PAD, a key recommendation of the 2016 mission, is included in the Action Plan but so far, its implementation has not started. The mission notes that some representatives from Alberta continue to question the need for such an assessment arguing that the current management systems to address impacts were sufficient.

The mission is further very concerned about current proposals to allow for the release of treated OSPW into the Athabasca River. The mission welcomes the assurances given by the Federal Minister of Environment and Climate Change in the meeting with the mission team that such a decision would require changes in the federal legislation and that OSPW releases would only be allowed if the released water would be treated to a standard of "drinking water quality". The Minister also noted that other options are also being considered. While it was later clarified that the release of treated OSPW is being considered as one of the potential options, the Alberta Director of Water Quality Policy presented a timeline to the mission showing that such releases into the Athabasca River could become a reality in 2025, indicating that he considered this to be the preferred and realistic way forward to dispose of OSPW accumulated over decades of oil sands development.

The current Action Plan runs until 2026 but that timeframe will likely not be sufficient to allow for all necessary action to be undertaken to reverse the trend of degradation of the PAD and hence the OUV of the property. The mission considers that while it is crucial that by 2026 the first tangible results are visible, actions will have to be sustained over time. This is especially the case given that concrete results of the work on environmental flows, which will be informing decisions on environmental flow releases and further water control structures, will only be available by 2024 and that little progress has been made so far in addressing cumulative impacts of oil sands developments and in identifying a solution to address the tailings pond reclamation which can guarantee the ecological integrity of the PAD.

The mission considers that while the current budget allocation by Parks Canada for the Action Plan is significant in terms of its budget, it is likely to be insufficient to ensure its full implementation. In particular, the planned construction and rehabilitation of water control structures in the PAD will likely be very costly, especially considering the remote location of the property. While appreciating that budget allocations are made based on annual budgets and that further budget allocations are likely to be provided in future budgets if the Action Plan yields positive results, the uncertainty of long-term funding to achieve the required impacts is a major concern to the indigenous rightsholders.

*In conclusion, the mission considers that the State Party has developed and is currently implementing a structured Action Plan responding to the recommendations of the 2016 mission with the objective to reverse the current downward trends in some of the desired outcomes linked to the attributes of the OUV. The mission notes that the implementation only started in 2019, hence it is too early to assess how far the Action Plan will succeed in reversing the current negative trends of the desired outcomes and in restoring the OUV of the property, including the ecological integrity of the PAD. The mission notes efforts to address the issues will need to be sustained beyond 2026 and that more substantial funding will be needed going beyond the current time horizon of the Plan to achieve its objectives. While the Action Plan is ambitious in certain aspects, the mission considers it needs to be strengthened in other areas. The mission proposes a number of priority recommendations listed below to improve certain areas of the Action Plan and address current weaknesses.*

1. *Strengthen efforts to transition to a genuine partnership with indigenous rightsholders in the governance and management of the property, in particular by:*

a. *supporting the Indigenous Caucus in developing an indigenous led vision for a shared governance model for WBNP, based on the values of respect and equity, which focuses on commonalities and respects differences by including both park-wide and locally tailored components;*
b. *operationalizing the Cooperative Management Committee by jointly developing the Terms of Reference agreed by all indigenous rightsholders and PCA and ensure that effective decision-making mechanisms are in place;*
c. *supporting indigenous communities' initiatives of interpreting and valorising the values of WBNP reflecting holistic indigenous worldviews and cultural elements of indigenous ways of life.*

2. *Complete hydrodynamic modelling and ELOHA (environmental flows assessment) tools that are essential to understanding the current hydrology (i.e., existing condition) of the Peace River and the PAD, the natural, pre-Bennett Dam baseline condition, the impact of climate change, and the feasibility of benefits to be derived from proposed water control structures and strategic flow releases on the OUV of the property.*

3. *Construct and repair water control structures in the PAD (such as the planned weir at Dog Camp) only after modelling and environmental flows tools have been completed, allowing an understanding of the benefits to the PAD, potential interactive effects and downstream impacts.*

4. *Ensure that no further dam projects on the Peace River are approved, including the proposed Amisk Project, until sufficient tools are in place to evaluate impacts on the hydrology of the PAD.*

5. *Urgently establish a sound decision-making mechanism allowing for key corrective actions to be taken in terms of ecological flow releases and potentially water control structures to protect the OUV of the property.*

6. *Before 2026, decide on a set of concrete mitigation measures including ecological flow releases and the construction of required water control structures to correct the impacts of the W.A.C. Bennett Dam and other alterations of the hydrology of the PAD, including increased impacts from climate change, and agree on operational strategies and or interjurisdictional protocols for the implementation of the adopted mitigation measures as well as a budget sufficient for their implementation.*

7. *Urgently and before the end of 2024, conduct an independent systematic risk assessment of the tailings ponds of the Alberta Oil Sands region with a focus on risks to the PAD, 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.*

8. *Re-evaluate and adapt (as needed) collaborative, systematic, science-based monitoring of oil sands impacts on the Athabasca River and PAD to ensure sufficient parameters, sampling design, and protocols are employed to detect impacts. Long-term monitoring and syntheses of long-term data will be essential to establishing baselines, detecting changes, and communicating impacts.*

9. *Before 2026, develop a clear, consensus-based strategy consistent with precautionary principles for the reclamation of tailing ponds, including the treatment and disposal of OSPW, which guarantees protection of the Athabasca River's and PAD's water quality and avoids any impacts on the OUV of the property.*

10. *Ensure that all major development projects in the PAD watershed, including all oil sands mining extension projects, are designated for federal impact assessments and specifically*

*address potential impacts on the OUV of the property, in line with the Guidance and Toolkit for Impact Assessments in a World Heritage Context*[31] *and submit these Environmental and Social Impact Assessments (ESIAs) to the World Heritage Centre.*

11. *Ensure that all impact assessments of other projects in the larger landscape around the property not undergoing federal impact assessment and under the responsibility of the Government of Alberta fully consider the OUV of the property and the concerns of indigenous rightsholders beyond the direct footprint of the project.*

12. *Expedite the preparation of a land use plan for the Lower Peace, building on lessons learned from the LARP and use the ongoing review process to address the weaknesses in the LARP identified by the 2015 Review Panel, taking into account the increased understanding on cumulative impacts as documented in the SEA, including from climate change. The revised LARP should include indicators and thresholds to support decision-making and approvals and require a biocultural approach to ensure that cumulative effects management fully considers the OUV of the property and in particular impacts of the desired outcomes identified in the SEA and Action Plan for the PAD.*

13. *Ensure that the innovative Integrated Research and Monitoring Programme developed under the Action Plan, which is integrating indigenous knowledge with western science, is standardized and sustained over time in order to understand trends and dynamics in response to various pulse (e.g., ice-jam flooding) and press (e.g., climate change) disturbances that affect the OUV of the PAD and across WBNP.*

14. *Further strengthen the monitoring of flagship species, in particular by:*
    a. *establishing a programme for enhanced monitoring of whooping cranes that have come into contact with OSPW to clarify the potential impacts on the population;*
    b. *continuing to improve methods for generating more frequent population estimates of wood bison in WBNP and in the disease-free, genetically-distinct Ronald Lake Bison Herd;*
    c. *continuing research to develop disease assays and vaccination as needed to reduce risk of spread to the disease-free Ronald Lake Bison herd.*

15. *Continue efforts to create a buffer zone around the property, as recommended by the Operational Guidelines for the Implementation of the World Heritage Convention, in particular by:*
    a. *further extending Kitaskino Nuwenëné Wildland Provincial Park by including the missing blocks identified by Mikisew Cree First Nation around the Athabasca River as well as the area in the south still covered by a forest concession license;*
    b. *putting in place urgently a co-management system for the newly created Kitaskino Nuwenëné Wildland in cooperation with the indigenous rightsholders, with appropriate resourcing and with clear management objectives which take into account the protection of the OUV;*
    c. *further extending the network of protected areas adjacent to the property in particular in the Lower Peace region, including by considering options for forest leases situated between the Birch River WPP and the Caribou Mountains WPP;*
    d. *formally designating a buffer zone according to paragraphs 103–107 of the Operational Guidelines for the Implementation of the World Heritage Convention.*

[31] The new Guidance was published in 2022 and is available at https://whc.unesco.org/en/guidance-toolkit-impact-assessments/. It replaces the IUCN World Heritage Advice Note on Environmental Assessment and World Heritage (2013).

16. *Revise the 10-year Management Plan based on an agreed indigenous-led vision for a shared governance model for WBNP and integrating strategies to address the key conservation concerns for the property as resulting from the SEA and the Action Plan.*

17. *Further streamline the implementation of the Action Plan by:*
    a. *organize a bi-annual review of the overall implementation of the Action Plan, involving senior management officials from the Governments of Canada, Alberta, British Columbia and Northwest Territories as well as representatives of indigenous rightsholders and civil society to assess if the planned actions are yielding the required impact and allow for adaptive management;*
    b. *before the end of 2023, update the Action Plan to consider the recommendations of the current Reactive Monitoring mission;*
    c. *develop for each theme of the Action Plan clear impact indicators to complement the colour coded tracking mechanism currently in place;*
    d. *ensure long-term and multiannual support and funding for capacity building for indigenous rightsholders to allow for effective, informed and full participation in the various Action Plan Task teams and working groups and the meaningful inclusion of indigenous knowledge in its implementation;*
    e. *develop a clear multi-year budget estimate for the full implementation of the Action Plan, specifying the required budget allocations from both federal and provincial levels and ensure that the budget allocations are foreseen for full implementation of the Action Plan also beyond 2026.*

The mission concludes that the OUV of the property continues to face important ascertained and potential threats, in particular as a result of changes to the hydrology of the PAD exacerbated by the impacts of climate change and the impacts of the industrial developments adjacent to the property. The State Party, through the Action Plan it developed in response to the recommendations of the 2016 mission, has begun a process aimed at reversing the current downward trend but its concrete impacts in the desired outcomes of the attributes of the OUV are not yet visible. Considerable effort and resources are invested in the implementation of the Action Plan, although progress has been hampered due to COVID-19. The hydrodynamic model will not be available before March 2024. The modelling is crucial to allow the development of corrective actions as an underpinning requirement to protect the ecological integrity of the PAD. At the same time, the decision-making process on a long-term solution to reclaim the oil sands process-affected water without impacting the integrity of the property needs to be completed.

The mission does not consider that the property should be recommended for inscription on the List of World Heritage in Danger at this stage. The mission recommends that the World Heritage Committee continues to closely monitor the implementation of the Action Plan and the implementation of the above recommendations. The mission further recommends that a new World Heritage Centre/IUCN Reactive Monitoring mission is invited in 2026 to evaluate if sufficient progress has been made in the implementation of the Action Plan and of the above recommendations to avert further degradation of the OUV of the property and to assess if the property meets the conditions for inscription on the List of World Heritage in Danger.

# 6. ANNEXES

**Annex 1: SOUV of the property**

**Brief synthesis**
Wood Buffalo National Park is an outstanding example of ongoing ecological and biological processes encompassing some of the largest undisturbed grass and sedge meadows left in North America. It sustains the world's largest herd of wood bison, a threatened species. The park's huge tracts of boreal forest also provide crucial habitat for a diverse range of other species, including the endangered whooping crane. The continued evolution of a large inland delta, salt plains and gypsum karst add to the park's uniqueness.

***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 predatorprey 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.

**Integrity**
Wood Buffalo National Park straddles the boundary between the province of Alberta and the Northwest Territories, and encompasses 4.5 million hectares of forest, wetland and prairie, including the majority of the Peace-Athabasca Delta. The size of the park allows for the protection of entire ecosystems and the ecosystem features that are the basis for the park's Outstanding Universal Value. The park's size, remoteness, very low human population density and the absence of resource extraction activities minimize human-related stress within the property, resulting in a high level of integrity. Bovine brucellosis and tuberculosis are present within the wood bison population in and around the park. The actual and potential impact on the delta from stressors originating outside the park, such as flow regulation, water withdrawals, industrial discharge and climate change, is monitored by the park and by working in collaboration with a network of partners to monitor and manage impacts from upstream development.

**Protection and management requirements**
The *Canada National Parks Act* provides effective legal protection for the park. Under the requirements of the legislation, a park management plan was approved in June 2010 and provides direction for protecting the features of the park that are the basis for its Outstanding Universal Value, and for providing opportunities for visitors to experience and learn about the park. The park's two largest wetlands (the Peace-Athabasca Delta and the whooping crane nesting area) have also been declared Wetlands of International Importance under the RAMSAR convention.

Park managers work with 11 Aboriginal groups for whom Wood Buffalo National Park is an area of significant cultural value to cooperatively manage the park, as each group carries out traditional harvesting and other cultural activities within the park boundaries. Endangered species and their critical habitat, including the breeding grounds of the whooping crane, are

protected under provisions of Canada's *Species at Risk Act.* Park staff also work with Environment Canada, international crane preservation groups and U.S. government agencies to ensure the long-term viability of the park's whooping crane flock.

Park staff closely monitors upstream development on the major rivers that flow into the park and work closely with local Aboriginal partners, other government agencies, stakeholders and industry to maintain the ecological integrity of Wood Buffalo National Park. The park management plan commits park managers to developing an Area Management Plan for the Peace-Athabasca Delta to address the challenges of managing the delta's ecological and cultural values in cooperation with partners and stakeholders. The Peace-Athabasca Delta Ecological Monitoring Program, a multi-stakeholder group made up of Aboriginal representatives, government and non-government organizations, is a cornerstone in developing and implementing this plan.

Special attention will be given over the long term to monitoring and taking appropriate actions related to a number of factors in or near the property. Specifically, attention will focus on the actual and potential impacts of upstream development and climate change. (Adopted in Bonn, 2015 (39 COM 8E))

**Annex 2: Elements of Outstanding Universal Value and Desired Outcomes (Table 1 of Action Plan for WBNP (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 |
|---|---|---|---|
| *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. Great concentrations of migratory wildlife of world importance | Migratory wildlife means migratory waterfowl* populations that make seasonal use of WBNP.<br><br>Migratory waterfowl from four continental flyways converge in great numbers on the PAD for staging and breeding habitat.<br><br>*Waterfowl is understood in this context to include water birds, gulls, shorebirds, and cormorants. | • Great concentrations of viable, healthy populations of migratory waterfowl species continue to use WBNP seasonally.<br><br>• Adequate quantity and quality habitat, unimpaired by contamination, is available for migratory waterfowl to fulfil all key life cycle stages while present in WBNP.<br><br>• 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. | • Flow regimes and water quality into the PAD maintain the ecological function of the ecosystem.<br><br>• 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.<br>• 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 | • The salt plains remain aesthetically, ecologically and geologically unique in Canada, providing habitat for salt tolerant plants, grazing bison and nesting / staging waterfowl. |
| | iv. Gypsum karst | Gypsum karst topography within WBNP. | • Gypsum karst topography in WBNP remains intact and functioning within natural parameters.<br>• The karst landforms in the park continue to provide some of the finest examples of collapse and pond sinkholes in the world. |
| *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. 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. | • All species and community representatives of the Great Plains–Boreal grassland are present and functioning.<br>• 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. | • The predator-prey relationship between wolves and wood bison that spend time in the park remains intact and within natural ranges of variation.<br>• Populations of both species remain viable, evolve as naturally as possible and support Indigenous traditional use and ways of life. |
| *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."* | 1. Whooping Crane breeding habitat | Whooping Crane habitat within the WBNP. Includes habitat and population. | • Habitat continues to support recovery strategy goals for breeding.<br>pairs and demonstrates resilience to climate change impacts.<br>• Whooping Crane population reaches the recovery strategy goal.<br>• Recovery and down listing from endangered status. |

## Annex 3: Recommendations of the 2016 Reactive Monitoring mission

**Recommendation 1**
Adopt a clear and coherent policy and guidance to enable the transition to a genuine partnership with First Nations and Métis in the governance and management of the property.

**Recommendation 2**
Considering the increasing pressures on the property at this time, prioritise 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.

**Recommendation 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 Peace-Athabasca Delta (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.

**Recommendation 4**
Conduct, in line with the IUCN World Heritage Advice Note on Environmental Assessment, an environmental and social impact assessment of the Site C Hydroelectric project and, if moved forward, any other hydropower projects potentially affecting the Outstanding Universal Value of the property.

**Recommendation 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 Peace-Athabasca Delta.

**Recommendation 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*.

**Recommendation 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.

**Recommendation 8**
Expand the scope of the Strategic Environmental Assessment (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.

**Recommendation 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.

**Recommendation 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.

**Recommendation 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.

**Recommendation 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 an all-year status and staffing of WBNP;
Recruiting a full-time Superintendent exclusively in charge of WBNP;
Ensuring an adequate Parks Canada presence in Fort Chipewyan, part of the critical Peace-Athabasca Delta area and a major ecological region of WBNP.

**Recommendation 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.

**Recommendation 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.

**Recommendation 15**
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:
Urgently invest in comprehensive and independent analysis of the conservation importance and status of the Ronald Lake Bison Herd, including threats to it posed by proposed development, within a broader Species Recovery Strategy;
Dedicate, in full cooperation with First Nations, adequate attention and funding to the management of wood bison, including as regards the development of disease management options other than culling.

**Recommendation 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 possibly changing management requirements.

**Recommendation 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.

## Annex 4: Terms of Reference (ToR) of the mission

**Terms of Reference**
**Joint World Heritage Centre/IUCN Reactive Monitoring mission**
**Wood Buffalo National Park, Canada**

**Date: 18-26 August 2022 (excl. arrival and departure days)**

At its extended 44th session, the World Heritage Committee requested the State Party of Canada to invite a joint World Heritage Centre/IUCN Reactive Monitoring mission to the World Heritage property 'Wood Buffalo National Park'. The objectives of the Reactive Monitoring mission are to review the overall state of conservation of the property with a particular focus on the threats raised by the Committee in its Decisions **41 COM 7B.2**, **43 COM 7B.15** and **44 COM 7B.190** (**Annex I**) and the 2016 joint World Heritage Centre/IUCN Reactive Monitoring mission recommendations which were endorsed by the Committee. The Committee will also examine the state of conservation of this property at its 45th session. The Committee at its extended 44th session, has additionally requested the mission to 'confirm whether the property meets the conditions for inscription on the List of World Heritage in Danger, and to recommend the measures necessary to address the threats to its [Outstanding Universal Value] OUV'.

The mission shall:

a. Review the status of effective inter-jurisdictional water governance as it pertains to the OUV;

b. Assess the progress made in developing an environmental flow framework and in determining the environmental flow regulation for the Peace River taking into account the effects of climate change;

c. Assess the current status of the Site C Hydroelectric Dam construction, and review any updates regarding the Amisk Hydroelectric Project;

d. Review the progress made towards a systematic risk assessment of tailings ponds, in relation to the OUV of the property, with regards to existing and planned oil sands projects in the Athabasca oil sands region, and discuss the development and implementation of monitoring programmes, including cumulative effects, with the relevant authorities and stakeholders;

e. Review the relevant data on oil sands tailings management in relation to OUV, including oil sands process-affected water (OSPW) seepage from tailings ponds into groundwater within the Athabasca watershed. Discuss the current status of initiatives pertaining to the potential discharge of treated effluent from oil sands mines into the Athabasca River upstream of the Peace Athabasca Delta (PAD), including the possible development of regulations of the federal *Fisheries Act*. Based on this information, the mission shall assess the risks of OSPW and its implications for the OUV of the property, including ecosystems that support some of the traditional ways of life of Indigenous communities;

f. Review the monitoring and management of wood bison in Wood Buffalo National Park, as an element of OUV, and assess the progress towards improving the protection of the disease-free Ronald Lake Bison Herd, a herd which is facing imminent threat, within the broader recovery strategy for the species;

g. Review and discuss the current status of protected areas and land use outside of Wood Buffalo National Park, including Kitaskino Nuwenëné Wildland Provincial Park, in relation to OUV.

h. Assess the progress made by the State Party towards adopting 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;

i. Review the progress achieved by the State Party in addressing all other Committee decisions and the 2016 joint WHC/IUCN Reactive Monitoring mission recommendations, as well as progress in the implementation and long-term funding of the Wood Buffalo National Park Action Plan;

j. In line with Paragraph 173 of the *Operational Guidelines*, review any other relevant issues that may negatively impact the OUV of the property, including its conditions of integrity and protection and management;

k. Based on the above, make a recommendation as to whether the property fulfils the criteria for inscription on the List of World Heritage in Danger, in line with Paragraph 180 of the *Operational Guidelines.*

The State Party should facilitate necessary field visits to key locations, within and around the property in relation to the above objectives. The mission should hold consultations with the relevant government authorities at federal and provincial or territorial levels, and other management partners, including Parks Canada Agency, First Nations and Métis and BC Hydro. In addition, the mission will hold consultations with a range of relevant stakeholders including: industry representatives, non-governmental organizations (NGOs); civil society and relevant scientists, researchers and experts. The State Party should facilitate and organize the site visits and meetings with the above-mentioned stakeholders.

To ensure the smooth running of the mission, the State Party will prepare a mission programme in consultation with the World Heritage Centre and IUCN, and will share with the World Heritage Centre, preferably two months prior to the mission, any new relevant information since the submission of the state of conservation report on 1 February 2022.

In line with policies of both UNESCO and IUCN, their experts will not engage with the media, nor discuss the mission findings and recommendations, which should only be presented in the final mission report.

Following the mission, the World Heritage Centre and IUCN will prepare a report on the findings and recommendations using a standard mission report format (**Annex II**) for examination by the World Heritage Committee. The mission team may request additional information from the State Party following the mission for the preparation of the mission report. The mission report will be made available to the State Party prior to it becoming publicly accessible, to comment on any factual errors.

**Annex 5: Itinerary and programme of the mission as implemented (short version)**

# Wood Buffalo National Park (WBNP) World Heritage Centre/IUCN Reactive Monitoring Mission (RMM) August 16 to 27, 2022

## Itinerary – WHC/IUCN/PCA

### About the Reactive Monitoring Mission

Reactive Monitoring is defined in the World Heritage Convention as being "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".

The World Heritage Committee requested the State Party of Canada to invite a joint World Heritage Centre/IUCN Reactive Monitoring mission to the World Heritage property 'Wood Buffalo National Park'. The objectives of the Reactive Monitoring mission are to review the overall state of conservation of the property with a particular focus on the threats previously noted by the Committee and on the 2016 joint World Heritage Centre/IUCN Reactive Monitoring mission recommendations.

With respect to the Outstanding Universal Value (OUV) of WBNP, the Terms of Reference outlines the key items the Mission representatives are specifically interested in discussing:

a. Inter-jurisdictional water governance (August 19th, Fort Chipewyan and August 23rd, Fort Smith)
b. Development of an environmental flows framework including effects of climate change and water management control structures and processes (August 19th, Fort Chipewyan)
c. Site C Hydroelectric Dam and Amisk Hydroelectric Project (pre-mission binder)
d. Tailings ponds risk assessment including cumulative effects and implementation of monitoring programmes (August 18th, Edmonton)
e. Oil sands tailings management including oil sands process-affected water seepage and Fisheries Act (August 18th, Edmonton)
f. Wood bison monitoring and management (August 23rd, Fort Smith)
g. Protected areas and land use outside of WBNP, including Kitaskino Nunewëné Wildland (August 21st, Fort Chipewyan)
h. Shared governance and management of WBNP with Indigenous partners (throughout the mission and August 24th, Fort Smith)
i. Implementation of the 2016 mission recommendations and Action Plan (August 18th, Edmonton)
j. Review any other relevant issues (August 23rd, Fort Smith)

Based on their understanding of these issues, the Mission representatives will make a recommendation as to whether the property fulfils the criteria for inscription on the List of World Heritage in Danger.

**Mission Itinerary at-a-glance**

**August 16th & 17th: WHC/IUCN representatives arrive in Edmonton**

**August 17th: PCA Core Team meets at Hotel in Edmonton – for logistics, last minute items**

**August 18th Day 1: (EDMONTON & FORT CHIPEWYAN) - Introductory session, tailings ponds sessions, travel:** Introductory sessions on Mission itinerary, Wood Buffalo National Park and Action Plan implementation. Session with community and government representatives about tailings ponds. Evening charter flight from Edmonton to Fort Chipewyan.

**August 19th Day 2: (FORT CHIPEWYAN) - PAD monitoring and management session:** all day session on Peace-Athabasca Delta monitoring and management.

**August 20th Day 3: (FORT CHIPEWYAN) – All-day PAD boat tour.** Discussion of proposed water control structures, existing weirs, field station location and PAD monitoring

**August 21st Day 4: (FORT CHIPEWYAN) - Protected areas session; meetings:** morning session on protected areas; afternoon and evening meetings with land users, youth, Indigenous partners.

**August 22nd Day 5: (TRAVEL TO FORT SMITH) – All-day Slave River boat tour:** travel from Fort Chipewyan to Fort Fitzgerald, ground transport to Fort Smith. Travel and presentations with Smith's Landing First Nation.

**August 23th Day 6: (FORT SMITH) – Flight-Seeing Tour and Overview of Water Governance Session, Whooping Cranes, Wood Bison Conservation and Management**

**August 24rd Day 7: (FORT SMITH) – Meeting with the Cooperative Management Committee, Session on Shared Governance, Debrief with Indigenous Caucus, Evening Ceremony and Feast:** morning and afternoon sessions with Indigenous leaders, the Cooperative Management Committee and the Indigenous Caucus; evening "Feeding of the Fire Ceremony and Feast".

**August 25th Day 8: (FORT SMITH & EDMONTON) – Travel, ENGOs session:** Morning travel to Edmonton. Afternoon meeting with ENGOs.

**August 26th Day 9: (EDMONTON) - Mission Wrap Up.** Morning session for Mission Debrief, PCA representatives depart for home.

**August 27th Day 10: (EDMONTON) – WHC/IUCN representatives depart**

**August 17th – Mission Reps Arrive**

**October 3rd (online) – Virtual meeting the Federal Minister of Environment and Climate Change The Honourable Steven Guilbeault**

## Annex 6: Current Stressors and Trends in the PAD (Table 5-3 of the 2018 SEA report)

*Table 5-3: Current Stressors and Trends in the PAD*

| Valued Component | Current Trends and Stressors in the PAD | Trend Direction |
|---|---|---|
| *Peace River Seasonal Flows* | Seasonal flow rates in the Peace have become much less variable due to flow regulation on the river and (past) climate change, resulting in decreased summer flows and increased winter flows. | ↓ |
| *Peace River Sedimentation* | Sedimentation in the Peace River is increasing due to the reduced erosional force of the river resulting from changes in flow regime. | ↓ |
| *Ice Jam Recharge* | Increased winter flows on the Peace River have increased freeze up elevations, resulting in decreased ice jamming flooding frequency, and reduced recharge of perched water basins.<br>Winter releases of water have resulted in poorer quality ice. | ↓ |
| *Open Water Recharge* | Reduced summer flows in the Peace River and reduced flows in the Athabasca, in combination with (past) climate change, have decreased open water recharge. | ↓ |
| *Lake Athabasca Water Levels* | Reduced summer flows on the Peace and reduced seasonal flows on the Athabasca have decreased water levels in Lake Athabasca.<br>Weir operation has increased winter water levels and produced a less variable water regime. | ↓ |
| *Central PAD Lake Water Levels* | Reduced summer flows on the Peace and reduced seasonal flows on the Athabasca, in conjunction with (past) climate change, have decreased water levels and extents. | ↓ |
| *Athabasca River Annual & Seasonal Flows* | Annual and seasonal flows have declined over the past fifty years due to a combination of water withdrawals and (past) climate change. | ↓ |
| *PAD Water Quality* | ITK indicates decreased water quality over the long term, while the WQI indicates a consistent 'Fair' trend over the last 6 years. | ↓→ |
| *Athabasca River Water Quality* | Increasing concentrations of magnesium, sodium, dissolved aluminum, total selenium, dissolved iron, dissolved arsenic, and PAHs and PACs have reduced water quality. | ↓ |
| *Groundwater Quality & Quantity* | Information is limited. It is unclear if groundwater quality and quantity are issues. | ? |
| *Air Quality* | ITK and science indicate contaminants from industrial sources and forest fires have reduced air quality at certain times of the year. | ↓ |

| Valued Component | Current Trends and Stressors in the PAD | Trend Direction |
|---|---|---|
| ***Sufficient Water for Indigenous People to Navigate Safely in the Exercise of their Treaty & Aboriginal Rights*** | Winter water releases on the Peace River have resulted in reduced quality and quantity of ice, reducing or eliminating access to areas of the PAD in winter.<br>Lower water levels have reduced or eliminated access to the inland PAD lakes and back channels.<br>Flow rates on the Athabasca River are consistently below the ABF, below the AXF in early spring, and approaching the AXF in fall, preventing and/or limiting access to traditional lands during early spring and fall hunting season. |  |
| ***Indigenous Access and Enjoyment of the PAD*** | Decreased quality and quantity of fish, increased exposure to toxins and pathogens, films, and foams on water.<br>Inability to transfer knowledge and skills between generations |  |
| ***Wildlife Quantity and Habitat*** | Reduced water levels have caused drastic declines in muskrat populations.<br>Reduced water levels and increased invasive species have caused declines in bison populations.<br>Increased winter water releases have caused decreases in beaver and muskrat populations. |  |
| ***Migratory Bird Quantity, Quality and Habitat*** | Lowered water levels have reduced water bird habitat, causing water birds to shift their migratory patterns.<br>Increased mercury levels have been found in bird eggs, resulting in consumption advisories. |  |
| ***Vegetation Quantity and Quality*** | Lowered water levels have increased vegetation cover and invasive species, such as thistle and willows.<br>Lowered water levels have reduced availability of medicinal and food plants. |  |
| ***Fish Quantity, Quality and Habitat*** | Lowered water levels have reduced fish populations and habitat.<br>Water quality changes have produced malformations and abnormalities and increased contaminant levels in fish.<br>Increased mercury levels have been found in fish, resulting in consumption advisories.<br>Silting of PAD lakes has affected fish spawning. |  |

## Annex 7: Current stressors and trends in the PAD system (Table 3 of the Action Plan)

***Table 3 of the Action Plan**: 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: ↓*

## Annex 8: Pathway of Effects (Table 6-9 of the 2018 SEA report)

*Table 6-9: Pathways of Effects Identified in Chapter 4 and 5*

| Primary Pathway of Effect | Secondary Pathway of Effect | Receptor |
|---|---|---|
| Peace River Seasonal Flows | • Invasive species<br>• Changes in habitat and food availability for migratory waterfowl<br>• Changes in bison habitat from drying and fewer flooding events<br>• Ice jam and open water recharge<br>• PAD Water Quality | Great Plains Boreal Grasslands<br>Migratory waterfowl<br>Wolf-Bison Relationship<br>Indigenous people |
| Athabasca River Annual & Seasonal Flows | | |
| Groundwater Quality & Quantity in Athabasca Basin | | |
| Groundwater Quality & Quantity in Athabasca Basin | • PAD Water Quality<br>• Exposure to contaminants in water, food and sediments in the PAD of migratory waterfowl | Migratory waterfowl<br>Indigenous people |
| Air Quality | | |
| Athabasca River Water Quality | | |
| Fire suppression | | Great Plains Boreal Grasslands |
| Increased linear corridor density and habitat changes surrounding WBNP | | Wolf-Bison Relationship |
| Disease management and hunting outside WBNP | • Changes resulting from changes in other prey species populations | Wolf-Bison Relationship |
| Hydrological changes in karst/Whooping Crane nesting area | • Changes in habitat and food availability in nesting habitat for Whooping Crane | Karst<br>Whooping Crane |
| Short-term exposures to contaminants in local migratory habitat | | Migratory waterfowl<br>Whooping Crane |
| Changes to habitat and food availability in local migratory habitat | | Migratory waterfowl<br>Whooping Crane |
| Invasive species | | Great Plains Boreal Grasslands<br>Salt plains |
| Changes in local migration routes | | Migratory waterfowl |

## Annex 9: Threats to wood bison

Threat Assessment Table, in: Environment and Climate Change Canada. 2018. Recovery Strategy for the wood bison *(Bison bison athabascae)* in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada. Ottawa. p. 11-14.

| Threat # | Threat Description | Impact[a] | Scope[b] | Severity[c] | Timing[d] | Detailed Threats/Comments |
|---|---|---|---|---|---|---|
| **2** | **Agriculture & aquaculture** | **Low** | **Restricted** | **Slight** | **High** | |
| 2.1 | Annual & perennial non-timber crops | Low | Restricted | Slight | High | Herd expansion limited by agriculture. This threat is inferred. |
| 2.3 | Livestock farming & ranching | Low | Restricted | Slight | Moderate | Herd expansion limited by ranching; potential for bi-directional disease transfer (Threat 8.1). This threat is inferred. |
| **3** | **Energy production & mining** | **Low** | **Large** | **Slight** | **High** | |
| 3.1 | Oil & gas drilling | Low | Large | Slight | High | Direct mortality; disturbance at or near well sites. Other impacts (road construction, worker presence, pollution) are considered elsewhere. This threat has been observed. |
| 3.2 | Mining & quarrying | Low | Small | Extreme | Moderate | The Ronald Lake herd may be significantly impacted by the mine(s) proposed within their range. Mining also occurs in YT. This threat is inferred. |
| **4** | **Transportation & service corridors** | **Low** | **Large** | **Moderate-Slight** | **High** | |
| 4.1 | Roads & railroads | MediumLow | Large | Moderate - Slight | High | Many herds live along roads and road mortality is common in some herds. Roads also facilitate hunting, though hunting mortality is accounted for in Threat 5.1. This threat has been observed. |
| 4.3 | Shipping lanes | Low | Small | Slight | High | Barge traffic could lead to mortality for the Nahanni herd. This threat has been inferred. |

| 5 | Biological resource use | Medium | Pervasive | Moderate | High | |
|---|---|---|---|---|---|---|
| 5.1 | Hunting & collecting terrestrial animals | Medium | Pervasive | Moderate | High | 5.1.1 Intentional Use. Indigenous Traditional use and non-Indigenous hunting. Hunting occurs both legally and illegally; unregulated hunting is a risk. 5.1.3 Persecution/Control. Although required in the short-term to prevent disease transmission, the largest threat to bison expansion across the landscape are the strong control measures taken to prevent the spread of disease from the Wood Buffalo National Park region to disease-free herds and domestic ranched animals. This threat has been observed. |
| 5.3 | Logging & wood harvesting | Unknown | Restricted | Unknown | High | Clear-cutting may create new meadows and regenerate summer habitat, but these areas do not represent good winter habitat. Logging may increase forage quantity, but not quality. This threat is inferred. |

| 6 | Human intrusions & disturbance | Low | Restricted | Slight | High | |
|---|---|---|---|---|---|---|
| 6.3 | Work & other activities | Low | Restricted | Slight | High | Industrial activities are disruptive to animals and they generally avoid both helicopters and areas where ongoing work is occurring. This threat is inferred. |
| 7 | Natural system modifications | Low | Large | Slight | High | |
| 7.1 | Fire & fire suppression | Low | Large | Slight | High - Moderate | Fire suppression may limit grazing and meadows for calving. Fire itself naturally acts to maintain meadow habitat preferred by |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | wood bison, and prescribed burning is thought to improve bison habitat. Fires that burn too hot and too strong (often due to fire suppression over a long period or climate change) can cause direct mortality or starvation due to exclusion from a region until regrowth begins. This threat is inferred. |
| 7.2 | Dams & water management/use | Low | Large | Slight | High | The W.A.C. Bennett Dam on the Peace River, along with climate change, has resulted in hydrological changes in the Peace River system. Additional proposed dams may worsen these effects or impact other regions. This threat is observed. |
| **8** | **Invasive & other problematic species & genes** | **High-Medium** | **Large** | **Serious - Moderate** | **High** | |
| 8.1 | Invasive nonnative/alien species | Medium-Low | Large | Moderate - Slight | High | Brucellosis and bovine tuberculosis are cattle-derived diseases in the Wood Buffalo National Park (WBNP) metapopulation (~50% of the species). Presence of both of these diseases appears to increase depredation by wolves. Significant population control measures are implemented outside WBNP to stop the spread of these diseases (Threat 5.1.3). (scope=Large; Severity=Slight) Invasive thistle species in Wood Buffalo National Park exclude bison from previously high quality range, as they cannot forage in these areas and avoid walking through them. (scope=Large; Severity=Slight) |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | Reclamation seed mixes on well sites and other disturbed locations can result in the introduction and spread of non-native plant species, as can vehicle traffic. The impact of non-native plants on bison is unknown, but they can alter movement patterns by being more or less palatable to the species (scope=Large; Severity=Slight). This threat is inferred. |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8.2 | Problematic native species | High-Low | Pervasive | Serious - Slight | Moderate | Anthrax bacteria affects bison as lethal infection outbreaks. Outbreak timing and extent are unpredictable. (scope=Pervasive; Severity=Serious) Threat of predation by wolves appears to be rising. (scope=Pervasive; Severity=Slight). This threat has been observed. |
| 8.3 | Introduced genetic material | Low | Large - Restricted | Slight | Moderate - Low | Hybridization can produce less fit animals that are less likely to successfully breed and/or survive in their environments. Hybridization with cattle, domestic, or Plains Bison will likely lead to human-mediated culls at a large scale to prevent further spread of genes(Threat 5.1.3). This threat is suspected. |
| **9** | **Pollution** | **Unknown** | **Large** | **Unknown** | **High** | |
| 9.2 | Industrial & military effluents | Unknown | Large | Unknown | High | Water systems surrounding and downstream from oil exploration sites contain higher levels of pollutants than normal. Direct mortality and/or cumulative negative |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | health effects are possible. Oil and other spills can exclude bison from a region. Bison have been observed licking or rolling in industrial effluents. This threat is suspected. |
| 9.5 | Airbourne pollutants | Unknown | Restricted | Unknown | High | Air pollution has been reported from oil and gas development, particularly in the Fort McMurray, AB, region. Road construction, land-clearing, and mining increase airbourne particulates, and the oil and gas extraction process produces airbourne chemicals. Direct impacts remain unknown, although cumulative health effects are possible. This threat is suspected. |
| 9.6 | Excess energy | Unknown | Restricted | Unknown | High | Winter drilling noise and/or lights have altered behaviour patterns. This threat has been observerd. |
| **11** | **Climate change & severe weather** | **High-Low** | **Pervasive** | **SeriousSlight** | **High-Moderate** | |
| 11.1 | Habitat shifting & alteration | Not calculated | Pervasive | Serious - Slight | Unknown | Climate change-induced habitat shifts will likely lead to drying events, more severe climate fluctuations, increased fire, and shifting forage availability. The impact of these factors is unknown. This threat is inferred. |
| 11.2 | Droughts | Low | Large | Slight | High | Wood Buffalo National Park's Peace-Athabasca Delta region has been in a drying period for decades as a result of climate change and the construction of the W.A.C. Bennett dam. As a result, vegetation is shifting, including increased spread of invasive thistle. The drought conditions reduce forage, leading |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | to some mortality due to starvation.<br>This threat has been observed. |
| **Threat #** | **Threat Description** | **Impact[a]** | **Scope[b]** | **Severity[c]** | **Timing[d]** | **Detailed Threats/Comments** |
| 11.3 | Temperature extremes | MediumLow | Pervasive | Moderate - Slight | Moderate - Low | Harsh winter conditions that reduce foraging ability (i.e., heavy snow/ice) have been linked to large reductions in population size.<br>This threat has been observed. |
| 11.4 | Storms & flooding | Medium | Large | Moderate | Moderate | Flooding events have impacted >25% of Mackenzie animals in the past. Major floods can lead to up to 50% herd mortality. This threat has been observed. |
| **12** | **Other threats** | | **Pervasive** | **Slight** | **Low** | |
| 12.1 | Loss of genetic diversity | Not calculated | Pervasive | Slight | Low | The entire species was reduced to ~200 animals, and all reintroduced herds have experienced further founder effects. Thus, the species is at a higher risk of inbreeding effects than normal.<br>This threat is suspected. |

[a] **Impact** – The degree to which a species is observed, inferred, or suspected to be directly or indirectly threatened in the area of interest. The impact of each threat is based on Severity and Scope rating and considers only present and future threats. Threat impact reflects a reduction of a species population or decline/degradation of the area of an ecosystem. The median rate of population reduction or area decline for each combination of scope and severity corresponds to the following classes of threat impact: Very High (75% declines), High (40%), Medium (15%), and Low (3%). Unknown: used when impact cannot be determined (e.g., if values for either scope or severity are unknown); Not Calculated: impact not calculated as threat is outside the assessment timeframe (e.g., timing is insignificant/negligible or low as threat is only considered to be in the past); Negligible: when scope or severity is negligible; Not a Threat: when severity is scored as neutral or potential benefit.

[b] **Scope** – Proportion of the species that can reasonably be expected to be affected by the threat within 10 years. Usually measured as a proportion of the species' population in the area of interest. (Pervasive = 71–100%; Large = 31–70%; Restricted = 11–30%; Small = 1–10%; Negligible < 1%).

[c] **Severity** − Within the scope, the level of damage to the species from the threat that can reasonably be expected to be affected by the threat within a 10-year or three-generation timeframe. Usually measured as the degree of reduction of the species' population. (Extreme = 71–100%; Serious = 31–70%; Moderate = 11–30%; Slight = 1–10%; Negligible < 1%; Neutral or Potential Benefit ≥ 0%).

[d] **Timing** – High = continuing; Moderate = only in the future (could happen in the short term [< 10 years or 3 generations]) or now suspended (could come back in the short term); Low = only in the future (could happen in the long term) or now suspended (could come back in the long term); Insignificant/Negligible = only in the past and unlikely to return, or no direct effect but limiting

**Annex 10: Composition of mission team**

Guy Debonnet, Head of Natural Heritage Unit, UNESCO World Heritage Centre
Stefanie Grüssinger, Junior Professional Officer, UNESCO World Heritage Centre
Stephen Davis, IUCN consultant

**Annex 11: List of people met**

| Name | Job title/position | Organisation/institution |
|---|---|---|
| Christine Loth-Bown | Vice President, International Affairs & Cultural Heritage | Parks Canada Agency |
| Patricia Kell | Executive Director, Cultural Heritage | Parks Canada Agency |
| Rhona Kindopp | Site Superintendant, Wood Buffalo National Park | Parks Canada Agency |
| Cameron Zimmer | Negotiations Manager, International Affairs & Cultural Heritage | Parks Canada Agency |
| Ifan Thomas | Director, Wood Buffalo Action plan, Operations | Parks Canada Agency |
| Laurie Wein | Senior Project Manager, Wood Buffalo Action Plan, Operation | Parks Canada Agency |
| Paul Zorn | Science Lead, Wood Buffalo Action Plan, Protected Areas Establishment & Conservation | Parks Canada Agency |
| Todd Shury | Manager, Wildlife Health & Management, Protected Areas Establishment & Conservation | Parks Canada Agency |
| Nicholas Irving | A/FUS Southwest NWT Field Unit | Parks Canada Agency |
| | | |
| Nadine Stiller | Associate Regional Director, Strategic Policy, West and North | Environment and Climate Change Canada |
| Daniel Peters | Research Scientist, Watershed Hydrology and Ecology Division, Water Science & Technology | Environment and Climate Change Canada |
| Mark McMaster | Research Scientist, Aquatic Contaminants Research Division, Water Science & Technology | Environment and Climate Change Canada |
| Jean-Francois Bibeault (TBC) | Director, Aquatict Contaminants Research Division, Water Science & Technology | Environment and Climate Change Canada |
| Lorie Cummings | Manager, Manager, Mining and Processing Division, | Environment and Climate Change Canada |
| Sean Kearnan- Carbonneau | Program Scientist, Mining and Processing, | Environment and Climate Change Canada |

| | | |
|---|---|---|
| | Environmental Protection Branch | |
| Daniel Smith | Regional Director, Environmental Law Enforcement | Environment and Climate Change Canada |
| | | |
| Jamie Curran | ADM, Strategy and Governance Division | Alberta Environment and Protected Areas |
| Scott Duguid | Executive Director, Indigenous Initiatives, Consultation and Collaboration | Alberta Environment and Protected Areas |
| Angela Rideout | Consultation and Engagement Advisor | Alberta Environment and Protected Areas |
| Steve Wallace | Director of Water Quality Policy | Alberta Environment and Protected Areas |
| Troy Hegel | Wildlife Recovery Biologist | Alberta Environment and Protected Areas |
| | | |
| Heather Matthews | Director, Generation System Operations | BC Hydro |
| Bruce Mattock | Resource Planning Specialist | BC Hydro |
| | | |
| Tony Vermillion | Superintendent, South Slave Region | Government of Northwest Territories |
| Annie Lavesseur | Water Management Advisor | Government of Northwest Territories |
| Kevin Smith | | Government of Northwest Territories |
| | | |
| Melody Lepine | Director, Government & Industry Relations | Mikisew Cree First Nation |
| Mark Gustafson | Legal Counsel | Mikisew Cree First Nation |
| Carl Braun | Manager, Government Relations | Mikisew Cree First Nation |
| Bruce MacLean | Technical Advisor | Mikisew Cree First Nation |
| Martin Carver | Technical Advisor | Mikisew Cree First Nation |
| Monique Dube | Technical Advisor | Mikisew Cree First Nation |
| Caroline Bampfylde | Technical Advisor | Mikisew Cree First Nation |
| Terry Marten | Community Member | Mikisew Cree First Nation |
| Alice Martin | Community Member | Mikisew Cree First Nation |
| Mathew Lepine | Community Member | Mikisew Cree First Nation |
| Joe Gibot | Community Member | Mikisew Cree First Nation |
| Jocelyn Marten | Community Member | Mikisew Cree First Nation |
| Ronnie Campbell | Community Member | Mikisew Cree First Nation |
| Archie Antoine | Community Member | Mikisew Cree First Nation |

| | | |
|---|---|---|
| George Pichet | Community Member | Mikisew Cree First Nation |
| Kevin Marten | Community Member | Mikisew Cree First Nation |
| Lorne Antoine | Community Member | Mikisew Cree First Nation |
| Danny Mercredi | Community Member | Mikisew Cree First Nation |
| Gerald Gibot | Community Member | Mikisew Cree First Nation |
| Larry Marten | Community Member | Mikisew Cree First Nation |
| George Marten | Community Member | Mikisew Cree First Nation |
| | | |
| Allan Adam | Chief | |
| Lori Cyprien | Manager, Rights and Lands | Athabasca Chipewyan First Nation |
| Morgan Voyageur | CBM Guardian Coordinator | Athabasca Chipewyan First Nation |
| Brian Fung | Manager, Government Relations | Athabasca Chipewyan First Nation |
| Jay Telegdi | Manager, Government Relations | Athabasca Chipewyan First Nation |
| Leslie Wiltzen | Cooperative Committee representative | Athabasca Chipewyan First Nation |
| Leslie Laviolette | Community Member | Athabasca Chipewyan First Nation |
| Alice Rigney | Community Member | Athabasca Chipewyan First Nation |
| Horace Adam | Community Member | Athabasca Chipewyan First Nation |
| | | |
| Carmen Wells | Lands and Regulatory Manager | Fort Chipewyan Métis Association |
| Kendrick Cardinal | President | Fort Chipewyan Métis Association |
| Jumbo Fraser | Community member | Fort Chipewyan Métis Association |
| Bethany Thacker | Community member | Fort Chipewyan Métis Association |
| Ruby Ladouceur | Community member | Fort Chipewyan Métis Association |
| Braden Elingson | Community member | Fort Chipewyan Métis Association |
| Mike Cardinal | Community member | Fort Chipewyan Métis Association |
| Curtis Girard | Community member | Fort Chipewyan Métis Association |
| Larry Paquette | Community member | Fort Chipewyan Métis Association |
| Sarah Loutitt | Community member | Fort Chipewyan Métis Association |
| Caroline Poder | Community member | Fort Chipewyan Métis Association |
| Marina Stewart | Community member | Fort Chipewyan Métis Association |
| | | |

| | | |
|---|---|---|
| Patrick Simon | Cooperative Management Committee representative | Deninu K'ue First Nation |
| Kevin Boucher | Cooperative Management Committee representative | Deninu K'ue First Nation |
| | | |
| Thaidene Paulette | Chief | Smith's Landing First Nation |
| Becky Kostka | Lands Manager/Cooperative Management Committee representative | Smith's Landing First Nation |
| Sarah Cook | Consultant | Smith's Landing First Nation |
| Christina Trottier | Consultant | Smith's Landing First Nation |
| Mandy Olsgard | Consultant | Smith's Landing First Nation |
| Cochise Paulette | Community member | Smith's Landing First Nation |
| Francois Paulette | Community member | Smith's Landing First Nation |
| | | |
| Garry Bailey | President | Northwest Territory Métis Nation |
| Ron Yaworsky | Technical Advisor | Northwest Territory Métis Nation |
| | | |
| Allan Heron | President and Cooperative Management Committee representative | Fort Smith Métis Council |
| Betty Villebrun | Vice President and Cooperative Management Committee representative | Fort Smith Métis Council |
| | | |
| Arthur Beck | President | Fort Resolution Métis Government |
| | | |
| Andy Cardinal | Lands Manager | K'atl'odeeche First Nation First Nation |
| Peter Redvers | Director | K'atl'odeeche First Nation First Nation |
| Peter Sabourin | Community member | K'atl'odeeche First Nation First Nation |
| | | |
| Jim Webb | Technical Advisor | Little Red River Cree First Nation |
| | | |
| Kecia Kerr | Director | Canadian Parks and Wilderness Association - Northern Alberta |
| Gillian Chow-Fraser | Manager | Canadian Parks and Wilderness Association - Northern Alberta |
| Carolyn Campbell | Conservation Specialist | Alberta Wilderness Association |
| Adam Norris | | Mighty Peace Watershed Alliance |

| | | |
|---|---|---|
| Jim Webb | Board member | Mighty Peace Watershed Alliance |

## Annex 12: Photographs taken during the mission

*Image 2: Herd of bison. WBNP Flightseeing Tour on 24 August 2022 organized by PCA. © UNESCO/Stephen Davis.*

*Image 3: Lakes and wetlands of the PAD. WBNP Flightseeing Tour on 24 August 2022 organized by PCA. © UNESCO/Stephen Davis.*

*Image 4: Pine Lake. WBNP Flightseeing Tour on 24 August 2022 organized by PCA. © UNESCO/Stephen Davis.*

*Image 5: Salt plains. WBNP Flightseeing Tour on 24 August 2022 organized by PCA. © UNESCO/Stephen Davis.*

*Image 6: Visit at the salt plains, evening of 24 August 2022. © UNESCO/Stefanie Grüssinger.*

*Image 7: PAD Field Trip on 20 August 2022 organized by indigenous rightsholders, break at the cabins. © UNESCO/Stefanie Grüssinger.*

*Image 8: Slave River Tour on 22 August 2022 organized by indigenous rightsholders, on our way from Fort Chipewyan to Fort Fitzgerald. © UNESCO/Stefanie Grüssinger.*

*Image 9: Slave River Tour on 22 August 2022 organized by indigenous rightsholders, visit and lunch at Hay Camp. © UNESCO/Stefanie Grüssinger.*

*Image 10: PAD Field Trip on 20 August 2022 organized by indigenous rightsholders, leaving Fort Chipewyan in several boats. © UNESCO/Stefanie Grüssinger.*

*Image 11: Slave River. WBNP Flightseeing Tour on 24 August 2022 organized by PCA. © UNESCO/Stephen Davis.*

*Image 12: Sinkholes. WBNP Flightseeing Tour on 24 August 2022 organized by PCA.*
*© UNESCO/Stephen Davis.*

**Annex 13: List of key documents which have informed the mission**

**Nomination document:**

| | |
|---|---|
| 1983 | Nomination file 256 (4 MB) |

**World Heritage Committee Decisions:**

| | |
|---|---|
| 2021 | 44COM 7B.190 - Wood Buffalo National Park (Canada) (N 256) |
| 2019 | 43COM 7B.15 - Wood Buffalo National Park (Canada) (N 256) |
| 2017 | 41COM 7B.2 - Wood Buffalo National Park (Canada) (N 256) |
| 2015 | 39COM 7B.18 - Wood Buffalo National Park (Canada) (N 256) |
| 2015 | 39COM 8E - Adoption of Retrospective Statements of Outstanding Universal Value |
| 2006 | 30COM 11B - Follow-up to the Periodic Report for North America / Adoption of Statements of Significance |
| 2004 | 28COM 15B.25 - Wood Buffalo National Park |
| 2003 | 27COM 7B.17 - Wood Buffalo National Park (Canada) |
| 2002 | 26COM 21B.4 - Wood Buffalo National Park (Canada) |
| 2000 | 24COM X - Changes to names of properties inscribed on the World Heritage List |
| 1992 | 16COM VIII.12 - State of Conservation of 3 Properties and Revised Boundaries of Dinosaur Provincial Park (Canada) |
| 1992 | 16BUR V.17 - Wood Buffalo National Park (Canada) |
| 1991 | 15COM VIII - SOC: Wood Buffalo National Park (Canada) |
| 1991 | 15BUR VI.31-34 - Wood Buffalo National Park (Canada) |
| 1990 | 14COM IX - SOC: Wood Buffalo National Park (Canada) |
| 1989 | 13COM VIII.16 - SOC: Wood Buffalo National Park (Canada) |
| 1989 | 13BUR IVB.12 - State of conservation of other natural properties |
| 1985 | 09COM XIIIC - SOC: Wood Buffalo National Park (Canada) |
| 1983 | Report of the 7th Session of the Committee |
| 1983 | 07COM VIII.29 - Nominations to the World Heritage List (inscribed sites) |
| 1983 | 07COM VIII - Inscription: Wood Buffalo National Park (Canada) |

**Management Plans:**

| | |
|---|---|
| 2010 | 2010 Wood Buffalo National Park of Canada Management Plan |

**Mission reports:**

| | |
|---|---|
| 2016 | Report of the joint WHC/IUCN Reactive Monitoring mission to Wood Buffalo National Park, Canada 25 September - 4 October 2016 |

**State of Conservation reports by the State Party:**

| | |
|---|---|
| 2022 | State of conservation report by the State Party / Rapport de l'Etat partie sur l'état de conservation |
| 2020 | State of conservation report by the State Party / Rapport de l'Etat partie sur l'état de conservation |
| 2018 | State of conservation report by the State Party / Rapport de l'Etat partie sur l'état de conservation |
| 2018 | State of conservation report by the State Party / Rapport de l'Etat partie sur l'état de conservation |
| 2017 | State of conservation report by the State Party / Rapport de l'Etat partie sur l'état de conservation |

| | |
|---|---|
| 2015 | State of conservation report by the State Party / Rapport de l'Etat partie sur l'état de conservation |

**State of Conservation reports prepared by the World Heritage Centre and the Advisory Bodies:**

| | |
|---|---|
| 2021 | State of conservation reports |
| 2019 | State of conservation reports |
| 2017 | State of conservation reports |
| 2015 | State of conservation reports |
| 2004 | State of conservation reports |
| 2003 | State of conservation reports |
| 2002 | State of conservation reports |
| 1992 | State of conservation reports |
| 1991 | State of conservation reports |
| 1990 | State of conservation reports |
| 1989 | State of conservation reports |
| 1985 | State of conservation reports |

**Literature Cited**


Arciszewski, T.J., R.R.O. Hazelwinkel, and M.G. Dubé. 2021. A critical review of the ecological status of lakes and rivers from Canada's oil sands region. *Integrated Environmental Assessment and Management*. 18(2):361-387.

Arens, C.J., J.C. Arens, N.S. Hogan, R.J. Kavanagh, F. Berrue, G.J. Van Der Kraak, and M.R. van den Heuvel. 2017. Population impacts in white sucker (Catostomus commersonii) exposed to oil sands-derived contaminants in the Athabasca River. *Environmental Toxicology and Chemistry*. 36(8):2058–2067. https://doi.org/10.1002/etc.3735

Arthington, A.H., A. Bhaduri, S.E. Bunn, S.E. Jackson, R.E. Tharme, D. Tickner, B. Young, M. Acreman, N. Baker, S. Capon, A.C. Horne, E. Kendy, M.E. McClain, N. LeRoy Poff, B.D. Richter, and S.Ward. 2018. The Brisbane Declaration and Global Action Agenda on Environmental Flows. *Frontiers in Environmental Science*. doi: 10.3389/fenvs.2018.00045

Beltaos, S., T. Prowse, B. Bonsal, R. MacKay, L. Romolo, A. Pietroniro, and B. Toth. 2006. Climatic effects on ice-jam flooding of the Peace-Athabasca Delta. *Hydrological Processes*. 20(19):4031-4050.

Cronmiller, J.G. and B.F. Noble. 2019. The discontinuity of environmental effects monitoring in the Lower Athabasca region of Alberta, Canada: Institutional challenges to long-term monitoring and cumulative effects management. *Environmental Reviews*. 26(2):169–180.

Dubé, M.G., J.M. Dunlop, C. Davidson, D.L. Beausoleil, R.R.O. Hazelwinkel, and F. Wyatt. 2021. History, overview, and governance of environmental monitoring in the soil sands region of Alberta, Canada. *Integrated Environmental Assessment and Management*. 18(2):319-332.
Fennell, J. and T.J. Arciszewski. 2019. Current knowledge of seepage from oil sands tailings ponds and its environmental influence in northeastern Alberta. Science of the Total Environment. 686:968-985. https://doi.org/10.1016/j.scitotenv.2019.05.407

Klemt, W.H., M.L. Kay, J.A. Wiklund, B.B. Wolfe, and R.I. Hall. 2020. Assessment of vanadium and nickel enrichment in Lower Athabasca River floodplain lake sediment within the

Athabasca Oil Sands Region (Canada). *Environmental Pollution*. https://doi.org/10.1016/j.envpol.2020.114920

LeRoy Poff, N., B.D. Richter, A.H. Arthington, S.E. Bunn, R.J. Naiman, E. Kendy, M. Acreman, C. Apse, B.P. Bledsoe, M.C. Freeman, J. Henriksen, R.B. Jacobson, J.G. Kennen, D.M. Merritt, J.H. O'Keefe, J.D. Olden, K. Rogers, R.E. Tharme, and A. Warner. 2010. The ecological limits of hydrologic alteration (ELOHA): a new framework for developing regional environmental flow standards. *Freshwater Biology*. 55:147-170.

Maclean, B., Bampfylde, C. J., Lepine, M., & Tssessaze, L. 2021. Towards a Rights-Based Ice Monitoring Trigger. CGU HS Committee on River Ice Processes and the Environment - 21st Workshop on the Hydraulics of Ice Covered Rivers; Saskatoon, Saskatchewan, Canada, August 29 - September 01, 2021.

NHC (Northwest Hydrologic Consultants). 2020a. Rivière des Rochers and Revillon Coupé Weir structures survey. NHC Ref. No. 1005092. 73 pages.

NHC (Northwest Hydrologic Consultants). 2020b. Feasibility plan for water control structure at Dog Camp. NHC Ref. No. 1005166. 108 pages.

NHC (Northwest Hydrologic Consultants). 2020c. Feasibility plan for removable control structures in the Peace-Athabasca Delta: Big Egg Lake water control structure. NHC Ref. No. 1005166. 90 pages.

Peters, D.L., T.D. Prowse, P. Marsh, P.M. Lefleur, and J.M. Buttle. 2006. Persistence of water within the perched basins of the Peace-Athabasca Delta, Northern Canada. *Wetlands Ecology and Management*. 14:221-243.

Prowse, T.D., S. Beltaos, J.T. Gardner, J.J. Gibson, R.J. Granger, R. Leconte, D.L. Peters, A. Pietroniro, L.A. Romolo, and B. Toth. 2006. Climate change, flow regulation and land-use effects on the hydrology of the Peace-Athabasca-Slave System; Findings from the Northern Rivers Ecosystem Initiative. *Environmental Monitoring and Assessment*. 113:167-197.

Shaheen, S.M., D.S. Alessi, F.M.G. Tack, Y.S. Ok, K.H. Kim, J.P. Gustafsson, D.L. Sparks, and J. Rinklebe. 2019. Redox chemistry of vanadium in soils and sediments: Interactions with colloidal materials, mobilization, speciation, and relevant environmental implications – A review. Advances in Colloid and Interface Science. https://doi.org/10.1016/j.cis.2019.01.002

Shaheen, S.M., J. Rinklebe, T. Frohne, J.R. White, and R.D. DeLaune. 2016. Redox effects on release kinetics of arsenic, cadmium, cobalt, and vanadium in Wax Lake Deltaic freshwater marsh soils. 150:740-748. http://dx.doi.org/10.1016/j.chemosphere.2015.12.043

Telfeyan, K., A. Breaux, J. Kim, J.E. Cable, A.S. Kolker, D.A. Grimm, K.H. Johannesson. 2017. Arsenic, vanadium, iron, and manganese biogeochemistry in a deltaic wetland, southern Louisiana. Marine Chemistry. http://dx.doi.org/10.1016/j.marchem.2017.03.010

**List of documents received from the State Party and third parties in the framework of the Advisory mission to Wood Buffalo National Park**

| Title | Author | Date |
|---|---|---|
| Lower Athabasca Regional Plan 2012-2022 | Alberta Environment and Parks (now Alberta Environment and Protected Areas) | August 2012 |

| | | |
|---|---|---|
| Lower Athabasca Region: Tailings Management Framework for the Mineable Athabasca Oil Sands | Alberta Environment and Parks (now Alberta Environment and Protected Areas) | March 2015 |
| A compendium of work plans to fill information gaps to inform the development of regulatory guidance documents for the safe release of treated oil sands mine waters to the Lower Athabasca River | Alberta Environment and Parks (now Alberta Environment and Protected Areas) | January 2022 |
| Proposed Amendments To The Lower Athabasca Regional Plan | Athabasca Region First Nations | 26 January 2018 |
| The Downstream Impacts of Hydropower Dams and Indigenous and Local Knowledge: Examples from the Peace–Athabasca, Mekong, and Amazon | Baird, I.G. et al. | January 2021 |
| Past variation in Lower Peace River ice-jam flood frequency | Brent B. Wolfe et al. | 2019 |
| Summary of recent Community Based Monitoring findings and assessments relating to the health of the Peace Athabasca Delta and the Wood Buffalo National Park Action Plan. 2022 Update from Fort Chipewyan Community Based Monitoring Programs for the Joint World Heritage Centre/IUCN Reactive Monitoring Mission to Wood Buffalo National Park, Canada | Bruce Maclean, Caroline Bampfylde | 2022 |
| 2022 Update from Fort Chipewyan Community Based Monitoring Programs for the Joint World Heritage Centre/IUCN Reactive Monitoring Mission to Wood Buffalo National Park, Canada | Bruce Maclean, Caroline Bampfylde | August 2022 |
| Towards a Rights-Based Ice Monitoring Trigger | Bruce Maclean et al. | September 2021 |
| Expert and Joint Letters | Canadian Parks and Wilderness Society, the Environmental Law Centre, and other NGOs | |
| Environmental Flows and Hydrology Case Studies: Applying Structured Decision Making to the Wood Buffalo National Park Action Plan | Compass Resource Management Ltd. | 26 March 2021 |
| Essential components and pathways for developing Indigenous community-based monitoring: Examples from the Canadian oil sands region | Danielle Beausoleil, Kelly Munkittrick, Monique G. Dubé, and Faye Wyatt | June 2021 |
| A synthetic review of terrestrial biological research from the Alberta oil sands region: 10 years of published literature | David R. Roberts et al. | September 2021 |
| An integrated knowledge synthesis of regional ambient monitoring in Canada's oil sands | David R. Roberts et al. | July 2021 |
| A synthetic review of terrestrial biological research from the Alberta oil sands region: 10 years of published literature | David R. Roberts, Monique G. Dubé et al. | 2022 |
| Human-caused ecological Changes and Threats to the Peace Athabasca Delta and Wood Buffalo National Park | David W Schindler | May 2015 |

| | | |
|---|---|---|
| Conservation Agreement For The Wabasca And Ronald Lake Bison Herds: In Support Of Wood Bison Recovery In Alberta | ECCC, PCA, Alberta (representing Her Majesty the Queen) | 26 April 2021 |
| Request for an Inquiry into Regulatory Negligence: Canada's Failure to Control Elk Valley Coal Mine Pollution | ELC Clinic | July 2021 |
| Series on Tailings Threats to Wood Buffalo National Park: Overview of reports prepared to assist the 2022 joint WHC/IUCN Reactive Monitoring Mission to Wood Buffalo National Park | Endeavour Scientific Inc. | 12 Aug 2022 |
| Recovery Strategy for the Wood Bison (Bison bison athabascae) in Canada | Environment and Climate Change Canada | 2018 |
| Cleaning up Tar Sands Tailings Ponds: Selected Precedents for Optimal Regulation and Indigenous Co-Governance | Environmental Law Centre | May 2022 |
| A decadal synthesis of atmospheric emissions, ambient air quality, and deposition in the oil sands region | Erin C. Horb et al. | October 2021 |
| Strategic Environmental Assessment of Wood Buffalo National Park World Heritage Site | Independent Environmental Consultants | 30 May 2018 |
| Towards a unified study of multiple stressors: divisions and common goals across research disciplines | James A. Orr, Rolf D. Vinebrooke, Michelle C. Jackson et al. | 2020 |
| Review Panel Report 2015 Lower Athabasca Regional Plan | Jeff Gilmour (Review Panel) | |
| Mercury Levels in Gull and Tern Eggs | Jenna Rabley | July 2022 |
| Muskrat Abundance | Jenna Rabley | July 2022 |
| Synthesis Report for the Water Component, Canada-Alberta Joint Oil Sands Monitoring: Key Findings and Recommendations | Joseph M. Culp, Ian G. Droppo and Peter D. di Cenzo | 2018 |
| Population trends for dabbling waterfowl in the Peace-Athabasca Delta | Kevin Hawkshaw | July 2022 |
| Population trends for diving waterfowl in the Peace-Athabasca Delta | Kevin Hawkshaw | July 2022 |
| Occupancy trends for marsh birds in the Peace-Athabasca Delta | Kevin Hawkshaw | July 2022 |
| Population trends for bison in Wood Buffalo National Park | Kevin Hawkshaw | July 2022 |
| Discussion of "Frequency of ice-jam flooding of Peace-Athabasca Delta" | Kevin Timoney, Jared D. Smith, Jonathan R. Lamontagne, and Martin Jasek | 2019 |
| Continued Decline in the Hydrologic Prospects of Peace-Athabasca Delta and the Outstanding Universal Value of Wood Buffalo National Park | Martin Carver (Aqua Environmental Associates) | 16 Aug 2022 |
| How the Regulatory Regime is Bringing about Declining Water Levels in the Peace-Athabasca Delta and Degrading the Outstanding Universal Value of Wood Buffalo National Park | Martin Carver (Aqua Environmental Associates) for Mikisew Cree First Nation | July 2016 |

| | | |
|---|---|---|
| Community-Based Monitoring of Water Depth in and around the Peace-Athabasca Delta: Ten-Year Review | Martin Carver, Bruce Maclean | 26 July 2022 |
| Death of a Delta: Negative impacts of hydropower projects on Canada's largest World Heritage Site (In: Heritage Dammed: Water Infrastructure Impacts on World Heritage Sites and Free Flowing Rivers by Rivers without Boundaries, World Heritage Watch, WFN) | Mikisew Cree First Nation | June 2019 |
| World Heritage Watch Report 2021: Canada's "Call to Action" for Wood Buffalo National Park has not Fully Materialized | Mikisew Cree First Nation | 2021 |
| Water Is Still Everything: A 2022 Update on Mikisew Cree Understandings Of The Outstanding Universal Value Of Wood Buffalo National Park | Mikisew Cree First Nation | August 2022 |
| Water is everything: an indigenous understanding of the outstanding Universal value of wood buffalo national park | Mikisew Cree First Nation | May 2016 |
| Feasibility Plan for Removeable Control Structures In The Peace-Athabasca Delta Big Egg Lake Water Control Structure | Michael Brayall | 27 February 2020 |
| Mikisew Cree Information Package: Community briefing notes, commentary, and presentation slides on tailings, water management, land use, cumulative effects, Action Plan Progress Reviews, and Indigenous Knowledge | Mikisew Cree First Nation | |
| Paleolimnological evaluation of metal(loid) enrichment from oil sands and gold mining operations in northwestern Canada | Mitchell L. Kay, Izabela Jasiak, Wynona H. Klemt et al. | 2022 |
| History, overview, and governance of environmental monitoring in the oil sands region of Alberta, Canada | Monique G. Dubé et al. | June 2021 |
| Political dynamics and governance of World Heritage ecosystems | Morrison, TH; Adger, WN; Brown, K; et al. | 14 October 2020 |
| Lake Ice Phenology | Nicolas Comerford | June 2022 |
| River Discharge Status | Nicolas Comerford | July 2022 |
| Parks Canada Presentation Slides Day 1 – 9 | Parks Canada | |
| Action Plan WBNP WHS | Parks Canada | 2019 |
| Wood Buffalo National Park of Canada Management Plan | Parks Canada | 2010 |
| Fort Chipewyan Air Quality | Paul Giroux | June 2022 |
| Fort Chipewyan Primary Climate Variables | Paul Giroux | June 2022 |
| Lake Athabasca Water Level | Paul Giroux | June 2022 |
| Peace Athabasca Delta Surface Water Area | Paul Giroux & Andrew Newall | July 2022 |
| Forest Fire Disturbance | Philip Wilson and Claude Samson | July 2022 |
| Plant Productivity and Growing Season Change: WBNP Forests | Philip Wilson and Claude Samson | July 2022 |
| Plant Productivity and Growing Season Change: Peace Athabasca Delta | Philip Wilson and Claude Samson | July 2022 |
| Feasibility Plan For Water Control Structure At Dog Camp | Robyn Andrishak | 27 February 2020 |

| | | |
|---|---|---|
| Rivière Des Rochers And Revillon Coupé Weir Structures Survey | Robyn Andrishak | 09 March 2020 |
| Water Quality Summary | Sarah Yuckin | July 2022 |
| Reply to discussions by Timoney et al. (2018) and Hall et al. (2018) on “Frequency of ice-jam flooding of Peace-Athabasca Delta” | Spyros Beltaos | 2019 |
| Frequency of ice-jam flooding of Peace-Athabasca Delta | Spyros Beltaos | 2018 |
| Commentary on “Past variation in Lower Peace River ice-jam flood frequency” by Wolfe et al. (2020) | Spyros Beltaos and Daniel L. Peters | 2020 |
| A critical review of the ecological status of lakes and rivers from Canada's oil sands region | Tim J. Arciszewski et al. | September 2021 |
| Report of the Auditor General | W. Doug Wylie | June 2021 |
| Drying drives decline in muskrat population in the Peace-Athabasca Delta, Canada | Ward, E. M. and Gorelick, S.M. | 2018 |